RUTLAND COUNTY COUNCIL
DRAFT STRATEGIC FLOOD RISK ASSESSMENT (LEVEL 1)
October 2023

Rutland
County Council

Executive Summary

This report has been produced for the purposes of helping the Rutland County Council (RCC) progress its Local Plan and establish the constraints of development from existing flood risk and water infrastructure capacity.

A Level 1 Strategic Flood Risk Assessment (SFRA) has been undertaken to form an evidence base for further decision-making on the water environment within the planning process and to ensure the Local Plan meets the requirements of the National Planning Policy Framework (NPPF) with respect to the water environment and water infrastructure provision.

Note:
At the time of preparing this report the Environment Agency mapping layers were awaited. This means that some of the maps included within the report are copied from the Environment Agency's website. As soon as the requested layers have been received the maps in this report will be updated.

SFRA Key Findings

The flood zone maps indicate that fluvial flood risk covers a limited geographical area within the county and that the majority of the higher risk flood zones (2 and 3) are located in rural areas away from the main settlements. There are a few settlements where the flood map shows properties at risk and these include Langham, Whissendine, Cottesmore, Ryhall, Ketton and parts of Oakham.

The baseline assessment of fluvial (rivers and Sea), surface and historic incidents of flooding identify that the extent of flood risk within the county is low to moderate. Due to the low risk of flooding in the county, which predominantly lies outside of the main settlements it is unlikely that an exceptions test will be required as part of the development of the emerging Local Plan.

There are identified low to moderate surface water issues within Oakham within the River Welland CFMP area which will need to be taken into consideration both on a site-by-site basis in bringing forward allocations and the potential cumulative impact.

Sustainable Drainage Systems (SuDS) should be used to reduce runoff from new development and they can in turn provide an attractive high-quality urban environment. In general, the western part of Rutland has more clay soils and infiltration SuDS are unlikely to be feasible. Other attenuation measures to control runoff such as long-term storage are likely to be more appropriate in such areas. In the east of the county the soils are loamy in nature and contain some major aquifers. In such locations infiltration SuDS are likely to be feasible but this should be confirmed in site specific investigations as part of a Flood Risk Assessment.

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1. Introduction

1.1 The overall objective of the SFRA is to identify any constraints on housing and employment growth planned for Rutland up to 2041 that may be imposed by flood risk and how these can be resolved i.e. by ensuring that flood risk taken into consideration. Furthermore, it will provide a strategic approach to the management and use of water which ensures that the sustainability of the water environment in Rutland is not compromised.

1.2 Using national and local Environment Agency guidance, the SFRA is being undertaken in stages.

1.3 The outputs of the study aim to inform development of the Local Plan and help RCC to select and develop in the most sustainable locations for growth, minimising the impact on the environment, water quality, and water resources.

Study Area

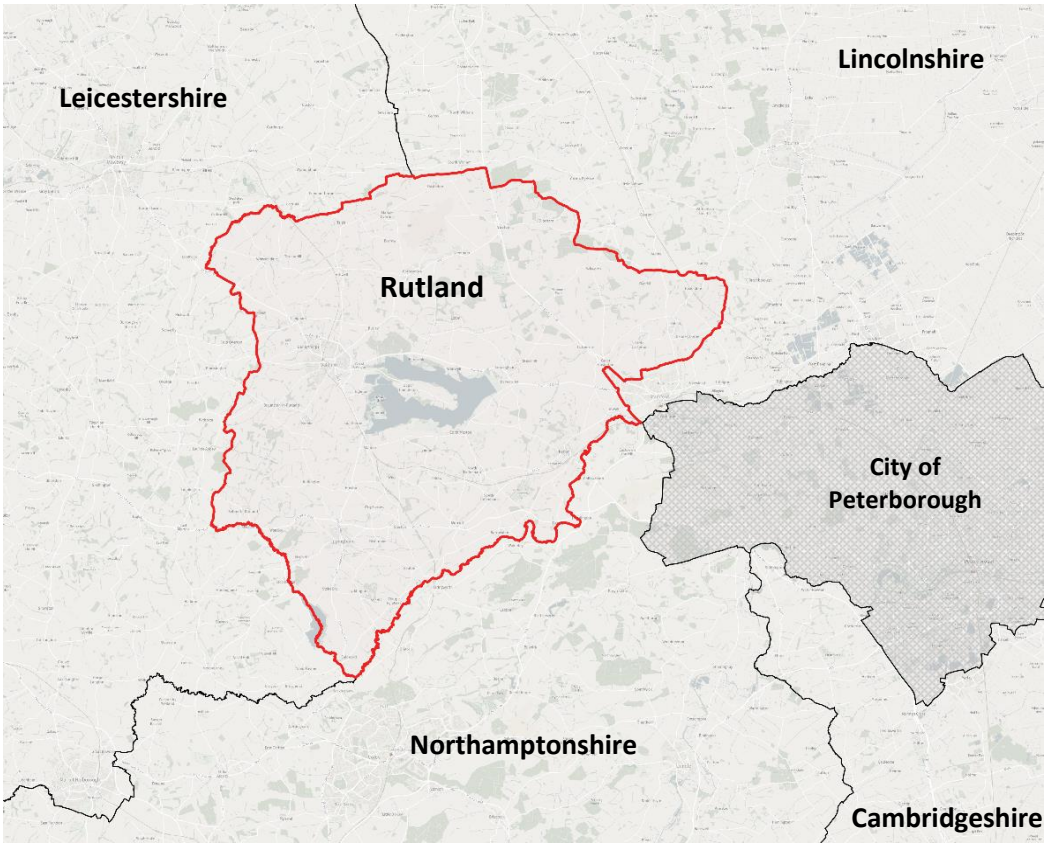

Figure 1 Rutland County Boundary with neighbouring County boundaries and extent of study area

1.4 Rutland is located in the East Midlands and is one of the smallest Counties in England covering an area of 382 km2. It lies predominantly in the Anglian River Basin, with a small area in the north of the county in the Humber River Basin. The river system comprises the headwaters of tributaries for the Welland, Wreake and Witham. As a result, river systems can respond quite rapidly to rainfall and surface water runoff from relatively impermeable soils.

1.5 The County is drained predominantly by the River Chater which rises near Whatborough Hill in Leicestershire and flows east before crossing into Rutland. It continues east, to the north of Ridlington, Preston, and then to the south of Manton and the north of Wing. At North Luffenham, it meets a stream that had risen south of Ridlington. It continues north-east, going through Ketton, before meeting the River Welland.

1.6 Rutland also contains Rutland Water Reservoir and part of the Eyebrook Reservoir. Rutland Water at 3,100 acres is the largest man-made reservoir in Europe. It is maintained by Anglian Water and is fed by the North Gwash which rises just outside the village of Knossington in Leicestershire, near the western edge of Rutland. A controlled flow is released from the reservoir to maintain its flow through Empingham, around Tolethorpe Hall, near Stamford and into the River Welland. There are also minor brooks, North Brook flows from Cottesmore through Greetham and discharges into the Gwash east of Empingham. Bisbrooke Brook flows from Uppingham eastwards where it joins the River Welland at the County Boundary.

1.7 A small number of watercourses in the north west of the County drain into the Rivers Wreake and Witham. The main rivers and ordinary watercourses are shown in Figure 2.

1.8 Rutland contains significant groundwater flows in the east of the county corresponding to limestone and sandstone rock. This corresponds to a major aquifer area. There are 11 groundwater monitoring boreholes in the east of the county, with many of these located in close proximity to the West Glen as it cuts through the far east of the county near Essendine.

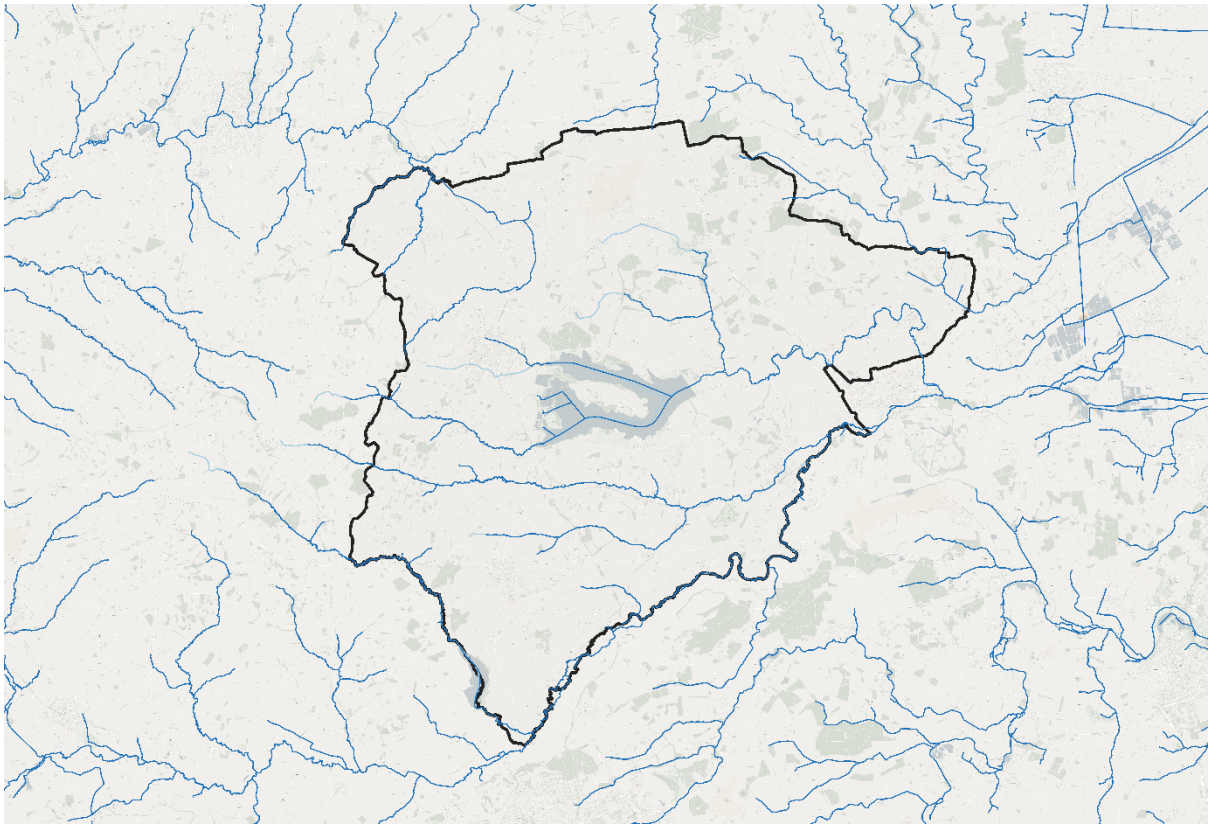

Figure 2 Environment Agency Map of main and ordinary water courses.

1.9 The area of Rutland is approximately 382 km^2 and latest data indicates that in 2021 the population was 41,381 . This is projected to rise to 45,038 by 2036 and to 46,100 by 2041 . The density of population is low with 108 people per km2 . Rutland has been classed as the most rural county or unitary authority in England and Wales with a high proportion of land in agricultural use.

1.10 Oakham is the largest town with a population of approximately 11,227. Oakham has a range of education, community, health and leisure facilities. It is also a centre for employment and shopping, including a twice-weekly market and a mix of independent and country wide retailers. Uppingham has a population of about 5001 with a more limited range of facilities, employment and shopping, a weekly market and bus services to the surrounding area.

1.11 Rutland has 52 villages ranging in size from small hamlets with a few houses and no facilities to larger villages with facilities such as a school, a convenience store, a post office, general medical practice, employment opportunities, community and leisure facilities and bus links to the towns and neighbouring villages. The six largest villages each have a population of more than 1,000 and account for about 25% of Rutland's population.

1.12 Beyond Rutland's borders, Stamford lies just outside the county boundary, providing a range of community facilities, shopping, education, health services and acting as a service centre to some of the villages on the eastern side of Rutland. Stamford is tightly constrained by the county boundary and may have limited space to grow and meets its own needs within Lincolnshire. Corby lies approximately 3 miles south of Rutland and is planned to double in size in the next 30 years including new housing, leisure and shopping facilities.

2 The water environment in Rutland

2.1 Flooding is a natural process that plays an important part in shaping the environment. However, flooding can cause damage, disruption; and in extreme circumstances loss of life. Flood risk in England appears to be increasing. While it is not possible to prevent all flooding, understanding the risks means we can put plans in place to manage them and reduce the impact flooding may have on our communities.

2.2 There are 11 River Basin Districts within England and three of them have headwaters in the RCC area the Anglian River Basin Management Plan, The Humber River Management Plan and the Severn River Management Plan.

2.3 The headwaters for three river basins originate in the higher ground to the north and west of Rutland. The water then sheds in three separate directions through a series of ordinary watercourses before reaching the main rivers downstream.

2.4 The predominant catchment is that of the River Welland which forms a part of the wider Anglian River Basin. Small areas in the north and west of the county provide sources the River Eye, which lies in the Severn Basin, and the River Witham, which lies in the Humber Basin.

2.5 This higher ground is typically formed of clay soils which means that a relatively high proportion of the water falling here will runoff into the watercourses and down to the rivers.

2.6 Figure 3 identifies the slopes and topography in the county which means that the water level in the watercourses can change quite rapidly during periods of heavy rain.

2.7 As the slopes become gentler in the east of the county the ground conditions start to change, the presence of limestone beneath the surface allows more opportunity for water to soak into the ground and also opportunity for water to spring from the ground.

River Welland

2.8 The River Welland runs west to east on the southern boundary of the authority area and eventually into the wash near Fosdyke Bridge.

