## Revision Schedule

**Corby Borough Level 1 Strategic Flood Risk Assessment**

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<td>Draft SFRA Level 1 Main Report</td>
<td>Josie Bateman and Aiden Grist</td>
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<td>Draft SFRA Level 1 Main Report version 2 following partner consultation</td>
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Executive Summary

A Level 1 Strategic Flood Risk Assessment (SFRA) (Data Collection and Evaluation) was produced in March 2004 by Corby Borough Council (CBC) to ensure compliance with Planning Policy Guidance (PPG) 25: Development and Flood Risk. The stage 2 report was completed in August 2006 and updated again in 2011 to ensure compliance with Planning Policy Statement (PPS) 25: Development and Flood Risk.

PPS25 has since been replaced by the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance. There have also been a number of legislative and procedural changes, alongside updates to a number of flood and water data sets, modelling and mapping layers, as well as the update of the North Northamptonshire Joint Core Strategy (JCS) and the commencement of CBC’s Part 2 Local Plan. These changes need to be reflected within the SFRA, to ensure that a sound flood and water management evidence base is available to support the plan-making process for development. In light of these changes, in December 2017 CBC commissioned Northamptonshire County Council (NCC) to prepare an updated Level 1 SFRA to satisfy the requirements of the NPPF.

The NPPF states that an SFRA is required to assess the risk to an area from flooding from all sources, now and in the future, taking account of the impacts of climate change, and to assess the impact that land use changes and development in the area will have on flood risk.

The NPPF requires Local Planning Authorities (LPAs) to review the variation in flood risk across their area, and to steer all development towards areas with the lowest probability of flooding from any source. Where there are no reasonably available sites and this cannot be achieved, the NPPF requires the LPA to demonstrate that there are sustainable mitigation solutions available that will ensure that the flood risk can be managed now and over the lifetime of the development should flooding occur.

Corby Borough has undergone significant expansion historically and in recent years, with more growth still planned. This Level 1 SFRA update has considered all sources of flood risk based on information obtained through consultation with all Risk Management Authorities (RMAs) as specified within the NPPF. The assessment is compliant with the NPPF and will continue to inform all future land allocation and flood risk management needs within the Borough of Corby.

A significant number of studies and strategies have previously reviewed the level of flood risk in the Borough, including the North Northamptonshire Flood Risk Management Study 2007, North Northamptonshire Flood Risk Management Study Update 2012, Corby Borough Council Level 1 SFRA 2004, Corby Borough Council Level 2 SFRA 2006, Corby Borough Council Level 2 SFRA 2011 and Corby Flood Risk Management Study 2015. This Level 1 SFRA updates this information and incorporates relevant data, recommendations and policies from these studies and strategies as appropriate, but no new modelling has been undertaken as part of this report.

There has been a history of flooding in the Borough, with a total of 118 flooding incidents recorded since 1982 to the present day. These are from all sources of flood risk.

Fluvial flood risk poses the greatest future risk in Corby, followed by surface water. The Borough is also affected by groundwater flooding.

Surface water flooding has been identified as a more recent concern and a key consideration for all new development. Major new developments now have to address surface water drainage requirements set out in the National Standards and local guidance produced by NCC. This guidance will ensure that careful design of the site lay-out and drainage system is factored into new
development, giving due consideration to the implementation of SuDS solutions and their ongoing maintenance where appropriate.

Groundwater flooding is also a key consideration to future growth and detailed guidance has been produced by NCC as the Lead Local Flood Authority (LLFA) and should be considered at all stages of the planning process.

There are a number of flood storage areas located within the Borough, which may pose a residual flood risk to local communities if they were to breach. Also, the over-topping of flood defences could affect properties within the potential flow path or located behind defences. This risk should be incorporated within any assessment at all stages of the planning application process.

Existing planning policy within the North Northamptonshire Joint Core Strategy is considered to be robust and fully up-to-date. Therefore no additional strategic policies are recommended as part of the development of the Part 2 Local Plan. Site-specific policies have however been recommended.

The site-specific assessment (Sequential Test) has identified the majority of sites as having an ‘Amber’ rating, as they are either at risk of surface water or groundwater flooding, have experienced flooding on the site or in close proximity of the site in the past, or have capacity issues within the existing drainage systems. These sites will require site-specific policies to be incorporated as part of the allocation process. None of the sites have been classed as ‘Green’ and two sites are ‘Red’. The two ‘Red’ sites are within Flood Zones 1, 2 and 3, have a significant surface water flood risk, and have been affected by flooding incidents in the past. Two of the sites also have undetermined planning applications associated with them.

Study Area

The Borough of Corby falls within North Northamptonshire, along with the Kettering, Wellingborough and East Northamptonshire Councils. The Borough comprises the town of Corby and eight surrounding villages.

The Borough is the eleventh smallest local authority in the United Kingdom and covers an area of 80 square miles. The Borough is expanding at a fast pace, with the population growing by 12,000 to approximately 66,900 in the past 14 years. The Office of National Statistics has reported the Borough as in the top ten nationally for growth.

Until the 1930s Corby was a small village but began to grow rapidly when the steelworks were opened by Stewarts and Lloyds. Corby grew quickly through the 1950s and 60s as a huge influx of migrants seeking work arrived, many of which were from central Scotland.

In recent years the construction of large housing developments as well as educational, leisure and business premises has taken place. Over 6,000 new homes have been built since 2001 at Oakley Vale, Little Stanion and Priors Hall, along with major town centre developments.

Corby is a comparatively upstream catchment containing the main rivers of Willow Brook, Harpers Brook and the Gretton Brook. Given its upstream location these watercourses are small in comparison to the size of the town.

The catchments which fall within the Borough of Corby are relatively small with shallow gradients and there have been very few severe flooding incidents as a result. The most notable event occurred in July 1982 and following this a number of flood storage reservoirs were constructed to attenuate storm runoff from the impermeable newly developed areas.
1 Introduction

1.1 The North Northamptonshire JCS was adopted on 14 July 2016 and is the strategic part of the Local Plans for Corby, East Northamptonshire, Kettering and Wellingborough Councils. It was prepared by the North Northamptonshire Joint Committee, a plan making authority made up of elected representatives from the District, Borough and County Councils, and provides the basis for more detailed plans prepared by the District and Borough Councils and by Neighbourhood Planning Groups.

1.2 A Level 1 SFRA (Data Collection and Evaluation) was produced in March 2004 by CBC to ensure compliance with PPG25: Development and Flood Risk. The stage 2 report was then completed in August 2006 and updated again in 2011 to ensure compliance with PPS25: Development and Flood Risk. This Level 1 SFRA updates this information and incorporates relevant data, recommendations and policies from these studies and strategies as appropriate.

1.3 PPS25 has since been replaced by the NPPF and associated Planning Practice Guidance. There have also been a number of legislative and procedural changes, alongside updates to a number of flood and water data sets, modelling and mapping layers. These changes need to be reflected within the SFRA, to ensure that a sound flood and water management evidence base is available to support the plan-making process for development. In light of these changes, in December 2017 CBC commissioned NCC to prepare an updated Level 1 SFRA to satisfy the requirements of the NPPF.

1.4 One of the aims of the NPPF is to ensure that flood risk is taken into consideration at all stages in the plan-making process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest flood risk. Where new development is necessary in such areas, it aims to test this concept and make it safe without increasing flood risk elsewhere and, where possible, reduce flood risk overall.

1.5 The NPPF requires LPAs to apply a risk-based sequential approach as part of the identification of land for development in areas at risk of flooding. The purpose of the sequential approach is to ensure that areas of low flood risk are developed in preference to areas of higher flood risk; and within this, ensuring that the developments that are most vulnerable to flood risk are located in the lowest flood risk areas. The application of the Sequential Test needs to be underpinned by an appropriate assessment of flood risk. The sequential approach process uses this information to avoid the highest flood risk areas and where this is not possible, take opportunities to substitute more vulnerable development to lower flood risk areas, or mitigate the risk of flooding.

Applying the Sequential Test for Plan Making Purposes

1.6 The Sequential Test ensures that a sequential approach is followed to steer new development to areas with the lowest risk of flooding. The detailed mapping, found within the accompanying Site Specific and Strategic Map Documents, provides the basis for applying the Test. The aim is to steer new development to Flood Zone 1 (areas with the lowest risk of flooding from rivers or sea). Where there are no reasonably available or sufficient sites located within Flood Zone 1, LPAs in their decision-making process should take into account the flood risk vulnerability of land uses and consider reasonably available sites located within Flood Zone 2 (areas with a medium risk of flooding from rivers or sea),
applying the Exception Test, if required. Only where there are no reasonably available sites located within Flood Zone 1 or Flood Zone 2 should the suitability of sites located within Flood Zone 3 (areas with a high risk of flooding from rivers or sea) be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test, if required (see Image 1).

1.7 Robust application of the Sequential Test in the plan-making process will help to ensure that development can be safely and sustainably delivered and developers do not waste time and resources promoting proposals which are inappropriate on flood risk grounds.

1.8 All sources of flooding should be treated consistently with river flooding in terms of mapping probability and assessing vulnerability to ensure that the Sequential Test and approach are properly applied across all flood zones.

![Image 1: Extract from the Planning Practice Guidance Applying the Exception Test for Plan Making Purposes](image)

**Applying the Exception Test for Plan Making Purposes**

1.9 The Exception Test is a method to demonstrate and ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

1.10 Essentially, the two parts to the Test (see Image 1) require proposed development to show that it will provide wider sustainability benefits to the community that outweigh flood risk, and that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible seek to reduce flood risk overall.

1.11 This process is summarised in Image 2. The Exception Test should only be applied as set out in *National Planning Practice Guidance Flood Risk and Coastal Change* (6th March 2014).
Study Area

1.12 The Borough of Corby falls within North Northamptonshire along with Kettering, Wellingborough and East Northamptonshire. The Borough comprises the town of Corby and eight surrounding villages and lies to the northeast of the county, approximately 23 miles (37 km) northeast of Northampton.

1.13 The Borough is the eleventh smallest local authority in the United Kingdom and covers an area of 80 square miles. The Borough is expanding at a fast pace, with the population growing from approximately 12,000 to approximately 66,900 over the past 14 years. The Office of National Statistics has reported the Borough as in the top ten nationally for growth.

1.14 Until the 1930s Corby was a small village but began to grow rapidly when the steelworks were opened by Stewarts and Lloyds. Corby grew quickly through the 1950s and 60s as a huge influx of migrants seeking work arrived, many of which were from central Scotland.

1.15 In recent years the construction of large housing developments as well as educational, leisure and business premises has taken place. Over 6,000 new homes have been built since 2001 at Oakley Vale, Little Stanion and Priors Hall, along with major town centre developments.

1.16 The Borough of Corby lies within two catchment areas, the Nene Catchment and Welland Catchment, as can be seen on Map 13: Watercourse and Canal Network in the accompanying Strategic Map Document. There are no canals found within the Borough of Corby.

1.17 Corby is a comparatively upstream catchment and the watercourses within the Borough are small in comparison to the size of the town. There are four classified main rivers in the Borough of Corby:

- The River Welland, which rises at Sibbertoft in Daventry District and then flows from west to northeast along the Borough’s north-western boundary;
• Gretton Brook, which rises at north Corby and flows in a north-easterly direction, joining Willow Brook approximately 3km east of the Borough’s north-eastern boundary;

• Willow Brook, which has a northern branch rising at north Corby and flows in a north-eastern direction, and a central branch, which rises at east Corby and flows through Weldon in a north-easterly direction; and

• Harpers Brook, which rises at south Corby and flows adjacent to Stanion in a north-easterly direction, and then exits the Borough flowing in a south-easterly direction.

1.18 The catchments which fall within the Borough of Corby are relatively small with shallow gradients and there have been very few severe flooding incidents as a result. The most notable event occurred in July 1982 and following this a number of flood storage reservoirs were constructed to attenuate storm runoff from the impermeable newly developed areas.

1.19 The geology for the majority of Corby is mostly impermeable and when flooding has occurred in the past it has been largely caused by short, intense storms rather than longer, less severe ones.

Flood Risk Objectives

1.20 The general aim of the NPPF is to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest flood risk.

1.21 The NPPF states that Local Plans should take account of climate change over the longer term. Furthermore, when new development is brought forward in areas which are vulnerable, “care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure”.

1.22 The SFRA is a strategic assessment of flood risk which all LPAs are required to carry out in preparation of their Local Development Documents (LDDs). It aims to enable sound and reliable sustainability appraisals, land allocations and development control policies, to be informed by an understanding of the catchment-wide flooding issues affecting the area and the implications of climate change.

1.23 This updated SFRA will form a key part of the evidence base to help inform the Local Plan Part 2 preparation. A Level 1 SFRA is principally a desk-based study required to provide the LPAs with flood risk information to apply the Sequential Test. Where it is clear that a proposed development and infrastructure cannot be accommodated in accordance with the Sequential Test, taking account of the flood vulnerability of the intended use, then a more detailed Level 2 SFRA is required to facilitate the application of the Exception Test.

1.24 At the planning application stage, an appropriate site-specific flood risk assessment (FRA) will be required for all major development proposals, sites of 1 hectare or greater located within Flood Zone 1, and for all proposals for new development located in Flood Zone 2 and Flood Zone 3. This is required to demonstrate how flood risk from all sources of flooding within the development itself, and flood risk to others, will be managed taking climate change into account. Developers, and those promoting sites, should ensure that all site-specific FRAs use the information included within this assessment to inform their production.

1.25 The aims of the updated Level 1 SFRA are to:
- Provide a sound evidence base for site allocation purposes;
- Improve the understanding of flood risk within Corby Borough;
- Provide information that reflects the changes to planning policy and guidance;
- Incorporate updated flood and water mapping;
- Include a climate change position statement;
- Provide an assessment of the flood risk (fluvial, pluvial, reservoir and groundwater) to inform the suitability of proposed development sites;
- Provide updated information on existing flood defences within the area;
- Provide sufficient information to enable the Sequential Test and approach (as defined in the NPPF) to be undertaken where required; and
- Include recommended policies and practices to ensure that development at risk of flooding can incorporate appropriate mitigation measures.

The Strategic Flood Risk Assessment Structure

1.26 The NPPF and associated guidance recommends that SFRAs are completed in two consecutive stages, which follow an iterative approach to provide LPAs with sufficient information to inform and update decisions regarding development sites. The two stages are:

- **Level 1 SFRA** - the objective of this document is to collate and review available information on flood risk for the study area. This enables a review of the preliminary site allocations, through the Sequential Test process, to determine if a Level 2 SFRA is required along with the scope.

- **Level 2 SFRA** - the principal objective of this document is to facilitate the application of the Exception Test. The Level 2 SFRA uses information from the Level 1 SFRA and potential additional work for sites allocated in areas at risk of flooding, which have been identified following Level 1 Sequential Testing. Modelling of key watercourses may be required to define the functional floodplain as well as the extent of the floodplain, taking into account climate change, where no data is. Clear guidance will be given on appropriate policies for the application of the Exception Test and the preparation of site-specific FRAs will be provided.
2 Methodology

Overview

2.1 As outlined in Section 1.25 the aim of the Level 1 SFRA is to collect, collate and review the information available relating to flooding in the study area. It also aims to review existing documents and guidance, making recommendations to ensure that the document follows current best practice and guidance.

Tasks

2.2 The following sets out the sequence of tasks undertaken in the preparation of the updated Level 1 SFRA:

- NCC, as LLFA, organised an inception meeting with CBC, the Environment Agency (EA) and Anglian Water Services (AWS) on 8th January 2018 (North Northamptonshire Joint Planning Delivery Unit were unable to attend);
- Identified the local stakeholders;
- Contacted the EA requesting data / information;
- Collated and reviewed the data;
- Undertook the Sequential Test for all proposed sites;
- Presented the available and relevant information on all flood sources.

2.3 All of the tasks set out above were completed between December 2017 and March 2018.

Stakeholders

2.4 The stakeholders relevant to Corby Borough are as follows:

- CBC;
- NCC as LLFA;
- North Northamptonshire Joint Planning Delivery Unit (NNJPDU)
- EA; and
- AWS.

2.5 Where relevant, all flood and water management related information and data received from the stakeholders has been reviewed and incorporated into this document.
3 Data Collection and Review

Overview

3.1 In order to inform the production of this SFRA, all data related to flood risk and proposed development has been reviewed.

3.2 Data has been obtained from CBC, the EA, AWS, the Highways Authority and existing data held by the LLFA. This data includes:

- Growth aspirations for the area;
- Existing flood risk management plans, strategies and studies;
- Local development plans;
- Flood warning and alert areas;
- EA Flood Maps – fluvial and surface water;
- NCC Groundwater mapping;
- Flood related asset information from all stakeholders;
- Historical flooding information including the sewer flooding register from AWS;
- Details relating to reservoirs within and adjacent to the study area;
- Terrain/topography maps; and
- Geological maps.

Topography, Natural Landform and Geology

3.3 The Borough of Corby falls within both the Welland and Nene catchments. The River Welland forms the northern boundary of the Borough. The majority of the Borough is, however, situated within the catchments of a number of major tributaries of the River Nene. The actual town of Corby is located within the River Nene catchment and is situated towards the upper end of three of the Nene’s major tributaries, namely the Gretton, Willow and Harpers Brooks.

3.4 The Borough of Corby has a varied topography as can be seen on Map 2: Topography, in the accompanying Strategic Map Document. The Borough’s lowest lying areas (of between 35 - 65 mAOD) are found in the north and northwest of the Borough, corresponding to the River Welland valley. The settlements of Middleton and Rockingham are located within the River Welland valley, with East Carlton, Cottingham, Gretton and the north of Corby town all located on adjacent high ground of between 95 - 155 mAOD.

3.5 Other low lying areas of approximately 65 mAOD are found in the east, where the settlement of Weldon is located, corresponding to Willow Brook and its associated valley, and in the south east, relating to Harpers Brook. The settlement of Stanion is found at approximately 95 mAOD, adjacent to Harpers Brook, with Little Stanion located approximately 700m west, on slightly higher ground of 95 – 125 mAOD.

3.6 The Borough of Corby has a varied geology as can be seen on Map 3: Bedrock Geology, in the accompanying Strategic Map Document. The underlying bedrock of the River Welland valley, which extends across the entirety of the Borough’s north-western boundary, consists of the Charmouth Mudstone Formation, Dyrham Formation and the Whitby Mudstone Formation.
The underlying bedrock of the west of the Borough is the Lower Lincolnshire Limestone Member, whereas the east is characterised by a complement of the Northampton Sand Formation, Grantham Formation, Lower and Upper Lincolnshire Limestone Members, and the Rutland Formation.

3.7 This combination of geology has produced the landforms typical of the central English Midlands; broad, relatively flat river valleys separated by expanses of upland characterised by a rolling landscape of ridges and steeper tributary stream valleys. It should also be noted that in the Corby area the underlying geology contains extensive ironstone beds, which has resulted in large scale mineral extraction in the area. This has now ceased, and these opencast quarries have since been restored, either to mixed-agricultural use or to woodland.

**River Welland**

3.8 The River Welland runs from west to east along the northern boundary of the Borough of Corby and drains a relatively large catchment, approximately 400 km². The catchment area of the Welland and its tributaries lies within the western and northern edges of the Borough of Corby.

**Harpers Brook**

3.9 Harpers Brook rises from several points, but most notable are the two branches which run eastwards along the southern edge of the town of Corby to their confluence at the Great Oakley Reservoir. Harpers Brook then continues eastwards out of the Borough towards Little Oakley. There is also a section of the Willow Brook South Arm catchment that has been diverted to Harpers Brook since 1963. Again this starts on the west side of the town where an open channel collects the runoff from the surrounding open country. This open channel is then culverted through the southern part of the town picking up inflows of urban runoff before discharging into the main branch of Harpers Brook in the vicinity of Oakley Road. There is also a tributary which drains the Oakley area under the development. Its confluence with the main branch of Harpers Brook is downstream from Great Oakley.

**Gretton Brook**

3.10 Gretton Brook originally would have risen within the northern part of the town, however since urbanisation the head of the natural channel has been culverted and in the process has diverged from its natural drainage path. The culverted sections now discharge into Gretton Reservoir, which outfalls into the Gretton Brook. Gretton Brook then runs north-easterly through open country to its confluence with Willow Brook, south of Bulwick.

**Willow Brook**

3.11 Willow Brook North Arm originally would have risen within the northern part of the town, however since urbanisation the head of the natural channel has been culverted and diverted from its natural drainage path. The culverted sections discharge into the open channel section of the Willow Brook North Arm at the intersection of Rockingham Road and Studfall Avenue. The Brook then runs north-easterly to Deene Lake and the southern arm of Willow Brook.

3.12 Willow Brook Central Arm rises from two separate points, both of which are located to the west of the town. These channels run eastwards towards the town at which point they enter culverts that run towards their confluence located in Thoroughsale Wood. Immediately
before this confluence, the upper branch emerges from its culvert into the open channel via the boating lake. The Central Arm then continues to run eastwards through a series of channels and culverts until its confluence with the southern arm of Willow Brook at Weldon.

3.13 Willow Brook South Arm also rises from two separate points. The upper branch rises to the west of the town and runs eastwards entering a long section of culvert underneath the town. The initial point of the lower branch of open channel is at the intersection of Lyveden Way and Oakley Road. This open channel runs along Oakley Road and enters a length of culvert, which intersects with the upper branch adjacent to the intersection of Oakley Road and Gainsborough Road. The culverted flow re-emerges east of the railway line and continues eastwards in open channel to the south of the Weldon Road industrial estate. The channel then continues to run north-easterly to the south of Weldon and on to Deene Lake.

GIS Layers

3.14 Using the data collected from a variety of partners, a series of Geographic Information System (GIS) layers were collated to assist any site allocation decisions. Using GIS, the data was analysed and interrogated to produce flood related statistics. Broadly, the layers can be classified into three main categories; planning policy, informative and flood risk, as detailed in Table 1.

