

Strategic Flood Risk Assessment Level 1



Prepared for
Royal Borough of Greenwich

Authored by: EM/IG
Reviewed by: NS/CG
Approved by: CG
Date: July 2026
Version: 1.1

Metis Consultants Ltd.
2 Sheen Road, Richmond
London, TW9 1AE
United Kingdom
0208 948 0249
metisconsultants.co.uk

Revision History

Version	Date	Description	Prepared	Reviewed	Approved
1.0	November 2025	Draft for Client Review	EM/IG	NS/CG	CG
1.1	July 2026	Second Draft following Client Review	EM	NS	CG

Limitations

Metis Consultants Limited (Metis) have prepared this Report for the sole use of the Client. No other warranty, expressed or implied, is made as to the professional advice included in this Report or any other services provided by Metis. This Report is confidential and may not be disclosed by the Client nor relied upon by any other party without the prior and express written agreement of Metis.

The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by Metis has not been independently verified by Metis, unless otherwise stated in the Report.

The work described in this Report is based on the conditions encountered and the information available during the period of production. The scope of this Report and the services are accordingly factually limited by these circumstances.

Metis disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to Metis's attention after the date of the Report. Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. Metis specifically does not guarantee or warrant any estimate or projections contained in this Report.

The Client should take appropriate professional legal advice prior to implementing any recommendations made within this Report that may impact the legal exposure of the Client.

Copyright

© This Report is the copyright of Metis Consultants Limited. Any unauthorised reproduction or usage by any person other than the addressee is strictly prohibited.



Executive Summary

The Royal Borough of Greenwich (Greenwich) has appointed Metis Consultants Ltd. (Metis) to undertake a Level 1 Strategic Flood Risk Assessment (SFRA). The borough is exposed to fluvial, tidal, surface water, groundwater, sewer and artificial sources of flood risk and has a 13.8 km boundary along the River Thames.

This Level 1 SFRA has been developed to meet the planning and flood risk requirements as defined by the National Planning Policy Framework (2025) (NPPF). This SFRA supersedes the previous SFRA completed in 2017. The SFRA is also developed to support the Borough's new Local Plan.

This assessment provides a strategic overview of all types of flood risk across the borough, both now and in the future. This document and the accompanied web-based mapping delivered as a part of this SFRA are designed to help address local flooding issues, manage development requirements, and manage the risk of flooding that is posed to residents and buildings. The document will also focus on climate change impacts, local flood characteristics, and interpretations of flood zones.

A combination of climate change, population growth, and future development needs is likely to increase flood risk from multiple sources at local, national, and global levels. In Greenwich, the cumulative impact of these factors may lead to a heightened overall flood risk, affecting people, properties, and infrastructure. Rising demand for housing could also result in more developments being proposed in areas with higher flood risk, further exacerbating their vulnerability. Additionally, continued urbanisation may reduce permeable ground surfaces, leading to an increase in surface water flooding.

Local policy that addresses the impact of future growth on flood risk is essential to support housing development while ensuring effective flood risk mitigation. This SFRA will assist Greenwich in enhancing its borough-wide approach to managing flood risk, balancing the need for increased development with the challenges posed by flood resilience.

The document has been broken down into the following eight sections:

Section 1 (Introduction) provides an overview of the purpose and objectives of the SFRA.

Section 2 (Policy Summary) provides an overview of the relevant national, regional, sub-regional and local policies relating to flood risk and associated requirements.

Section 3 (Data Sources and Mapping) provides an overview of the web-based maps produced as part of the SFRA. The interactive maps depict the various flood risks across the study area. Further information on the SFRA web maps is found within the data sources list, which is provided as part of this document's appendices.



Section 4 (Applying Climate Change Scenarios) provides an overview of the Environment Agency's (EA) climate change guidance. This includes information on updates, how to apply the updated guidance, and adapting to climate change.