2.9 River Welland catchment tributary, Bisbrooke Brook originates from the highland around Uppingham and runs in an easterly direction to join the River Welland.

River Chater

2.10 The River Chater runs from west to east, entering the RCC area near Launde Abbey and running east before it is joined by Morcott Brook between North and South Luffenham and continues in an easterly direction, passing through Ketton before joining the Welland.

River Gwash

2.11 The River Gwash South Arm runs from west to east through Braunston in Rutland and Brooke before feeding into Rutland Water reservoir. The River Gwash North Arm and Barleythorpe Brook both flow through Oakham from the rural area to the west and then combine downstream of Oakham before entering Rutland Water. Flows from Rutland Water feed the River Gwash to the east of the reservoir. North Brook runs from north to south through Cottesmore and Greetham flowing into the River Gwash at Empingham before flowing through Tickencote, Great Casterton and Ryhall on the way to its outfall into the River Welland downstream of Stamford.

Eye Brook

2.12 Eye Brook has its head waters in Leicestershire and runs north to south on the western border from Belton in Rutland, passing through Eyebrook reservoir to Caldecott before entering the Welland. To the east the River West Glen runs from north to south passing around Essendine before joining the Welland.

River Witham Catchment

2.13 A series of watercourses in the north of the RCC area, near Thistleton, drain across the border and eventually into the River Witham near South Witham. The River Witham then flows east to the wash.

River Eye Catchment

2.14 A second series of watercourses serves a number of settlements in the north- west including Whissendine, Langham and Ashwell. This then flows into the River Eye near Stapleford and in turn joins the River Wreake which is a tributary of the River Soar. The River Soar then joins the River Trent before passing into the River Humber and on to the North Sea.

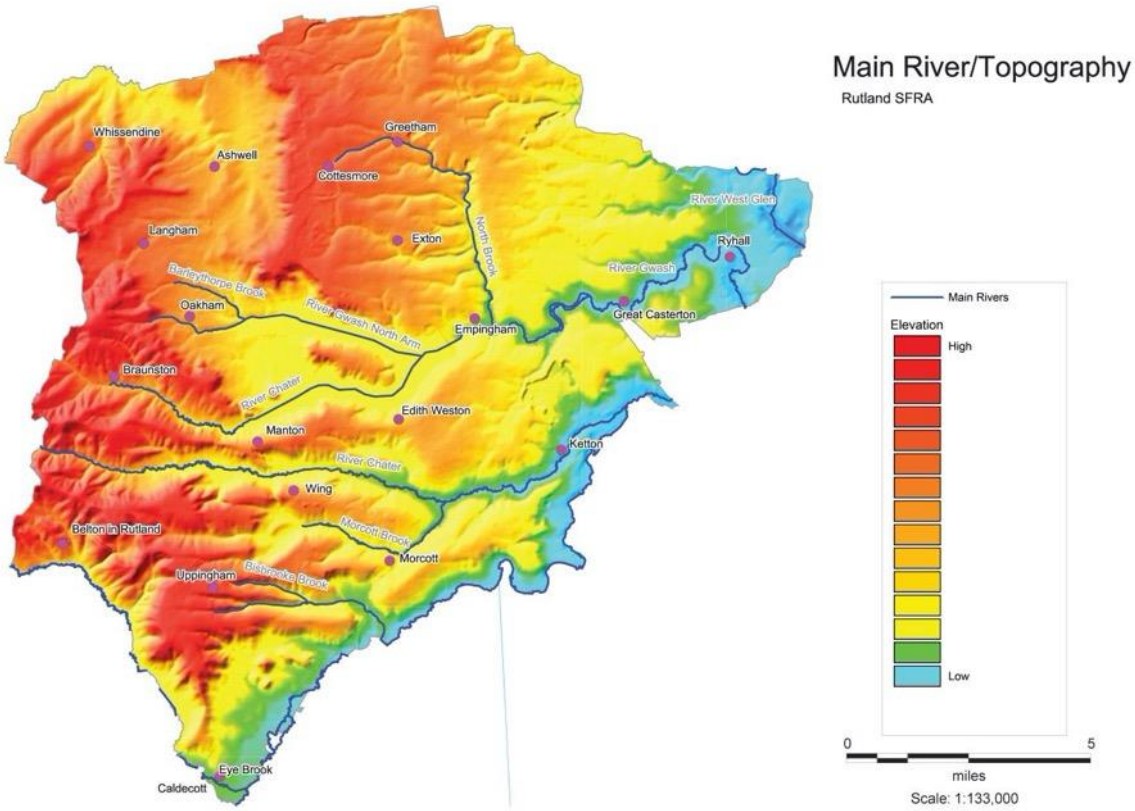

Figure 3 Main River/Topography Map Rutland SFRA (2009)

Reservoirs

2.15 Rutland Water lies in the catchment of the River Welland and was created in the 1970s for public water supply and is recharged with flows from Barleythorpe Brook, River Gwash North Arm and River Gwash South Arm. The reservoir is also now a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) for wildfowl and a Ramsar wetland conservation area.

2.16 Eyebrook Reservoir lies in the River Welland Catchment and was constructed in the 1930s to supply water to Corby steel works but is now associated more as a fishery. This reservoir has also a SSSI.

Oakham canal

2.17 Oakham canal provided a link between Oakham and Melton Mowbray to transport goods, this was formally closed in the 1840s. Whilst connectivity between the two towns has been lost, some sections of the canal still hold water and have a value for amenity and wildlife.

Sewers

2.18 The public sewers in the Rutland area are operated by the Water and Sewerage Companies (WaSC) with Severn Trent managing the sewers that discharge into the Severn catchment and Anglian Water managing the sewers that discharge into the Witham and Welland river catchments.

Other Watercourses

Moorcott Brook

2.19 The Morcott Brook, also known locally as "The Foss", is a small watercourse It is a tributary of the River Chater and part of the River Welland catchment. The Morcott Brook rises near Ridlington and flows in an easterly direction through a narrow valley past Ayston and between Glaston and Wing. It continues eastwards, passing to the north of Morcott where it turns sharply towards the north-east and passes through the centre of South Luffenham. under the Birmingham to Peterborough Railway Line and joins the River Chater.

North Brook

2.20 The North Brook rises near Cottesmore and flows east through Greetham before turning southwards. It then flows through into the parkland of Exton Hall where it has been dammed to create two ornamental lakes. On the western side of the upper lake stands Fort Henry, a pleasure-house built in 1788 in the elegant Gothick style. After the lower of the two lakes, it passes to the west of the deserted medieval village of Horn, before flowing under the remains of the Exton Park wall.

Whissendine Brook

2.21 Whissendine Brook is a small watercourse and is a tributary of the Langham Brook and part of the River Soar catchment. The Whissendine Brook rises to the west of Cold Overton and flows in a north easterly direction past the village and across the county boundary into Rutland. From here it continues through a gentle valley, splitting the village of Whissendine into two distinct halves, with the older settlement on higher ground to the east and a larger collection of more modern houses around a restored 19th century windmill to the west. In the centre of the village, it is joined by a smaller tributary from the south at a location formerly known as Horse Pit Lane. In periods of heavy rain, it regularly floods at this point. Upon leaving the village, it continues to flow north through arable fields where it soon joins the Langham Brook back on the border of Leicestershire.

Local Plan Evidence

2.22 A Strategic Flood Risk Assessment was commissioned by Entec in 2009, the SFRA Level 1 concluded that the flood zone maps indicate that fluvial flood risk is of limited spatial extent within the county and that the majority of the higher risk flood zones (2 and 3) are located in rural areas away from the built environment. The study identified a few settlements where the flood map shows properties at risk these were Langham, Whissendine, Cottesmore, Ryhall, Ketton and parts of Oakham.

2.23 In 2009 the proposed/existing minerals and waste sites within Rutland were all shown to fall within Flood Zone 1 except for Ketton which had a small proportion of its area in Zones 2 and 3.

2.24 The SFRA (2009) concluded that at present the need for application of the Exception Test for planned development in Rutland is unlikely due to sufficient availability of land in Flood Zone 1.

2.25 The results of the Level 1 SFRA were then used as a basis to focus in greater detail on SFRA Level 2 for the towns of Oakham and Uppingham. The SFRA (2009) also recommended that Sustainable Drainage Systems (SuDS) should be used to reduce runoff from new development and they can in turn provide an attractive high-quality urban environment and identified that the western part of Rutland has more clayey soils and infiltration SuDS are unlikely to be feasible and that other attenuation measures to control runoff such as long term storage are likely to be more appropriate in such areas. In the east of the county the soils are loamy in nature and contain some major aquifers. In such locations infiltration SuDS are likely to be feasible but this should be confirmed in site specific investigations as part of a further Flood Risk Assessment.

2.26 Rutland County Council (RCC) is a lead local flood authority (LLFA) and is responsible for producing, maintaining, applying and monitoring a local flood risk management strategy (LFRMS) which is consistent with the national strategy. The LLFA are responsible for all ordinary watercourses as there are no internal drainage boards within the County of Rutland.

2.27 At the planning stage of a development the LLFA will require a Flood Risk Assessments on all major development sites. The FRA's must demonstrate that a development will not cause any flooding, is SUDs compliant and the surface water discharge rate is limited to greenfield run-off rate.

2.28 In 2017 RCC reviewed its Preliminary Flood Risk Assessment (PFRA) against current flood risk data and information held by the Environment Agency. The assessment concluded that since the publication of the original PFRA report in 2009 there had been no nationally or locally significant flood events.

2.29 The latest surface water flood risk mapping was assessed as a part of the PFRA and was found to highlight a new area of nationally significant flood risk in Oakham. This newly identified Flood Risk Area (FRA) creates a requirement on RCC as a LLFA to investigate that risk and if necessary, identify a means of managing that risk.

SFRA Update April 2020

2.30 The SFRA update 2020 reviewed flood risk in the county in line with revisions to the NPPF and other key documents produced by flood risk authorities, including revised climate change allowances, updated flood mapping and the progression of the now withdrawn Local Plan and its proposed allocations.

2.31 Overall, flood risk remained unchanged and of low to moderate risk within the county. Sites were assessed through the Strategic Housing Land Availability Assessment. Sites which were identified within an area of medium or high surface water flood risk were scored an amber RAG rating. In the majority of cases, it was considered that surface water flooding could be managed by design and mitigation and detailed layout considerations and that surface water flooding is not considered to be a constraint to development.

2.32 This updated study will review and update this study and reconsider all sources of flood risk in line with the updated PPG and EA guidance published in 2022.

3 Level 1 Strategic Flood Risk Assessment (SFRA) Methodology

3.1 This Strategic Flood Risk Assessment will include the following –

- a Level 1 Strategic Flood Risk Assessment (SFRA) to inform policies and the site selection processes for the emerging new Local Plan.
- identify key flood risk constraints within the development plan area to enable RCC to assess the suitability of future development and inform planning policy with regards to flood risk.
- assessment of flood risk from all sources which will first involve the collation of available EA data, historical information on flooding and details on flood risk management infrastructure. Flood risk will be assessed for the baseline and the future scenario, which will consider the latest climate change guidance.

3.2 In this context, the assessment will

i) identify and map flood risk from all sources, (see Appendix A)
ii) assess existing and future flood management infrastructure and

iii) outline potential measures to reduce the causes and impacts of flooding.

3.3 A key requirement of the SFRA is to enable RCC to make informed decisions on the spatial distribution of growth and allocating sites for development in the Local Plan. Due to the lack of high flood risk areas in the county a sequential approach to the allocation of future development sites will be undertaken by the council at SHLAA/site selection stage. This SFRA Level 1 assessment will not, therefore sequentially assess sites and will be limited to ruling out areas where flood risk is unacceptable. As proposed allocations are developed through the Local Plan process, Level 2 assessments may be required in some areas of the county.

3.4 In summary the SFRA will cover the following –

- Overview of National Planning Policy
- Data Sources – EA - Flood Map for Planning.
- Review of Flooding Sources in RCC, Historic Flooding Events including Surface Flooding.
- Sequential Test, Fluvial Flood Risk, Other Sources of Flooding and Baseline Flood Risk Review.
- Flood Risk Management – identify opportunities to reduce flood risk, SuDs and measures to improve flood resilience.

3.5 The SFRA will be undertaken at a county-wide level (local authority level) and future growth and development in Rutland is being assessed as part of the emerging Local Plan.

4 Stakeholders and consultation for SFRA

4.1 In preparing the SFRA the council has engaged with key stakeholders and a focussed consultation was undertaken on the initial draft report in March and April 2023. Engagement will continue as the preparation of the Local Plan and its evidence base progresses. In particular the Council will liaise with partners to ensure that the SFRA and associated Water-cycle Study and the Infrastructure Delivery Plan reflect the comments and requirements of the following stakeholders in relation to the water environment.

- Environment Agency
- Natural England
- South Kesteven District Council
- Leicestershire County Council
- Anglian Water
- Severn Trent
- Tata Steel (Eyebrook Reservoir)
- River Trust (Natural Flood Management Proposal
- Rutland County Council Lead Local Flood Authority

4.2 Comments received at that time have been used to update the SFRA ready for publication alongside the Regulation 18 Preferred Options Local Plan. Further comment will be invited on the SFRA when the Local Plan consultation commences in the autumn of 2023.