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<td></td>
<td>Background Ordnance Survey Mapping (1:10,000, 1:25,000 and 1:250,000)</td>
<td>Historic flood hotspot data</td>
</tr>
</tbody>
</table>

Table 1: List of GIS layers used

Data Gaps and Assumptions

3.15 The main gaps in the data relate to watercourses where no flooding information is available. Whilst it is possible that there is no flooding related to these watercourses, it is also possible that this may indeed be a gap in the data.

3.16 One of the requirements of the NPPF is that the functional floodplain, Flood Zone 3b, should be identified and mapped to highlight those areas where only water-compatible development and land use is recommended. Where this data is available the extent has been mapped.
4 Relevant Flood Risk Management Plans, Strategies and Studies

4.1 The plans, studies and strategies that have been reviewed to inform the update of this assessment are set out below. The key points with specific reference to flood and water management have been extracted and should be used to inform the development of future planning policy and the undertaking of site-specific FRAs.

National Flood and Coastal Erosion Management Strategy for England

4.2 The National Flood and Coastal Erosion Management Strategy for England was published in September 2011 and provides guidance on “Understanding the risks, empowering communities and building resilience.”

4.3 The document builds upon existing approaches to flood and coastal erosion risk management and promotes the use of a wide range of measures to manage risk. The strategy promotes a framework to enable communities to have a greater role in local flood risk management decisions. The strategy encourages more effective flood risk management by enabling people, communities, business, infrastructure operators and the public sector to work together to:

- Ensure a clear understanding of the risks of flooding and coastal erosion, nationally and locally, so that investment in risk management can be prioritised more effectively;
- Set out clear and consistent plans for risk management so that communities and businesses can make informed decisions about the management of the remaining risk;
- Manage flood and coastal erosion risks in an appropriate way, taking account of the needs of communities and the natural environment;
- Ensure that emergency plans and responses to flood incidents are effective and that communities are able to respond effectively to flood forecasts, warnings and advice; and
- Help communities to recover more quickly and effectively after incidents.

4.4 This document is relevant because it promotes the concept of “the better understanding of flood risk through detailed assessment”. Therefore this SFRA contributes towards providing this improved awareness and understanding.

Preliminary Flood Risk Assessments

4.5 A Preliminary Flood Risk Assessment (PFRA) is a requirement under the Flood Risk Regulations (2009), which implement the European Floods Directive (2007) into UK law. The PFRA is an assessment of:

- Flooding that has taken place in the past; and
- Flooding that could take place in the future.

4.6 It considers flooding from surface water runoff, groundwater and ordinary watercourses, and is updated on a six year basis.

4.7 PFRA are used to identify areas that are at risk of significant flooding and the first were prepared by LLFAs in 2011. These areas are called Flood Risk Areas (FRAs). LLFAs are responsible for preparing preliminary assessment reports and reviewing indicative Flood Risk
Areas (iFRAs) identified nationally through an assessment of surface water flood risk, or determining new FRAs based on local knowledge and understanding.

4.8 For the 2011 to 2017 planning cycle, NCC were required to identify FRAs for local sources using guidance produced by Defra. The areas represent ‘clusters’ where flood risk is an issue and where 30,000 people or more live. The Northamptonshire PFRA and associated FRA Map illustrated that there were none in Northamptonshire.

4.9 LLFAs are responsible for mapping local flood hazard and flood risk for each FRA and the EA is responsible for mapping flood hazard and flood risk for rivers, the sea and reservoirs, and for publishing the maps. These are reviewed and if required, updated and re-published every six years. These flood hazard and flood risk maps are used by the EA to prepare the Flood Risk Management Plans (FRMPs).

4.10 Following on from the previous six years, the EA will publish the updated PFRA's and FRAs in 2018 and these will be valid until 2023. The updated PFRA has not identified any FRAs within Corby Borough.

4.11 The PFRA review has also necessitated an assessment of flooding incidents since 2011 that have had ‘significant’ human health, economic, cultural or environmental consequences. For the purposes of the review, and in accordance with guidance issued by the EA, all incidents investigated under Section 19 (Local Authorities: Investigations) of the Flood and Water Management Act (FWMA) (the Act) have been assessed, a total of 51 incidents across the county with two of these located within the Borough of Corby.

Flood Risk Management Plans and River Basin Management Plans

4.12 FRMPs build on Catchment Flood Management Plans (CFMPs) and highlight the hazards and risks of flooding from rivers, the sea, surface water, groundwater and reservoirs. They also set out how RMAs work together with communities to manage flood risk. By law (EU Floods Directive 2007) the EA must produce FRMPs for each River Basin District. Map 13: Watercourse and Canal Network, in the accompanying Strategic Map Document shows the two major river catchments that cover the Borough of Corby: the Nene Catchment and the Welland Catchment. It is for these that CFMPs have been prepared.

4.13 Each FRMP covers a specific River Basin District. There are 11 River Basin Districts in England and Wales, as defined in the legislation. A River Basin District is an area of land covering one or more river catchments. A river catchment is the area of land from which rainfall drains to a specific river.

Anglian Flood Risk Management Plan

4.14 Corby Borough is wholly located within the Anglian River Basin District. The relevant FRMP is therefore the ‘Anglian River Basin District Flood Risk Management Plan’ (Anglian FRMP).
There are a number of sub-areas within the Anglian FRMP. Corby Borough is located within the Nene catchment and Welland catchment sub-areas, as shown within Image 3 and Image 4.

The FRMPs describe the river basin and the likely source and characteristics of flooding, as well as the key objectives for managing the flood risk. The FRMPs set out actions, known as ‘measures’, which demonstrate the ways in which RMAs focus efforts to reduce flood risk. The plans promote four key themes as follows:
- **Preventing risk** - Identifying and mitigating flood risk through the development of schemes and appropriate maintenance programmes;
- **Preparing for risk** - Working with communities to help them recognise their flood risk and ensure that they are adequately prepared for flooding;
- **Protecting from risk** - Actively reducing the likelihood of flooding affecting people and property, including maintaining watercourses that pose the most significant risk; and
- **Recovery and review** - Investigating instances of flooding to help communities recover from their impact and consider actions that may mitigate future risk.

4.17 FRMPs set out how RMAs (including LPAs) and communities will work together to reduce the potential adverse consequences of flooding. The EA worked in partnership with LLFAs and other RMAs to develop these plans at a catchment scale by pooling information from various existing plans such as CFMPs and Reservoir Plans. The FRMPs are high-level documents that should be referred to when developing spatial policies.

4.18 To meet the requirements of the Water Framework Directive (WFD), each River Basin District also has a River Basin Management Plan (RBMP), which looks at how to protect and improve water quality and ecology, and use water in a sustainable way. FRMPs and RBMPs work to a six-year planning cycle. The current cycle is from 2015 to 2021. Both flood risk management and river basin management form an important part of a collaborative and integrated approach to catchment planning for water.

**Northamptonshire Local Flood Risk Management Strategy and Action Plan**

4.19 The Act (Section 9) requires the LLFA, in this case NCC, to develop, maintain, apply and monitor a strategy for local flood risk management in its area. Local flood risk includes surface runoff, groundwater and ordinary watercourse flooding. The Northamptonshire LFRMS was first published in November 2013 and is reviewed and updated every three years.

4.20 The LFRMS provides an overall picture of flood risk at a county scale and outlines how NCC, as the LLFA, will coordinate and manage flood risk along with its RMAs. The strategy sets out the policy direction for flood defence consenting, thresholds for formal flood investigations, formal partnership and management arrangements, details regarding the asset register, and a great deal of general advice and guidance relating to flood mitigation and resilience.

4.21 The updated LFRMS and associated documents were approved by the NCC Cabinet in November 2017 and are available on the [Flood Toolkit](#), including the annual action plan, which incorporates the following partner actions, projects and flood alleviation schemes for Corby (included are those completed, shown in Table 2):

<table>
<thead>
<tr>
<th>Location</th>
<th>Infrastructure requirements</th>
<th>Reason for need</th>
<th>Lead body</th>
<th>Broad phasing</th>
<th>Estimated total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weldon</td>
<td>Enlargement of Weldon reservoir by 21,000 litres plus mitigation</td>
<td>Development within Corby</td>
<td>CBC, NCC, (EA)</td>
<td>2016-2021</td>
<td>£5,400,000</td>
</tr>
</tbody>
</table>
Corby Culvert
Sewage works and additional storage
Development in the area. To mitigate against an increase in discharge due to new development
CBC
2014-2021
£305,000

Gainsborough Road
Flood risk improvement works
Investigate potential works to reduce risk of flooding to highway and property from culverted ordinary watercourse
NCC
2014-2016 (Completed)
£13,000

Harpers Brook
Flood alleviation scheme – develop and fund scheme
Investigating opportunities to manage existing flood risk – any new development in the catchment would ideally contribute
EA
2021-2031
£102,000

Harpers Brook
Partnership approach to catchment management
Working with partners to deliver revenue maintenance for an underfunded main river catchment
EA
2017-2019
To be confirmed

Table 2: Schedule of infrastructure requirements for Corby

Flood and Water Related Work


4.22 The Water Cycle Strategy (WCS) was developed by Halcrow and emphasised that the most urgent flood risk mitigation works required in Corby were to bring the existing rivers, culverts and flood storage areas up to an acceptable standard. One such requirement was for the improvements of the Corby Culvert, located immediately downstream of the Corby Sewage Treatment Works. The WCS also outlined additional mitigation measures, including:

- Removal of debris and maintenance of the system throughout the watercourses within Corby;
- Excavation to increase storage and throttle flow at Cottingham Road/Hospital;
- Improvement of channel conveyance along a number of reaches of the Willow Brook;
- Utilisation of the lower football fields at Cottingham Lane Football Ground to increase storage; and
- Surface water runoff emanating from new development in the Borough of Corby being restricted to 2l/s/ha.


4.23 This detailed strategy was completed in November 2006 by Halcrow and built upon the work undertaken as part of the Phase 1 Strategy, confirming some of the initial findings and developing others. This was achieved through more detailed investigation and costing exercises. This was particularly the case for sewage treatment as the study concluded that a second sewage treatment works would not be necessary. A number of flood risk mitigation measures (largely storage and channel improvements), additional sewage treatment capacity (by expanding the existing works), foul network improvements and the additional water infrastructure were identified to facilitate the planned growth at the time.

4.24 A number of flood risk mitigation measures were identified, which were designed to:
- Prevent additional run-off entering the west of Corby; and
- Store flood flows in central Corby; and release it more quickly in the east of the town.

4.25 The principal works were flood storage ponds and general channel improvements. In addition, maintenance of the existing system was seen as critical before any new works were undertaken.

4.26 The WCS also identified the capacity problems of the Corby Culvert, which were highlighted as a constraint on development. See Section 4.28 below for more information. This document established the need for £1.13 million to increase the capacity of the culvert to accommodate future growth to 2021.

**Corby Water Cycle Strategy Update: Corby Culvert Options Assessment – May 2012**

4.27 The Corby Culvert is located on the Willow Brook, downstream from the Corby Sewage Works which is operated by AWS. This assessment identified that the culvert was nearing capacity, which had environmental permitting implications [environmental permits are issued by the EA]. It was also highlighted that unless the capacity of the culvert is increased, the EA will begin to object to planning applications in Corby Borough, on the grounds that there is not enough capacity in the sewage works to be able to discharge water into the Willow Brook after treating the foul drainage. This in turn could jeopardise future housing and employment development in Corby. Previous work (Corby Water Cycle Strategy in 2006) had identified that £1.13 million would be required to increase the capacity to accommodate Corby’s future growth to 2021.

4.28 Therefore, CBC commissioned Atkins to undertake a complete re-assessment of the previous work that had been carried out. This assessment involved modelling flood flows and providing an indication of costs for five suggested improvement options, including:
- **Option 1:** New additional culvert at the location of the Corby Culvert;
- **Option 2:** Moving the Sewage Treatment Works outfall downstream of the Corby Culvert;
• **Option 3:** Improving the channel conveyance adjacent to the downstream end of the Corby Culvert through channel alignment and vegetation clearance;

• **Option 4:** Provision of additional storage and vegetation clearance at the location of the Sewage Treatment Works outfall and adjacent to the downstream end of the Corby Culvert;

• **Option 5:** Increase capacity within the Weldon Flood Storage Reservoir through excavation.

4.29 It was determined that Option 4 was the preferred option. This was a much more cost effective solution totalling £248,000 and involves increasing the capacity of the watercourse in the vicinity of the culvert, bank strengthening works and a contribution to annual maintenance. A total of £150,000 has been secured via Section 106 developer contributions by CBC to put towards this required upgrade, and the remaining funding gap will be bridged by funding recently secured following a successful £3.9m key infrastructure improvement bid, which was submitted into the Housing Infrastructure Fund in 2017.

**North Northamptonshire Detailed Water Cycle Strategy – 2009**

4.30 The North Northamptonshire detailed WCS was commissioned and managed by the North Northants Development Company (NNDC) in partnership with the North Northamptonshire Joint Planning Unit (NNJPU), AWS and the EA. The purpose of the strategy was to identify the water services infrastructure requirements to support the levels of growth identified within the North Northamptonshire Core Spatial Strategy and to also provide a framework for the ongoing detailed technical work and delivery programme needed to achieve these requirements.

4.31 The WCS comprises an interactive PDF accompanied by six technical sections. The Flood Risk Investigation Report is the most relevant to this study as it provides an overview of flood risk in the study area.

4.32 The 2009 report made a number of area-specific recommendations for strategic flood risk management within North Northamptonshire, none of which relate to Corby Borough.


4.33 The North Northamptonshire Flood Risk Management Study (FRMS) was the first iteration of this document. The key findings are summarised below:

- Surface water management was found to be a key issue in all four Local Authority areas (Corby, Kettering, Wellingborough and East Northamptonshire);

- The study recommended that updates to the SFRA’s were needed to ensure full compliance with PPS25: Development and Flood Risk, to address the latest guidance on climate change, to assess all sources of flooding in more detail and to map the functional floodplain;

- At the time of the study, the Core Spatial Strategy for North Northamptonshire was emerging. The study found that the Councils had generally taken a sequential approach when identifying broad locations for the proposed Sustainable Urban Extensions; and

- A robust flood risk management strategy for North Northamptonshire was recommended, even if the proposed development sites were located in low risk areas, in order to address extra runoff and residual risk issues resulting from planned growth proposals and the existing flooding problems on receiving watercourses.
4.34 The study outlined key requirements to be addressed by a flood risk management strategy, to be delivered through policies, planning conditions, physical measures, residual risk management and guidance. The 2007 report recommended a strategy that:

- Implemented strategic flood risk management measures in advance or in parallel with the proposed developments in order to obtain financial contributions from prospective developers through Section 106 agreements including long term management.
- Sought opportunities using a partnership approach across North Northamptonshire to avoid managing flood risk within individual administrative areas.
- Provided a combination of source control and strategic SuDS measures within individual development sites where the opportunities for catchment-wide strategic measures are limited.
- Incorporated sufficient capacity in strategic flood management measures allowing for planned growth and future climate change.
- Avoided a piecemeal approach to managing runoff from small individual sites whilst providing strategic and local green corridors to incorporate SuDS for managing additional runoff from new developments.
- Restored floodplains as land becomes available for redevelopment, through set back options and creation of green space.
- Incorporated SuDS within strategic and local green corridors where possible.
- Identified locations of known surface water flooding problems from sewers and overland flow routes and explores possible solutions for them through new development proposals.
- Recognised the importance of accommodating imminent development currently planned in North Northamptonshire ahead of the final JCS.

North Northamptonshire Flood Risk Management Study Update – April 2012

4.35 This report updated the FRMS that Royal Haskoning produced in 2007 to inform the Joint Core Strategy evidence base, which was subsequently adopted.

4.36 The aim of the report was to update the North Northamptonshire FRMS to provide a sound basis for further developing local policy, along with related project priorities and delivery actions. The key objectives in delivering this were to:

- Identify key priorities for the future, arising from updated Level 1 SFRAs and all other relevant studies;
- Provide clear policy recommendations that can be taken forward at all levels of plan-making;
- Assess requirements arising from the proposed strategic land allocations;
- Estimate broad costs and potential funding mechanisms to support priority infrastructure projects; and
- Provide a sound evidence base to support infrastructure planning and the Section 106 legal agreements.

Corby Borough Council Strategic Flood Risk Assessments

4.37 This Stage 1 SFRA was produced in March 2004 and was written to be in compliance with PPG25: Development and Flood Risk (published in 2001). This document provided details of flooding incidents, most of which were identified from previous flood study reports, such as a report produced by John Taylor and Sons in 1984.
In December 2006, the publication of PPS25: Development and Flood Risk superseded PPG25 and this resulted in CBC updating the Level 2 SFRA to ensure that it met the new requirements of PPS25.

An update to the Level 2 SFRA was completed in July 2011. The SFRA identifies Borough-wide flood risk and provides mapping to aid with the application of the Sequential Test. It also included specific FRAs for the five areas that were identified for potential residential development and five areas identified for potential industrial development within the Borough, including:

- Western Extension;
- Southern Extension;
- Northern Extension;
- Oakley/Stanion Extension;
- Priors Hall and Weldon Extensions;
- Great Oakley – light industrial development;
- St James Industrial Estate – town centre mixed use development;
- Corby East – mix of high quality business, processing parks and logistic uses; and
- Weldon South Industrial Estate and Max Park – mix of high quality business.

This SFRA did not review any single site in great detail, however information submitted to support the Western Expansion outline planning application has now provided additional information which has been used to inform this updated SFRA.

**Corby Flood Risk Management Plan 2015**

This Flood Risk Management Plan (FRM) was published in January 2015. It included a four stage approach: preparation; risk assessment; options identification; and implementation and review.

A short list of seven areas were identified for detailed assessment as set out below, three of which were combined as a ‘Joint area’:

- Gainsborough Road;
- Cottingham Road;
- Joint area (Rockingham Road, Newark Drive and Baltic Close);
- Middleton; and
- Rockingham.

A thorough assessment of each area was undertaken, including hydraulic modelling, WFD analysis, sites visits and groundwater investigation.

A selection of options for flood risk improvements were identified that included both engineering and non-engineering solutions. These flood risk management solutions were scored based on various criteria including economics and environmental impacts. High level costs were estimated for the short listed solutions and an implementation plan was developed which identified those options that would allow for quick flood risk benefits, and those that would require more significant investment.

The conclusions at the seven priority areas are set out in Table 3 below:
<table>
<thead>
<tr>
<th>Priority area</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gainsborough Road</td>
<td>The assessment identified the high profile flooding issues associated with Gainsborough Road. It has been concluded that the flood risk in this area was associated with reduced capacity in the watercourse, owing to the available flood storage and blockages at culvert inlets. The frequency and severity of flooding could be reduced through an improved maintenance regime and public engagement. It was noted that these options would not prevent flooding during extreme events.</td>
</tr>
<tr>
<td>Cottingham Road</td>
<td>Fluvial flood risk was identified along Cottingham Road, which is associated with the constriction caused at the culvert inlet near Studfall Avenue. Flood risk at this location could be reduced through capital works to either increase conveyance or provide flood storage.</td>
</tr>
<tr>
<td>Joint area (Rockingham Road, Newark Drive and Batlic Close)</td>
<td>Flood risk was identified at the three locations, albeit relatively minor with a low risk to properties. The study concludes that options to reduce flood risk would be beneficial however this should be achieved through solutions such as improved maintenance and public engagement, rather than typically more expensive capital works.</td>
</tr>
<tr>
<td>Middleton</td>
<td>Flood risk, either through groundwater or surface water runoff was identified but would only affect a small number of properties. Owing to the risk identified at this location, the requirements of mitigation to alleviate this risk was not identified through this study.</td>
</tr>
<tr>
<td>Rockingham</td>
<td>Flood risk was identified from the culverted watercourse through Rockingham. The culvert was found to have sufficient capacity for the upstream flow. Therefore it was concluded that historical flooding events at this location are likely to have been the result of the culvert not being able to freely discharge at the outlet.</td>
</tr>
</tbody>
</table>

Table 3: Corby Flood Risk Management Plan 2015 – priority area conclusions
5 Local Plans

5.1 The Local Plans that comprise the Statutory Development Plan for CBC have been reviewed to inform the update of this assessment. The key development sites have been provided by the LPA and have been assessed in terms of flood risk in more detail. The key points with specific reference to flood and water management have been extracted and should be used to inform the development of future planning policy and the undertaking of site-specific FRAs submitted as part of future planning applications. This SFRA will be used to inform the development of future planning policy and key decisions on site-specific allocations.

5.2 The requirement to produce a Local Plan was introduced as part of the Planning and Compulsory Purchase Act 2004. The Development Plan in North Northamptonshire (which covers Corby Borough) consists of a number of documents, all of which have been reviewed as part of the update to this SFRA. These documents include the overarching updated North Northamptonshire JCS Local Plan (Part 1), which was adopted in July 2016 and sets out the long-term vision (for the plan period up to 2031) and objectives for the whole of the area covered by CBC. A number of site-specific or subject based Supplementary Planning Documents have also been reviewed.

North Northamptonshire Joint Core Strategy (Local Plan Part 1)

5.3 This JCS Local Plan forms Part 1 of the suite of Local Plans in North Northamptonshire and was updated and adopted in July 2016. It provides a long-term vision for the area with an overall framework in which more detailed plans will be set out. It contains a broad planning strategy which provides a strategic framework to guide the preparation of Part 2 Local Plans. These will provide more detailed planning policies and site allocations for each of the partner Borough and District Councils.

5.4 The Plan was prepared by the NNJPU on behalf of CBC, Kettering Borough Council, Borough Council of Wellingborough and East Northamptonshire Council, working together with NCC.