Section 5 (Assessment of Flood Risk) provides an overview of the flood risk from all sources across the study area, including climate change implications where this information is available. Climate change is expected to increase rainfall activity, sea level rise, and groundwater level changes increasing the risk of groundwater, surface water, fluvial and tidal flooding. This is supported by a series of web maps to present the flood risk information.

Section 6 (Flood Risk and Assessment Guidance) provides guidance for developers and applicants undertaking Flood Risk Assessments (FRA) for proposed development sites. This section explains the Sequential Test and Exception Test requirements per Flood Zone and includes local requirements for areas at risk of surface water flooding.

Section 7 (Recommendations) provides recommendations of site-specific and strategic policies. These are based on the findings of this SFRA, which the Royal Borough of Greenwich is advised to incorporate into future versions of its Local Plans and/or associated policy guidance documents. An overview of the potential impact that future growth could have on flood risk across the study area is provided. Additionally, property level resilience measures, emergency planning, and managing residual risks within the borough is also provided.

Section 8 (Review and Next Steps) provides a summary of the proposed update schedule for the SFRA (the technical content and the mapping).



Contents

1	Introduction	1
1.1	Borough Background	1
1.2	SFRA Objectives.....	1
1.3	Previous Level 1 and Level 2 SFRAs (2017 and 2018)	2
1.4	A living document.....	2
2	Policy Summary	3
2.1	Overview	3
2.2	National Policy.....	3
2.2.1	Town and Country Planning Act (1990)	3
2.2.2	Flood and Water Management Act (2010)	3
2.2.3	National Flood and Coastal Erosion Risk Management Strategy (2020)	4
2.2.4	UK Environment Act (2021)	5
2.2.5	UK Climate Change Risk Assessment (2022).....	5
2.2.6	Flood Risk and Coastal Change Planning Practice Guidance (2025)	6
2.2.7	National Planning Policy Framework (2025)	7
2.2.8	Planning and Flood Risk – Chapter 14 of the NPPF	8
2.3	Regional Policy.....	8
2.3.1	Thames Catchment Flood Management Plan (2009).....	8
2.3.2	The London Plan (2021)	9
2.3.3	Thames River Basin District Flood Risk Management Plan (2022)	10
2.4	Local Policy	11
2.4.1	Greenwich Local Plan.....	11
2.4.2	Local Flood Risk Management Strategy (2015)	12
2.4.3	Greenwich Climate Change Action Plan	12
2.4.4	Draft Climate Resilience SPD	13
3	Data Sources and Mapping.....	14
3.1	Mapping.....	14
4	Applying Climate Change Scenarios	16
4.1	Overview	16
4.2	Climate Change Guidance	16
4.2.1	Updates.....	16



4.2.2	Applying the Updated Climate Change Guidance	18
4.3	Adapting to Climate Change	20
5	Assessment of Flood Risk.....	21
5.1	RMA Responsibilities	21
5.2	Types of Flood Risk	22
5.2.1	Fluvial and Tidal Flood Risk	22
5.2.2	Surface Water and Ordinary Watercourse Flood Risk	24
5.2.3	Groundwater Flood Risk	25
5.2.4	Sewer Flood Risk.....	26
5.2.5	Artificial Sources of Flood Risk	27
5.2.6	Residual Flood Risk	27
5.3	Historic Flooding	27
5.3.1	Flood Investigations	28
6	Flood Risk Assessment Guidance	30
6.1	Overview	30
6.2	Sequential and Exception Tests	31
6.2.1	Plan Making.....	31
6.2.2	Applying the Sequential and Exceptions Tests	31
6.3	Planning Application and Development Requirements	34
6.4	Water Framework Directive (2000)	46
6.5	Planning Applicants.....	47
6.5.1	Application of Sequential and Exceptions Tests.....	47
6.5.2	SuDS Strategies	50
6.5.3	Sustainable Drainage Systems (SuDS)	51
6.5.4	Flood Storage Compensation and Mitigation.....	53
6.6	Local Planning Authority – Development Management	54
6.6.1	Application of Sequential and Exception Tests	54
6.6.2	Site-specific Flood Risk Assessments.....	54
6.6.3	SuDS Strategies	55
6.6.4	Sustainable Drainage Systems (SuDS)	56
6.7	National Flood Risk Standing Advice.....	57
6.8	Emergency Planning	58
6.9	Assessment of Local Plan Policies	58