5 Level 1 Strategic Flood Risk Assessment (SFRA)

5.1 A Level 1 SFRA is a desk-based study, using available existing information and any available modelling datasets to enable the application of the Sequential Test and to identify where the Exception Test may be required. The main tasks in preparing the Level 1 SFRA are described below:

- Working with partners and understanding the planning context. In preparation for the SFRA the main flood risk issues in the area have been identified and discussed with other internal RCC colleagues the Environment Agency, Anglian Water and Severn Trent Water.
- Gathering data and analysing it for suitability - Under Section 14 of the NPPF, the risk of flooding from all sources must be considered as part of a Level 1 SFRA, including flooding from tidal sources, rivers (fluvial), land (overland flow and surface water), groundwater, sewers and artificial sources.
- Producing strategic flood risk maps – see Appendix A

6 Overview Key Legislation, National Planning Guidance on WCS and SFRA

Flood Risk Regulations (2009)

6.1 The Flood Risk Regulations 2009 were created to transpose the EU Floods Directive (Directive 2007/60/EC) into law in England and Wales. The Floods Directive provides a framework to assess and manage flood risks in order to reduce adverse consequences for human health, the environment (including cultural heritage) and economic activity.

Flood and Water Management Act 2010

6.2 In response to the severe flooding across large parts of England and Wales in summer 2007, the Government commissioned Sir Michael Pitt to undertake a review of current flood risk management practices. The Pitt Review – Learning Lessons from the 2007 Floods[12], and subsequent progress reviews outlined the need for changes in the way the UK is adapting to the increased risk of flooding and the role different organisations have to deliver this function.

6.3 The FWMA, enacted by Government in 2010 in response to The Pitt Review, created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. This included the creation of a lead role for Local Authorities, as Lead Local Flood Authorities, designed to manage local flood risk (from surface water, groundwater and Ordinary Watercourses) and to provide a strategic overview role of all flood risk for the Environment Agency.

6.4 The FWMA also formalises the flood risk management roles and responsibilities of other organisations including the Environment Agency, water companies and highways authorities establishing them as Risk Management Authorities (RMAs). The responsibility to lead and co-ordinate the management of tidal and fluvial flood risk remains that of the Environment Agency.

National Strategy for Flood and Coastal Erosion Risk Management for England (2020)

6.5 In accordance with the FWMA, the Environment Agency has developed a National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in England. Whilst this strategy has been developed by the Environment Agency with input from Defra, it provides an overarching framework for future action by all risk management authorities to tackle flooding and coastal erosion in England. The first strategy was published in 2011, the strategy was updated in 2020.

6.6 The National FCERM Strategy sets out the long-term objectives for managing flood and coastal erosion risks and the measures proposed to achieve them.

6.7 It sets the context for, and informs the production of, local flood risk management strategies by LLFAs, which will in turn provide the framework to deliver local improvements needed to help communities manage local flood risk. It also builds on Governments 25 Year Environment Plan by incorporating a stronger approach to making nature part of the solution and to support an integrated approach to land management to better support flood risk management needs. It has 3 long-term ambitions:

1. Climate resilient places: working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change today's growth and infrastructure resilient in tomorrow's climate;
2. Making the right investment and planning decisions to secure sustainable growth and environmental improvements, as well as infrastructure resilient to flooding and coastal change a nation ready to respond and adapt to flooding and coastal change;
3. Ensuring local people understand their risk to flooding and coastal change and know their responsibilities and how to take action.

6.8 The Environment Agency's 'Flood and coastal risk projects, schemes and strategies: climate change allowances' guidance[13] was first published in July 2020. The 2020 version of the guidance reflects an assessment completed by the Environment Agency using the UK Climate Projections (UKCP) data to produce more representative climate change allowances for river flood flows and extreme rainfall for each of the river basin districts in England. In July 2021 climate change allowances for river flow were provided at a management catchment level rather than by river basin district.

6.9 The new guidance will apply to flood and coastal risk projects, schemes and strategies from 20 July 2021. In May 2022 updates to peak rainfall intensity have set allowances based at a management catchment level. Different approaches are used based on catchment size and level of urbanization within the catchment.

Flood Risk Management Plans

6.10 The Environment Agency is required to prepare FRMPs for all of England covering flooding from Main Rivers, the sea and reservoirs. As such, the Anglian FRMP, Humber FRMP and Severn FRMP have been published by the Environment Agency and set out the proposed measures to manage flood risk in each areas (RBD) from 2021 to 2027.

6.11 FRMPs explain the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs and set out how risk management authorities will work with communities to manage flood and coastal risk over the period 2021-2027. Risk management authorities include the Environment Agency, local councils, internal drainage boards, Highways England and LLFAs.

6.12 Each river basin district also has a river basin management plan, which looks at how to protect and improve water quality and use water in a sustainable way. Both flood risk management and river basin planning form an important part of a collaborative and integrated approach to catchment planning for water.

River Basin Management Plans

6.13 River Basin Management Plans were created to fulfil the Water Framework Directive requirements providing protection and improvements to the water environment. First drafted in 2009 these plans were updated in December 2022 to take into consideration the principles of the Environment Bill.

6.14 There are 11 River Basin Districts within England and three of them have headwaters in the RCC area;

Anglian RBMP https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1118190/Anglian-FRMP-2021-2027.pdf

Humber RBMP https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022

Severn RBMP https://www.gov.uk/guidance/severn-river-basin-district-river-basin-management-plan-updated-2022

6.15 Although RCC is covered in part by the three areas, the predominant area is the Anglian RBMP.

Anglian RBMP

Oakham Surface Flood Risk Area - Current flood risk 2022

6.16 The flood hazard and risk maps show that in the Oakham FRA[1], 1,783 people live in areas at risk of flooding from surface water. Of these people, 9% live in areas of high risk.

6.17 Also shown to be in areas at risk of flooding from rivers and sea are:

- 109 non-residential properties - including community centres retail parks and public utilities
- 1.83 km of roads - including parts of the A606 and A6003
- 0.69 km of railway
- 140.13 ha of agricultural land
- 10ha environmental designated sites (Ramsar and SSSI)
- 1 listed building
- 0.92ha scheduled ancient monuments
- 0.42ha parks and gardens

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1118190/Anglian-FRMP-2021-2027.pdf page 175.

6.18 The Leicestershire Local Resilience Forum (LRF) is a multi-agency partnership made of representatives from local public services, Partners are required to respond in the event of emergencies in their respective roles. Jointly they safeguard and mitigate the consequential impacts on property, the wellbeing of residents, communities and businesses.

6.19 Flooding is one of the risks addressed through community flood preparation. Rutland County Council Flood Risk Management Strategy forms the basis for how flooding is dealt with within the county, an overview of this Strategy is set out in paragraph 3.22 of this report.

6.20 The Environment Agency monitor river and rainfall conditions at 1 site near to the FRA, which is Oakham (Level). This information is used to inform activities related to 1 flood warning area that covers the FRA. This enables people to receive a warning when flooding could occur. This data also informs the operational response during a flood incident.

6.21 Rutland Council and Anglian Water Services operate and maintain assets that perform a flood risk management function on the drainage network. Rutland Council also maintain several other structures and defences on ordinary watercourses.

6.22 The Environment Agency similarly operates and maintains flood risk management assets on the main watercourses in the FRA. This work includes routine inspection and clearance activities as well as regular repair and replacement of assets.

6.23 Rutland County Council capital programme focuses on general maintenance of assets across the FRA. In particular, it works to reduce highway flooding. Landowner engagement also takes place to manage flood risk to properties from overland flows.

Catchment Flood Management Plans (CFMP)

6.24 A CFMP is a high-level strategic planning document that provides an overview of the main sources of flood risk and how these can be managed in a sustainable framework for the next 50 to 100 years. The Environment Agency engages stakeholders within the catchment to produce policies in terms of sustainable flood management. There are three relevant CFMP's in Rutland the River Welland, Witham and Trent. The predominant CFMP is the River Welland which covers all of the county. The Witham and Trent cover a very minor part of the county, all are classified as low to moderate risk.

CFMP Welland

6.25 Figure 4 below identifies the Environment Agency's CFMP area for the River Welland;

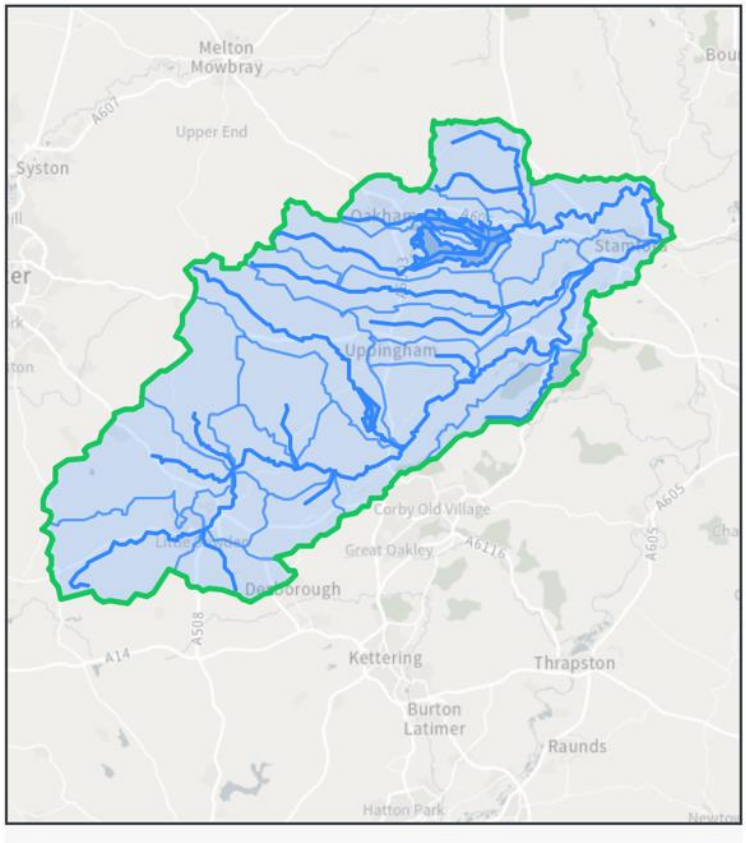

Figure 4: Draft Map taken from EA data source March 2023: https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3506

6.26 The River Welland CFMP area overall identifies that the area is low to moderate risk there are specific policies for Oakham set out below;

Oakham Policy 3
Areas of low to moderate flood risk where we are generally managing existing flood risk effectively. This policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. However, we keep our approach under review, looking for improvements and responding to new challenges or information as they emerge. We may review our approach to managing flood defences and other flood risk management actions, to ensure that we are managing efficiently and taking the best approach to managing flood risk in the longer term.

RCC Local Flood Risk Management Strategy

6.27 The Local Flood Risk Management Strategy is a legal document which provides a framework for addressing flood risk across the county. The development, maintenance and implementation of the strategy for the management of local flood risk is a statutory duty of RCC, as a LLFA under the FWMA.

6.28 The LFRMS defines how RCC, in partnership with other organisations who also have statutory roles, will seek to manage flood risk across their area. The FWMA defines 'Local Flood Risk' as flooding from Ordinary Watercourses, surface water and groundwater. The FRMS recognises the importance of dealing with flood risk from all sources in a co-ordinated way, so the strategy has been developed to reflect this.

6.29 The strategy aims to understand flood risk from all sources across the area, reduce its likelihood and impact on residents and visitors and take the opportunity to improve the environment. It is a living document which provides an ongoing comprehensive framework for managing flood risk. The strategy has drawn on existing plans and knowledge to form an understanding of the various flood risks, what management is already in place and where risk remains a concern.

Surface Water Management Plan

6.30 A Surface Water Management Plan (SWMP) is a study to understand the flood risks that arise from local flooding, which is defined by the Flood and Water Management Act 2010 as flooding from surface runoff, groundwater, and Ordinary Watercourses.

6.31 The purpose of a SWMP is to identify what the local surface water flood risk issues are, what options there may be to prevent them or the damage they cause and who should take these options forward. At the time of undertaking this of this study, no SWMP has been published that covers RCC.

Environment Agency

6.32 The Environment Agency has published a good practice guide[2] in how to undertake a SFRA's. This Level 1 SFRA, this has been used alongside this assessment to ensure that all guidance and best practice has been considered.

National Planning Policy Framework

6.33 The National Planning Policy Framework (NPPF)[4] (July 2021) and associated Planning Practice Guidance (PPG) for Flood Risk and Coastal Change emphasise the active role Local Planning Authorities (LPAs) should take to ensure that flood risk is understood and managed effectively and sustainably throughout all stages of the planning process.

6.34. The National Planning Policy Framework (NPPF)3 provides guidance to planning authorities on taking account of managing flood risk in their plan making. It states that (paragraph 160):

'Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.'

6.35. It goes on to say that (paragraph 161) 'all plans should apply a sequential, risk-based approach to the location of development - taking into account the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property.'

Flood Risk Zones

6.34 The risk of flooding is a function of the probability that a flood will occur and the consequence to the receptor as a direct result of flooding. The NPPF seeks to ensure the probability of flooding from rivers is appropriately assessed by categorising areas within the fluvial floodplain into zones of low, medium and high probability, as defined in Table 1.

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[2] https://www.adeptnet.org.uk/system/files/documents/FRS18204%20SFRA%20Good%20Practice%20Guide_Final_Nov2021.pdf

[3] Published February 2019 https://www.gov.uk/government/publications/national-planning-policy-framework--2

Table 1: Flood Zones (PPG 2022)[4]

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

[4] https://www.gov.uk/guidance/flood-risk-and-coastal-change#para78 Paragraph: 078 Reference ID: 7-078-20220825 Revision date: 25 08 2022

Sequential Test

6.35 The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The SFRA will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding.

6.36 Annex 3 to NPPF provides the flood risk vulnerability classification to support the use of the sequential approach. This identifies what is considered to be essential infrastructure, vulnerability of particular uses and what is considered to be water compatible development.