5.5 The JCS sets out the long-term vision and objectives for the whole of North Northamptonshire area for the plan period from 2011 to 2031, including strategic policies for steering and shaping development. It identifies specific locations for new strategic housing and employment as well as changes to transport infrastructure and other supporting community facilities, alongside defining areas where development will be limited. It outlines the strategic picture for North Northamptonshire over the period to 2031, including the provision of a minimum of 35,000 homes and 31,100 jobs and the necessary supporting infrastructure. The JCS sets out policies to guide this development, including focusing on how the places in North Northamptonshire can be changed for the better.

5.6 In addition to this assessment of housing needs, the Plan incorporates a strategic opportunity for a further 5,000 dwellings at Corby, as the town works towards doubling its population to support ongoing regeneration. This increases the housing figure to 40,000 dwellings, which equates to over 30% more than were delivered in the previous 20 years.

5.7 The Plan provides the conditions for this strategic opportunity to be realised, including the allocation of land for a SUE at West Corby, supporting regeneration of the town centre and development of major new employment, and ensuring that infrastructure plans accommodate the full growth ambition for the town.
An important part of the JCS is supporting North Northamptonshire’s resilience and self-reliance by ensuring: that its water environment is protected; that there is sufficient water and waste water infrastructure; and that the area is resilient to flood risk, particularly when the impact of future climate change is considered. The Plan promotes the concept of sustainable places that are naturally resilient to future climate change and in particular flood risk. This is demonstrated by the use of Policy 5 (as set out in Section 5.9 below), which helps to achieve this outcome.

Policy 5 – Water Environment, Resources and Flood Risk Management

Development should contribute towards reducing the risk of flooding and to the protection and improvement of the quality of the water environment. This will be achieved through the following criteria:

- Development should, wherever possible, be avoided in high and medium flood risk areas through the application of a sequential approach considering all forms of flooding for the identification of sites and also the layout of development within site boundaries;
- Development should meet a minimum 1% (1 in 100) annual probability standard of flood protection with allowances for climate change unless local studies indicate a higher annual probability, both in relation to development and the measures required to reduce the impact of any additional run off generated by that development, to demonstrate that there is no increased risk of flooding to existing and surrounding properties;
- Development should be designed from the outset to incorporate Sustainable Drainage Systems wherever practical, to reduce flood risk, improve water quality and promote environmental benefits;
- Where appropriate, development should, subject to viability and feasibility, contribute to flood risk management in North Northamptonshire;
- Following any identified mitigation, development that would lead to deterioration or may compromise the ability of a water body or underlying groundwater to meet good status standards in the Anglian RBMP (required by the WFD) is unlikely to be permitted; and
- Development will only be permitted where it can be demonstrated that adequate and appropriate water supply and wastewater infrastructure is available (or will be prior to occupation).

The location of development can play a significant role in flood risk management. The use of the Sequential Test for all proposed sites will ensure that development is focused towards areas subject to a lower probability of flooding.

The JCS states that developers must manage flood risk on site for a 1% (1 in 100) annual probability flood with an allowance for climate change (see Appendix 5: Guidance on Climate Change Allowances for more information) without increasing risk to others. It also makes reference to the need for developers and those promoting sites to apply the sequential approach when locating development within the site boundary, where appropriate. New development should be located in areas at the lowest probability of flooding so that the most vulnerable development is located in the lowest flood risk areas.

Corby Part 2 Local Plan
5.12 The Council is preparing the Part 2 Local Plan for Corby, which will cover the plan period to 2031. It provides detailed planning policies to deliver the Part 1 North Northamptonshire JCS. The housing requirement for Corby Borough is 9,200 dwellings by 2031 or 14,200 dwellings including the strategic opportunity. The projected housing delivery is set out as follows:

- Projected housing delivery 2017 / 2018 - 503
- Projected housing delivery 2018 / 2019 - 569
- Projected housing delivery 2019 / 2020 - 539
- Projected housing delivery 2020 / 2021 - 614
- Projected housing delivery 2021 - 2022 - 810
- Projected housing delivery 2022 - 2023 - 597
- Projected housing delivery 2023 - 2031 - 5,390

- Projected housing delivery future years – to be confirmed.

Note: The Sustainable Urban Extensions are expected to deliver additional housing beyond 2031.

5.13 The Regulation 18 scoping consultation is the first formal stage in the production of the Part 2 Local Plan for Corby and was undertaken between November and December 2016. At this stage of the process, the Council primarily sought representations about what the plan ought to contain. Research and evidence, including previous consultations over the past few years, were used to identify a number of policy options within the consultation document.

5.14 The timetable for the delivery of the Part 2 Local Plan for Corby was approved in August 2016 and is currently being updated, the revised timetable will be available on the council webpages.

5.15 This SFRA should be used to inform site-specific policy considerations within the Part 2 Plan.

North Northamptonshire Brownfield Land Assessment

5.16 Through the Housing and Planning Act 2016, the Government introduced a requirement for LPAs to publish and maintain registers of brownfield land suitable for housing development. This was required to be in place by April 2017.

5.17 The NNJPU undertook this exercise on behalf of CBC. Each site reviewed was 0.25 hectares or above in size and considered suitable for future housing development. Site-specific data has been collated on each site following guidance set by the Department for Communities and Local Government (now Ministry of Housing, Communities and Local Government).

5.18 The NNJPU engaged the services of NCC, as the LLFA, to screen each of the sites in relation to flood and water management and this included applying the Sequential Test to each site. This information has been used to inform the update of this SFRA (see Section 8: Site-Specific Information for more details).

Neighbourhood Planning

5.19 Neighbourhood planning gives communities direct power to develop a shared vision for their neighbourhood, and help shape the development and growth of their local area. Communities are able to choose where they want new homes, shops and offices to be built,
have their say on what those new buildings should look like and what infrastructure should be provided, and grant planning permission for the new buildings they want to see go ahead.

5.20 Neighbourhood planning provides a powerful set of tools for local people to ensure that they get the right types of development for their community, in order to align the aims and aspirations of the neighbourhood with the strategic needs and priorities of the wider local area.

5.21 The Localism Act of 2011 states that “an LPA should be proactive in providing information to communities about neighbourhood planning and fulfil its duties and take decisions as soon as possible, and within statutory time periods where these apply”. It also suggests that the LPA should set out a clear and transparent decision-making timetable and share this with those wishing to prepare a Neighbourhood Plan.

5.22 Through the development of Neighbourhood Plans, flood risk should be considered early on in the planning process and the LPA should promote this essential part of the process taking into account the NCC-produced guidance on ‘Neighbourhood Planning and Flood Risk’. Those wishing to develop Neighbourhood Plans in Corby Borough should refer to this guidance for more information.
6 Flood History

6.1 The LLFA’s (NCC) historic flooding record shows that there has been a total of 118 incidents of flooding in the Borough of Corby since 1982, 45 of which have affected properties internally, with the vast majority of these occurring within Corby (see Map 4: Recorded Flood Incidents, in the accompanying Strategic Map Document for more information). A number of incidents are also recorded within the settlements of Cottingham, Middleton and Weldon. All recorded incidents of flooding affecting properties have taken place within the town of Corby, with the exception of a single incident in Middleton.

6.2 Experience has shown that the primary flood risk sources in Corby Borough are the three branches of Willow Brook, Harpers Brook and Gretton Brook. There have been few problems with regards to severe flooding within the town and in fact within the Borough itself. This can be attributed to relatively small, low gradient catchment areas both upstream and downstream of the town. In conjunction with this, the engineering works within the town ensure the required hydraulic capacities of channels and culverts, and temporary runoff storage requirements are generally sufficient. Therefore any flooding which does occur tends to be localised small channel overflow in conjunction with surcharging of storm water sewers following short, intense storms rather than those of a longer duration. Secondary flood risk sources within the Borough also include major surface water sewers.

6.3 In the recent past Corby Borough has been relatively unscathed of the effects of severe flooding. This can be put down to the fact that it is situated near the head of a cluster of small catchments and therefore the quantity of runoff by the time it reaches any urbanised areas is relatively small. The town itself underwent major development during the early 1930’s when Corby’s steel industry expanded and the open channels were progressively covered as development encroached on the valley floors.

6.4 The 30th July 1982 flooding in Corby resulted from a 1 in 72 year storm event of which the effects were documented in 1984 by John Taylor & Sons. This study reported that “...flooding was generally limited to the main valley water courses with secondary flooding occurring in isolated local low lying spots”. One of the main recommendations of this study was to look into various options for the use of balancing reservoirs, which have since been implemented.

6.5 From 1972 to 1998, incidents of flooding affecting Gainsborough Road, Corby, were first reported, with open space and highway areas reported to have flooded on numerous occasions during this period. The most severe case of flooding in the area was experienced in spring 1998. It was in November 2012 that a repeat incident was experienced, whereby open space and highway areas were flooded twice in a single week. Flooding was again experienced in August 2013, October 2013, November 2013, December 2013, February 2014, October 2015 and March 2016, demonstrating a localised issue.

6.6 During the summer of 2016, a Medical Practice at Cottingham Road, Corby, experienced two instances of internal flooding as a result of surface water, necessitating the undertaking of a Section 19 Formal Flood Investigation.

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of properties affected internally</th>
<th>No. of properties affected externally</th>
<th>Total affected property numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beanfield Ward</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Central Ward</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Corby Borough Council Level 1 SFRA Update (February 2019)
Danesholme Ward & 1 & 2 & 3 \\
Kingswood & Hazel Leys Ward & 3 & 6 & 9 \\
Lloyds Ward & 5 & 2 & 7 \\
Lodge Park Ward & 3 & 3 & 6 \\
Oakley South Ward & 2 & 1 & 3 \\
Rural West Ward & 1 & 2 & 3 \\
Stanio & Corby Village Ward & 1 & 1 & 2 \\
Weldon & Gretton Ward & 1 & 0 & 1 \\
Total & 21 & 24 & 45 \\

Table 5: Flooding incidents affecting properties in Corby Borough

N.B. This table is indicative of reported flood incidents which have affected properties either internally or externally only, rather than broader reported incidents of flooding.

Main Rivers

6.7 Corby is in an unusual situation as it is located at the source of three different brooks (Willow, Harper’s and Gretton) rather than on a single river downstream from its headwaters. The three brooks are distributed throughout Corby. Over the past 100 years Corby has developed in such a manner that little of the surface water network can be described as a natural system. Even the few remaining stretches of natural channel that exist are dominated by the backwater effects of manmade structures and the surrounding land use.

6.8 The brooks that enter the western edge of Corby are culverted into the surface water drainage network and do not reappear until they reach the centre of Corby. The majority of the drainage system is undersized and in the past various improvements have seen small flood storage areas and catchment transfer pipes added to store or redirect the flood water. The key fluvial flood risk areas are set out below.

River Welland

6.9 The River Welland forms the northern boundary of the Borough and the northern edge of the Borough is in the Welland valley.

Harpers Brook

6.10 Harpers Brook runs through the southern edge of the Borough and flooding has in the past been attributed to this watercourse.

Gretton Brook

6.11 Gretton Brook runs along the northern edge of the town and in the past there has been relatively insignificant flooding along this watercourse. The only documented reports of flooding are of Gretton Brook Road beside the reservoir.

Willow Brook (North, Central and Southern Arm)
6.12 The only documentation found on flooding of Willow Brook, was from the North Arm and this is included in a study of the July 1982 floods carried out in 1984 by John Taylor & Sons. Although the details are not very comprehensive, this study lists the properties affected along with suggestions of works required to mitigate the impacts of low return period storm events.

**Flood Defence Infrastructure**

6.13 NCC, along with its RMA partners, hold a great deal of GIS data showing the location of flood defences and assets. It should be noted that there is a residual risk of flooding from failure, breach or overtopping of all flood defences.

**Gretton Brook**

6.14 The only known form of flood defence along Gretton Brook is a balancing reservoir at the head of the open channel section. This reservoir provides temporary attenuation for the runoff created by the urbanisation of the upstream area of the catchment.

**Harpers Brook**

6.15 Several flood storage reservoirs have been created for flood defence within the Harpers Brook catchment, the main one being the Great Oakley balancing reservoir. This reservoir provides temporary attenuation for the increased runoff created by the urbanisation of the upstream area of the natural catchment, in conjunction with the diverted section of Willow Brook South Branch catchment. As part of the Oakley development, several reservoirs have been constructed to serve the area. These lakes have been networked together such that their outflow runs through the main lake adjacent to the Technology College. This in turn discharges to Harpers Brook.

**Willow Brook**

6.16 There are four balancing reservoirs along the northern arm of Willow Brook: Stanier Road Flood Storage Reservoir (FSR), Pen Green FSR, Pen Green Lane Balancing Pond and Phoenix Parkway FSR. These reservoirs provide temporary attenuation for the runoff created by the urbanisation of upstream sections of the catchment.

6.17 Flood defence along the Central Arm consists of several balancing reservoirs. The first is immediately upstream and the second immediately downstream of Willow Brook Road, where works have been undertaken to widen the channel and to install weirs. The next reservoir is located immediately upstream of The Jamb. Little is known of the details of these first three reservoirs however it is understood that they were all constructed during the 1980’s, probably as a result of the flooding which occurred in 1982. The Crucible Road Reservoir is located between Lloyds Lane and Crucible Road, and was constructed in the late 1980’s. Located at this point is a diversion culvert to transfer the majority of the flow to the Willow Brook South Arm. After this diversion the main central branch continues eastwards via a culvert to the Weldon Lagoon which was constructed during the early 1990’s.

6.18 Flood defence along the South Arm consists of several balancing reservoirs. Snatchill Reservoir is located on the lower branch before its intersection with the upper branch. On the length of channel between the railway line and Geddington Road there are two reservoirs. The first of these are the Clay Ponds, although again there are no details on
these. However, immediately downstream of the Clay Ponds is the Soot Banks reservoir for which much information has been obtained. There is another reservoir which also discharges to the South Arm in this area. This is the Eurohub Balancing Pond located at the end of Longcroft Road which is presumed to act as a balancing reservoir for local industry. Weldon Reservoir is located on both the upstream and downstream side of the A43 and would seem to be one of the main balancing reservoirs for the town.

**Local Sources of Flood Risk**

**Ordinary Watercourses**

6.19 An ordinary watercourse is a watercourse not defined by the EA as a main river. Ordinary watercourses are generally smaller than main rivers, and can include streams, ditches and piped watercourses. The full extent of the ordinary watercourse coverage can be seen on Map 13: Watercourse and Canal Network, in the accompanying Strategic Map Document.

**Surface Water Flood Risk**

6.20 The full extent of the surface water flood risk in Corby Borough can be viewed on Map 9: Risk of Flooding from Surface Water, in the accompanying Strategic Map Document. This map also demonstrates that, due to the landform and topography of Corby Borough, there is a wide-spread high risk of surface water flooding. Therefore where areas of surface water flood risk fall within a proposed development site, these should be considered as part of any site-specific FRA.

6.21 There are localised areas within the Borough where surface water flooding occurs regularly, for example along Gainsborough Road, between Jubilee Avenue and School Place.

**Water and Sewerage Systems**

6.22 Recorded incidents of this type of flooding are collated on a Sewer Flooding Register and are incorporated within Map 4: Recorded Flood Incidents, in the accompanying Strategic Map Document. AWS covers the entirety of Corby Borough and therefore only AWS related flooding incidents have been recorded.

6.23 There have been a total of 94 flooding incidents of this nature within the study area and they are listed in Table 6 below.

6.24 Where incidents are located within 400m of a proposed development site, consideration of the potential effects of capacity resulting in surcharging have been assessed as part of the Sequential Testing process, and should also be considered as part of any site-specific FRA.

<table>
<thead>
<tr>
<th>Location</th>
<th>Internal Sewer Flooding Register incidents</th>
<th>External Sewer Flooding Register incidents</th>
<th>Total no. of recorded Sewer Flooding Register incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beanfield Ward</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Central Ward</td>
<td>0</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Danesholme Ward</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Kingswood &amp; Hazel Leys Ward</td>
<td>0</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Lloyds Ward</td>
<td>5</td>
<td>13</td>
<td>18</td>
</tr>
</tbody>
</table>
Groundwater Flooding

6.25 The British Geological Survey data indicates that the geology of Corby comprises Pleistocene and Recent Boulder Clay overlying Jurassic Inferior Oolite. To the north, east, and south of Corby, Gretton Brook, Willow Brook and Harpers Brook have eroded the Boulder Clay to expose the underlying Inferior Oolite, which comprises Northampton Sand Ironstone; Upper Lincolnshire Limestone; Limestone and Marl. Springs are located at the boundary between the Boulder Clay and Inferior Oolite. The west of Corby is defined as a major aquifer (Lower Lincolnshire Limestone) with soils of low leaching potential. The central section of Corby is defined as a non-aquifer and to the east it is defined as a minor aquifer with soils of high leaching potential. Further east, the Weldon area is underlain by a major aquifer.

6.26 Groundwater flooding tends to last longer than fluvial or surface water flooding and mostly affects below surface infrastructure and buildings (for example, tunnels, basements and car parks). The main causes and impacts of groundwater flooding include:

- Rise of typically high groundwater levels to extreme levels in response to prolonged intense rainfall;
- Rising groundwater levels in response to reduced groundwater abstraction in an urban area (termed groundwater rebound) or a mining area (termed mine water rebound);
- Subsidence of the ground surface below the current groundwater level;
- Rise of groundwater levels due to leaking sewers, drains and water supply mains;
- Faulty borehole headworks or casings, causing upward leakage of groundwater driven by high pressure underground; and
- Increases in groundwater levels and changed flow paths due to artificial obstructions or pathways, and loss of natural storage and drainage paths.

6.27 There are no public water supply groundwater abstractions in the Corby area, nor are there any Catchment Abstraction Management Strategy (CAMS) aquifers. There are a number of recognised minor aquifers in the catchment that contribute to river flow and are used for small scale water supply. These are the Marlstone Rock, Northampton Sand, Lincolnshire Limestone, Cornbrash and recent sands and gravels.
6.28 The extent and level of risk posed by groundwater flooding across Corby Borough can be seen on Map 10: Groundwater Flood Risk, in the accompanying Strategic Map Document. The map shows pockets of very high bedrock.

6.29 Consideration of the potential effects of groundwater flooding should be considered as part of any site-specific FRA.

**Reservoir Risk**

6.30 The following section sets out the number of reservoirs and inland water bodies that either fall within the study area or where significant failure / breach would have an effect upon watercourses within the study area.

6.31 Map 11: Flood Storage and Water Supply Reservoirs, in the accompanying Strategic Map Document, shows the location of these reservoirs within the study area. In addition, there are a number of reservoirs located outside of the study area that may affect Corby Borough if they were to fail / breach. This includes the Eyebrook Reservoir, which lies between the border of Leicestershire and Rutland and is shown on the EA’s Long Term Flood Risk Map to have a maximum flood extent encompassing the settlement of Rockingham along with other sections of the Borough's northern boundary. Table 7 lists the reservoirs, their location, capacity and standard of protection (where known).

6.32 Where there is a risk of flooding to development sites as a consequence of reservoir breach, failure or overtopping, this has been captured within the maps provided in the accompanying Site Specific Map Document. An appropriate analysis should be undertaken as part of any site specific FRA for any development site that falls within a breach location.

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Location</th>
<th>Capacity (m³)</th>
<th>Standard of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen Green Lane Balancing Pond</td>
<td>Near Pen Green Flood Storage Reservoir</td>
<td>4,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>Soot Banks Flood Storage Reservoir</td>
<td>Adjacent to Stanion Lane</td>
<td>2,200</td>
<td>Unknown</td>
</tr>
<tr>
<td>Eurohub Balancing Pond</td>
<td>End of Longcroft Road</td>
<td>Unknown</td>
<td>1 in 100</td>
</tr>
<tr>
<td>Little Stanion Balancing Pond</td>
<td>Adjacent to A43 Corby Link Road</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Gretton Brook Storage Reservoir</td>
<td>Gretton Brook Road / Earlstrees Road junction</td>
<td>25,230*</td>
<td>1 in 10</td>
</tr>
<tr>
<td>Weldon Flood Storage Reservoir</td>
<td>West Weldon</td>
<td>54,000*</td>
<td>1 in 50</td>
</tr>
<tr>
<td>Great Oakley Flood Storage Reservoir</td>
<td>Adjacent to Woodlands Lane</td>
<td>15,300</td>
<td>1 in 30 - 1 in 50</td>
</tr>
<tr>
<td>Stanier Road Flood Storage Reservoir</td>
<td>Near Stanier Road Bridge</td>
<td>645</td>
<td>Unknown</td>
</tr>
<tr>
<td>Phoenix Parkway Flood Storage Reservoir</td>
<td>Phoenix Parkway / Genner Road junction</td>
<td>10,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>Crucible Road Flood Storage Reservoir</td>
<td>Between Crucible Road / Lloyds Road</td>
<td>2,500</td>
<td>1 in 50</td>
</tr>
<tr>
<td>Quarry Road Flood Storage Reservoir</td>
<td>Adjacent to Hillside Crescent</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
Table 7: Reservoirs in close proximity to and within the Study Area

<table>
<thead>
<tr>
<th>Reservoir Name</th>
<th>Location</th>
<th>Capacity (m³)</th>
<th>Risk Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snatchill Flood Storage Reservoir</td>
<td>Adjacent to Oakley Road</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Pen Green Flood Storage Reservoir</td>
<td>Adjacent to Pen Green Lane</td>
<td>15,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>Weldon Flood Storage Lagoon</td>
<td>Stamford Road / Bangrave Road / Steel Road junction</td>
<td>18,038</td>
<td>&lt; 1 in 30</td>
</tr>
<tr>
<td>Car Yard Storage Reservoir</td>
<td>Adjacent to Gretton Brook Road</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Hazel Leys Balancing Pond</td>
<td>Near Hazel Leys</td>
<td>1,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>Studfall Avenue Balancing Pond</td>
<td>Near Studfall Avenue</td>
<td>4,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>The Jamb Balancing Pond</td>
<td>Near The Jamb</td>
<td>4,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>CTC Pond</td>
<td>Near Coomb Road</td>
<td>6,047</td>
<td>Unknown</td>
</tr>
<tr>
<td>Eyebrook Reservoir</td>
<td>Between the border of Leicestershire and Rutland</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

* Reservoirs with capacity >25,000m³ fall under the Reservoirs Act (1975)

6.33 There is a requirement within the NPPF to consider all sources of flood risk and therefore flood risk from reservoirs has been reviewed as part of this assessment.