7	Recommendations	60
7.1	Overview	60
7.2	Impact of Future Growth on Flood Risk	60
7.3	Property Level Resilience Measures	61
7.4	Emergency Plans.....	62
7.5	Managing Residual Risk	63
7.6	Recommended Policies	63
7.6.1	Strategic Policies	64
7.6.2	Site-Specific Policies.....	65
7.6.3	Thamesmead Recommendations	67
8	Review and Next Steps.....	68
8.1	Review and Updates	68
8.1.1	Technical Content.....	68
8.1.2	Mapping.....	68
8.2	Level 2 SFRA	69
	Appendix	71



Figures and Tables

Figure 6-1 Sequential Test Methodology	33
Figure 6-2 Exceptions Test Methodology	34
Table 4-1: London Management Catchment Peak Rainfall Allowances	19
Table 4-2: London Management Catchment peak river flow allowance	19
Table 5-1 outlines the specific responsibilities of different Risk Management Authorities (RMAs) in relation to flood risk. These responsibilities vary depending on the role and jurisdiction of each RMA.	21
Table 5-1 Responsibilities of each RMA in relation to flood risk.	21
Table 5-2 Flood Zone Definitions (as defined in the NPPF)	23
Table 5-3 RoFSW map High, Medium, and Low extent definition	25
Table 6-1 Planning Application and Development Requirements for All Developments (flood Zones 1, 2, 3a and 3b)	36
Table 6-2 Planning Application and Development Requirements for Individual Sites (Other Flood Risk Sources)	44
Table 6-3 : Watercourses WFD Status	46
Table 6-4 Ecological Status definitions	46

Glossary

Term	Definition
Annual Exceedance Probability	The percentage probability of a flood event of a certain magnitude to occur within any given year. <i>NB: Also see Return Period.</i>
Aquifer	Underground layers of saturated rock through which water can readily move. Natural springs and wells can transmit water from the aquifer to the surface.
Catchment	An area which drains to a specific watercourse (or a given point in a watercourse), waterbody, or other body of water.
Critical Drainage Area	Critical Drainage Areas are specific geographic areas that are usually hydrological catchments where multiple and cumulative flood risk sources could trigger flooding in one or more Local Flood Risk Zones. This potential flooding could impact people, property, and local infrastructure
Design Flood	The maximum flood flow that could be passed without an engineered structure being damaged or its stability being seriously threatened. Design floods are adopted to protect a structure against failure by overtopping during flood events.
Development	Defined within the Town and Country Planning Act 1990 as at least one of the following:



Term	Definition
	• Building operations (including construction, structural alterations, rebuilding, and demolition). • Material changes of use of land and buildings. • Subdivision of a building used as a dwelling for the use as two or more separate dwellings. • Groundworks or certain other engineering options. • Mining operations. • Other operations usually undertaken by a person carrying on a business as a builder.
Dry Island	Areas situated within Flood Zone 1 that are surrounded by areas at higher risk of flooding, such as those situated within Flood Zone 2 and 3.
Exception Test	Defined within the Flood Risk and Coastal Change Planning Practice Guidance , this is a method that must be carried out for certain development sites based upon their flood zone and vulnerability classification if the Sequential Test shows that it is not possible for an alternative site to be used. This Test is designed to demonstrate and ensure satisfactory flood risk management while enabling necessary development on higher-risk sites in cases where there is no availability of suitable sites at a lower flood risk. Greenwich Council's corresponding Level 2 Strategic Flood Risk Assessment, which was also completed in 2026, will provide more information on undertaking the Exception Test.
Flood Risk	The combination of the probability and potential consequences of flooding from individual or multiple sources, including from rivers and the sea, surface water runoff, rising groundwater, overwhelmed sewers and drainage systems, and the overtopping of reservoirs, canals, and lakes.
Flood Risk Assessment	A report that analyses the risk of flooding from all sources to a proposed site and its surrounding area, both at present and in the future. It should demonstrate how flood risk will be managed both currently and in the future throughout a development's lifespan. Details of appropriate flood resilience and/or resistance measures should also be provided where appropriate, according to Government Standing Advice .
Flood Storage Compensation	Reducing nearby ground levels to provide more volume to replace floodplain storage that is lost due to development.
Flood Zone	A geographic area that has a defined flood risk and an accompanying designated annual flooding probability. This is primarily from river (fluvial) or sea (tidal) flooding. Local Planning Authorities, the National Planning Policy Framework, and Flood Risk and Coastal Change Planning Practice Guidance set the Flood Zone definitions.
Flood Zone 1	Defined in the Flood Risk and Coastal Change Planning Practice Guidance as land with a 'Low Probability' of experiencing flooding from fluvial or tidal sources.