6.37 The Sequential Test can be undertaken as part of a Local Plan Sustainability Appraisal. Alternatively, it can be demonstrated as part of the Strategic Housing Land Availability Assessment. Whether any further work is needed to decide if the land is suitable for development will depend on both the vulnerability of the development and the Flood Zone it is proposed for. Table 2 of the PPG defines the vulnerability of different development types to flooding. Table 3 of the PPG shows whether, having applied the Sequential Test first, that vulnerability of development is suitable for that Flood Zone and where further work is needed.

Application of the Sequential Test for plan preparation

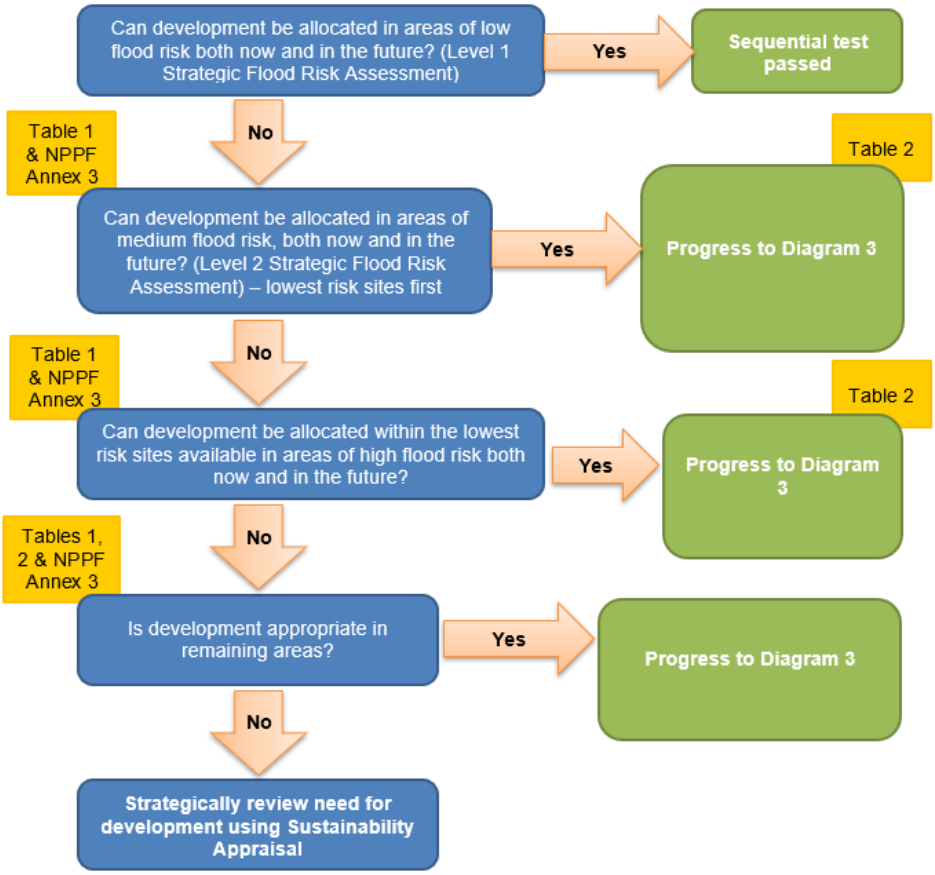


Figure 5: Diagram 2 PPG Flood Risk and Coastal Change Sequential Test for Local Plans August 2022[5]

Exception Test

6.38 If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. Due to the low risk of flooding in the county, it is unlikely that this will be an approach required as part of the development of the emerging Local Plan.

Flood Warning Areas

6.40 The Flood Warning Areas maps are included in Appendix A. Flood Warning Areas are geographical areas at risk of flooding, on which flood warnings issued by the Environment Agency are based. These areas generally contain properties that could flood from rivers, the sea or in some cases groundwater and are smaller than Flood Alert Areas. Flood Warnings are issued when flooding of properties is expected to occur, to alert people that they should take action to protect themselves and their property. Severe Flood Warnings are the highest level and are issued in Flood Warning Areas when there is a danger to life. Communities in flood warning areas can sign up for flood warnings on the government website[6] and find live flood warning information here[7]. To find out if warnings are available, the address post code should be typed in. Residents can register to receive warnings for properties other than their own if wished, for example relatives' homes.

Flood Alert Areas

6.40 Flood Alert Areas are wider geographical areas where it is possible for flooding to occur from rivers or sea and in some locations, groundwater[8]. Flood Alerts are the earliest stage of warning and mean that flooding is possible. They warn of flooding on low-lying land, roads, driveways and gardens and encourage people to be alert, stay vigilant and make early / low impact preparations for flooding. The Environment Agency encourages people such as highways officers, emergency services, local media, landowners and anyone travelling around to sign up for these, although they are available to everyone. They are usually issued during daylight hours and are issued more regularly than the Flood Warnings. The Flood Alert Areas are mapped in appendix A.

[5] https://www.gov.uk/guidance/flood-risk-and-coastal-change#diag2
[6] https://www.gov.uk/sign-up-for-flood-warnings
[7] https://flood-warning-information.service.gov.uk/warnings
[8] https://data.gov.uk/dataset/7749e0a6-08fb-4ad8-8232-4e41da74a248/flood-alert-areas

Application of the Exception Test to plan preparation

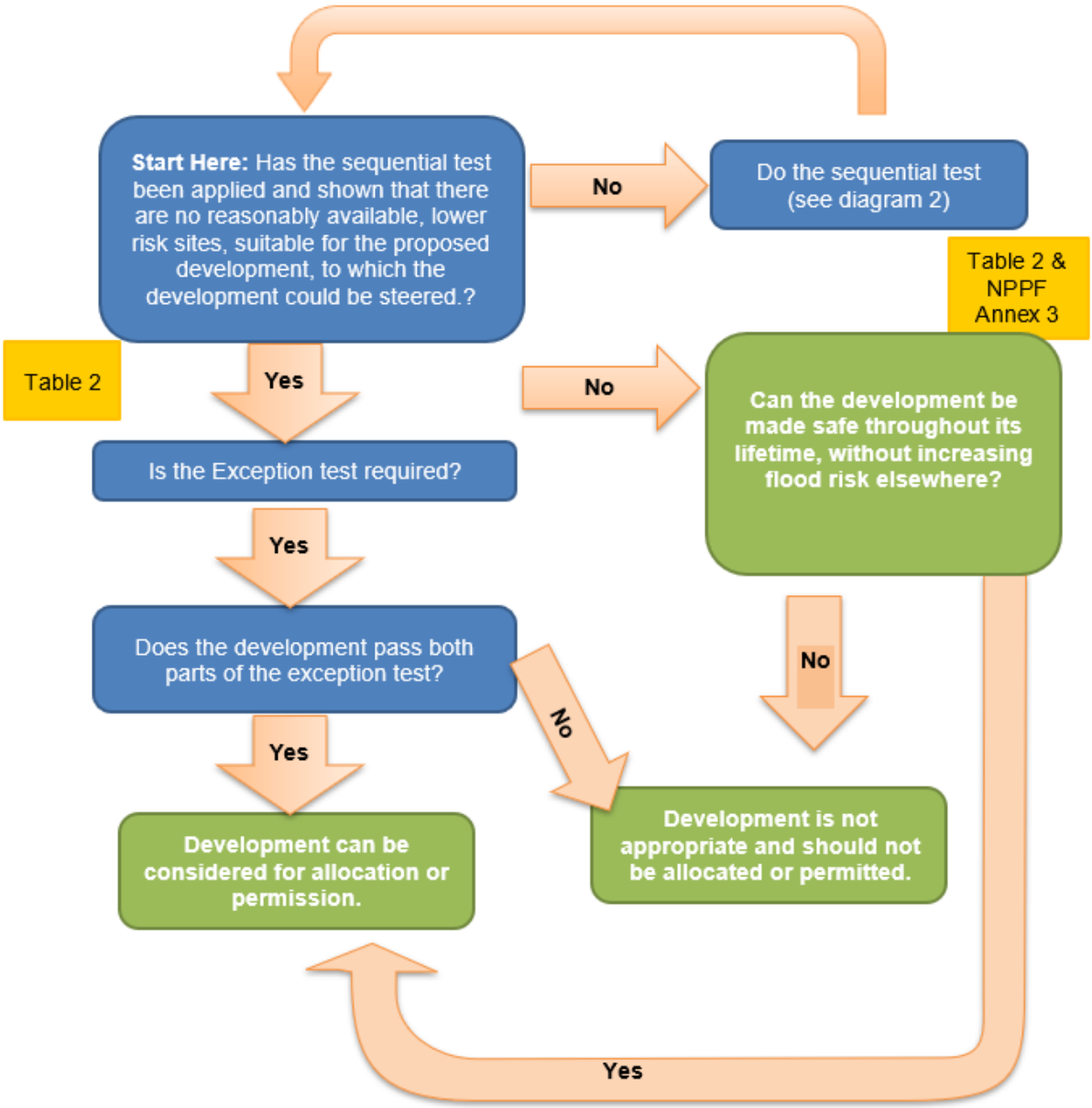
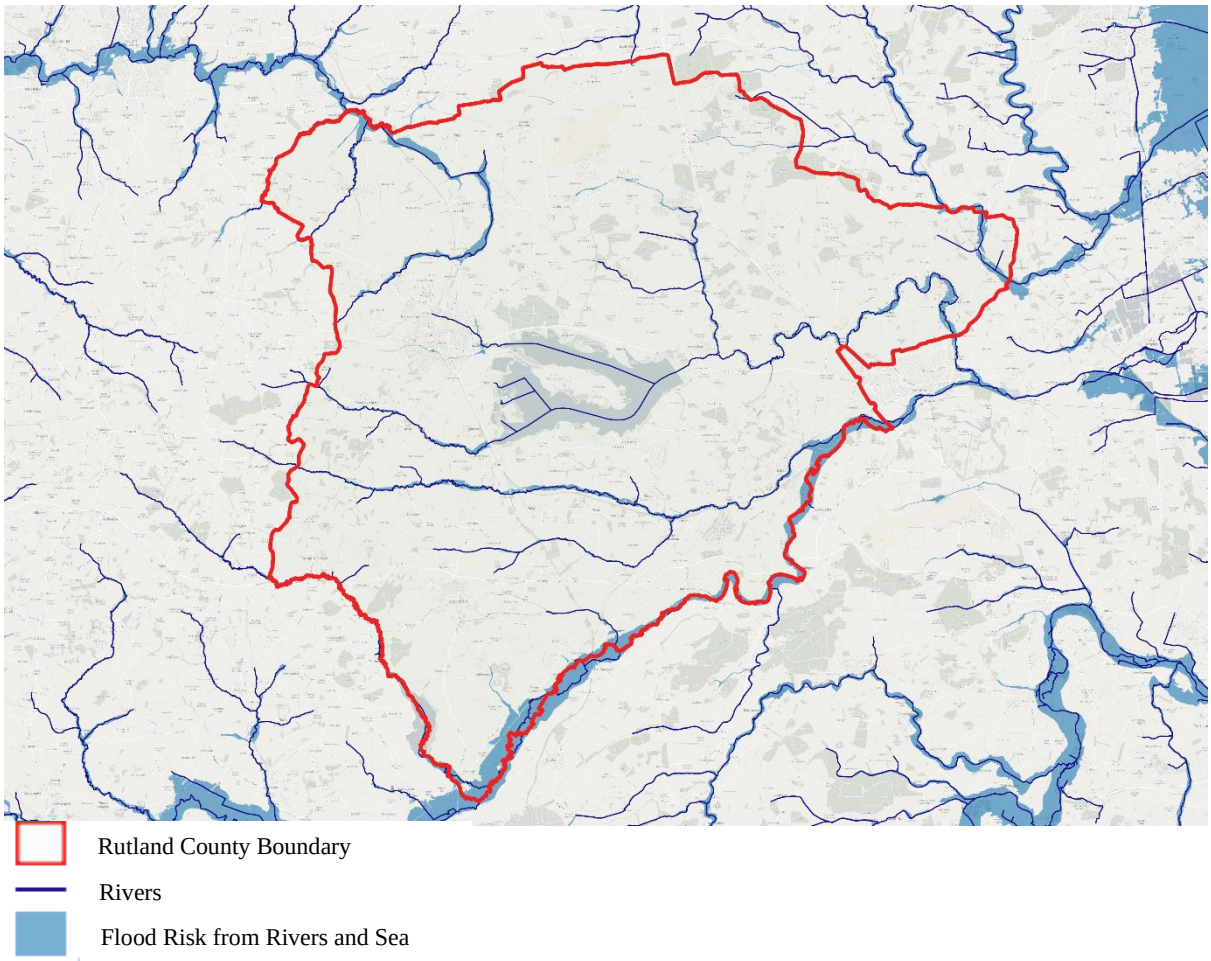


Figure 6: Diagram 3 Flood Risk and Coastal Change Exceptions Test for Local Plans August 2022

7 Desk top Assessment & Data Sources – EA - Flood Map for Planning

Flood risk from Rivers and Sea



7.1 The Flood Zones do not take into account the presence of flood defences. This is important for planning long term developments as long-term policy and funding for maintaining flood defences over the lifetime of a development may change over time. The Flood Zones do not take into account surface water, sewer or groundwater flooding or the impacts of canal or reservoir failure. They do not consider climate change. Therefore, there could still be a risk of flooding from other sources and that the level of flood risk will change over time during the lifetime of a development.