6.34 Reservoir flooding may occur as a result of the facility being overtopped and / or as a result of a breach developing in the dam wall. The latter can happen suddenly resulting in rapidly flowing, deep water that can cause a significant threat to life and major property damage.

6.35 Reservoirs overtopping or breaching could result in extensive flooding to the Borough of Corby, with potentially severe consequences on properties and infrastructure. If development is proposed in an area encompassing a flood storage area or reservoir, as shown on Map 11: Flood Storage and Water Supply Reservoirs in the accompanying Strategic Map Document, or within the extent of flood risk of reservoirs, as shown in the EA’s Long Term Flood Risk Map, then it is recommended that a site-specific FRA be produced and that this FRA should consider flood risk from a breach of the reservoir.

6.36 The EA is responsible for enforcing the Reservoirs Act 1975 (as amended by the Act 2010), which is the safety legislation for reservoirs in the United Kingdom. However, the responsibility for safety lies with reservoir owners. There are different requirements for reservoirs that hold 25,000m³ or more of water above ground level (known as large raised reservoirs), and for reservoirs that hold less than 25,000m³ of water above ground level. Reservoirs must be registered with the EA if it holds or could hold 25,000m³ or more of water above ground level.

6.37 The EA is also responsible for establishing and maintaining a register of reservoirs, and making this information available to the public. As the associated enforcement authority, the EA must ensure flood plans are produced for specified reservoirs.

6.38 Reservoir owners (Undertakers) have ultimate responsibility for the safety of their reservoirs. They must appoint a Panel Engineer (a specialist civil engineer who is qualified and experienced in reservoir safety) to continuously supervise the reservoir (Supervising
Engineer) and to carry out periodic inspections (Inspecting Engineer). A Panel Engineer must also be appointed to design and construct a new reservoir, or repair or make changes to an existing reservoir (Construction Engineer).

6.39 A periodic inspection by an Inspecting Engineer is required every ten years, or more frequently if necessary. As a result of that inspection, a safe operating regime will be specified and works required, ‘in the interests of safety’, may be recommended. A Supervising Engineer is required to supervise the operation and maintenance of the reservoir and produce an annual statement. The Supervising Engineer can recommend that a periodic inspection is carried out\(^1\). As a result of inspections and assessments of reservoirs, the risk of catastrophic breach, failure or over-topping is reduced, although there is still a residual risk.

\(^1\) [https://www.gov.uk/guidance/reservoirs-owner-and-operator-requirements](https://www.gov.uk/guidance/reservoirs-owner-and-operator-requirements)
7  Predicted Flood Risk

Surface Water Flooding

7.1 Also known as pluvial flooding, surface water flooding occurs when rainfall generates runoff which flows over the surface of the ground and ponds in low lying areas. It is usually associated with high intensity rainfall events and can be exacerbated when the ground is saturated or when the drainage network has insufficient capacity to cope with the additional flow.

7.2 Flooding occurs as a result of the rainfall that does not soak into the land or enter a drainage system or watercourse, but remains on the surface. Runoff does not necessarily cause a problem if it flows straight into drains or watercourses, or on to land where it can quickly soak away. However, in some cases runoff flows onto the road network creating a hazard, particularly in winter conditions, or into homes or onto their land where it can cause damage and disruption. Runoff may also pass into small ditches or channels that run through or adjacent to property. If not maintained these flow routes can become ineffective and flooding may occur. Surface water can also be caused by flood water coming out of a drainage system where capacity has been exceeded.

7.3 Surface water flooding can also originate from farmland, often termed agricultural runoff. This is a particular risk where soil has been compacted or vegetation removed, either seasonally by ploughing or temporarily as topsoil is stripped to allow for development, as rainwater is no longer able to quickly soak into the ground. Instead the rainwater flows over the land, carrying soil with it to create a “muddy flood”. The farmland itself can be damaged because the floodwater can carry away topsoil and even crops.

7.4 The updated Flood Map for Surface Water, produced by the EA, has been used to inform the findings of this report and in particular the site-specific assessment found in Section 8 of this document. This mapping layer assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- 1 in 30 (3.3%);
- 1 in 100 (1%); and
- 1 in 1000 (0.1%).

7.5 It provides the following data for each flooding scenario:

- Extent;
- Depth;
- Velocity (including flow direction at maximum velocity); and
- Hazard (as a function of depth and velocity).

7.6 It includes information about the source of the data (i.e. whether it was from nationally or locally produced modelling) and the confidence in the data outputs.

7.7 Map 9: Risk of Flooding From Surface Water, in the accompanying Strategic Map Document, shows the Borough of Corby is at significant risk of flooding from surface water, with each of the nine main settlements of Corby Town, Weldon, Rockingham, Gretton, Cottingham,
Middleton, East Carlton, Stanion and Little Stanion, all shown to be at risk. The town of Corby is shown to be at particularly high risk.

7.8 The data has also been used to inform the site-specific assessments and the associated maps show that there are numerous potential development sites at risk from surface water flooding, particularly those close to the watercourses and with undulating topography.

7.9 In total, there are 7,733 properties at risk of surface water flooding in the study area.

**General Drainage Issues**

7.10 Overflowing surface water drains can lead to flooding, either due to under capacity of drainage or failure of a drainage system, such as blocked pipes, mechanical breakdown or operational errors. Gravity drained systems can back up due to an inability to flow into the river due to high water levels occurring in the receiving watercourse. Individually these impacts usually have little consequence for the flood risk across the wider catchment. However, due to their widespread occurrence, the local impacts cannot be ignored.

7.11 Sewers are typically designed to cater for a storm period from 2% up to the 3.33% Annual Exceedance Probability (AEP). Combined sewer systems (where surface water and foul water use the same network), in comparison to the separate systems, have more limited capacity. They often do not have the capacity to convey all flows during a significant event, with excess flows being discharged into adjacent watercourses via combined sewer overflows. Furthermore, during high flow events, excess flood water can flow out of the combined sewer system at manholes, and flood roads and properties in the vicinity. The level of performance of the sewers will be reduced by lack of regular maintenance.

7.12 It is clear from the number of instances of flooding in the study area, combined with the increased pressure for development and the impacts of climate change, that localised flood risk, arising from inadequate surface water drainage capacity, will need to be managed effectively to deliver an overall reduction in flood risk. Where known capacity issues have been identified, as part of the site-specific assessments, these have been highlighted.

7.13 Detailed consideration and assessment will be required for certain sites as part of the planning application process, and this has been outlined within Table 8.

**Fluvial Flooding**

7.14 The fluvial flooding risk to Corby Borough is identified on Map 8: Risk of Flooding from Rivers and Seas, in the accompanying Strategic Map Documents, and shows the most significant risk of flooding from rivers and seas extending along the north-western boundary of the Borough, enveloping the River Welland and its associated tributaries. Land located within this area is of primarily rural use.

7.15 Fluvial flooding occurs when a watercourse cannot accommodate the volume of water that is flowing into it. Rivers are categorised into main rivers and ordinary watercourses. Main rivers are usually large watercourses, but also include smaller watercourses of strategic drainage importance. These are coordinated, in flood risk terms, by the EA. Smaller watercourses, ditches and streams are classified as ordinary watercourses. Ordinary watercourses in Northamptonshire are those not defined as main rivers and are coordinated in flood risk terms by NCC. All Borough and District Councils have permissive powers under the Land Drainage Act (1991 as amended) to undertake works on these watercourses.
Both Flood Zone 2 and Flood Zone 3 extents are present within the Borough of Corby as can be seen on Map 6: Fluvial Flood Zones, in the accompanying Strategic Map Document. The Flood Zone extents associated with the River Welland are those with the greatest spatial extent and interact with the Borough’s north-western boundary, extending across primarily rural areas. The Flood Zone extents associated with Willow Brook interact with the urban settlements of Weldon and Corby Town, indicating that it is the fluvial flooding associated with this main river that is likely to carry the most significant risk to people and property. The Flood Zone extents associated with Harpers Brook also have a minor interaction with the south of Corby, as well as with public highway infrastructures in Stanion.

Within Corby Borough there are 710 properties identified as being located in Flood Zone 2 and 214 properties located in Flood Zone 3. Map 6: Fluvial Flood Zones, in the accompanying Strategic Map Document, identifies these zones.

There is a single raised flood defence structure present within the Borough of Corby, providing protection from Harpers Brook south of Corby Town. However, no areas benefitting from flood defences are identified.

Map 7: Flood Zone 3a and 3b, in the accompanying Strategic Map Document, identifies a Flood Zone 3b area which covers a large spatial extent, associated with the River Welland, extending from the northwest of the Borough to the north. The areas of Corby that are found within this extent are primarily rural. Additional Flood Zone 3b extents are found in the northeast and south of Corby, as well as along the routes of the Willow Brook and Harpers Brook watercourses. The Flood Zone 3b extents associated with Willow Brook show a significant risk of fluvial flooding to the settlement of Weldon and the east of Corby.

Land deemed to be in Flood Zone 3a is described as having a high probability of flooding, with a predicted 1 in 100 (1%) or greater annual probability of river flooding. Flood Zone 3b comprises land where water has to flow or be stored in times of flood. It is a requirement within the NPPF that LPAs identify, in their SFRAs, areas of functional floodplain. This Flood Zone depicts areas with an annual probability of flooding of 1 in 20 (5%) or greater in any year. It also highlights areas that are designed to flood (such as flood storage reservoirs) in an extreme flood (0.1% annual probability). The functional floodplain is a very important planning tool in ensuring that space is made for flood waters when flooding occurs. Development should be directed away from these areas.

For several watercourses within the study area, the EA hold detailed modelled flood outlines for the 1 in 20 year (5% annual probability) and 1 in 25 year (4% annual probability) flood events. Where this is the case, this data has been used to map the functional floodplain. Where this information is not available, the EA Flood Map for Planning (Rivers and Sea), Flood Zone 3, has been used. This provides the best estimate for the areas of land at risk of flooding, when the presence of flood defences are not considered. This zone also covers land with a 1 in 100 (1%) or greater chance of flooding each year from rivers.

Detailed consideration should be given to fluvial flood risk as part of the preparation of any site-specific FRA and should include the updated climate change allowances. See Appendix 4 ‘Guidance on the preparation of FRAs’ and Appendix 5 ‘Guidance on Climate Change Allowances’ for more information. This information should also be used to inform future planning policy considerations.

Residual Flood Risk
7.23 Flood defence infrastructure data has been provided in the study area to control floodwater and to reduce fluvial flood risk. Flood defence infrastructure comes in a variety of forms (flood walls, flood embankments, flood relief channels and flood storage reservoirs), and it is important to stress that this infrastructure does not altogether alleviate the risk of flooding.

7.24 Residual flood risk will remain if there is a system malfunction and/or if the magnitude of the flood event exceeds the flood management design standard of the infrastructure. Regular maintenance of the flood defence assets, as well emergency preparedness, will help keep this residual risk as low as possible. A key element of emergency preparedness is the maintenance of a flood warning service.

7.25 The NPPF defines residual risks as those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- The failure of flood management infrastructure, such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- Failure of a reservoir; or
- A severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

7.26 Development areas located behind flood defences are at particular risk from rapid onset of fast-flowing and deep water flooding, with little or no warning if defences are overtopped or breached. Therefore, where development is located in areas behind formal or informal defences, as displayed on Map 6: Fluvial Flood Zones, in the accompanying Strategic Map Document, this should be considered as part of the preparation of any site-specific FRA.

**Groundwater Flooding**

7.27 This type of flooding occurs when the water table rises and water levels in the ground rise above the surface of the land. Flooding tends to occur after long periods of sustained heavy rainfall and can last for weeks or even months. The areas at most risk are often low-lying areas where the water table is more likely to be at a shallow depth and flooding can be experienced through water rising up from the underlying aquifer, or from water flowing from springs. Flooding from groundwater is most common in areas where the underlying bedrock is chalk, but it can also happen in locations with sand and gravel, such as in the Northamptonshire river valleys.

7.28 The main causes and impacts of groundwater flooding have previously been identified in Section 6.26 of this document.

7.29 Map 10: Groundwater Flood Risk, in the accompanying Strategic Map Document, illustrates the groundwater flood risk in Corby Borough. This shows there are areas at significant risk of experiencing groundwater flooding. The settlements at greatest risk of groundwater flooding are Weldon, East Carlton and Stanion, with areas of Corby, particularly in the south and east, also at significant risk.

7.30 A total of 379 properties in the study area are located in areas at very high risk of groundwater flooding, with 460 properties at high risk, 66 at moderate risk, 63 at low risk, 3,496 at very low risk and 25,775 at negligible risk.
7.31 Further investigation should be carried out as part of the preparation of a site-specific FRA, for any site deemed to be at risk of groundwater flooding. The FRA should incorporate a site-based assessment of the potential risk of groundwater flooding to the site, confirming from borehole data whether groundwater is a source of flood risk for the site, and setting out any mitigation measures proposed.

7.32 More information about this type of flood risk, along with the detailed Northamptonshire Groundwater Flood Risk Study (2016), prepared by ESI, and associated planning guidance, can be found on the NCC Flood Toolkit.
8 Site-Specific Information

8.1 Map 12: Potential Development Sites, in the accompanying Strategic Map Document, identifies all of the sites that have been reviewed in terms of flood risk within Corby Borough, as set out in Table 8. All proposed development sites are located within the town of Corby.

8.2 This site-specific review has included an assessment of the fluvial, surface water, sewer, groundwater and reservoir breach flood risk. To illustrate the various sources of flood risk, maps have been produced for each site in the accompanying Site Specific Map Document. Where a site has experienced flooding in the past, or flooding has been experienced in close proximity (i.e. within 400m), this has been highlighted. Where a site has a watercourse located adjacent or flowing through it, the need for a Land Drainage Consent (for Ordinary Watercourses) or Environmental Permit (for Main Rivers) has also been highlighted. Where sewer flooding (surface water) due to capacity issues has been experienced within 400m of the site, this has been included within the assessment.

8.3 Site-specific development considerations have been provided for each site and additional advice provided where considered appropriate. The data displayed in Table 8 includes a Red, Amber, and Green (RAG) Assessment, which has been used to communicate the following:

<table>
<thead>
<tr>
<th>Limited flood risk to site, acceptable for allocation in flood risk management terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site deliverable in flood risk management terms, providing the site-specific considerations e.g. sequential approach are incorporated into the policy requirement for the site</td>
</tr>
<tr>
<td>Additional work required before allocation</td>
</tr>
</tbody>
</table>

8.4 Where potential development sites are at risk from flooding, ideally they should be relocated to Flood Zone 1, if possible, in line with the Sequential Test. However, in the absence of other suitable locations, the development sites may be located in Flood Zone 2 and Flood Zone 3 (in order of preference respectively). Where the sequential approach to the site can be taken this has also been recommended. Development sites that are either wholly or partly situated in Flood Zone 2 or Flood Zone 3 will require further assessment or justification through the Exception Test.

8.5 It should be noted and acknowledged that sites which are located within Flood Zone 2 and Flood Zone 3, often have an area also located within Flood Zone 1. Therefore a sequential approach to the site layout can be adopted, providing the scale and density of the proposed development is known, with a view to locating more vulnerable land uses in Flood Zone 1 and less vulnerable uses in the higher risk Flood Zones. Site boundaries can also be redefined to avoid areas of high flood risk if required.

8.6 The majority of the sites have been assessed as ‘amber’, because they are either at risk of surface water or groundwater flooding, have experienced flooding on the site or in close proximity of the site in the past, or have capacity issues within the existing drainage systems. These sites will require site-specific policies to be incorporated as part of the allocation process. None of the sites have been classed as ‘green’ and two sites are ‘red’. Both of these sites are within Flood Zones 1, 2 and 3, have a significant surface water flood risk, and have
been affected by flooding incidents in the past. Two of the sites also have undetermined planning applications associated with them.
<table>
<thead>
<tr>
<th>SITE</th>
<th>Name/Site</th>
<th>Location</th>
<th>Is the site affected by Flood Zone 1, 2 or 3</th>
<th>Is the site affected by local sources of flood risk?</th>
<th>Sequential Test</th>
<th>Site-specific development requirements</th>
<th>Comments</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Garage Court, Lindisfarne Road, Corby (Map 14)</td>
<td>487570, 290140</td>
<td>Flood Zone 1 Medium Negligible No N/A</td>
<td>Avoid built development on part of the site affected by surface water flood risk. Use of on-site surface water drainage systems required and better provision for flow path conveyance. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood risk to any adjacent land.</td>
<td>Surface water: The north of the site is prone to medium risk surface water flooding. Avoid development in surface water flood areas and flow paths. Flood incidents: An Anglian Water Sewer Register incident relating to a combined sewer overspill is located within 20m of the site. A capacity assessment is required as part of any development coming forward and it is recommended that pre-planning advice is sought from Anglian Water to identify a feasible drainage strategy. Two additional Anglian Water Sewer Register incidents are located within 400m of the site.</td>
<td></td>
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<tr>
<td></td>
<td>Garage Court, Swale Close, Corby (Map 15)</td>
<td>487497, 290304</td>
<td>Flood Zone 1 Very Low Negligible No N/A</td>
<td>Use of on-site surface water drainage systems required and better</td>
<td>Flood incidents: An Anglian Water Sewer Register incident relating to a combined sewer overspill is located within 150m of the site. A capacity assessment is required as part of any development coming forward.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SITE</td>
<td>Name/ Site Location</td>
<td>Is the site affected by Flood Zone 1, 2 or 3?</td>
<td>Site-specific development requirements</td>
<td>Comments</td>
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<tr>
<td></td>
<td></td>
<td>Is the site affected by local sources of flood risk?</td>
<td>Sequential Test</td>
<td>Risk</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Surface Water</td>
<td>Ground Water</td>
<td>Required</td>
<td>Passed</td>
<td></td>
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<td></td>
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<td></td>
<td>provision for flow path conveyance. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood risk to any adjacent land.</td>
<td>Two additional Anglian Water Sewer Register incidents are located within 400m of the site.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Use of on-site surface water drainage systems required and better provision for flow path conveyance. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood risk to any adjacent land.</td>
<td>Surface water: Central areas of the site are susceptible to high risk surface water flooding. Avoid development in surface water flood areas. Flood incidents: Two LLFA recorded flood incidents relating to flooding of the public highway are located within 300m of the site.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Maple House, Canada Square, Corby (Map 16)</td>
<td>487038, 287221</td>
<td>Flood Zone 1</td>
<td>High</td>
<td>Negligible</td>
<td>No</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name/Site</td>
<td>Location</td>
<td>Is the site affected by Flood Zone 1, 2 or 3</td>
<td>Sequential</td>
<td>Site-specific development requirements</td>
<td>Comments</td>
<td>Risk</td>
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<tr>
<td>Land at Station Road, Corby (Map 17)</td>
<td>489239, 288632</td>
<td>Flood Zone 1</td>
<td>Low</td>
<td>Negligible</td>
<td>No</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Is the site affected by local sources of flood risk?**
  - Yes

- **Sequential Test**
  - Required: No
  - Passed: N/A

- **Comments**
  - Use of on-site surface water drainage systems required and better provision for flow path conveyance.
  - Flooding has been experienced on the site or within close proximity. The FRA has not addressed this matter. Ensure that the development is safe and does not increase flood risk to any adjacent land.

- **Risk**
  - Moderate

- **Flood incidents**: An LLFA recorded flood incident is located in close proximity to the site, relating to heavy flooding of the Oakley Road/Station Road junction. Any proposal coming forward should incorporate an investigation of the highways surface water drainage at this location. Three additional LLFA recorded incidents are located within 400m of the site.

- **Surface Water**: A small area in the centre of the site is at low risk of flooding. Avoid development in the surface water flood risk area.