Term	Definition
	Annual flooding probability (fluvial or tidal sources) of less than 1 in 1,000 years (<0.1% Annual Exceedance Probability).
Flood Zone 2	Defined in the Flood Risk and Coastal Change Planning Practice Guidance as land with a ‘Medium Probability’ of experiencing flooding from fluvial or tidal sources. - Annual flooding probability (fluvial sources) of between 1 in 100 years to 1 in 1,000 years (1% to 0.1% Annual Exceedance Probability). - Annual flooding probability (tidal sources) of between 1 in 200 years to 1 in 1,000 years (0.5% to 0.1% Annual Exceedance Probability).
Flood Zone 3a (fluvial)	Defined in the Flood Risk and Coastal Change Planning Practice Guidance as land with a ‘High Probability’ of experiencing flooding from fluvial or tidal sources. - Annual flooding probability (fluvial sources) of greater than 1 in 100 years (>1% Annual Exceedance Probability). - Annual flooding probability (tidal sources) of greater than 1 in 200 years (>0.5% Annual Exceedance Probability).
Flood Zone 3b (fluvial)	Defined in the Flood Risk and Coastal Change Planning Practice Guidance as ‘The Functional Floodplain’, where land is deemed to be at the greatest risk of flooding from rivers or seas, and where water must flow or be stored during times of flood. It is for the Local Planning Authority to define but, typically, this includes land that has an annual probability of flooding from rivers or seas of at least 1 in 30 years ($\geq 3.3\%$ Annual Exceedance Probability), and land designed to flood, including Water Storage Areas. For this assessment, Flood Zone 3b has been delineated using the modelled 1 in 30-year flood extent, the Water Storage Areas, and any land riverward of Thames Tidal Flood Defences. This extent includes areas of existing development, including building footprints, where these are located within the modelled floodplain. While buildings themselves do not provide floodplain storage or conveyance, their inclusion reflects the spatial extent of frequent flooding and recognises that such development is located within land that continues to function as floodplain during flood events.
Floodplain	An area of land which experiences flooding (with water either being stored within this area or flowing over it) when the capacity of flood management infrastructure is exceeded.
Functional Floodplain	As defined in the ‘Flood Zone 3b’ definition of this table.
Greenfield Runoff Rate	The rainfall runoff rate of a site in its undeveloped, naturally permeable state.
Main River	A statutory type of watercourse designated by the Environment Agency . These watercourses are generally (but are not limited to) larger rivers and streams.