7.2 The EA Flood Map identifies that most of the county lies within Flood Zone 1, with limited Flood Zone 2 and 3 to the south of the county.

7.3 The low to moderate risk of flooding means that sequentially, proposed growth can be accommodated outside of these areas, however figure 6 only relates to river and sea flooding. Surface and other flooding are considered within the next section of this report.

7.4 Whilst sites allocated in the emerging Local Plan will be directed to areas outside flood zone 3 during the lifetime of the Local plan windfall sites may also come forward. The EA therefore recommends the following provisions are considered to ensure that windfall development appropriately address flood risk issues:

- Developers will have to carry out site specific flood risk assessments (FRAs) for individual development applications. This should be included within Local Plan policies
- The SFRA should provide developers with a source of information to help them undertake FRAs where they are required.
- The LLFA should consider what requirements they would expect to see within FRAs.

8 Flooding from Surface Water

8.1 The EA's surface water flood risk mapping shows areas that could be affected by surface water flooding and the potential depth and velocity of that flooding. Surface water flooding is subdivided into the following categories:

- High – chance of flooding greater than 1 in 30 each year
- Medium – chance of flooding between 1 in 100 and 1 in 30 each year
- Low – chance of flooding between 1 in 1,000 and 1 in 100 each year

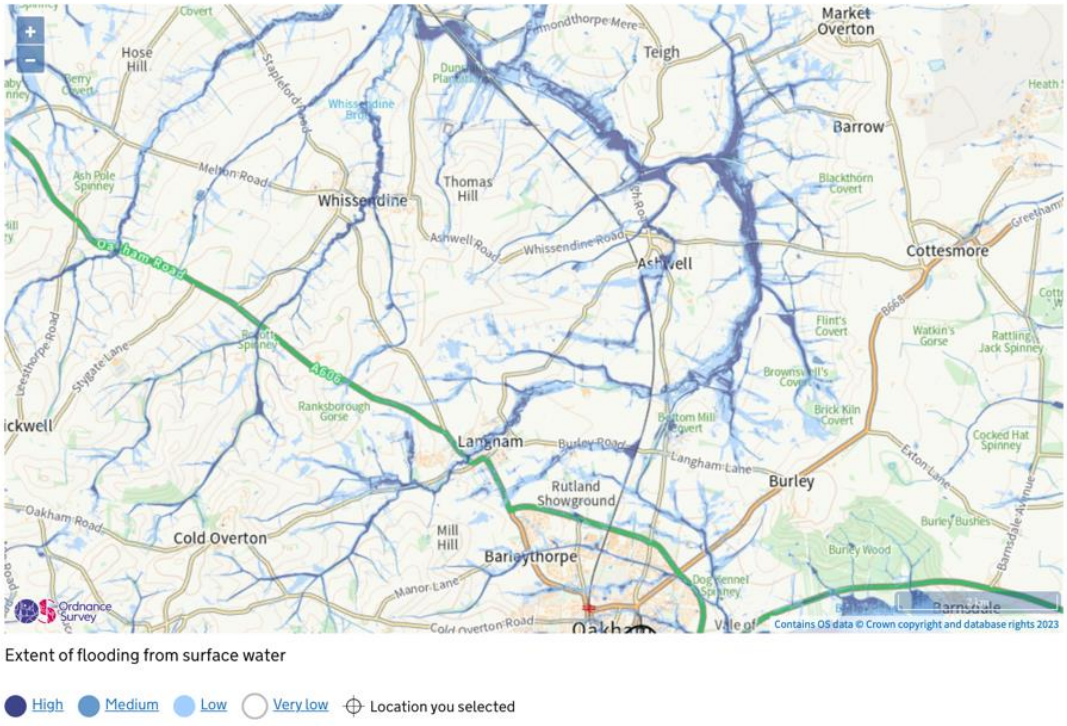
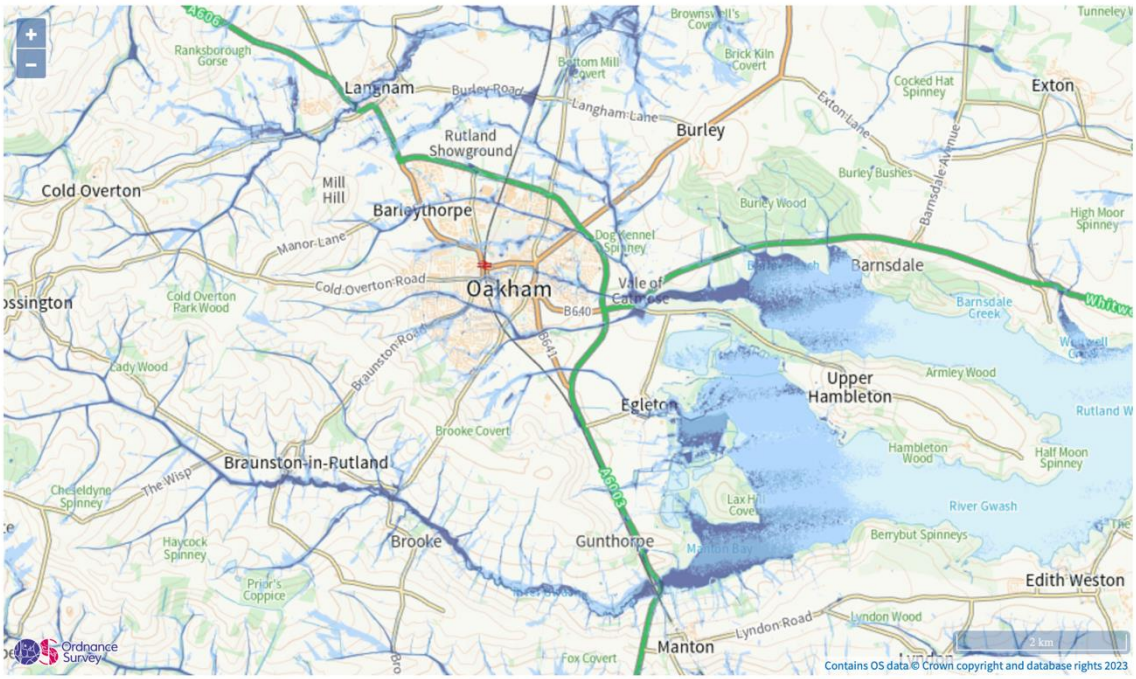


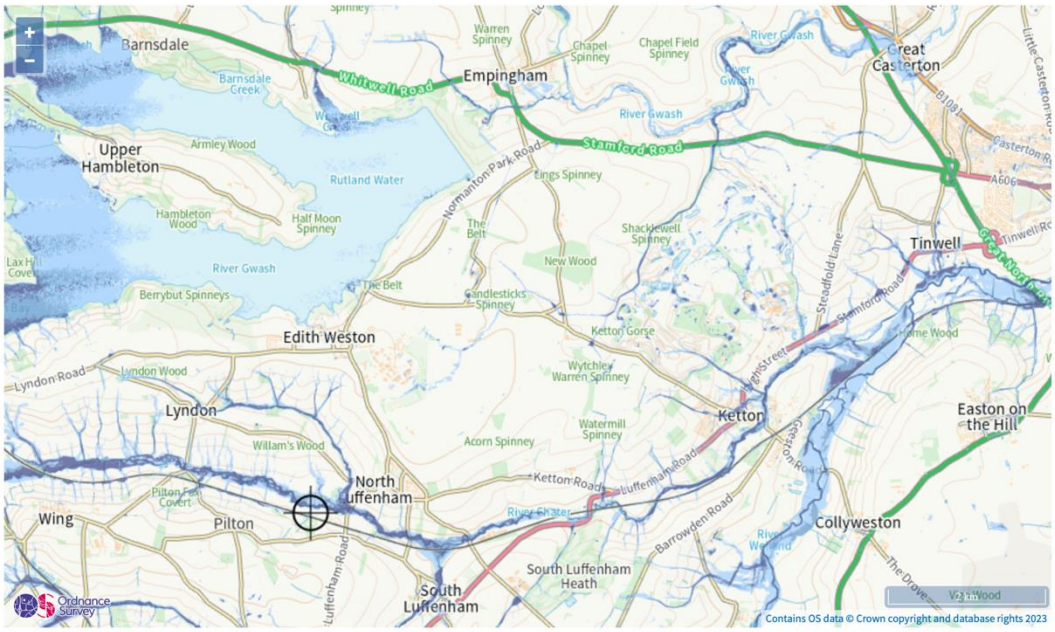
Figure 8: Draft map taken from EA data source March 2023: EA Flood Map for Planning (to be updated within GIS).



Extent of flooding from surface water

High Medium Low Very low Location you selected

Figure 9: Draft map taken from EA data source March 2023: EA Flood Map for Planning (to be updated within GIS).



Extent of flooding from surface water

High Medium Low Very low Location you selected

Figure 10: Draft map taken from EA data source March 2023: EA Flood Map for Planning (to be updated within GIS)

8.2 Surface water runoff, also known as 'pluvial' flooding, occurs when high intensity rainfall (e.g., thunderstorms) generates runoff which flows over the surface of the ground and accumulates in low lying areas. The presence of impermeable surfaces, saturated soils, and insufficient capacity within the drainage network or high-water levels in watercourses that can cause local drainage networks to back up can further exacerbate surface water flooding.

8.3 Localised flooding can be attributed to topographic depressions, insufficient capacity within Ordinary Watercourses and culverts, as well as obstructions to surface water flow paths. Flooding from surface water can also be associated with the failure in the management of the drainage network during high rainfall events.

8.4 The Environment Agency Risk of Flooding from Surface Water mapping (RoSFW) dataset, provided in figures 8 - 10, shows that a number of communities are at risk of flooding from surface water. The mapping shows that surface water predominantly follows topographical flow paths of existing watercourses or dry valleys and can pond in low-lying areas. Whilst in the majority of cases the risk is confined to mostly rural areas and roads, there are notable prominent run-off flow routes.

8.5 It is evident from the most recent surface water analysis that surface water is a greater constraint, although limited in extent, in terms of flood management than river and sea in Rutland. However, the risk of this is highest in some villages such as Langham, Whissendine, Ashwell and Braunston-in-Rutland where there are watercourses.

8.6 Whilst surface water can be mitigated through design, the revised PPG includes the requirement for the cumulative impact of development to be assessed against flood risk.

8.7 RCC as lead Local Flood Authority can provide information on when an FRA will be required to consider surface water flooding and how it should be addressed in the FRA. It is recommended that this information is included within a policy in the new Local Plan. Details of these requirements are awaited from the LLFA.

Flood risk from Reservoirs

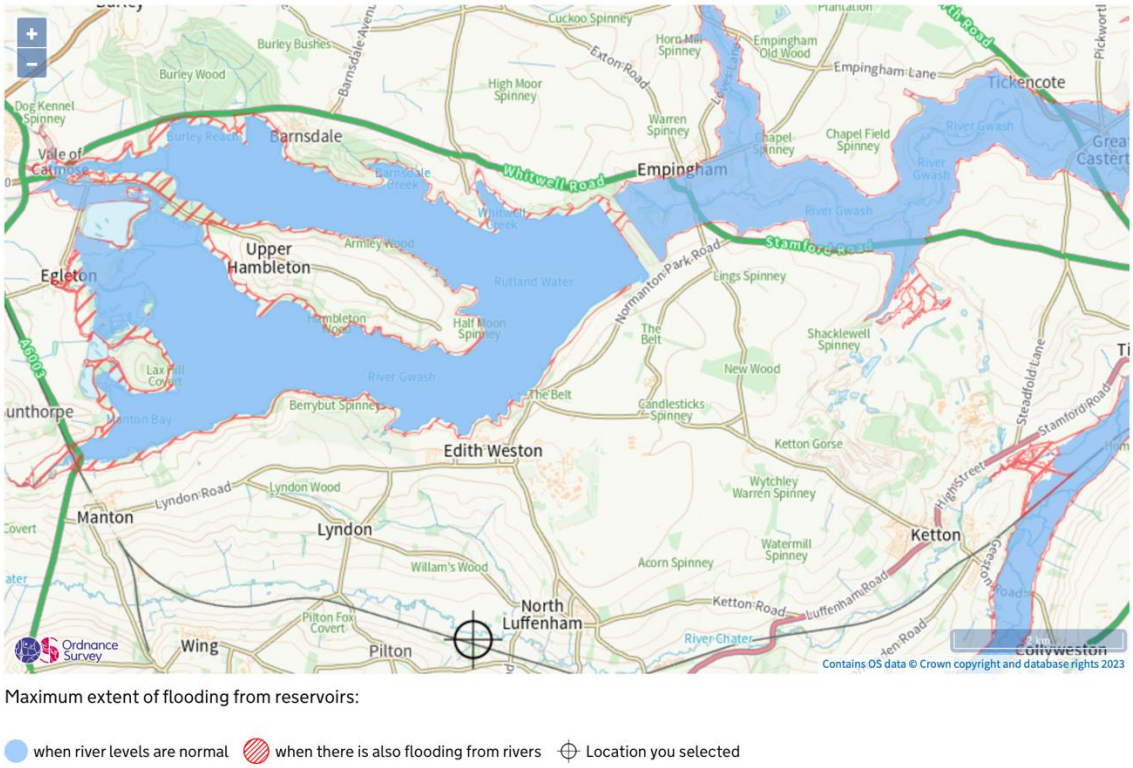


Figure 11: Draft map taken from EA data source March 2023: EA Flood Map for Planning (to be updated within GIS).