- **Planning applications**: There is an undetermined planning application for this site for the development of 150 residential units, car parking, new landscaping and associated works, which was submitted in December 2017 (reference 17/00663/DPA) and includes a FRA. However, this does not include the flood incidents recorded.
<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Flood Zone</th>
<th>Surface Water</th>
<th>Ground Water</th>
<th>Sequential Test</th>
<th>Site-specific development requirements</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Parkland Gateway, George Street, Corby (Map 18) | 488020, 288715 | Flood Zone 1 | Low | Very Low | No | N/A | Use of on-site surface water drainage systems required and better provision for flow path conveyance. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood risk to any adjacent land. | **Surface Water:** a small area to the south of the site is at low risk of flooding. Avoid development in the surface water flood risk area.  
**Flood incidents:** Two LLFA recorded flood incidents are located within 400m of the site, with one incident relating to flooding of Cottingham Road, and the other relating to flooding of a public pathway during a heavy rainfall event.  
**Section 19 Formal Flood Investigation:** An investigation into the flooding affecting a medical practice on Cottingham Road has been undertaken within 400m of the site. |
| Land at Pen Green Lane, Corby (Map 19a and 19b) | 489435, 290260 | Flood Zone 3 | High | Negligible | Yes | TBC | Avoid built development on part of the site affected by Fluvial and Surface Water Flood Zones. Use of on-site surface water drainage systems required and better | **Fluvial flood zones:** Willow Brook North flows from west to east, in close proximity to the southern boundary of the site. The south-eastern section of the site is located within Flood Zone 3, due to the presence of a flood storage area at this location.  
**Flood storage areas:** A flood storage area is located in the south-eastern section of the site. An additional flood storage area is
<table>
<thead>
<tr>
<th>Name/Site</th>
<th>Location</th>
<th>Is the site affected by Flood Zone 1, 2 or 3</th>
<th>Is the site affected by local sources of flood risk?</th>
<th>Sequential Test</th>
<th>Site-specific development requirements</th>
<th>Comments</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>provision for flow path conveyance. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood risk to any adjacent land.</td>
<td></td>
<td>located in close proximity to the site, adjacent to the flood storage area that falls within the site boundary.</td>
<td>Surface water: A central area of the northern section of the site is susceptible to high risk surface water flooding. Avoid development in extent of surface water flood risk area. Flood incidents: The flood storage area located outside of the site boundary, adjacent to the flood storage area that is located within the site, is identified in the Corby Water Cycle Strategy Phase 2 as a flood hotspot, due to inadequate flood storage capacity. An LLFA recorded flood incident is located in very close proximity to the southern boundary of the site, resulting in internal flooding of a residential property from surface water runoff. Two additional LLFA recorded incidents, relating to internal flooding of a residential property from groundwater sources, and a non-residential property from surface water runoff, are located within 250m of the site.</td>
<td></td>
</tr>
<tr>
<td>SITE</td>
<td>Location</td>
<td>Is the site affected by Flood Zone 1, 2 or 3</td>
<td>Is the site affected by local sources of flood risk?</td>
<td>Sequential Test</td>
<td>Site-specific development requirements</td>
<td>Comments</td>
<td>Risk</td>
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</tr>
<tr>
<td>Western Land at Pen Green, Corby (Map 20a and 20b)</td>
<td>489215, 290215</td>
<td>Flood Zone 3</td>
<td>High</td>
<td>Negligible</td>
<td>Yes</td>
<td>TBC</td>
<td>Avoid built development on part of the site affected by Fluvial and Surface Water Flood Zones. Use of on-site surface water drainage systems required and better provision for flow path conveyance. Ensure an Environmental Permit is sought from the EA if works are to be undertaken within 8m of the Main River. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flooding.</td>
</tr>
<tr>
<td>SITE</td>
<td>Name/Site</td>
<td>Location</td>
<td>Is the site affected by Flood Zone 1, 2 or 3</td>
<td>Is the site affected by local sources of flood risk?</td>
<td>Sequential Test</td>
<td>Site-specific development requirements</td>
<td>Comments</td>
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<td></td>
<td></td>
<td></td>
<td>Surface Water</td>
<td>Ground Water</td>
<td>Required</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>Oasis Retail Park, Alexander Road/Elizabeth Street, Corby (Map 21)</td>
<td>488269, 288661</td>
<td>Flood Zone 1</td>
<td>Low</td>
<td>Very Low</td>
<td>No</td>
<td>N/A</td>
<td>Avoid built development on part of the site affected by surface water flood risk. Use of on-site surface water drainage systems required and better provision for flow path conveyance. Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood risk to any adjacent land. <strong>Surface water</strong>: A surface water flow path runs through a small area to the east of the site. Avoid development in the surface water flood risk area. <strong>Flood incidents</strong>: Five LLFA recorded flood incidents are recorded within 400m of the site, one of which is 200m north of the north-eastern section of the site and resulted in internal flooding of a non-residential property as a consequence of a culvert overflowing.</td>
</tr>
<tr>
<td>Former Our Lady Pope John RC</td>
<td>486188, 287700</td>
<td>Flood Zone 1</td>
<td>High</td>
<td>Negligible</td>
<td>No</td>
<td>N/A</td>
<td>Avoid built development on part of the site is susceptible to high risk surface water</td>
</tr>
<tr>
<td>Name/Site Location</td>
<td>Surface Water</td>
<td>Ground Water</td>
<td>Required</td>
<td>Passed</td>
<td>Sequential Test</td>
<td>Site-specific development requirements</td>
<td>Comments</td>
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<tr>
<td>Secondary School, Corby (Map 22)</td>
<td></td>
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</tr>
</tbody>
</table>

- The site affected by surface water flood risk.
  - Use of on-site surface water drainage systems required and better provision for flow path conveyance.
  - Flooding has been experienced on the site or within close proximity. The detailed site-specific FRA is required to ensure that the development is safe and does not increase flood risk to any adjacent land.
  - Ensure Land Drainage Consent is sought from the Bedford Group of IDBs if works are to be undertaken within 9m water flooding. Avoid development in surface water flood area.

**Flood incidents:** An LLFA recorded flood incident is located within the site boundary, relating to surface water runoff, as identified within the Corby Water Cycle Strategy Phase 2. An LLFA recorded incident relating to the internal flooding of a residential property is located within 150m of the site.

**Ordinary watercourses:** An ordinary watercourse, culverted east of the A6003, runs from west to east, adjacent to the southern boundary of the site. The fluvial flooding that occurred in the area prior to 1983 has not occurred since then due to the culverting of the watercourse. The watercourse is still an open watercourse to the west of the A6003, which acts as a 3m high restriction. Based on the height of the flow restriction and the lack of flooding events since 1983 the risk to the site from fluvial flooding is considered minor.
<table>
<thead>
<tr>
<th>SITE</th>
<th>Name/Site</th>
<th>Location</th>
<th>Surface Water</th>
<th>Ground Water</th>
<th>Sequential Test</th>
<th>Site-specific development requirements</th>
<th>Comments</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Builders Yard (rear of garden centre), Cottingham Road, Corby (Map 23)</td>
<td>487890, 290570</td>
<td>High</td>
<td>Very Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Planning application: there is an undetermined application for the erection of 88 dwellings submitted in December 2017 (reference 17/00667/DPA). This includes a FRA and fully references the flooding incidents.</td>
<td></td>
</tr>
</tbody>
</table>

**SITE**

- **Is the site affected by Flood Zone 1, 2 or 3?**
- **Surface Water:**
  - High
  - Very Low
- **Ground Water:**
  - Required
  - Passed
- **Sequential Test:**
  - Yes
  - Yes
- **Site-specific development requirements:**
  - Avoid built development on part of the site affected by surface water flood risk.
  - Use of on-site surface water drainage systems required and better provision for flow path conveyance.
  - Flooding has been experienced on the site or within close proximity. A detailed site-specific FRA will be required to ensure that the development is safe and does not increase flood incidents.
- **Comments:**
  - Surface water: A small section of the northern boundary of the site is susceptible to high risk surface water flooding. Avoid development in surface water flood area.
  - Flood incidents: An LLFA recorded flood incident has been recorded within 90m of the southern boundary of the site, relating to agricultural runoff affecting the garden of a residential property.
### Table 8: Sequential Testing of key development sites within Corby Borough

<table>
<thead>
<tr>
<th>Name/Site</th>
<th>Location</th>
<th>Is the site affected by Flood Zone 1, 2 or 3</th>
<th>Is the site affected by local sources of flood risk?</th>
<th>Sequential Test</th>
<th>Site-specific development requirements</th>
<th>Comments</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

- **Comments**: flood risk to any adjacent land.
Further Site Specific Requirements

8.7 The two sites highlighted as ‘red’ (Land at Pen Green Lane, Corby – Maps 19a and 19b, and Western Land at Pen Green, Corby – Maps 20a and 20b) will require additional information to ensure the sequential test can be passed prior to formal allocation, otherwise the following options could be taken:

- The site boundaries could be amended / reduced to eliminate the flood risk;
- The sites could be removed from the site allocation process and dealt with at the planning application stage (at which point the information required could be provided by the applicant);
- The sites could be assessed as part of a Level 2 SFRA; and/or
- The sites could be included within the Part 2 Local Plan with associated policy regarding the flood risk attributed to them and outlining the additional information that is required.
9 Flood Risk Management, Resilience and Resistance

Flood Defence and Assets

9.1 Flood defences and assets within Northamptonshire have been identified within the Section 21 (the Act 2010) Asset Register. This register has been created by NCC as the LLFA and is a legal duty. This register is available to view on the NCC Flood Toolkit.

9.2 The asset register contains information about assets that could have an effect on flood risk in the county, including raised defences such as embankments and flood walls, as well as flood storage reservoirs and flood relief channels. Additionally the EA holds data along the defined main rivers.

9.3 The key defences within the study area have been identified and these are shown on Map 6: Fluvial Flood Zones in the accompanying Strategic Map Document.

9.4 With regards to reservoir safety, following the preparation of the reservoir inundation maps, emergency planners have prepared specific plans for those that have been judged to be higher priority reservoirs. The NCC Emergency Planning Team used these maps to develop emergency flood plans in partnership with the Local Resilience Forum (LRF). Developers and those promoting sites may need to refer to this information to support their site-specific FRAs and therefore more information can be obtained by contacting the NCC Emergency Planning Team.

Flood Warning and Hydrometric Stations

9.5 The EA measures river levels, river flows and rainfall across England at strategic locations. The hydrometric data, combined with flood forecasting models, are used to inform the EA’s Flood Warning System. The details for the one located within Corby Borough are provided in Table 9 below. Real-time information is available for this station, which can be viewed through the hyperlink provided. This data can be used to inform site-specific FRAs and associated flood model data.

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willow Brook at Weldon Flood Storage Reservoir</td>
<td>River Level Gauge</td>
</tr>
<tr>
<td></td>
<td>Station ID: 6124</td>
</tr>
<tr>
<td></td>
<td>Typical range: 0.00m to 3.64m</td>
</tr>
<tr>
<td></td>
<td>Highest level on record: 4.06m on 09 April 1998</td>
</tr>
<tr>
<td></td>
<td>Site datum: 82.00mAOD</td>
</tr>
<tr>
<td></td>
<td>Website: <a href="https://flood-warning-information.service.gov.uk/station/6124?direction=up">https://flood-warning-information.service.gov.uk/station/6124?direction=up</a></td>
</tr>
</tbody>
</table>

Table 9: Hydrometric Station within the study area

9.6 The timely issue, receipt and response to warnings of floods are essential elements in the management of the residual risk of flooding. Where development is located in flood risk areas this provides an essential early warning service. The EA is responsible for monitoring flood events and for issuing warnings to people, properties and businesses at risk of flooding.

9.7 Flood forecasting requires real time data and forecast model data to provide accurate and timely flood warnings to the public. The EA’s procedures for distributing warnings are
activated by triggers for individual river level and flow sites. Once a rain gauge and/or a river level gauge reaches pre-determined levels, catchment conditions are assessed using a combination of soil moisture deficit data, rainfall information from radar, and real-time rainfall and river responses. When conditions suggest that a flood is expected, a flood warning is issued and the EA’s flood warning service is activated. This is known as the **Floodline Warnings Direct** (FWD).

9.8 Four codes are used, which are:

- **Flood Alert**: when flooding of low-lying land and roads is possible;
- **Flood Warning**: when flooding of homes, businesses and main roads is expected;
- **Severe Flood Warning**: when severe flooding is expected. Under such conditions, there will be significant risk to life and property; and
- **Warning no longer in force**: when flood alerts or flood warnings are no longer in place.

9.9 Upon reaching an action trigger there is a built-in two-hour lead time before the onset of flooding. This lead time allows people to take remedial action in the face of an oncoming flood, such as lifting carpets, moving furniture and evacuating buildings.

9.10 Two EA designated flood warning areas intersect the Borough of Corby: the Welland Valley flood warning area and the Harpers Brook and Willow Brook flood warning area. These can be seen on Map S: Flood Alert and Warning Areas, in the accompanying Strategic Map Document. The Welland Valley flood warning area extends from west to northeast along the Borough’s north-western boundary; however it has no interaction with settlements within the Borough. The Harpers Brook and Willow Brook flood warning area encompasses the Gretton Brook, Willow Brook and Harpers Brook watercourses, interacting with the settlements of Corby, Weldon and Stanion.

9.11 There are two small sections of the Harpers Brook and Willow Brook flood warning area that are identified as flood alert areas, one of which encompasses Willow Brook as it runs through central Weldon, and the other extends along the section of Willow Brook that lies adjacent to Weldon Woodland Park.

9.12 All new development being promoted within these areas should be by exception and should detail within their FRA a robust strategy for ensuring new residents sign up to the FWD service.

9.13 Local Authorities are encouraged to work with the EA to ensure that as many homeowners as possible are signed up to FWD and that any new properties are made aware of this service.

**Emergency Planning and New Development**

9.14 Where efforts to avoid and reduce flood risk have been exhausted at the planning application stage, flood risk can be further managed by mitigating the damages caused by flooding on homes, businesses and infrastructures. This can be achieved by promoting flood resilience and flood resistance measures as set out below.

9.15 During flood events, the EA and Local Authorities are required (under the Civil Contingencies Act 2004) to liaise closely, and the Councils will implement a range of contingency plans to detail how local services are to work together to respond to any incident or disaster. These
plans include but are not limited to a Civil Emergency Manual, Flood Plan, and Emergency Communication plan.

9.16 Evacuation plans should be designed and put in place for new development areas identified as being at risk of flooding and should take into account that the occupiers are likely to lack local knowledge. The mobility of occupants also needs to be considered.

9.17 Developers and those promoting sites should refer to the guidance produced by NCC regarding New Development and Emergency Flood Plans, which can be found on the NCC Flood Toolkit, when producing their site-specific FRAs.

**Flood Resilience**

9.18 The concept of flood resilience refers to the ability of a building to recover following inundation from flood water. Flood resilient buildings are designed to reduce the consequences of flooding and facilitate recovery from the effects of flooding sooner than conventional buildings.

9.19 Flood resilience may be achieved through the use of water-resistant materials for floors, walls and fixtures, and by ensuring electrical controls, cables and appliances are placed at a higher than normal level. More information is available, including interactive diagrams, on the Flood Prevention pages of the NCC Flood Toolkit.

9.20 Where possible, the finished floor levels (lowest floor level) should be raised above the predicted flood level to prevent the ingress of flood water. For fluvial flooding this should generally be 300mm above the 1% (1 in 100) probability flood, including an allowance for climate change (see Appendix 5 for more information).

9.21 For single storey residential development (bungalows and ground floor flats), finished floor levels should be set 300mm above the 0.1% (1 in 1000) annual probability flood event, including an allowance for climate change (see Appendix 5 for more information).

9.22 Consideration must be given to providing access for those with restricted mobility. In considering appropriate resilience measures, it will be necessary to plan for specific circumstances and have a clear understanding of the mechanisms that lead to flooding and the nature of the flood risk. This information will need to be included within any FRA supporting the planning application where a risk of flooding has been demonstrated (see Appendix 4: Guidance on Preparation of FRAs, for more information).

**Flood Resistance**

9.23 The concept of flood resistance refers to the ability of a building to keep floodwater from entering it, even if surrounded by it. Flood resistant construction prevents the entry of water or minimises the amount of water that may enter a building where there is flooding outside and therefore relies on the operational deployment of flood defences at the property scale. This can be achieved by raising finished floor levels for instance, and often these measures rely on the availability of a reliable flood forecasting and warning system, and well established mobilisation and closure processes.

9.24 This form of construction should be used with caution and accompanied by resilience measures, as flood exclusion may rely on the effective deployment of elements such as barriers to doorways. Temporary and demountable defences are not normally appropriate for new developments.
9.25 Resilient construction is favoured because it can be achieved more consistently and is less likely to encourage occupiers to remain in buildings surrounded by rapidly rising water levels, thereby making access for emergency services difficult and possibly hazardous.

9.26 Essential infrastructure which has to be located in flood risk areas should be designed to remain operational when floods occur. More information is available on flood resistance and can be found on the NCC Flood Toolkit.

**Reducing Flood Risk through Site Layout and Design**

9.27 Flood risk should be considered at an early stage in designing the layout and development of a site in order to provide an opportunity to reduce flood risk within the development.

9.28 The NPPF states that a sequential, risk-based approach should be applied to try to locate more vulnerable land-use to higher ground, while more flood-compatible development (e.g. vehicular parking, recreational space) can be located in higher risk areas. However, vehicular parking in floodplains should be based on the nature of flooding, flood depths and hazard, including evacuation procedures and flood warnings.

9.29 Waterside areas, or areas along known flow routes, can act as green infrastructure, being used for recreation, amenity and environmental purposes, allowing the preservation of flow routes and flood storage, and at the same time providing valuable social and environmental benefits to contribute towards other sustainability objectives. Landscaping should ensure safe access to higher ground from these areas, and avoid the creation of isolated islands as water levels rise.

**Modification of Ground Levels**

9.30 Modifying ground levels to raise the land above the required flood level is an effective way of reducing flood risk to a particular site in circumstances where the risk is entirely from tidal flooding or the land does not act as conveyance for flood waters. However, care must be taken at locations where raising ground levels could adversely affect existing communities and properties.

9.31 In most areas of fluvial flood risk, raising land above the floodplain would reduce conveyance or flood storage in flood cells and could adversely impact flood risk downstream or on neighbouring land.

9.32 Compensatory flood storage should be provided, and would normally be on a level for level, volume for volume basis, on land that does not currently flood but is adjacent to the floodplain (in order for it to fill and drain). It should be in the vicinity of the site and within the red line of the planning application boundary (unless the site is strategically allocated).

9.33 Raising ground levels can also deflect flood flows, so appropriate assessment should be performed to demonstrate that there are no adverse effects on third party land.

9.34 Raising levels can also create areas where surface water might pond during significant rainfall events. Any proposals to raise ground levels should be tested to ensure that it would not cause increased ponding or build-up of surface runoff on third party land.

**Buffer Strips**
9.35 As a minimum, developers should set back development eight metres from the landward toe of a main river (fluvial defences or top of bank where defences do not exist) and nine metres for ordinary watercourses. This provides a buffer strip to ‘make space for water’, allow additional capacity to accommodate climate change, ensure access to defences is secured for maintenance purposes and provide added resistance to the site. Where works are required within eight metres of main river an Environmental Permit for flood risk activities may be required. Where works are required within nine metres of an ordinary watercourse Flood Defence Consent will be required.

**Houses in Multiple Occupation**

9.36 Houses in multiple occupation can put residents at greater risk in areas of high flood risk, as they often have bedrooms on the ground floor or have basements that are converted into living accommodation. Basements, by their very nature, are susceptible to flooding particularly in areas that are located in flood risk areas or have a residual flood risk from being located behind flood defences.

9.37 Proposals in areas of flood risk may not be appropriate where previously unoccupied ground floor rooms are proposed to be converted to living accommodation. Therefore, all planning applications for the conversion of dwellings into homes of multiple occupation, must be accompanied by a site-specific FRA demonstrating that the accommodation (and indeed the whole development) is safe from the risk of flooding from all sources, and includes safe refuge. It is recommended that full consideration is given to whether or not planning permission should be granted for proposals for houses in multiple occupation, if it cannot be demonstrated that there would not be an increase in the number of people at risk from flooding.

**Developer Contributions**

9.38 In some cases, and following the application of the Sequential Test, it may be necessary for the developer to make a contribution to the improvement of flood defence provision that would benefit both the proposed new development and the existing local community. This would be subject to a S106 legal agreement.

9.39 For new development in locations without existing defences, or where the development is the only beneficiary, the full costs of appropriate risk management measures for the life of the assets proposed must be funded by the developer.

9.40 Funding from developers should be explored prior to the granting of planning permission and in partnership with the LPA and the EA and/or LLFA.

9.41 The appropriate route for the consideration of strategic measures to address flood risk issues is the Northamptonshire LFRMS. The LFRMS and associated documents can be found on the NCC Flood Toolkit and describes the priorities with respect to local flood risk management. The action plan includes the measures to be taken, their timescale for completion and how they will be funded. Developers should be able to demonstrate that strategic provisions are in accordance with the LFRMS, and can be afforded and maintained for their lifetime.
10 Sustainable Drainage Systems

Statutory Consultee Role

10.1 As of April 2015, all major planning applications have to demonstrate the use of sustainable drainage as part of their development. NCC, as LLFA, is now a statutory consultee on these planning applications.

Statutory Consultee Role

10.2 Sustainable Drainage Systems (SuDS) mimic natural drainage in a built environment. Instead of surface water being piped underground, water remains at the surface, where it is cleaned and stored, reducing flood risk and improving the quality of the water before it either soaks into the ground or discharges to a watercourse. This allows for greater biodiversity, habitat creation and visual amenity.

10.3 NCC encourages all new development and redevelopment that requires planning permission to use SuDS in order to reduce flood risk, improve water quality and present options for biodiversity and public amenity gains. This is consistent with existing national guidance and local planning policy.

General SuDS Advice for Developers in Northamptonshire

10.4 The demands of each individual development will lead to a wide variety of solutions. Understanding NCC’s priorities in terms of SuDS will help ensure the solutions are appropriate to the defined requirements.

10.5 It is important that developers establish the geological and hydrological conditions of their site at an early stage through ground investigations, before coming to any conclusions about the suitability of any particular SuDS system.

10.6 SuDS incorporate cost-effective techniques that are applicable to a wide range of schemes, from small developments to major residential, leisure, commercial or industrial operations with large areas of hard standing and roof.

10.7 They can also be successfully retro-fitted into existing developments.

Local Standards and Guidance for Surface Water Drainage in Northamptonshire

10.8 NCC updated this document in September 2017, which is intended to assist developers in the design of all surface water drainage systems, and to support LPAs in considering drainage proposals for new development in Northamptonshire. The guide sets out the standards that NCC applies in assessing all surface water drainage proposals. The Local Standards and Guidance for Surface Water Drainage in Northamptonshire provides more information including local SuDS standards for the relevant water and sewerage companies, specifically AWS for Corby Borough.

Flood Data and Information Requests

10.9 NCC can provide the following information to inform and supplement any flood risk/drainage assessment, regardless of the size or nature of the development:

- A review of surface water drainage constraints from national mapping;
• A review of site-specific flood risk issues;
• A summary of any historic flood incidents that have occurred on the site or within the related locality;
• A review of flood related assets that are within the related locality;
• A statement of any flood related issues you should consider further;
• Advice on the type and nature of surface water drainage that could be designed into the relevant development; and
• Information about flood risk consenting that may be required for your proposed development.

10.10 For more information about these data requests, contact the NCC Surface Water Drainage Team.

**Technical Flood Advice Services**

10.11 NCC also provides technical advice on the surface water drainage design and other local sources of flood risk, for any proposed development in the County. The use of formal pre-application discussions is advocated to ensure SuDS and their management can be incorporated into developments in a well-planned manner from the early stages of design formation, which will then streamline the planning determination process.