Term	Definition
	The Environment Agency has powers to carry out maintenance and operational works main rivers, including flood defence works.
Major Development	Defined in the Town & Country Planning (Development Management Procedure) Order 2015 as one of the following: - Residential developments situated on a site area of at least 0.5 hectares, or developments which propose 10 or more dwellings. - Non-residential developments situated on a site area of at least 1 hectare, or developments with a new floorspace of at least 1,000m². - Developments that use land for the winning and working of minerals or for mineral-working deposits. - A waste development.
Minor Development	Defined in the Flood Risk and Coastal Change Planning Practice Guidance as one of the following: - Residential developments with a site area below 0.5 hectares or those proposing between 1 and 9 dwellings. - Non-residential extensions with a site area below 1 hectare or a total building floorspace of below 1,000m².
Ordinary Watercourse	A watercourse which is not designated as a main river by the Environment Agency. This includes rivers, streams, culverts, ditches, drains, sluices, dikes, some sewers (aside from public sewers that fall within the meaning of the Water Industry Act 1991), and passages through which water flows.
Residual Risk	Defined in the Flood Risk and Coastal Change Planning Practice Guidance as the risks that remain after application of the sequential approach and taking flood risk mitigation actions.
Return Period	The estimated average time between events of equal magnitude i.e. a 1 in x year event. <i>NB: Also see Annual Exceedance Probability.</i>
Risk Management Authorities	Defined within the Flood and Water Management Act (2010) , including Lead Local Flood Authorities, the Environment Agency, Highway Authorities, and Water and Sewerage Companies.
Sequential Test	Defined within the Flood Risk and Coastal Change Planning Practice Guidance , this is a sequential approach that aims to steer development towards areas with the lowest risk of flooding. This test is designed to avoid development in areas which are classified as being at a medium and high risk of flooding from all sources where possible, both at present and in future. This is the most effective way of addressing flood risk, placing minimal reliance on flood defences and property-level resilience features within developments.
Standard of Protection	The return period of a flood event against which a specific defence should be effective.
Strategic Flood Risk Assessment	A study undertaken by one or more Local Planning Authorities to assess a given area's current and future flood risk from all sources. The study considers the impacts of climate change alongside the impacts of land use changes and development in the area on flood risk.



Term	Definition
Sub-Catchment	A geographical area (that is a sub-division of a Catchment) where multiple and cumulative flood risk sources could trigger flooding that could impact people, property, and local infrastructure.
SuDS Strategy	The strategy should demonstrate site drainage measures aimed at minimising surface water runoff onto adjacent land uses. The strategy should analyse the behaviour of water within the site, establish runoff rates, demonstrate flow pathways, and show flood depths that may occur under various rainfall events. The strategy should investigate a proposed development's potential impacts to the site upon which it is situated and demonstrate the inclusion of measures that ensure the site's compliance with the requirements of local and national policies. Where appropriate, it should include the results of on-site investigations to establish the suitability of the site for infiltration measures.
Sustainable Drainage Systems	Techniques and measures that are designed to manage surface water runoff by mimicking natural processes to control flow rates, improve water drainage, improve water quality, and encourage groundwater recharge.
White Paper	Government-produced Policy documents that provide an in-depth analysis of a certain topic and set out proposals for future legislation.

Acronyms and Abbreviations

Table 1-1: Acronyms and abbreviations

Abbreviation	Definition
AEP	Annual Exceedance Probability
AStGWF	Areas Susceptible to Groundwater Flooding
BNG	Biodiversity Net Gain
CCRA	Climate Change Risk Assessment
CDA	Critical Drainage Area
CFMP	Catchment Flood Management Plan
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EU	European Union
FCERM	Flood and Coastal Erosion Risk Management
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
FRR	Flood Risk Regulations (2009)
FWMA	Flood and Water Management Act (2010)
GLA	Greater London Authority
GSF	Green Space Factor
LFRMS	Local Flood Risk Management Strategy



LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
LSDAP	London Sustainable Drainage Action Plan
NPPF	National Planning Policy Framework
PFRA	Preliminary Flood Risk Assessment
PPG	Planning Practice Guidance
Greenwich	The Royal Borough of Greenwich
RFRA	Regional Flood Risk Appraisal
RMA	Risk Management Authority
RoFSW	Risk of Flooding from Surface Water
SAB	SuDS Approving Body
SFRA	Strategic Flood Risk Assessment
SPD	Supplementary Planning Document
STS	Sustainable Transport Strategy
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
TfL	Transport for London
TRBD	Thames River Basin District
TWUL	Thames Water Utilities Limited
UKCP	United Kingdom Climate Projections



1 Introduction

1.1 Borough Background

The Royal Borough of Greenwich (Greenwich) is located in southeast London. As of the 2021 ONS Census, the borough has a population of 289,100, reflecting a 7.5% increase since 2011. This places Greenwich within the top 10% most densely populated Local Authority areas in the country. Urban areas are more concentrated in the northern and central areas, particularly around key town centres such as Greenwich, Woolwich and Charlton.