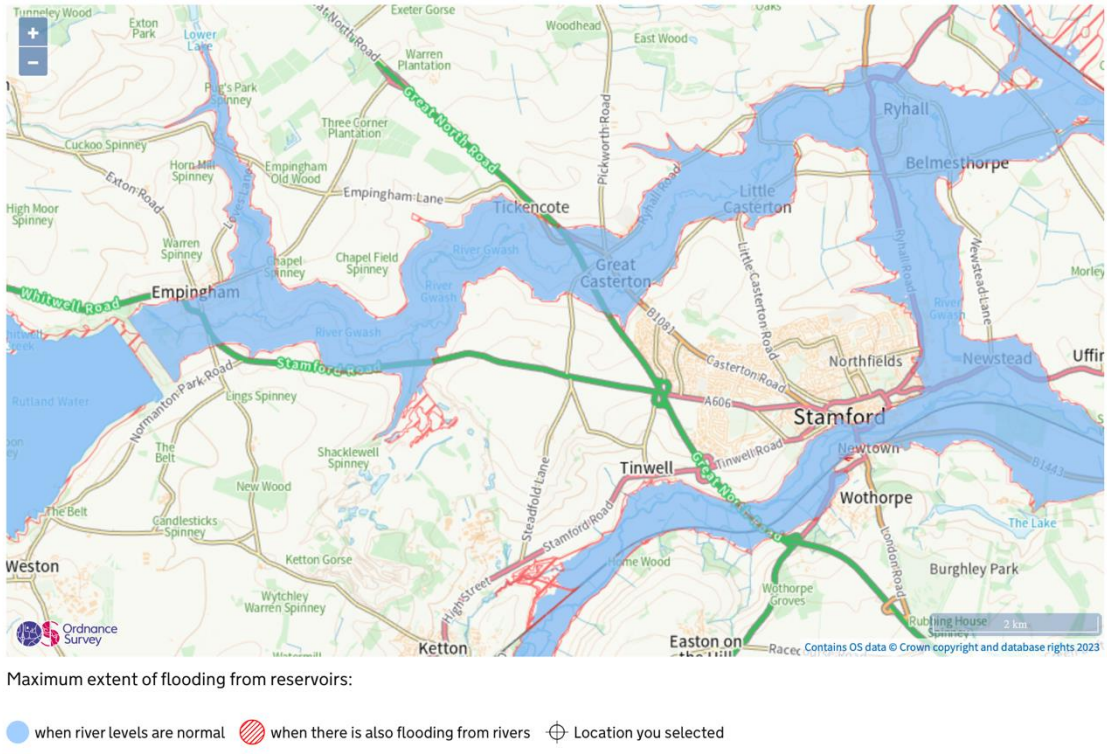


Figure 12: Draft map taken from EA data source March 2023: EA Flood Map for Planning (to be updated within GIS).

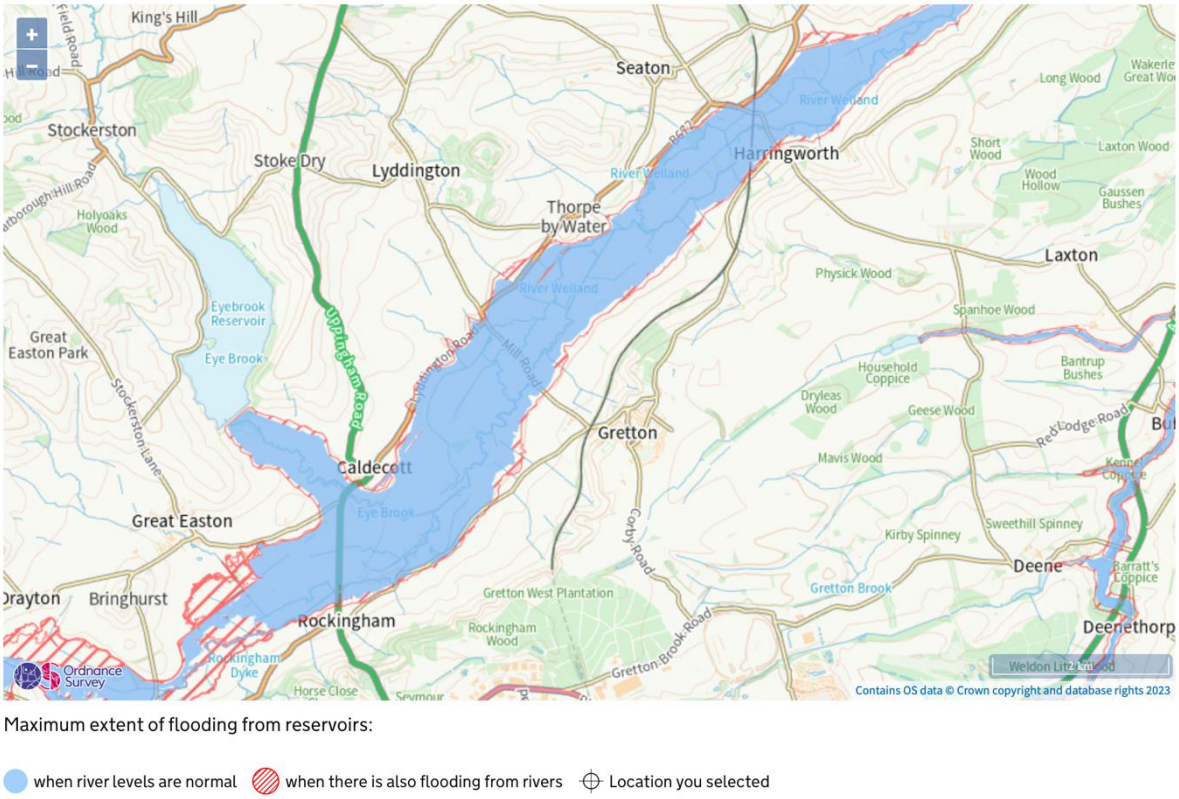


Figure 13: Draft map taken from EA data source March 2023: EA Flood Map for Planning (to be updated within GIS).

8.8 The risk of flooding from reservoirs is mainly due to overtopping of the dam/reservoir wall or a wall breach. There are two significant reservoirs within the county: Rutland Water and Eyebrook reservoir both of which fall under the Reservoir Act 1975 (having a volume greater than 25,000m3). As part of the Reservoirs Act there is a need to create an onsite reservoir plan, which sets out how to respond to an emergency incident.

8.9 The EA's flood risk mapping shows areas at risk of flooding from reservoirs and should be used to inform development decisions when considering the flood risk posed by reservoirs. The PPG[9] states that LPAs should discuss their proposed site allocations with reservoir undertakers to avoid an intensification of development within areas at risk from reservoir failure and ensure that reservoir undertakers can assess the cost implications of any reservoir safety improvements required due to changes in land use downstream of their assets.

8.10 Due to the risk of these areas, it is unlikely site allocations will be considered in the mapped reservoir flood risk areas and AWS who manage both Rutland Water and Eyebrook reservoir will be consulted at various stages of the Local Plan process.

Groundwater

8.11 Groundwater refers to all water which is below the surface of the ground and in direct contact with the ground or subsoil. Groundwater flooding occurs when the water table in permeable rocks rises to enter basements/cellars or comes up above the ground surface. Groundwater flooding is not necessarily linked directly to a specific rainfall event and is generally of longer duration than other causes of flooding.

8.12 The presence of existing springs and limestone bedrock in the area suggest that ground water flooding could be possible in the county. However, the risk is considered to be low.

8.13 The British Geological Society (BGS) have produced information on the susceptibility of groundwater flooding .

8.14 Figure 14 below, also identifies the key distinct differences in geology in the county. In general, the western part of Rutland has more clay soils and the infiltration SuDS are unlikely to be feasible. Other attenuation measures to control runoff such as long-term storage are likely to be more appropriate in such areas. In the east of the county the soils are loamy in nature and contain some major aquifers. In such locations infiltration SuDS are likely to be feasible but this should be confirmed in site specific investigations as part of a Flood Risk Assessment.

[9] https://www.gov.uk/guidance/flood-risk-and-coastal-change#para46

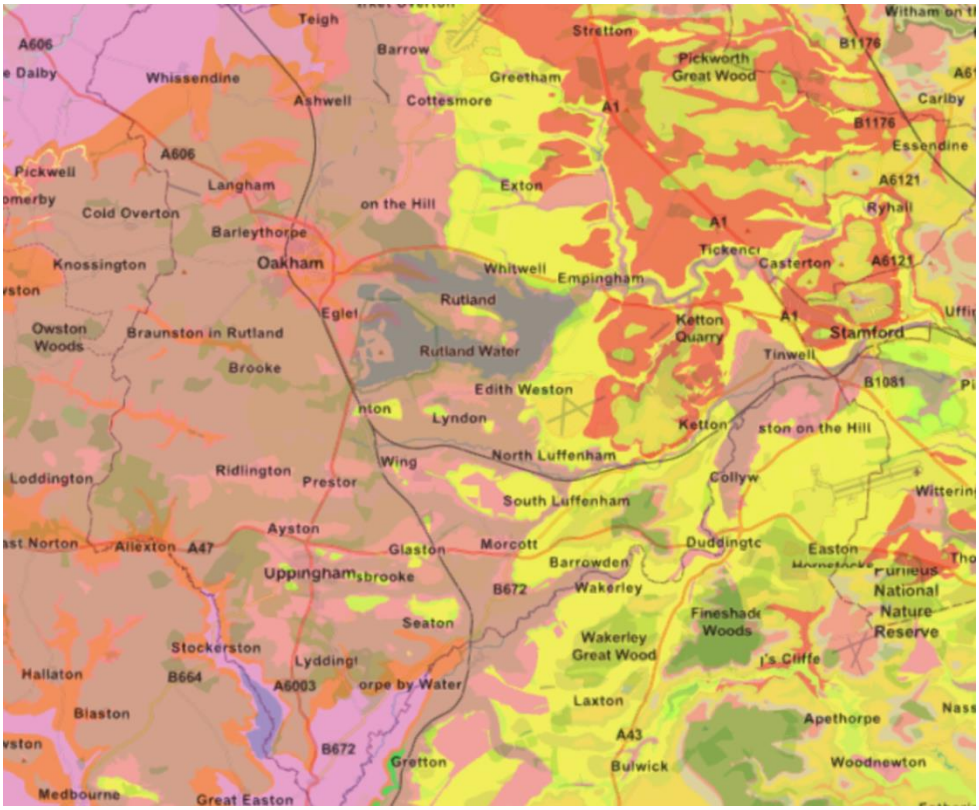


Figure 14: Draft map taken from BGS data source March 2023

Figure 15: EA Historic Flood Map March 2023 (February 2023 dataset)[10]

[10] https://www.data.gov.uk/dataset/76292bec-7d8b-43e8-9c98-02734fd89c81/historic-flood-map

9.1 At the time of writing the most recent EA historic flood map indicates that there have been no recorded incidents of river flooding in the county.

9.2 In additional to reviewing the EA maps, Climate Node[11] have mapped all media records of incidents of river and surface flooding, this also has not identified any occurrences of historic flooding in Rutland.

9.3 Incidents of surface water flooding are reported to the county council as lead local flood authority.

9.4 The draft LFRMS[12] summarises significant historical surface water flooding events in the county;

Whissendine

9.5 Whissendine Brook is an ordinary watercourse which drains the area to the south of Whissendine. It has a confluence with an unnamed ordinary watercourse immediately south of Main Street before passing under the road and flowing north. The brook has a history of exceeding its bank capacity and flooding Main Street which becomes impassable. The adjacent public house has property level protection which appears to be effective.

Langham

9.6 Langham Brook is an ordinary watercourse which had a history of exceeding its bank capacity. Action was taken in the 1990s to ensure riparian owners kept the brook clear of obstruction. The watercourse continues to be monitored on a regular basis by the Council to minimise the potential for future flooding problems.

Schofield Road Culver, Oakham

9.7 Barleythorpe Brook is a main river which was culverted under the Oakham to Melton Canal in the 1800s. This area was developed in the 1980s and 90s and the culver extended under the adjacent estate roads. In the event of a collapse or blockage of the culvert locally significant flooding may occur.

River Chater, Ketton, November 2000

9.8 The Rutland SFRA (2009) highlights a flood event from the River Chater in November 2000. This followed one of the wettest recorded autumns in the UK and coincided with widespread flooding throughout Europe. It is understood that extensive flooding of farmland around Ketton also occurred at this time as the River Welland channel capacity was exceeded.

[11] https://www.climatenode.org/maps/UK_flood_map.html?utm_source=POLITICO.EU&utm_campaign=cf3b893ebb-EMAIL_CAMPAIGN_2022_01_05_06_51&utm_medium=email&utm_term=0_10959edeb5-cf3b893ebb-190543823

[12] https://www.rutland.gov.uk/environment/floods-water/local-flood-risk-management-strategy

Highways flooding, various locations, 2013 & 2016

9.9 Heavy rainfall events experienced in July 2013 and March 2016 lead to a temporary build-up of surface water on the highway in a number of locations. This was caused by the high intensity of the rain fell and the drainage network being unable to drain the surface in time. These storms caused widespread damage throughout the UK. On both occasions the water quickly drained away as the storms eased and there were no reported incidents of property flooding within Rutland.

9.10 More recent reporting of flooding events has been collated by the council and indicates that a number of individual properties have been affected by surface water flooding in a number of communities across the county. In many cases these incidents arise from blocked ditches and drains in the local area and can be resolved through management of these watercourse. Appendix B provides details of these incidences.

10 Sequential Test, Fluvial Flood Risk, Other Sources of Flooding and Baseline Flood Risk Review

10.1 The flood zone maps indicate that fluvial flood risk covers a limited geographical area within the county and that the majority of the higher risk flood zones are located in rural areas away from the main settlements.