10.12 For more information about the technical flood advice service, contact the NCC Surface Water Drainage Team.

10.13 In addition, AWS offer a Pre-Application Service which can be used to identify feasible drainage solutions for development sites prior to the submission of planning applications.
11 Responsibility for Risk Management Authorities

Overview

11.1 Numerous organisations, agencies, authorities and individuals have roles and responsibilities relating to flood risk management. This section sets out what these roles and responsibilities are for each of the different organisations, agencies and authorities.

11.2 Part 1, Section 6 (13) of the Act 2010 defines the following as flood risk management authorities:

- The EA;
- An LLFA;
- A District or Borough Council for an area for which there is no unitary authority;
- An Internal Drainage Board;
- A Water Company; and
- A Highway Authority.

11.3 Under Section 13(4) of the Act 2010, an RMA can arrange for a flood risk management function to be exercised on its behalf by another RMA. A flood risk management function is defined in the Land Drainage Act 1991 as including anything done to maintain, operate, improve, alter or remove existing works; and to construct or repair new works, to maintain or restore natural processes, to monitor, investigate or survey a location or natural process, or to increase or reduce the level of water.

The Environment Agency

11.4 The EA is responsible for the management of flood risk from the sea, main rivers and reservoirs. It has a strategic overview role for all forms of flooding in addition to responsibilities for the prevention, mitigation and remedying of flood damage for main rivers and coastal areas.

11.5 Main rivers are watercourses shown on the statutory main river map held by the EA and Defra. The EA has permissive powers to carry out works of maintenance, improvement and flood defence on main rivers. This can include any structure or appliance for controlling or regulating the flow of water into or out of the channel. The overall responsibility for maintenance of main rivers, however, lies with the riparian owner.

11.6 The EA is the lead organisation responsible for all flood and erosion risk management around the coastline of England, including tidal flood risk. The EA leads the country in developing a coastal management plan that works at a local, regional and national level, with partner organisations, including local authorities, putting agreed plans into practical action. The EA supports this by administering Grant-in-Aid funding and overseeing the work carried out.

11.7 The EA enforces the Reservoirs Act 1975, which is the safety legislation for reservoirs in the United Kingdom. Although the responsibility for safety lies with the owners, the EA is responsible as Enforcement Authority of reservoirs in England and Wales that are greater than 25,000m³. The EA is also responsible for establishing and maintaining a register of reservoirs, and making this information available to the public. As Enforcement Authority the EA must ensure flood plans are produced for specified reservoirs.
11.8 The EA is responsible for controlling works which affect main rivers and flood defences through permitting works under the Environmental Permitting Regulations.

11.9 The EA is also responsible for providing advice to planning authorities, providing fluvial and coastal flood warnings, monitoring flood and coastal erosion risks and supporting emergency responders when flooding occurs.

11.10 In support of its objectives, the EA is involved in land use planning, including advising on strategic planning guidance, development plans and planning applications. Its primary role, subject to any changes in light of the Planning Green Paper, is to advise on those aspects of draft plans, planning applications, environmental statements and hazardous substances consent applications, which relate to its operational functions and particular expertise, using information it already has. The EA also has a role in providing advice at the early stages in the planning process: both to help shape development briefs and draft plans before they go out to consultation; and to advise prospective applicants on the potential implications of their proposals before an application is made to the LPA. If the EA considers there to be gaps in the evidence base underpinning a planning authority’s draft plan or appraisal of an application from the wider sustainability point of view, it should draw the authority’s attention to this. Where the EA provides advice it should do so in a timely, consistent, justifiable and understandable way.

11.11 The EA is a statutory consultee on a number of types of development, for the purposes of responding on planning application consultations from LPAs and pre-planning application enquiries from developers. In addition they provide consultation responses on some types of development on which they are not a statutory consultee.

11.12 When planning proposals are brought forward for major new road, rail or airport developments, the EA will require that:

- Drainage is via SuDS, designed and maintained to current good practice standards, including the provision of suitable treatment or pollution prevention measures. The point of discharge of such systems should normally be outside Source Protection Zone (SPZ) 1 and ideally outside SPZ2; and
- Where there is an existing or unavoidable need to discharge in SPZ1, the EA requires a detailed risk assessment to demonstrate that pollution of groundwater will not occur.

11.13 The Government’s expectation is that SuDS will be provided in new developments wherever this is appropriate.

11.14 Where infiltration SuDS are to be used for surface run-off from roads, car parking and public or amenity areas, they should:

- Be suitably designed;
- Meet the Government’s non-statutory technical standards for SuDS - these standards should be used in conjunction with the NPPF and PPG; and
- Use a SuDS management treatment train - that is, use drainage components in series to achieve a robust surface water management system that does not pose an unacceptable risk of pollution to groundwater.

11.15 Where infiltration SuDS are proposed for anything other than clean roof drainage in an SPZ1, a hydrogeological risk assessment should be undertaken, to ensure that the system does not pose an unacceptable risk to the source of supply.
11.16 Discharges of surface water run-off to ground at sites affected by land contamination, or from sites used for the storage of potential pollutants, are likely to require an Environmental Permit.

11.17 This applies especially to sites where storage, handling or use of hazardous substances occurs (for example, garage forecourts, coach and lorry parks/turning areas and metal recycling/vehicle dismantling facilities). These sites will need to be subject to risk assessment with acceptable effluent treatment provided.

11.18 In its strategic overview of all sources of flood risk role, the EA provides:

- Advice to Government on flood and coastal erosion risk, supporting future national responses, policy and strategy;
- Supervision of flood and coastal erosion risk management;
- Allocation of flood and coastal erosion risk management capital funding; and
- Support to LLFAs by providing data and guidance on assessing, planning and carrying out flood risk management for flooding from ordinary watercourses, surface runoff and groundwater.

**Lead Local Flood Authority**

11.19 NCC is an LLFA and as such is responsible for the coordination and management of flood risk from surface water runoff, ordinary watercourses and groundwater.

11.20 **Table 10** sets out all of the functions that the County Council can exercise under the Act 2010 and the Flood Risk Regulations (2009).

<table>
<thead>
<tr>
<th>Function</th>
<th>Legislation</th>
<th>Explanation</th>
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<tbody>
<tr>
<td><strong>Local Flood Risk</strong></td>
<td><strong>Management Strategy</strong></td>
<td><strong>Flood &amp; Water Management Act (2010)</strong></td>
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<td></td>
<td>Develop, maintain, apply and monitor a strategy for local flood risk management of the area for surface water runoff, groundwater and ordinary watercourses. The strategy must specify:</td>
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<td>• The RMAs in the authority’s area;</td>
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<td></td>
<td>• The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area;</td>
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<td>• The objectives for managing local flood risk;</td>
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<td>• The measures proposed to achieve those objectives;</td>
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<td></td>
<td></td>
<td>• How and when the measures are expected to be implemented;</td>
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<td></td>
<td>• The costs and benefits of those measures, and how they are to be paid for;</td>
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<td>• The assessment of local flood risk for the purpose of the strategy;</td>
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<td>• How and when the strategy is to be reviewed; and</td>
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<td></td>
<td>• How the strategy contributes to the achievement of wider environmental objectives.</td>
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<tr>
<td>Function</td>
<td>Legislation</td>
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<tr>
<td>Co-operation and joint working arrangements</td>
<td>Flood &amp; Water Management Act (2010)</td>
<td>Authorities must co-operate with each other in exercising functions. Authorities can also delegate functions to each other by local agreement.</td>
</tr>
<tr>
<td>Power to request information</td>
<td>Flood &amp; Water Management Act (2010)</td>
<td>LLFAs and the EA may request information from an individual in relation to the authority’s risk management functions. The information must be provided in the form/manner and period specified within the request. Enforcement action may be taken if the individual neglects to comply with the request. A financial penalty may also be imposed.</td>
</tr>
<tr>
<td>Creation and maintenance of an asset register</td>
<td>Flood &amp; Water Management Act (2010)</td>
<td>This section requires LLFAs to establish and maintain a register of structures, or features, which may significantly affect flood risk in their administrative area and also provide a record of information about such structures and features, including ownership and state of repair. The register must be available for public inspection at all reasonable times. This requirement does not apply to the record which may contain personal or other confidential data. The method by which inspection of the register is provided is not specified in the legislation.</td>
</tr>
<tr>
<td>Investigation of flooding incidents</td>
<td>Flood &amp; Water Management Act (2010)</td>
<td>The purpose of this provision is to require the LLFA to investigate flooding incidents where appropriate, so as to try and ascertain where responsibility for managing the flood risk lies and what is being done about it. The LLFA must publish the results of any investigation and notify any relevant flood risk management authority of those results.</td>
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<tr>
<td>Designation of features</td>
<td>Flood &amp; Water Management Act (2010)</td>
<td>This Schedule to the Act provides additional legal powers for certain authorities in England and Wales to formally designate assets or features which affect flood risk. It increases the regulatory control of the significant number of assets or features that form flood risk management systems, but which are not maintained or operated by those formally responsible for managing the risk. Once a feature is designated, the owner must seek consent from the designating authority to alter, remove, or replace it. A series of conditions have to be met prior to designation.</td>
</tr>
<tr>
<td>Land Drainage Act 1991 consenting and enforcement powers</td>
<td>Flood &amp; Water Management Act (2010)</td>
<td>With the provisions in the Flood and Water Management Act 2010, powers relating to consenting and enforcement on ordinary watercourses moved from the EA to LLFAs outside areas under the jurisdiction of an IDB where relevant.</td>
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<tr>
<td>Function</td>
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<td>Explanation</td>
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| **Surface Water Drainage – Statutory Consultee Role to the planning application process.** | Article 2(1) of the Town and Country Planning Development Management Procedure (England) Order 2015 | On the 24th March 2015, the Government laid a statutory instrument making the County Council, as LLFA, a statutory consultee to the planning application process for major development that has surface water drainage implications. Major development is defined as development involving any one or more of the following;  
   a) The winning and working of minerals or the use of land for mineral-working deposits;  
   b) Waste development;  
   c) The provision of dwellinghouses where -  
      i. the number of dwellinghouses to be provided is 10 or more; or  
      ii. the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i);  
   d) The provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or  
   e) Development carried out on a site having an area of 1 hectare or more. |
| **PFRA Report** | Flood Risk Regulations (2009) | An LLFA must prepare a PFRA for their area. A PFRA is a report about past floods and the possible harmful consequences of future floods. The report must be based on relevant existing information. |
| **Identify areas of significant flood risk** | Flood Risk Regulations (2009) | Ministerial guidance has been published about the criteria for assessing whether a risk of flooding is significant. The EA has used the Flood Map for Surface Water and the Defra guidance to produce iFRAs. It is important to note that no iFRAs have been identified in Northamptonshire. |

**Table 10: LLFA responsibilities**

**Water and Sewerage Companies**

11.21 Water and sewerage companies are responsible for managing the risks of flooding from public sewer systems. A public sewer is a conduit, normally a pipe that is vested in a water and sewerage company, or predecessor, that drains two or more properties and conveys foul, surface water or combined sewerage from one point to another point and discharges via a positive outfall. Public sewers are designed to protect properties from the risk of flooding in normal wet weather conditions. However, in extreme weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding.

11.22 The water and sewerage company that operates within Corby Borough is AWS.
In October 2011, under the ‘Private Sewer Transfer’, water and sewerage companies adopted piped systems on private land that serve more than one property and connect to a public sewer. Sewerage undertakers have a duty under Section 94 of the Water Industry Act 1991, to provide, improve and extend sewers for the drainage of buildings and associated paved areas.

**Borough and District Councils**

The information set out below highlights the full range of mechanisms available to CBC in the exercise of their flood risk management functions.

**Responsibilities under the Act 2010** include:

- **Section 6**: District and Borough Councils are classed as RMAs.
- **Section 11**: In exercising its flood and coastal erosion risk management functions, a District or Borough Council must act in a manner which is consistent with the national strategy and associated guidance, and also act in a manner which is consistent with local strategies and associated guidance. In exercising any other function in a manner which may affect a flood risk or coastal erosion risk, a District or Borough Council must have regard to the national and local strategies and guidance.
- **Section 13**: A District or Borough Council must co-operate with other RMAs in the exercise of their flood and coastal erosion risk management functions. A District or Borough Council may share information with another RMA for the purpose of discharging its duty in the exercise of their flood and coastal erosion risk management functions. In addition, a District or Borough Council may arrange for a flood risk management function to be exercised on its behalf by another RMA or a navigation authority.
- **Section 27**: In exercising a flood or coastal erosion risk management function, District and Borough Councils must aim to make a contribution towards the achievement of sustainable development.
- **Section 39**: A District or Borough Council may carry out work (as specified by Section 3 (3) (a) to (e) of the Act) that will or may cause flooding, increase water below the ground, or coastal erosion.
- **Schedule 1**: District and Borough Councils are classed as designating authorities under Schedule 1 of the Act. This allows the Councils, where the conditions outlined in Schedule 1 are satisfied, to designate a structure, or a natural or man-made feature of the environment, where the authority thinks that the existence or location of the structure or feature affects flood risk. The effect of designation is that a person may not alter, remove or replace a designated structure or feature without the consent of the responsible authority.

**Responsibilities under the Land Drainage Act 1991** (as amended by the Act) include:

- **Section 14A**: A District or Borough Council may carry out flood risk management work where the authority considers the work desirable, having regard to the local flood risk management strategy for its area, and that the purpose of the work is to manage flood risk in the authority's area from an ordinary watercourse.
- **Section 66**: A District or Borough Council may make byelaws to secure the efficient working of a drainage system in the authority's district or area, to regulate the effects on the environment, to secure the effectiveness of flood risk management work within the meaning
of section 14A and/or to secure the effectiveness of works done in reliance on Section 39 of the Act 2010.

11.27 Responsibilities under the Public Health Act 1936 include:

- **Section 260**: A District or Borough Council may undertake works to manage statutory nuisances in connection with watercourses, ditches, ponds, etc. as outlined by Section 259 of the Public Health Act 1936. This includes the clearance of any obstruction or impediment to the proper flow of water. Other provisions within the Public Health Act 1936 outline further provisions related to watercourses, culverting and land drainage.

11.28 Responsibilities under the Environmental Protection Act 1990 include:

- **Section 79**: Section 79 (Statutory nuisances and inspections therefore) outlines that the following would constitute a statutory nuisance; that any water covering land or land covered with water which is in such a state as to be prejudicial to health or a nuisance.

11.29 Responsibilities under the Localism Act 2011 include:

- **Section 9FH and 9JB**: A District or Borough Council (as an RMA) must comply with a request made by an LLFA’s overview and scrutiny committee, in the course of its arrangements to review and scrutinise the exercise by RMAs of flood risk management functions, which may affect the local authority’s area. District and Borough Councils must have regard to reports and recommendations of an overview and scrutiny committee in the course of the arrangement outlined above.

11.30 Under planning legislation, Borough and District Councils operate their development planning and control functions, having due regard to the NPPF and associated technical guidance.

**Highway Authority**

11.31 Northamptonshire Highways is the Highway Authority responsible for the provision and management of highway drainage under the Highways Act (1980). This excludes motorways and trunk roads that are the responsibility of Highways England.

11.32 Northamptonshire Highways has various duties and powers in relation to flooding and drainage on the highway. The Highway Authority is not responsible for flooding or drainage on private land – this is the responsibility of the owner or occupier of the land. Where flooding on a highway is caused by another person (e.g. an adjoining landowner), the Highway Authority can take action against the person responsible.

11.33 Highway drainage systems are for the primary purpose of accepting surface water runoff from the highway and are the responsibility of the Highway Authority unless they have been specifically adopted by the sewerage undertaker.

**Highway England**

11.34 Highways England is responsible for the strategic road network, however there are none in Corby Borough.

11.35 Where a motorway or trunk road is identified as being at risk from flooding, contingency plans are prepared to warn road users and, where necessary, divert them away from the problem. Where possible, weather data from the Met Office is analysed and if intense
rainfall events are forecast in sensitive flood areas, suitable warnings are posted using the variable message signs.

Riparian Owners

11.36 Under common law, a riparian owner is someone who has a watercourse within or adjacent to any boundary of their property. Where a watercourse is sited between two or more property boundaries each owner may be equally responsible up to the centre line of the watercourse.

11.37 Although not defined as a flood risk management authority under the Act, riparian owners retain their own duties and responsibilities for watercourses on or adjacent to their land, as set out in the Land Drainage Act 1991. This includes the responsibility for the maintenance of any river, stream, ditch, drain, cut, dyke, sluice, culvert, sewer (excluding public sewers) or any other passage through which water flows.

11.38 The NCC Flood Toolkit provides a vast amount of guidance to help clarify the rights and responsibilities of riparian owners.

Parish Councils

11.39 Parish Councils have the powers to undertake maintenance works on ponds, ditches and other open drainage in order to prevent the feature from becoming a risk to health. Parish Councils can also play an important role in managing flood risk at the community level by preparing community flood plans, raising additional funding for local flood resilience and flood defence measures, and gathering information on flooding by reporting any flood incidents in their area. For further details on the roles of Parish Councils please see Flood Guide 19 on the Flood Toolkit.

Other Bodies

11.40 There are many other bodies that play an important role in flood risk management: for example, Natural England, The Met Office, the Flood Forecasting Centre; and charities such as the National Flood Forum, Red Cross and Salvation Army, and the National Farmers Union.
12 Conclusions and Recommendations

Conclusions

12.1 Corby Borough has undergone significant expansion historically and in recent years, with more growth still planned. This Level 1 SFRA update has considered all sources of flood risk based on information gained through consultation with all RMAs as specified within the NPPF. The assessment is compliant with the NPPF and will continue to inform all future land allocation and flood risk management needs within the Borough of Corby.

12.2 A vast amount of data and a significant number of studies and strategies have previously reviewed the level of flood risk in the Borough. This SFRA updates this information. There has been a history of flooding in the Borough with a total of 118 incidents recorded since 1982 to the present day. These are from all sources of flooding.

12.3 Fluvial flood risk poses the greatest future risk in Corby, followed by surface water. The Borough is also affected by groundwater flooding.

12.4 Surface water flooding has been identified as a more recent concern and a key consideration for all new development. Major new developments now have to address surface water drainage requirements set out in the National Standards, and local guidance produced by NCC. This guidance will ensure that careful design of the site lay-out and drainage system is factored into new development, giving due consideration to the implementation of SuDS solutions and their ongoing maintenance where appropriate.

12.5 Groundwater flooding is also a key consideration to future growth and detailed guidance has been produced by NCC as the LLFA and should be considered at all stages of the planning process.

12.6 There are a number of flood storage areas located within the Borough, which may pose a residual flood risk to local communities if they were to breach. Also, the over-topping of flood defences could affect properties within the potential flow path or located behind defences. This risk should be incorporated within any assessment at all stages of the planning application process.

12.7 Existing planning policy within the North Northamptonshire JCS is considered to be robust and fully up-to-date. Therefore no additional strategic policies are recommended as part of the development of the Part 2 Local Plan. Site-specific policies have however been recommended, and should be adopted if CBC brings forward additional non-strategic land allocations in the Part 2 Local Plan or if planning applications come forward for the assessed sites.

12.8 The site-specific assessment (Sequential Test) has identified the majority of sites as having an ‘Amber’ RAG rating, as they are either at risk of surface water, fluvial and/or groundwater flooding, have experienced flooding on the site or in close proximity of the site in the past, or have capacity issues within the existing drainage systems. These sites will require site-specific policies to be incorporated as part of the allocation process. None of the sites have been classed as ‘Green’ and two sites are ‘Red’. These ‘Red’ sites are within Flood Zones 1, 2 and 3, have a significant surface water flood risk, and have been affected by flooding incidents in the past. Two of the sites also have undetermined planning applications associated with them.
**Recommendations**

**Robust Evidence Base**

12.9 This SFRA is compliant with the NPPF and therefore if this framework is significantly altered, along with any associated guidance, the SFRA will need to once again be reviewed and updated to reflect these changes. A robust SFRA can be achieved by ensuring the following actions take place:

- During future iterations the key stakeholders should be contacted to ensure that the most up-to-date records are included in the SFRA;
- Information on all sources of flooding should continue to be collected, where possible;
- When more detailed or updated hydraulic modelling becomes available, these should be included in the SFRA;
- When more detailed information is carried out by developers and land owners, information should be captured and submitted to CBC as part of the development control process;
- Datasets that are updated regularly should be identified, saved and recorded;
- Continued partnership working between all RMAs should be promoted to maximise opportunities for holistic flood risk management and natural resilience;
- Early consultation with CBC, the EA, LLFA and developers should be encouraged for any proposed development; and
- Emergency planning is imperative to minimise the risk to life posed by flooding within the area. It is recommended that the Borough Council has regard to the guidance set out in Flood Guide 23: New Development and Emergency Flood Plans, and advise the LRF of the risks raised in light of this SFRA, ensuring that the planning for future emergency response can be reviewed accordingly.

**Development Principles**

12.10 In accordance with the NPPF, a specific policy on flood risk should be included within the Local Plan Part 2 document to ensure that the advice provided for each site, outlined within the Sequential Test table, is incorporated if necessary to support non-strategic land allocation.

12.11 CBC should adopt a sequential approach to land allocation and no development on the floodplain should be promoted.

12.12 The information provided within this report should be used to inform the information required to support a planning application e.g. FRA (see the Developer Checklist in Appendix 6). This information should also be used to inform planning application decisions taken by CBC.

12.13 Any potential development sites adjacent (typically within 8m - 9m) to a stretch of watercourse without flooding information (i.e. broad-scale flood zone maps) should either be examined in more detail as part of a Level 2 SFRA or during a site-specific FRA.