The topography of Greenwich varies significantly, with elevated terrain in the South, most notably around Shooters Hill, and gradually sloping northwards towards the River Thames. The underlying geology is primarily composed of clay, with areas of sand, gravel and chalk present, creating some local variation in soil composition and drainage.

The north of Greenwich is characterised by the tidal River Thames, housing the Thames Barrier which is a key asset for flood management. While the main course of the Ravensbourne River does not flow through Greenwich, its floodplain extends into the borough, meeting the Thames at Deptford Creek. The River Quaggy, a tributary of the Ravensbourne River, drains the southwestern part of the borough, flowing through areas like Eltham and Kidbrooke. The Kyd Brook, a tributary of the Quaggy, rises in Kidbrooke and forms part of the Borough's boundary before joining the River Quaggy. Other watercourses include the River Shuttle, which flows east into Bexley, and the Wickham Valley Watercourse, which starts in Oxleas Wood and connects to the Butts Canal, which is part of the Marsh Dykes water system. These larger watercourses are in addition to a network of smaller streams and drainage channels, contributing to water management and natural habitats.

1.2 SFRA Objectives

A SFRA's purpose is to execute the requirements of the [NPPE](#) for planning and flood risk. This Level 1 SFRA aims to provide an overview for all sources of flood risk throughout Greenwich.

This document forms a part of the evidence base for Greenwich's emerging Local Plan, helping to inform strategic decisions around land-use, development, and flood risk management. It will support the borough in identifying and assessing potential development sites, ensuring that flood risk is considered while balancing the demands of growth and development within the borough.

The SFRA includes a series of supporting maps and technical information, addressing key considerations such as:

- Specific policies and interpretations of the Flood Zones.
- Impacts of climate change (particularly with regards to surface water and fluvial mapping)



1.3 Previous Level 1 and Level 2 SFRA (2017 and 2018)

The previous Level 1 [SFRA](#), published in 2017, identified areas at risk of flooding from a range of sources, including surface water, fluvial, groundwater, and sewer flooding. These were assessed using the most up-to-date information available at the time. It also included planning policy recommendations and a site assessment database to support the sequential testing of potential development sites.

In 2018, a Level 2 [SFRA](#) was published to inform the evidence base for the Royal Borough of Greenwich's previous Local Plan (see Section 2.4.1 for further details). This document provided technical guidance on proposed draft site allocations located within areas of flood risk. It set out how these sites could be brought forward in line with the requirements of the Exception Test and offered recommendations to ensure developments remain safe for their lifetime. This earlier iteration of the site allocations was deferred and rolled into the current preparation of the new Local Plan.

1.4 A living document

The SFRA is considered a 'living document', continuously shaped by evolving policy, legislation, and flood risk data. It is essential that updated Level 1 and Level 2 SFRA are prepared, published, and regularly reviewed. These updates must reflect any new policies, regulations, or information that could influence flood risk management and planning decisions. Any necessary revisions following the completion of this SFRA in 2026 will be documented accordingly.



2 Policy Summary

2.1 Overview

This section outlines the various strategic documents, requirements and policies relevant to flood risk across the borough. This SFRA is guided by policy frameworks and guidance at national, regional and local levels as summarised below.

2.2 National Policy

2.2.1 Town and Country Planning Act (1990)

The [Town and Country Planning Act \(1990\)](#) regulates land development in England and Wales, providing a statutory definition of ‘development’ and a legal framework for the town and country planning system. The Act deals with matters including:

- The roles and responsibilities of Local Planning Authorities.
- Control over development, including development orders, planning permission, and appeals.
- Enforcement of planning law, including stop notices.