10.2 The baseline assessment of fluvial (rivers and Sea), surface and historic incidents of flooding identify that the extent of flood risk within the county is low to moderate. Due to the low risk of flooding in the county, which predominantly lies outside of the main settlements it is unlikely that an exceptions test will be required to be an approach required as part of the development of the emerging Local Plan.

10.3 It is clear that under the NPPF, strategic policies and Strategic Flood Risk Assessments (SFRAs), are required to 'consider cumulative impacts in, or affecting, local areas susceptible to flooding' (para. 160), rather than just to or from individual development sites. In short, whilst the loss of storage for individual developments may only have a minimal impact on flood risk, the cumulative effect of multiple developments within settlements may be more severe.

10.4 When proposing allocations, consideration should be given to the potential cumulative impact of the loss of floodplain storage volume, as well as the impact of increased flows on flood risk downstream. There should be no loss of floodplain as a result of development. Any reduction in floodplain must be compensated on a level for level, volume for volume basis.

10.5 Previous flood risk assessments and government policy have relied on the assumption that if each individual development does not increase the risk of flooding, the cumulative impact will also be minimal. Therefore, providing developments comply with the latest guidance and legislation relating to flood risk and sustainable drainage, in theory they should not increase flood risk downstream. However, if there is a lot of development occurring within one catchment, particularly where there is flood risk to existing properties or where there are few opportunities for mitigation, the cumulative impact may be to change the flood response of the catchment.

10.6 There are identified low to moderate surface water issues within Oakham within the River Welland CFMP area which will need to be taken into consideration both on a site-by-site basis in bringing forward allocations and the potential cumulative impact.

10.7 The risk of this could be identified at a high level, by comparing potential development site locations with hydrological catchments and areas of existing and historic risk to people and property. These will be the locations where existing communities will be most concerned at the prospect of further development exacerbating existing problems.

10.8 The NPPF requirements for consideration of cumulative flood risk can be addressed with:

- Stricter controls on minor extensions due to the potential cumulative impacts on for example fluvial flood storage or on surface water;
- Stricter requirements on the management of surface water, because of the potential cumulative impact of multiple small-scale developments located in a small area in an urban catchment;

- A requirement for local sewer capacity checks to become a material consideration in the planning process with waste utility companies forming part of the regulatory consultee on future planning applications.

10.9 Detailed conclusions on cumulative effect however, this would be post Regulation 18 stage of the Local Plan were potential sites are likely to be allocated, the size/density of the development, and potentially hydraulic modelling to test impacts downstream. At this stage of the new Rutland Local Plan process site allocations are emerging, as certainty increases a further assessment of the cumulative impact will need assessment.

Adaptation for Climate Change

10.10 The PPG sections on climate change contain information and guidance on how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change.

10.11 Examples of adapting to climate change include:

- Considering future climate risks when allocating development sites to ensure risks are understood over the development's lifetime;
- Considering the impact of and promoting design responses to flood risk and coastal change for the lifetime of the development;
- Considering availability of water and water infrastructure for the lifetime of the development and design responses to promote water efficiency and protect water quality;
- Promoting adaptation approaches in design policies for developments and the public realm for example by building in flexibility to allow future adaptation if needed, such as setting new development back from watercourses; and
- Identifying no or low-cost responses to climate risks that also deliver other benefits, such as green infrastructure that improves adaptation, biodiversity and amenity, for example by leaving areas shown to be at risk of flooding as public open space.

10.12 The Environment Agency data web site provides information about the impact of climate change on peak river flow allowances for each of the main river catchments.

10.13 Please refer to 'Climate change allowances for peak river flow in England (data.gov.uk)' (https://environment.data.gov.uk/hydrology/climate-change-allowances/river-flow) for the updated climate change allowances. The following link sets out the requirements for particular developments: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

For example, more vulnerable development in flood zone 3a should use the central allowance of 17%, however essential infrastructure in flood zone 3b would need to use the higher allowance of 28%. Our current models include a climate change allowance of 20%.

For the Welland these allowances are:

Central	Higher	Upper
2020s5%	10%	22%
2050s4%	10%	26%
2080s17%	28%	53%

Sustainable Drainage Systems

10.14 The NPPF requires all major developments to incorporate Sustainable Drainage Systems (SuDS) unless it can be clearly demonstrated to be inappropriate and developments in areas of flood risk will only be permitted where SuDS are incorporated. When considering planning applications, local planning authorities should consult the LLFA on the management of surface water in order to satisfy that the proposed minimum standards operational standards are appropriate and that there are clear arrangements for the on-going maintenance of the system over the development's lifetime.

10.15 Good design of SuDS is crucial as there is no 'one fits all' solution and they should be considered early in the design process of a development. SuDS should be designed to provide multiple benefits and clear arrangements must be in place for the on-going maintenance and/or adoption of the proposed drainage system for the lifetime of the development.

10.16 The PPG provides further guidance on the use of SuDS and guidance on the technical standards for their design, maintenance and operation can be found in the non-statutory technical standards.

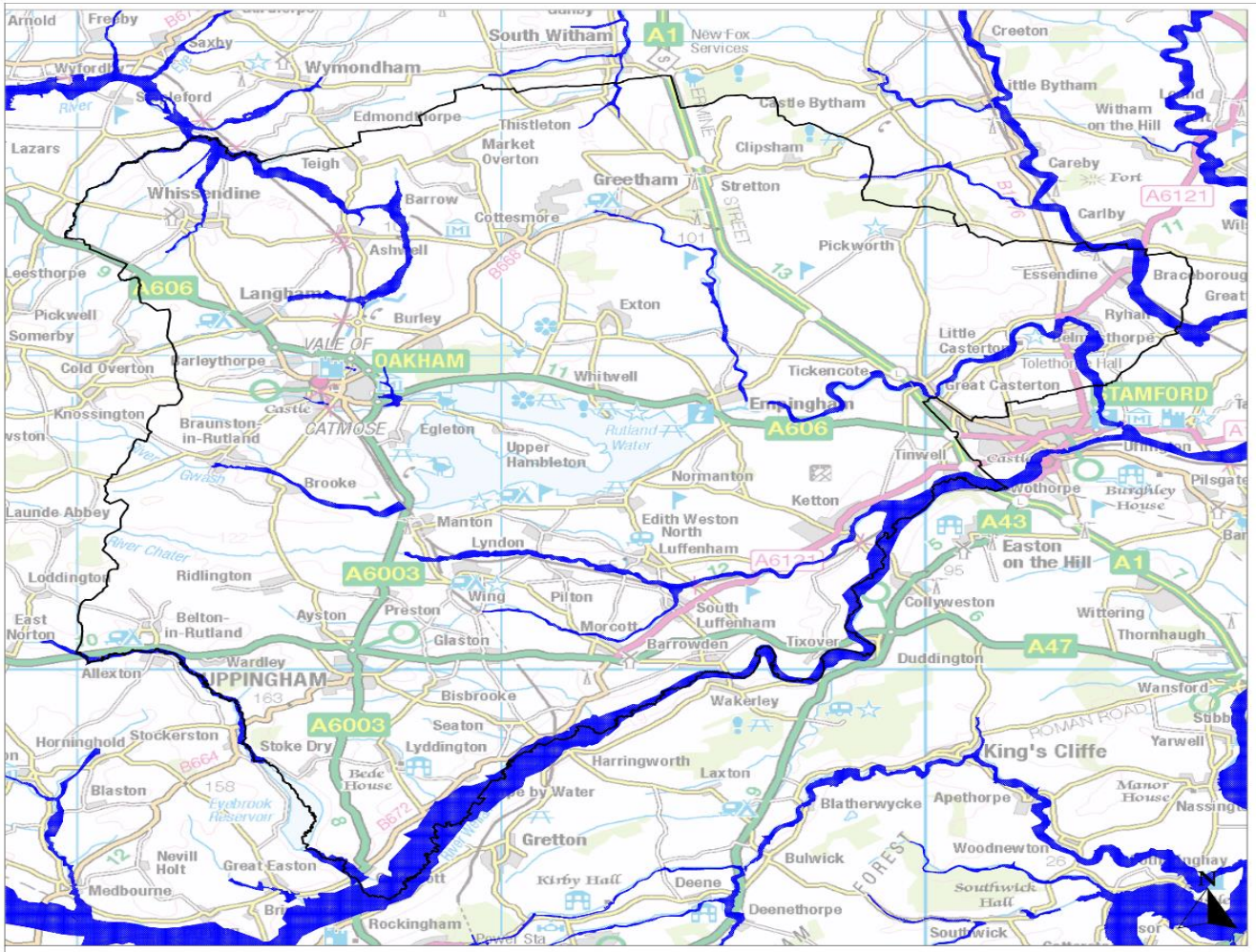
10.17 Surface water flood risks should be managed using sustainable drainage systems (SuDS). SuDS should be designed to control surface water run off as close to where it falls as possible and mimic the natural catchment process.

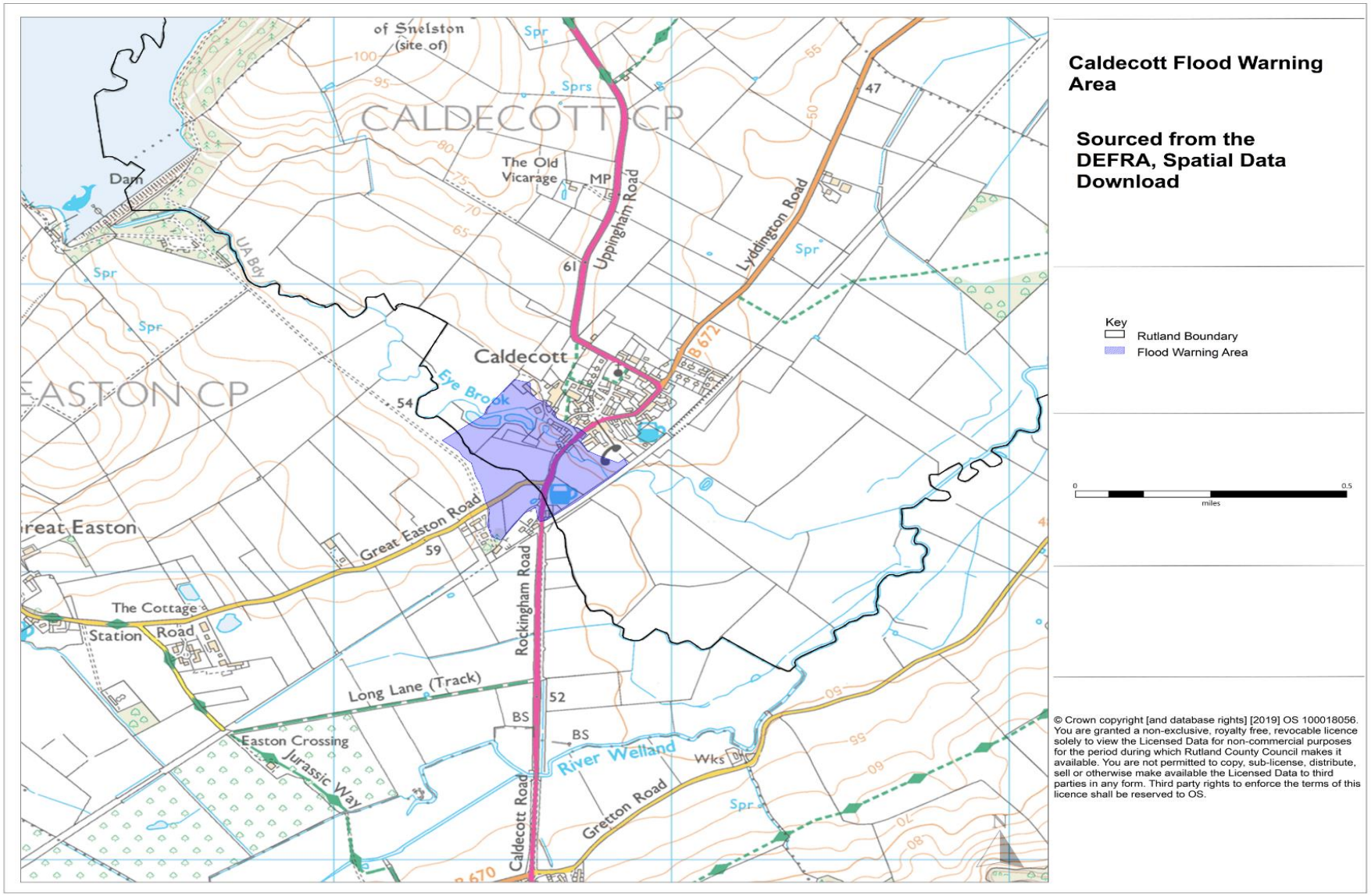
10.18 SuDS can provide opportunities to:

- Reduce surface water run off;
- Encourage natural groundwater recharge;
- Reduce pollution
- Positively influence the design and landscape value of development through the provision of green space and providing opportunities for biodiversity.

10.19 In general, the western part of Rutland has more clay soils and infiltration SuDS are unlikely to be feasible. Other attenuation measures to control runoff such as long-term storage are likely to be more appropriate in such areas. In the east of the county the soils are loamy in nature and contain some major aquifers. In such locations infiltration SuDS are likely to be feasible but this should be confirmed in site specific investigations as part of a Flood Risk Assessment.