**Technical Matters**
12.14 Post-development surface water flows and volumes should be restricted to the Local Standards set out in the Guidance for Surface Water Drainage in Northamptonshire. This includes the following:

- No flooding for a 1 in 100 year (plus climate change) event (as per Policy 5 of the North Northamptonshire JCS) - achieved by the combination of measures;
- Developers are required to restrict run-off from new developments to greenfield run-off rates of 2l/s/ha or better;
- SuDS features will be required for all major developments, although consideration must be given to the fact that much of Corby lays on impermeable geology and so the effects of SuDS is naturally limited;
- Confirm that there is no net increase in flood risk to upstream or downstream communities and provide evidence; and
- As Flood Estimation Handbook (FEH) rainfall data is more up to date, calculations should use FEH data for surface water drainage design, except where the critical storm duration is less than 60 minutes, as it is recognised that FEH data is less robust than Flood Studies Report for short duration storms.

Flood Mitigation Measures

12.15 Piecemeal flood mitigation measures should be avoided by implementing strategic flood risk management infrastructure projects through partnership schemes. Furthermore, as the North Northamptonshire JCS Infrastructure Delivery Plan identifies, large developments taking place across North Northamptonshire offer opportunities to encourage comprehensive water management schemes, that can help to reduce the risk of flooding across wide catchment areas.

12.16 Targeted watercourse maintenance regimes should be implemented where they are shown to be effective in maintaining the standard of service that the channel was originally designed for. This relates to introducing new and existing (e.g. Gainsborough Road) targeted channel maintenance in urban areas to restore, and then subsequently maintain, the best possible level of service to reduce flood risk. More information can be found in Section 9 of this report.

Flood Risk Resistance and Resilience Measures

12.17 These measures should be introduced into new developments within areas under pressure from fluvial and surface water flood risk. Reference to existing guidance, such as Flood Guide 23 on the NCC Flood Toolkit, within LPA’s Local Plan Part 2 policies should be considered. More information can be found in Section 9 of this report.

Riparian Matters

12.18 The awareness of private Riparian responsibilities, and protecting areas alongside watercourses, should continue to be promoted.

Land Drainage Consent and Environmental Permits

12.19 New river crossings/weed screens should be designed to minimise risk of blockage and obtain the correct consents and permits. Sufficient access to watercourses should also be
maintained to allow for future maintenance. No development should be located within 8 metres of a main river or 9m of an ordinary watercourse to ensure adequate access for maintenance and a riparian corridor is maintained.

**Developer Contributions**

12.20 There should be continued identification of the locations that are known to have surface water flooding problems from sewers and overland flow routes, and explore possible solutions for them through new development proposals.

12.21 There should be consideration of strategic flood risk management measures in advance, or in parallel with, proposed development with the intent of obtaining appropriate financial contributions from the prospective developers through a Section 106 Agreement, including for long-term management.

**Partnership Working**

12.22 A partnership approach should continue to be used to seek opportunities to reduce flood risk within Corby Borough.

**Environmental Enhancement**

12.23 Where a watercourse runs through a development site, incorporation of river naturalisation and environmental enhancement should be considered where feasible, providing these do not increase flood risk.

**Water Usage**

12.24 The EA’s ‘Water stressed areas - final classification’ identifies that Corby Borough sits within an area classified as an area of serious water stress. The water stress classification takes a long-term view of the balance between water availability and the demand for public water supply. It considers where the current and future household demand for water is a high proportion of the current effective rainfall. High population density and high levels of demand increase the pressure on available supplies, as well as environmental factors such as local water resource availability. Future population change and development also contributes, with parts of the east of England forecast to be the fastest growing in England.

12.25 Policy 9 - Sustainable Buildings and Allowable Solutions, of the North Northamptonshire JCS, includes specific reference to water efficiency standards for new developments. This aligns with the NPPG, which enables LPAs to set out the optional water efficiency requirement in a Local Plan where it can be demonstrated that there is a clear need. In order to ensure that all new housing is water efficient, all new developments will be required to comply with Policy 9 of the North Northamptonshire JCS. It is therefore considered that no additional policies relating to water usage are required.

**Level 2 SFRA**

12.26 Following the completion of the Sequential Testing, the two ‘red’ sites identified (Land at Pen Green Lane, Corby - Map 19a and 19b, and Western Land at Pen Green, Corby – Map 20a and 20b) could be examined in more detail during a Level 2 SFRA, which will provide enough information to allow the LPA to either re-apply the Sequential Test in light of further information, or to apply the Exception Test to the proposed development site. Alternatively
the site can be removed from the site allocation process or the boundary amended to exclude flood risk areas.
## Appendix 1: Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Aquifer</td>
<td>A source of groundwater comprising water-bearing rock, sand or gravel, capable of yielding significant quantities of water.</td>
</tr>
<tr>
<td>Breach</td>
<td>Flooding caused by the constructional failure of a flood defence or other structure that is acting as a flood defence.</td>
</tr>
<tr>
<td>Catchment Flood Management Plans</td>
<td>Catchment Flood Management Plans (CFMPs) have been produced by the EA and are high-level planning tools that set out objectives for flood risk management for each river catchment and estuary. CFMPs consider inland risk from rivers, surface water, groundwater and tidal flooding but do not consider sewer flooding. The CFMPs that cover Corby Borough are: River Nene Catchment Flood Management Plan (December 2009) and the River Welland Catchment Flood Management Plan (December 2009). Flood Risk Management Plans build upon Catchment Flood Management Plans.</td>
</tr>
<tr>
<td>Climate Change</td>
<td>A long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the whole planet.</td>
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<tr>
<td>Culvert</td>
<td>A closed conduit or pipe used for the conveyance of water under a road, railway, canal, property, or other impediment.</td>
</tr>
<tr>
<td>Defence</td>
<td>A structure that alters the natural flow of water or flood water for the purposes of flood defence, thereby reducing the risk of flooding. A defence may be ‘formal’ (a structure built and maintained specifically for flood defence purposes) or ‘informal’ (a structure that provides a flood defence function but has not been built and/or maintained for this purpose).</td>
</tr>
<tr>
<td>Environment Agency</td>
<td>An Executive non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and an Assembly Sponsored Public Body responsible to the National Assembly for Wales. The Environment Agency’s principal aims are to protect and improve the environment, and to promote sustainable development. They play a central role in delivering the environmental priorities of central government and the Welsh Assembly Government through our functions and roles.</td>
</tr>
<tr>
<td><strong>Environmental Permit for Flood Risk Activities</strong></td>
<td>A permit required under the Environmental Permitting (England and Wales) Regulations 2010 from the Environment Agency for any proposed works or structures, in, under, over or within eight metres of the top of the bank of any watercourse, designated a ‘main river’. This was formerly called a Flood Defence Consent. Some activities are also now excluded or exempt. A permit is separate to, and in addition to, any planning permission granted. Further details and guidance are available on the GOV.UK website: <a href="https://www.gov.uk/guidance/flood-risk-activities-environmental-permits">https://www.gov.uk/guidance/flood-risk-activities-environmental-permits</a></td>
</tr>
<tr>
<td><strong>Flood</strong></td>
<td>A flood is an overflow of an expanse of water that submerges land. Both the Flood and Water Management Act (2010) and the Flood Risk Regulations (2009) state that it does not matter whether a flood is caused by: heavy rainfall; a river overflowing its banks or being breached; a dam overflowing or being breached; tidal waters; groundwater; or anything else including a combination of factors. However, both state that a ‘flood’ does not include: a flood caused from any part of a sewerage system, unless wholly or partly caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system; or a flood caused by a burst water main.</td>
</tr>
</tbody>
</table>
| **Land Drainage Consent** | A Consent required if a landowner wants to:  
- Do work on, over, under or near an ordinary watercourse (within nine metres of the landward toe of the bank); or  
- Make changes to any structure that helps control water. |
<p>| <strong>Flood Map for Planning (rivers and sea)</strong> | A multi-layered map produced by the Environment Agency, which provides information on flooding from rivers and the sea for England and Wales, in the form of Flood Zones. The Flood Map also has information on flood defences and the areas benefiting from those flood defences. This map is intended for use as a planning tool. The Environment Agency has also published maps of the Risk of Flooding from Rivers and Seas, which includes the impact of any flood defences in the area. |
| <strong>Flood Map for Surface Water</strong> | The Flood Map for Surface Water represents the mechanisms that cause surface water flooding. |
| <strong>Flood and Water Management Act (2010)</strong> | The Act brings together the recommendations of the Pitt report and previous policies, to improve the management of water resources and create a more comprehensive and risk based regime for managing the risk of flooding from all sources. The Act reinforces the need to take an integrated approach to the management of flooding and places a number of roles and responsibilities on local authorities, such as the County Council, under the role of Lead Local Flood Authority. |</p>
<table>
<thead>
<tr>
<th><strong>Flood Resilience</strong></th>
<th>Actions taken which allow the ingress of flood water through a property but enable swift recovery after the flood event. Flood resilience measures may include (amongst others) flood-resistant construction materials, raised electricity sockets and water-resistant flooring.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flood Resistance</strong></td>
<td>Actions taken to prevent the ingress of flood water to a property. Flood Resistance measures may include flood barriers placed over doorways.</td>
</tr>
<tr>
<td><strong>Flood Risk</strong></td>
<td>Flood risk is a combination of two components: the chance (or probability) of a particular flood event occurring and the impact (or consequence) that the event would cause if it took place.</td>
</tr>
<tr>
<td><strong>Flood Risk Map</strong></td>
<td>A map showing: the number of people living in the area who are likely to be affected in the event of flooding; the type of economic activity likely to be affected in the event of flooding; any industrial activities in the area that may increase the risk of pollution in the event of flooding; any relevant protected areas that may be affected in the event of flooding; any areas of water subject to specified measures or protection for the purpose of maintaining the water quality that may be affected in the event of flooding; and any other effect on human health, economic activity or the environment (including cultural heritage). The Environment Agency has produced a suite of maps which can be found on <a href="https://www.gov.uk/">https://www.gov.uk/</a>. These maps are also available in the NCC Flood Toolkit.</td>
</tr>
<tr>
<td><strong>Flood Risk Management Plans</strong></td>
<td>Flood Risk Management Plans (FRMPs) highlight the hazards and risks of flooding from rivers, the sea, surface water, groundwater and reservoirs, and set out how RMAs work together with communities to manage flood risk. By law the EA must produce FRMPs for each River Basin District. The FRMP with relevance to Corby Borough is the Anglian River Basin District Flood Risk Management Plan.</td>
</tr>
<tr>
<td><strong>The Flood Risk Regulations</strong></td>
<td>The Flood Risk Regulations were enacted in December 2009 to implement the requirements of the EU Floods Directive, which aims to provide a consistent approach to managing flood risk across Europe. The regulations outline the roles and responsibilities of the various authorities consistent with the Act and provide for the delivery of the outputs required by the Directive. The Directive requires Member States to develop and update a series of tools for managing all sources of flood risk.</td>
</tr>
<tr>
<td><strong>Flood storage</strong></td>
<td>A temporary area that stores excess runoff or river flow, which are often ponds or reservoirs.</td>
</tr>
<tr>
<td><strong>Flood Zones</strong></td>
<td>Nationally consistent delineation of ‘high’ and ‘medium’ flood risk, published on a quarterly basis by the EA and based on the definitions within NPPF.</td>
</tr>
<tr>
<td><strong>Flood Zone 1 Low Probability</strong></td>
<td>Defined as an area only at risk of flooding from flood events with an Annual Exceedence Probability (AEP) of less than 0.1% (1 in 1000). The probability of flooding occurring in this area in any one year is less than 0.1%.</td>
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<tr>
<td><strong>Flood Zone 2 Medium Probability</strong></td>
<td>Defined as an area at risk of flooding from flood events with an AEP of between 1% (1 in 100) and 0.1% (1 in 1000). The probability of flooding occurring in this area in any one year is between 1% and 0.1%.</td>
</tr>
<tr>
<td><strong>Flood Zone 3a High Probability</strong></td>
<td>Defined as an area at risk of flooding from flood events with an AEP of greater than 1% (1 in 100). The probability of flooding occurring in this area in any one year is greater than 1%.</td>
</tr>
<tr>
<td><strong>Flood Zone 3b Functional Floodplain</strong></td>
<td>Defined as land where water has to flow or be stored in times of flood. Usually defined as areas at risk of flooding from flood events with an AEP of greater than 5% (1 in 20) design event. The probability of flooding occurring in this area in any one year is greater than 5%.</td>
</tr>
<tr>
<td><strong>Fluvial</strong></td>
<td>The processes associated with rivers and streams and the deposits and landforms created by them.</td>
</tr>
<tr>
<td><strong>Functional Floodplain</strong></td>
<td>This zone comprises land where water has to flow or be stored in times of flood. LPAs are required to identify in their SFRAs, areas of functional floodplain and its boundaries accordingly.</td>
</tr>
<tr>
<td><strong>Geographical Information Systems</strong></td>
<td>GIS is any system which stores geographical data, such as elevations, location of buildings and extent of flood outlines.</td>
</tr>
<tr>
<td><strong>Groundwater</strong></td>
<td>Water located beneath the ground surface, either in soil pore spaces or fractures in rock.</td>
</tr>
<tr>
<td><strong>Internal Drainage Board</strong></td>
<td>Independent body with responsibility for ordinary watercourses within a specified district or borough.</td>
</tr>
<tr>
<td><strong>Inundation</strong></td>
<td>To cover with floodwater.</td>
</tr>
<tr>
<td><strong>Local Planning Authority</strong></td>
<td>The body that is responsible for controlling planning and development through the planning system.</td>
</tr>
<tr>
<td><strong>Main River</strong></td>
<td>All watercourses shown on the statutory main river maps held by the Environment Agency. This can include any structure for controlling or regulating the flow of water into or out of the channel. The Environment Agency has permissive power to carry out works of maintenance and improvement on these rivers.</td>
</tr>
<tr>
<td><strong>Mitigation Measure</strong></td>
<td>An element of development design which may be used to manage flood risk or avoid an increase in flood risk elsewhere.</td>
</tr>
<tr>
<td><strong>National Flood and Coastal Erosion Risk Management Strategy</strong></td>
<td>The Environment Agency’s National Strategy was published in May 2011 and provides an overview of how flood risk and the risk of coastal erosion will be managed across England. The aims and objectives of the National Strategy have been translated onto a local scale through this Local Strategy for the County Council.</td>
</tr>
<tr>
<td><strong>National Planning Policy Framework</strong></td>
<td>Sets out the Government’s planning policies for England and how these are expected to be applied. It sets out the Government’s requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.</td>
</tr>
<tr>
<td><strong>National Planning Practice Guidance</strong></td>
<td>A planning practice guidance web-based resource. Links between the National Planning Policy Framework and relevant planning practice guidance.</td>
</tr>
<tr>
<td><strong>Ordinary Watercourse</strong></td>
<td>Any section of watercourse not designated as a main river.</td>
</tr>
<tr>
<td><strong>Pitt Review</strong></td>
<td>Sir Michael Pitt carried out an independent review of the 2007 floods and made a number of recommendations for future flood risk management. In particular, he recommended that local authorities should play a more significant role in tackling local problems of flooding and coordinating all relevant agencies. Many of the recommendations of The Pitt Review have been enacted through the Act.</td>
</tr>
<tr>
<td><strong>Pluvial</strong></td>
<td>Direct runoff as a result of rainfall and the processes associated with it.</td>
</tr>
<tr>
<td><strong>Precipitation</strong></td>
<td>Describes rain, sleet, hail, snow and other forms of water falling from the sky.</td>
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<tr>
<td><strong>Preliminary Flood Risk Assessment</strong></td>
<td>The PFRA is a process involving an assessment of past floods and the possible harmful consequences of future floods, leading to the identification of areas of significant risk. All LLFAs must prepare a PFRA report in relation to flooding in the LLFA’s area. The floods to be included are those which had significant harmful consequences for human health, economic activity or the environment (including cultural heritage), or which would have significant harmful consequences for those matters if they were to occur now.</td>
</tr>
<tr>
<td><strong>Reservoir</strong></td>
<td>Artificial lake used to store water. Reservoirs may be created in river valleys by the construction of a dam, or may be built by excavation in the ground or by conventional construction techniques, such as brickwork or cast concrete. Reservoirs greater than 25,000m³ are governed by the Reservoirs Act.</td>
</tr>
<tr>
<td><strong>Residual Risk</strong></td>
<td>The risk which remains after all risk avoidance, reduction and mitigation measures have been implemented.</td>
</tr>
<tr>
<td><strong>Return Period</strong></td>
<td>The probability of a flood of a given magnitude occurring within any one year e.g. a 1% (1 in 100) AEP flood event has a 1% probability of occurring once in any one year.</td>
</tr>
<tr>
<td><strong>Riparian Owner</strong></td>
<td>All landowners whose property is adjoining to a body of water have the right to make reasonable use of it and the responsibility to suitably maintain it.</td>
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<tr>
<td><strong>Risk</strong></td>
<td>The probability or likelihood of an event occurring.</td>
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<tr>
<td><strong>Risk Management Authority</strong></td>
<td>Flood Risk Management Authorities have a range of roles and responsibilities relating to flood risk management. These authorities include:</td>
</tr>
<tr>
<td></td>
<td>• The Environment Agency;</td>
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<tr>
<td></td>
<td>• An LLFA;</td>
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<tr>
<td></td>
<td>• A District or Borough Council for an area for which there is no unitary authority;</td>
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<tr>
<td></td>
<td>• An Internal Drainage Board;</td>
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<tr>
<td></td>
<td>• A water company; and</td>
</tr>
<tr>
<td></td>
<td>• A highway authority.</td>
</tr>
<tr>
<td><strong>River Basin Management Plans</strong></td>
<td>River Basin Management Plans (RBMPs) have been produced by the Environment Agency for the eleven River Basin Districts in England and Wales and are the central tool setting out the objectives and actions required to achieve the objectives of the Water Framework Directive. RBMPs describe the main issues for each river basin district and state the environmental objectives for the basin, explain the objectives selected to achieve good ecological status and summarise the actions needed to deliver those objectives. A River Basin District is: a river basin, or several river basins, and the river basin’s adjacent coastal waters.</td>
</tr>
<tr>
<td><strong>Sequential Test</strong></td>
<td>Informed by an SFRA, a planning authority applies the Sequential Test to demonstrate that there are no reasonably available sites in areas with less risk of flooding that would be appropriate to the type of development or land use proposed.</td>
</tr>
<tr>
<td><strong>Sewer</strong></td>
<td>A sewer is a pipe which carries and removes either rainwater (surface) or foul water (or a combination of both) from more than one property. A sewer can also be categorised as being a private or public sewer and can carry surface or foul water.</td>
</tr>
<tr>
<td></td>
<td>• A Private Sewer is solely the responsibility of the occupiers/owners of the properties that it serves.</td>
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<tr>
<td></td>
<td>• A Public Sewer is a sewer that has been adopted and maintained by a Sewerage Undertaker.</td>
</tr>
<tr>
<td><strong>Sewer Flooding</strong></td>
<td>The consequence of sewer systems exceeding their capacity during a rainfall event. Sewer flooding can also occur due to structural or operational issues.</td>
</tr>
<tr>
<td><strong>Strategic Flood Risk Assessment</strong></td>
<td>An SFRA is used as a tool by a planning authority to assess flood risk for spatial planning, producing development briefs, setting constraints, informing sustainability appraisals and identifying locations of emergency planning measures and requirements for FRAs. The purpose of an SFRA is to assess and map all forms of flood risk from groundwater, surface water, impounded water bodies, sewer and river sources, taking into account future climate change predictions, to allow planning authorities to use this as an evidence base to locate future development primarily in low flood risk areas. The outputs from an SFRA also assist in the production of sustainable policies for the long-term management of flood risk.</td>
</tr>
<tr>
<td><strong>Sustainable Drainage Systems</strong></td>
<td>SuDS are drainage systems which are designed to reduce the impact of urbanisation on the hydrology of a river system.</td>
</tr>
<tr>
<td><strong>Surface Run-off</strong></td>
<td>Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer. Areas that suffer a depth of greater than 0.1m are considered to be at risk of surface water flooding. Flooding that is greater than 0.3m deep is classed as being at risk of deep surface water flooding.</td>
</tr>
<tr>
<td><strong>Surface Water Management Plans</strong></td>
<td>SWMPs are produced by local authorities and are described as a framework through which key local partners with a responsibility for surface water and drainage in their area work together to understand the causes of surface water flooding and agree the most cost effective way of managing that risk. The purpose is to make sustainable surface water management decisions that are evidence based, risk based, future proofed and inclusive of stakeholder views. A SWMP should establish a long-term action plan to manage surface water in an area and should influence future capital investment, drainage maintenance, public engagement and understanding, land-use planning, emergency planning and future developments.</td>
</tr>
<tr>
<td><strong>1% annual probability flood event</strong></td>
<td>Event that on average will occur once every 100 years. Expressed as an event which has a 1% probability of occurring in any one year.</td>
</tr>
<tr>
<td><strong>0.5% annual probability flood event</strong></td>
<td>Event that on average will occur once every 200 years. Expressed as an event which has a 0.5% probability of occurring in any one year.</td>
</tr>
<tr>
<td><strong>0.1% annual probability flood event</strong></td>
<td>Event that on average will occur once every 1000 years. Expressed as an event, which has a 0.1% probability of occurring in any one year.</td>
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</table>
# Appendix 2: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning / Definition</th>
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<tbody>
<tr>
<td>AEP</td>
<td>Annual Exceedance Probability</td>
</tr>
<tr>
<td>AWS</td>
<td>Anglian Water Services</td>
</tr>
<tr>
<td>BCW</td>
<td>Borough Council of Wellingborough</td>
</tr>
<tr>
<td>BGS</td>
<td>British Geological Survey</td>
</tr>
<tr>
<td>CFMP</td>
<td>Catchment Flood Management Plan</td>
</tr>
<tr>
<td>CBC</td>
<td>Corby Borough Council</td>
</tr>
<tr>
<td>CRT</td>
<td>Canal and Rivers Trust</td>
</tr>
<tr>
<td>Defra</td>
<td>The Department for Food and Rural Affairs</td>
</tr>
<tr>
<td>DPD</td>
<td>Development Plan Document</td>
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<tr>
<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>ENDC</td>
<td>East Northamptonshire District Council</td>
</tr>
<tr>
<td>FCERM</td>
<td>Flood and Coastal Erosion Risk Management</td>
</tr>
<tr>
<td>FEH</td>
<td>Flood Estimation Handbook</td>
</tr>
<tr>
<td>FRMP</td>
<td>Flood Risk Management Plan</td>
</tr>
<tr>
<td>FMFSW</td>
<td>Flood Map for Surface Water</td>
</tr>
<tr>
<td>FRA</td>
<td>Flood Risk Assessment and/or Flood Risk Area</td>
</tr>
<tr>
<td>FSR</td>
<td>Flood Storage Reservoir</td>
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<tr>
<td>FWD</td>
<td>Floodline Warnings Direct</td>
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<tr>
<td>FWMA</td>
<td>Flood and Water Management Act 2010</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographical Information System</td>
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<td>IDB</td>
<td>Internal Drainage Board</td>
</tr>
<tr>
<td>JCS</td>
<td>Joint Core Strategy</td>
</tr>
<tr>
<td>KBC</td>
<td>Kettering Borough Council</td>
</tr>
<tr>
<td>LDD</td>
<td>Local Development Document</td>
</tr>
<tr>
<td>LFRMS</td>
<td>Local Flood Risk Management Strategy</td>
</tr>
<tr>
<td>LiDAR</td>
<td>Light Detection and Ranging</td>
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<td>LLFA</td>
<td>Lead Local Flood Authority</td>
</tr>
<tr>
<td>LPA</td>
<td>Local Planning Authority</td>
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<tr>
<td>LDF</td>
<td>Local Development Framework</td>
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<td>Local Resilience Forum</td>
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<td>NCC</td>
<td>Northamptonshire County Council</td>
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<td>NNJPDU</td>
<td>North Northamptonshire Joint Planning Development Unit</td>
</tr>
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<td>NPPF</td>
<td>National Planning Policy Framework</td>
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<td>PFRA</td>
<td>Preliminary Flood Risk Assessment</td>
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<td>PPG</td>
<td>Planning Policy Guidance</td>
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<td>PPS25</td>
<td>Planning Policy Statement 25</td>
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<tr>
<td>RBMP</td>
<td>River Basin Management Plan</td>
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<td>RMA</td>
<td>Risk Management Authority</td>
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<td>SFRA</td>
<td>Strategic Flood Risk Assessment</td>
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<td>SoP</td>
<td>Standard of Protection</td>
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<td>SPD</td>
<td>Supplementary Planning Document</td>
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<td>SuDS</td>
<td>Sustainable Drainage Systems</td>
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<td>SWMP</td>
<td>Surface Water Management Plan</td>
</tr>
<tr>
<td>WFD</td>
<td>Water Framework Directive</td>
</tr>
<tr>
<td>WCS</td>
<td>Water Cycle Study or Strategy</td>
</tr>
</tbody>
</table>
Appendix 3: Hydraulic Model Information