Appendix A Flood Risk Mapping




Caldecott Flood Warning Area
Sourced from the DEFRA, Spatial Data Download
Key
Rutland Boundary
Flood Warning Area
0
0.5
miles
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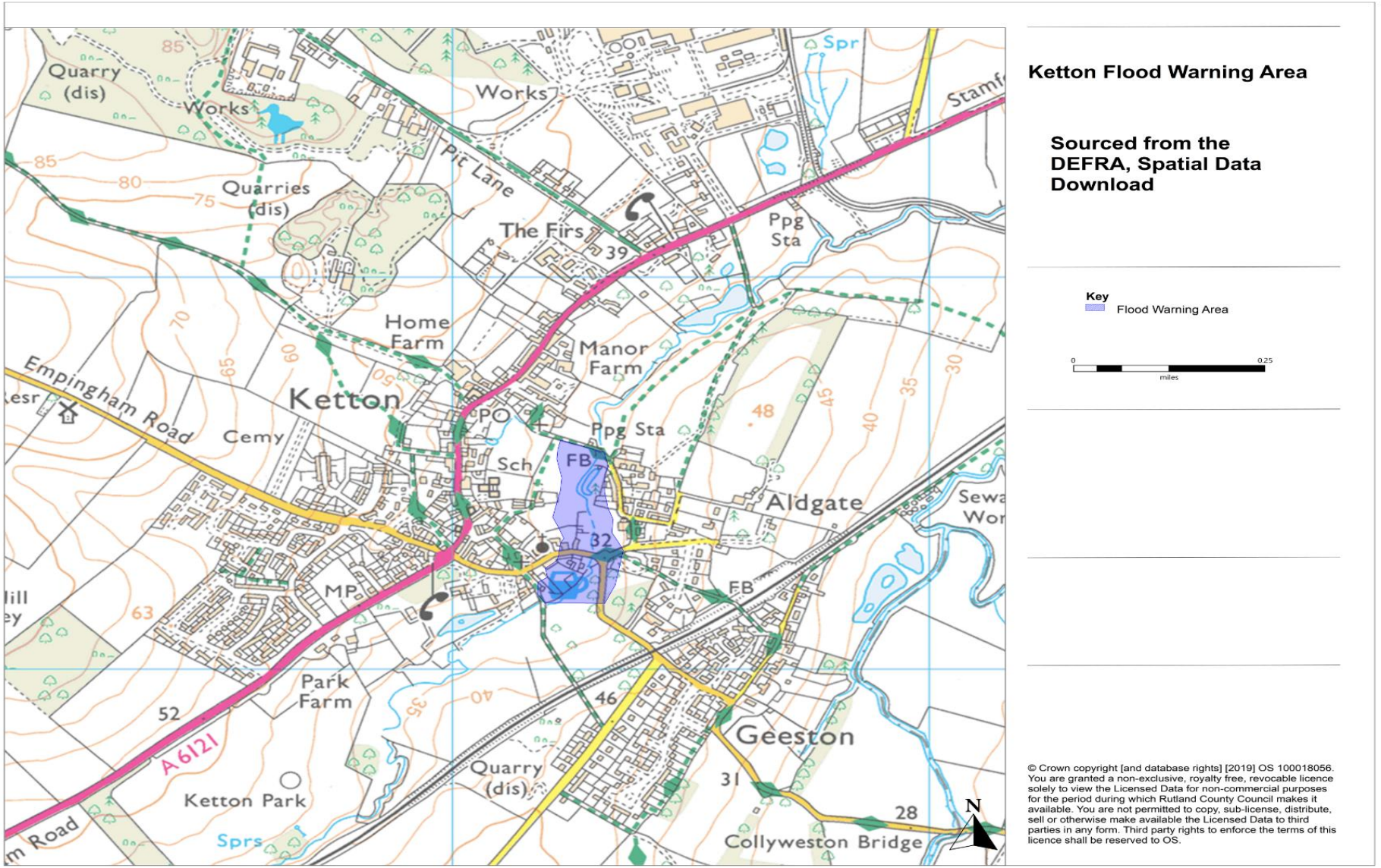
of Snelston (site of)
CALDECOTT CP
EASTON CP
Caldecott
The Old Vicarage
MP
Dam
UA Bdy
Uppingham Road
Lyddington Road
B 672
Eye Brook
Great Easton Road
Rockingham Road
The Cottage
Station Road
Long Lane (Track)
Easton Crossing
Jurassic Way
River Welland
Wks
Gretton Road
Caldecott Road
Spr
Sprs
BS
47
61
59
54
52


Ketton Flood Warning Area
Sourced from the DEFRA, Spatial Data Download
Key
Flood Warning Area
0
0.25
miles
Quarry (dis)
Works
Works
Spr
Pit Lane
Quarries (dis)
The Firs
39
Ppg Sta
Home Farm
Manor Farm
Empingham Road
Ketton
PO
Ppg Sta
48
Cemy
Sch
FB
Aldgate
Sewa
Wor
32
MP
FB
Park Farm
52
46
A6121
Ketton Park
Quarry (dis)
Geeston
31
28
Collyweston Bridge
Sprs
N
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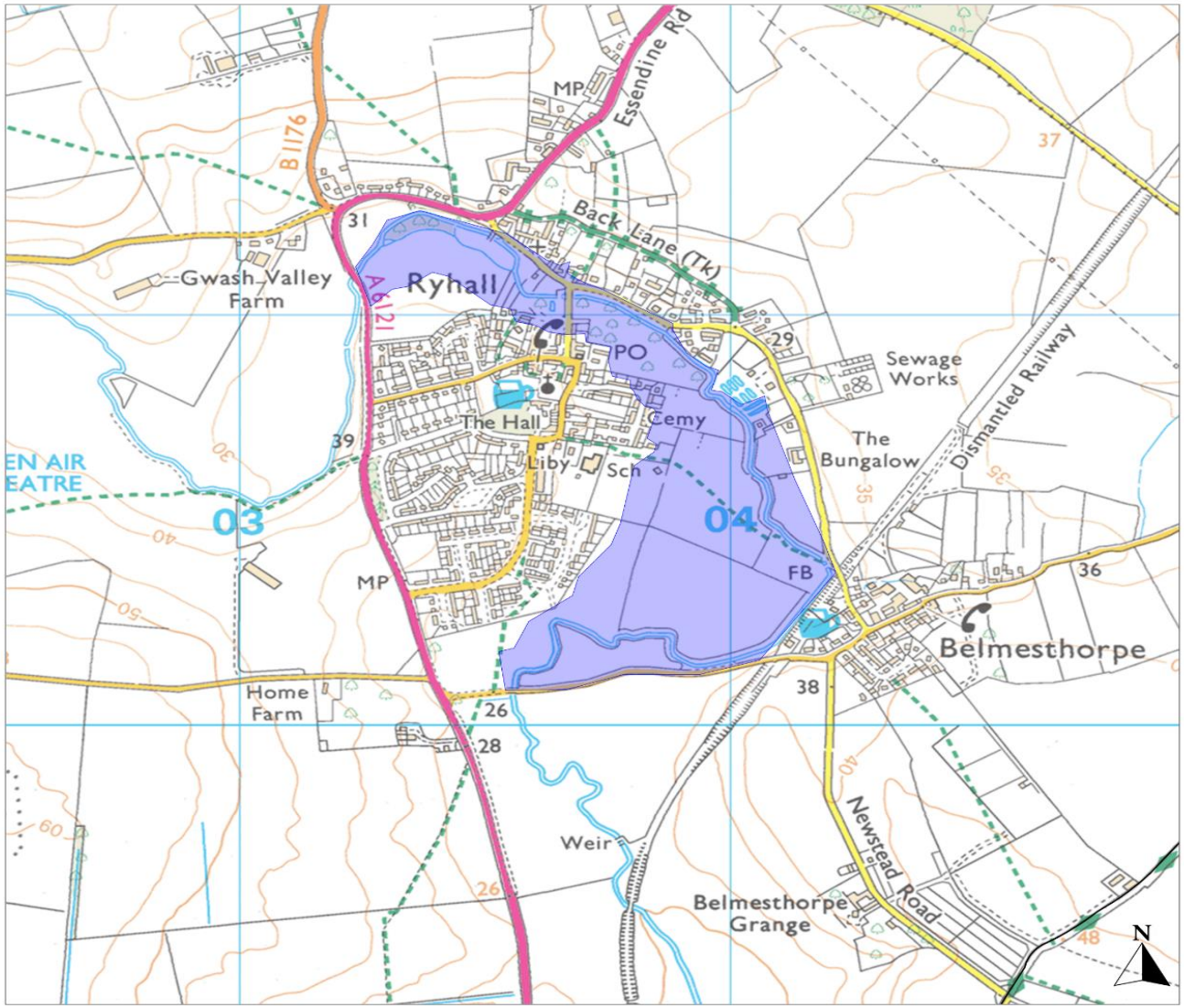
Oakham Flood Warning Area

Sourced from the DEFRA, Spatial Data Download

Key

Flood Warning Area

0 0.5 miles



Ryhall Flood Warning Area

Sourced from the DEFRA, Spatial Data Download

Key

Flood Warning Area

0 0.25 miles

Appendix B - Table of reported flood incidents since the Local Flood Risk Management Strategy was prepared in 2017

Flood ID	Date	Summary description	Name of Location	Town/village
111	08/01/2018	Brook has burst its banks and has flooded across the road	Main Street	Whissendine
112	02/04/2018	surface water system not able to cope with water	Ketton Road	Hambleton
113	02/04/2018	surface water system blocked with silt	Tixover Grange	Tixover
114	02/04/2018	water running off fields	Glebe Way	Oakham
115	02/04/2018	water running off fields	Noel Avenue	Oakham
116	25.04.2019	Shared driveway of no.8 & no.10 floods, but it only effects no.8's property.	Oakham Road	Greetham
117	26.03.2019	Field flooding	Field neighbouring, Thorpe By Water, Thorpe Road	Lyddington
118	18.03.2019	During heaving rain, the surface water that comes from the village towards Leicester Road is flooding the driveway of no.8.	New Road	Belton In Rutland
119	08.04.2019	Flooding on the junction of Rookery Lane/A1 slip road, The Shires	Junction of Rookery Lane/A1 slip road, The Shires	Streton
120	29.04.2019	During heavy rain the road floods due to blocked kerb side drains	eicester Road	Uppingham
121	30.04.2019	During heavy rain the road and footpath floods	Uppingham Road	Oakham
122	08.05.2019	Road flooding across 2/3 of road width. All 3 gullys blocked and not taking water away.	Home Cottage, Main Street	Teigh
123	30.05.2019	Footpath flooding outside the garage of The Old Manor, 10 Main Street.	Main Street	Market Overton

124	25.04.2019	Road flooded outside the Exeter Arms Pub and come inside the pub, all the way to the bar.	Exeter Arms, Leicester Road	Uppingham
125	01.08.2019	When it rains heavily it builds up on the road and runs down his drive and into the garage.	Cricket Lawns	Oakham
126	11.08.2019	Gargae flooded and damaged carpet and some furniture. Reported again on the 22.09.19	Melton Road,	Langham
127	24.04.19	Report of flooding to property. Lounge flooded.	Leicester Road	Uppingham
	16.06.19	Report of flooding to property. Lounge flooded.	Leicester Road	Uppingham
128	24.09.2019	Lounge flooded. According to resident, there used to be a hump in the Tarmac to prevent water from running off the carriageway but when highways resurfaced around 4 years ago, this hump was removed. Site visit with resident arranged for 26.09.19. Sandbags put out on 24.09.19	Station Road	Morcott
129	24.09.2019	We had raised the kerb 2 or 3 years ago, as the 2 driveways would flood during times of heavy rain. The recent road resurfacing has left the kerb at the same level as the road and the flooding issue is back.	Leicester Road	Uppingham
130	21.11.2019	Driveway and property flooding	Noel Avenue	Oakham
131	26.11.2019	Flooded under the front door into the house.	Main Street	Greetham
132	28.04.2020	Reported of flooding in the past	Main Street	Lyddington
133	09.03.2020	Gardens flooding	Gardens at the end of Hall Close	Empingham
134	18.06.2020	Kitchen Flooded	Stapleford Road	Whissendine
135	17.06.2020	Driveway and garage flooding	Redland Road	Oakham
136	30.06.2020	flooding to basement of (at least 2) properties	High Street East	Uppingham
137	22.06.2020	Flooding up to property door	Ayston road	Uppingham

138	17.08.2020	Garage flooding	Highgate House	Bisbrooke
139	21.08.2020	Workshop floods	High Street	Ketton
140	26.10.2020	Garage floods	Dove Close	Oakham
141	11.12.2020/27th Dec	Cellar flooded	Staunton House, Littleworth Lane	Belton In Rutland
142	30.12.2020	Garden flooding	The Nook	Whissendine
143	07.01.2020	Property flooding	Stoke Road	Lyddington
144	30.12.2020	Garden flooding	Bartles Hollow	Ketton
145	10.01.2021	Property flooding	Church Cottage, Church Lane	Barrowden
146	10.01.2021	Property flooding	The Walnuts, no.3 Luffenham Road	Ketton
147	04.07.2021	Property flooding	Main Street, Preston	Preston
148	16.11.2021	Driveway flooding	Leicester Road	Uppingham
149	04.07.2021	Driveway flooding	Main Street	Preston
150	20.02.2022	Driveway & garage flooding	Barrowden Road	Morcott
151	27.03.2023	Garden flooding	Pinfold Lane	South Luffenham
152	02.05.2023	Garage flooding	Willoughby Drive	Empingham
153	31.05.2023	Garden flooding	Stockerston Road	Uppingham
154	20.06.2023	Garages flooding	Church Farm Close	Exton
155	21.06.2023	Carriageway flooding	Church Lane	Greetham
156	27.06.2023	Garden flooding	The Green/Empingham Road	Ketton