Fluvial Hydraulic Models
A number of flood risk studies have previously been completed in this geographical area. As part of these, hydraulic models have been developed to improve the understanding of flooding and map flood risk across the catchment. The hydraulic models relevant to Corby Borough cover Lincolnshire and Northamptonshire, and include:

- River Welland Model 1D Mike11 Model (upper reach) and 2D Mike 21 Model (lower fenland reach), September 2016;
- Gretton Brook Model 1D ISIS model, August 2013;
- Harpers Brook Model 1D ISIS model, August 2013; and
- Willow Brook Model 1D ISIS model, August 2013.

Environment Agency Flood Maps
The EA’s Flood Map considers flood risk from rivers and from the sea only and is available on the Flood Toolkit.

The Flood Map ignores the presence of formal flood defences and the land is divided into the three following Flood Zones:

- The low probability Flood Zone 1 is assessed as the land having a less than 0.1% AEP of river or sea flooding in any one year;
- The medium probability Flood Zone 2 is assessed as the land having between a 0.1% and 1% AEP of river flooding or between a 0.1% and 0.5% AEP of sea flooding in any year;
- The high probability Flood Zone 3 is assessed as the land having 1% or greater AEP of river flooding or a 0.5% or greater AEP of sea flooding in any year; and
- Flood Zone 3b comprises land where water has to flow or be stored in times of flooding.

The NPPF recommends that LPAs should identify in their SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the EA. This information has therefore been presented in Map 7: Flood Zone 3a and 3b, in the accompanying Strategic Flood Map Document.

The NPPF also states that only Water-compatible Development and Essential Infrastructure should be permitted within the functional floodplain. However such development or infrastructure is required to ensure the functional floodplain remains operational and safe for users in times of flood, not to impede water flows nor increase flood risk elsewhere, and to result in no net loss of floodplain storage.

GIS Data Gaps and Assumptions
Data has been provided by the EA and collated by the LLFA, and the main gap in the data relates to ordinary watercourses where no flooding information/hydraulic modelling is available. Whilst it is possible that there is no flooding related to the stretch of watercourse, it is possible that this may indeed be a gap in the data.
Any potential development sites adjacent (typically within 8m - 9m) to a stretch of watercourse without flooding information (i.e. broad-scale flood zone maps) should either be examined in more detail as part of a Level 2 SFRA or during a site-specific FRA.

**Historical Flood Mapping**

Outlines of mapped historical flooding events have been combined to delineate approximate areas that have previously flooded. Much of the information used to create the outlines is estimated following a flood and some inaccuracies may exist. However the layer serves a useful purpose to highlight to CBC that there are areas, outside the flood zone maps, that have previously experienced flooding.

**Local Flooding Hotspots**

The LLFA has provided this data which relates to known incidences of flooding within the respective authority areas. Flooding has been attributed to lack of capacity of structures, watercourses, and areas where surface water and groundwater flooding is known to be an issue.

**Surface Water / Sewer Flooding**

Incidents of storm water flooding, due to a lack of hydraulic capacity at key local sites, have been provided to the LLFA by AWS. This is in the form of the Sewer Flooding Register data.

**Flood Alert and Warning Layers**

Areas benefiting from an EA Flood Alert and Warning have been shown as a separate GIS layer. Emergency Planning Officers can use the flood warning layers in conjunction with the flood zone maps and flood defence information to assist in developing emergency plans for areas at risk of flooding within the study area.

**Reservoir Act (1975) Water Bodies**

Map 11: Flood Storage and Water Supply Reservoirs, in the accompanying Strategic Map Document, displays major water bodies falling under the regulation of the Reservoir Act. This can assist CBC in assessing sites immediately downstream of major water bodies.
Appendix 4: Guidance on the Preparation of Flood Risk Assessments

Guidance for LPAs can be found on the National Government webpages in the guide on reviewing flood risk assessments.

Developers will usually need to pay a flood risk specialist to carry out the FRA. Planning applications can be refused by LPAs if a FRA is not satisfactory.

FRAs are required for most developments within one of the flood zones. This includes developments:

- In Flood Zone 2 or 3 including minor development and change of use;
- More than 1 ha in Flood Zone 1; or
- Less than 1 ha in Flood Zone 1, including a change of use in development type to a more vulnerable class (e.g. from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (e.g. surface water drains and reservoirs).

Standing Advice

Developers should follow the EA’s standing advice if they are carrying out a FRA of a development classed as:

- A minor extension (household extensions or non-domestic extensions less than 250 square metres) in Flood Zone 2 or 3;
- ‘More vulnerable’ in Flood Zone 2 (except for landfill or waste facility sites, caravan or camping sites);
- ‘Less vulnerable’ in Flood Zone 2 (except for agriculture and forestry, waste treatment, mineral processing, and water and sewage treatment); or
- ‘Water compatible’ in Flood Zone 2.

Developers also need to follow standing advice for developments involving a change of use into one of these vulnerable categories or into the water compatible category.

Information to Support a Flood Risk Assessment

The following products or packages of information available from the EA may help to complete a flood risk assessment:

- **Product 1**: Flood Map, including flood zones, defences and storage areas and areas benefiting from flood defences;
- **Product 3**: Basic Flood Risk Assessment Map, including flood zones, defences and storage areas, areas benefiting from defences, statutory main river designations and some key modelled flood levels;
- **Product 4**: Detailed Flood Risk Assessment Map, including flood zones, defences and storage areas, areas benefiting from defences, statutory main river designations, historic flood event outlines and more detailed information from our computer river models (including model extent, information on one or more specific points, flood levels, flood flows);
• **Product 5**: Reports, including flood modelling and hydrology reports, and modelling guidelines;

• **Product 6**: Model Output Data, including Product 5;

• **Product 7**: Calibrated and Verified Model Input Data; and

• **Product 8**: Flood Defence Breach Hazard Map including, maximum flood depth, maximum flood velocity and maximum flood hazard.

Contact the EA to obtain this data and to find out if there is a charge for the product, as well as the contact details of the local team that will deal with your request.

The following information is available from NCC as the LLFA:

• [Local Standards and Guidance for Surface Water Drainage in Northamptonshire](#), which should be incorporated into every FRA;

• Historic flood events/hotspot data;

• Asset Data;

• Groundwater flooding; and

• Flood Map for Surface Water.

More information about the charge for this data, and the contact details of the team that will deal with your request, is available on the [Flood Toolkit](#).

**Requirements for Flood Risk Assessments**

The aim of a FRA is to demonstrate that the development is protected to the 1 in 100-year (1% AEP) event and is safe during the design flood event, including an allowance for climate change.

Where appropriate, the following aspects of flood risk should be addressed in all planning applications in flood risk areas:

• The area liable to flooding;

• The probability of flooding occurring now and over time;

• The extent and standard of existing flood defences and their effectiveness over time;

• The likely depth of flooding;

• The rates of flow likely to be involved;

• The likelihood of impacts to other areas, properties and habitats;

• The effects of climate change – based on the updated allowances (see Appendix 5 for more information); and

• The nature and currently expected lifetime of the development proposed and the extent to which it is designed to deal with flood risk.

Development proposals requiring FRAs should:

• Apply the sequential approach;

• Apply the Sequential Test and, when necessary, Exception Test;

• Not increase flood risk, either upstream or downstream, of the site, taking into account the impacts of climate change;
• Not increase surface water volumes or peak flow rates, which would result in increased flood risk to the receiving catchments;

• Use opportunities provided by new development to, where practical, reduce flood risk within the site and elsewhere;

• Ensure that where development is necessary in areas of flood risk (after application of Sequential and Exception Tests), it is made safe from flooding for the lifetime of the development, taking into account the impact of climate change; and

• All sources of flood risk, including fluvial, surface water, groundwater, reservoir and drainage need to be considered.

FRAs should follow government guidance on development and flood risk, complying with the approach recommended by the NPPF (and its associated guidance) and guidance provided by the EA.

The NPPF advocates a risk-based approach to flood risk management in terms of appraising, managing and reducing the consequences of flooding both to and from a development site.

In circumstances where FRAs are prepared for windfall sites then they should include evidence that demonstrates the proposals are in accordance with the policies described in the Local Plan.

**Finished Floor Levels**

Where possible, the finished floor levels (lowest floor level) should be raised above the predicted flood level to prevent the ingress of flood water. For fluvial flooding this should generally be 300mm above the 1% (1 in 100) probability flood level, including an allowance for climate change (see Appendix 5 for more information).

For single storey residential developments (bungalows and ground floor flats), finished floor levels should be set 300mm above the 0.1% (1 in 1000) annual probability flood event, including an allowance for climate change (see Appendix 5 for more information).

**Modifying Ground Levels**

In most areas of fluvial flood risk, developments which propose to raise land levels above the floodplain risk reducing conveyance or flood storage, which could adversely impact flood risk upstream, downstream or on neighbouring land.

In such cases, details of compensatory flood storage should be provided as part of a FRA. It is expected that this will be on a level for level, volume for volume basis to ensure that there is no loss in flood storage capacity, and on land that does not currently flood but is adjacent to the floodplain (in order for it to fill and drain). It should be in the vicinity of the site and within the red line of the planning application boundary (unless the site is strategically allocated).

Raising ground levels can also deflect flood flows, so appropriate assessment should be performed to demonstrate that there are no adverse effects on third party land.

Raising levels can also create areas where surface water might pond during significant rainfall events. Any proposals to raise ground levels should be tested to ensure that it would not cause increased ponding or build-up of surface runoff on third party land.
Appendix 5: Guidance on Climate Change Allowances

Climate Change Allowances

The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. The NPPF and supporting PPG on Flood Risk and Coastal Change explain when and how FRAs should be used. This includes demonstrating how flood risk will be managed now and over the development’s lifetime, taking climate change into account. LPAs refer to this when preparing local plans and considering planning applications.

Making an allowance for climate change in your FRA will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. The climate change allowances are predictions of anticipated change for:

- Peak river flow by River Basin District;
- Peak rainfall intensity;
- Sea level rise; and
- Offshore wind speed and extreme wave height.

Climate Change Allowances Update

On 19th February 2016, the EA published new guidance on the climate change allowances that should be used in the assessment of flood risk. This guidance can be found on the GOV.UK website.

For assessment of rainfall intensity allowances, Table 2 of the guidance provides two allowances based on central and upper end predictions of climate change impacts.

Climate Change Allowances for Rainfall

Under the new guidance, for development with a design life to 2060-2115, NCC expects that all developers should design the surface water attenuation on site to accommodate the +20% climate change allowance, and undertake a sensitivity analysis to understand the flooding implications of the +40% climate change allowance.

If the implications are significant, i.e. the site could flood existing development (by allowing additional flow of runoff from the site) or put people at risk (as a result of increased hazard levels within or off the site), then a view may be taken to provide more attenuation within the drainage design up towards the +40% allowance, or to provide additional mitigation, for example a higher freeboard to ensure no risk to third parties/onsite users for the +40% allowance. This will tie into existing principles for designing for exceedance. NCC may also request that the +40% allowance is accounted for on development sites which could have a direct impact on sites of known flood risk, where no other mitigation is proposed.

This climate change guidance needs to be considered in the FRA/drainage design for all developments submitted for planning permission on and after 19th February 2016, even if the technical work was completed in advance of this date.

Climate Change Allowances for Fluvial Flooding

To ensure that the appropriate climate change allowances are considered within a site-specific FRA for fluvial flood risk matters, it is recommended that developers consult directly with the EA.
Appendix 6: Developer Checklist

This list, although not exhaustive, will give developers a useful reference to ensure relevant advice is incorporated into site design.

<table>
<thead>
<tr>
<th>Checklist Items</th>
<th>Completed Y/N?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development site and location</strong> – describe the site you are proposing to develop.</td>
<td></td>
</tr>
<tr>
<td>Where is the development site located?</td>
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<tr>
<td>What is the current use of the site? (e.g. undeveloped land, housing, shops, offices)</td>
<td></td>
</tr>
<tr>
<td>Which Flood Zone (for river or sea flooding) is the site within? (i.e. Flood Zone 1, Flood Zone 2, Flood Zone 3). As a first step, you should check the Flood Map for Planning (Rivers and Sea). It is also a good idea to check the Strategic Flood Risk Assessment for the area available from the local planning authority.</td>
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</tr>
<tr>
<td><strong>Development proposals</strong> - provide a general summary of the development proposals.</td>
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</tr>
<tr>
<td>What is the development proposal(s) for this site? Will this involve a change of use of the site and, if so, what will that change be?</td>
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<tr>
<td>In terms of vulnerability to flooding, what is the vulnerability classification of the proposed development? See Table 2 of this guidance for an explanation of the vulnerability classifications.</td>
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</tr>
<tr>
<td>What is the expected or estimated lifetime of the proposed development likely to be? (E.g. less than 20 years, 20-50 years, 50-100 years?). See Paragraph 026 of this guidance for further advice on how to assess the lifetime of developments for flood risk and coastal change purposes. It may also be advisable to seek advice from the local planning authority.</td>
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</tr>
<tr>
<td><strong>Sequential Test</strong> - describe how you have applied the sequential test.</td>
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</tr>
<tr>
<td>What other locations with a lower risk of flooding have you considered for the proposed development?</td>
<td></td>
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<tr>
<td>If you have not considered any other locations, what are the reasons for this?</td>
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</tr>
<tr>
<td>Explain why you consider the development cannot reasonably be located within an area with the lowest probability of flooding (Flood Zone 1). If your chosen site is within Flood Zone 3, explain why you consider the development cannot reasonably be located in Flood Zone 2.</td>
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</tr>
<tr>
<td>As well as flood risk from rivers or the sea, have you taken account of the risk from any other sources of flooding in selecting the location for the development?</td>
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<tr>
<td><strong>Site-specific flood risk.</strong></td>
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</tr>
<tr>
<td>What is/are the main source(s) of flood risk to the site? (E.g. fluvial, surface water, groundwater, reservoir). See the NCC Flood Toolkit mapping and the Strategic Flood Risk Assessment for any relevant and available information.</td>
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</tr>
<tr>
<td>What is the probability of the site flooding, taking account of the maps?</td>
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<tr>
<td>What is the expected depth and level for the design flood?</td>
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<tr>
<td>Are properties expected to flood internally in the design flood, and to what depth?</td>
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</tr>
<tr>
<td>Are there any opportunities offered by the development to reduce the causes and impacts of flooding? See Paragraph 050 of this guidance for further advice.</td>
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</tr>
<tr>
<td><strong>Climate Change</strong> - how is flood risk at the site likely to be affected by climate change?</td>
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</tr>
<tr>
<td>How will the development be made safe from the impacts of climate change, for its lifetime? Further information can be found in Paragraph’s 054 and 059 (including on the use of flood resilience and resistance measures) of this guidance. Further advice on how to take account of the impacts of climate change in flood risk assessments is available from the Environment Agency.</td>
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</tr>
</tbody>
</table>
**Surface Water** - describe the existing and proposed surface water management arrangements at the site?

Is the proposal defined as **major development**? If so then a surface water drainage assessment will be required to accompany the planning application.

Is the development compliant with the National “**Sustainable drainage systems: non-statutory technical standards**”?

Is the proposal compliant with the “**Local Standards and Guidance for Surface Water Drainage in Northamptonshire**”?

Provide evidence that the surface water run-off rate will be restricted to 2 l/s/ha, or demonstrate that the existing greenfield run off rate will be maintained or reduced.

**Occupants and users of the development** - provide a summary of the numbers of future occupants and users of the new development; the likely future pattern of occupancy and use; and proposed measures for protecting more vulnerable people from flooding.

Will the development proposals increase the overall number of occupants and/or people using the building or land, compared with the current use? If this is the case, by approximately how many will the number(s) increase?

Will the proposals change the nature or times of occupation or use, such that it may affect the degree of flood risk to these people? If this is the case, describe the extent of the change.

Where appropriate, are you able to demonstrate how the occupants and users that may be more vulnerable to the impact of flooding (e.g. residents who will sleep in the building; people with health or mobility issues etc.) will be located primarily in the parts of the building and site that are at lowest risk of flooding? If not, are there any overriding reasons why this approach is not being followed?

**Exception test** - provide the evidence to support certain development proposals in Flood Zones 2 or 3 where the sequential test cannot be passed. Use **Paragraph 035** of the NPPF guidance for further information.

Would the proposed development provide wider sustainability benefits to the community? If so, could these benefits be considered to outweigh the flood risk to and from the proposed development? See **Paragraph 037** of this guidance for further information.

How can it be demonstrated that the proposed development will remain safe over its lifetime without increasing flood risk elsewhere? See **Paragraph 038** of this guidance for further information. Also see **Flood Guide 23: New Development and Emergency Flood Plans**, on the NCC Flood Toolkit.

Will it be possible to for the development to reduce flood risk overall (e.g. through the provision of improved drainage)? See **Paragraph 050** for further advice.

**Residual risk** - describe any **residual risks** that remain after the flood risk management and mitigation measures are implemented, and to explain how these risks can be managed to keep the users of the development safe over its lifetime. See **Paragraph 042** of this guidance for more information.

What flood related risks will remain after the flood risk management and mitigation measures have been implemented?

How, and by whom, will these risks be managed over the lifetime of the development? (E.g. putting in place flood warning and evacuation plans). Also see **Flood Guide 23: New Development and Emergency Flood Plans** on the NCC Flood Toolkit.

**Land Drainage Consent and Flood Risk Permits.**

You must apply for **Land Drainage Consent** if you want to:
- Do work on, over, under or near an ordinary watercourse (within 9 metres of the landward toe of the bank); or
- Make changes to any structure that helps control water.

For works on main rivers (within 8 metres of the landward toe of the bank) in Northamptonshire you need to apply for an [Environmental Permit](#) from the Environment Agency.

### Water Quality

The number of outfalls from the site should be minimised. Any new or replacement outfall designs should adhere to [Statutory Guidance Form SD27](#).

Provide details of measures to minimise pollution to watercourses during construction.

Provide details of pollution prevention measures for the life of the development, such as oil and silt interceptors. Consider whether permeable pavement areas are protected from siltation.

### Water Consumption

Confirm that the development can meet a water consumption target as set out in the [North Northamptonshire JCS](#) of 110 litres/person/day (105 litres within the home and 5 litres external use) and enclose supporting details (e.g. proposals for measures such as rainwater harvesting, low/dual flush toilets and water saving tap and shower fittings).

Has a practical strategy been included for the supply of water for firefighting?

Confirm whether grey water recycling is to be utilised and provide details.

Provide details of any proposed measures to increase public awareness and community participation.

### Water Supply and Sewage Treatment

Provide evidence to confirm that water supply capacity is available, and that demand can be met.

Provide evidence to confirm that sewerage and wastewater treatment capacity is available, and that demand can be met in accordance with the [Water Cycle Strategy](#) (see Section 4.4.3 for more information).

**Flood risk assessment credentials** - provide details of the author and date of the flood risk assessment.

Who has undertaken the flood risk assessment?

When was the flood risk assessment completed?