The [Planning and Compulsory Purchase Act \(2004\)](#) amended and repealed parts of the existing Town and Country Planning Act 1990. The Act replaced local plans and structure plans with Local Development Frameworks.

2.2.2 Flood and Water Management Act (2010)

The [Flood and Water Management Act \(FWMA\) 2010](#) provides an effective means of managing flood risk across England and Wales. The FWMA defines the roles and responsibilities for RMAs, which are the bodies that manage flood risk from various flood sources. The FWMA defines the EA, LLFAs, District Councils (where there is no unitary authority), Internal Drainage Boards, Water and Sewerage Companies, and Highway Authorities as RMAs. Greenwich is an appointed LLFA under the FWMA and has the following responsibilities:

- Managing flood risk from local sources (surface water, groundwater, and ordinary watercourses).
- Regulating works on ordinary watercourses.
- Developing, maintaining, and applying a Local Flood Risk Management Strategy (LFRMS).
- Investigating and recording key local flood incidents.
- Designating structures or features that significantly impact flood risk.
- Maintaining a flood risk asset register.



- Sharing information about flood risk.

Schedule 3 of the FWMA relates to the management of surface water in new developments; however, it remains unimplemented in England. If commended, it would establish a statutory framework for the approval and adoption of SuDS, including the introduction of SuDS Approving Bodies (SABs), national standards, and a requirement for drainage systems to be approved prior to construction. This would amend the current automatic right to connect surface water drainage to the public sewer, making such connections contingent on compliance with approved SuDS standards.

A 2023 Government review explored options to strengthen the delivery of SuDS, including potential implementation of Schedule 3; however, this has not been progressed, and no confirmed timetable for commencement is in place at the time of writing. Therefore, SuDS delivery in England continues to rely on the existing planning-led approach, supported by national policy (NPPF and PPG) and local requirements set by Lead Local Flood Authorities.

2.2.3 National Flood and Coastal Erosion Risk Management Strategy (2020)

The [National Flood and Coastal Erosion Risk Management \(FCERM\) Strategy](#) was published in July 2020, with the strategy being most recently updated in June 2022. Climate change and the associated increased risk of flooding and coastal change is identified as a significant challenge within the National FCERM Strategy. The Strategy sets out the practical measures to be implemented by RMAs, partners, and communities, which will contribute to longer-term delivery objectives and the Government's vision of "a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100". The Strategy has three core ambitions concerning future risk and investment needs:

- Climate resilient places: increasing nation-wide resilience to flooding and coastal change through bolstered partnership working.
- Today's growth and infrastructure resilient in tomorrow's climate: taking the correct planning decisions and investment to ensure resilient infrastructure, environmental improvements, and sustainable growth.
- A nation ready to respond and adapt to flooding and coastal change: ensuring local people understand their risk to coastal change and flooding, their responsibilities, and how to take action.

Alongside the final Strategy, the EA published the [FCERM Roadmap to 2026](#), in 2022, which set out the actions required to support delivery of the Strategy's long-term vision to 2100. The roadmap was developed collaboratively with partner organisations to coordinate action across sectors. Delivery of the Strategy is being progressed through the current 2021-2027 investment programme and ongoing



partnership working, with no subsequent national strategy or funding framework published at the time of writing.

2.2.4 UK Environment Act (2021)

The [UK Environment Act](#) (2021) was implemented in November 2021, and serves as the UK's updated framework of environmental protection following its departure from the EU. The Act allows for the enshrinement of previous environmental protection into law, whilst offering new powers to set binding targets for priority areas. These priority areas are water, air quality, biodiversity, waste, and resource efficiency. The Act establishes a new relationship between local and central Government on environmental improvement through detailing the legal framework for reforming the waste and recycling services of Local Authorities.

The Act places duties on the Government regarding environmental governance, with actions including, the requirement to set at least one long-term target for each of the priority areas, to implement processes for setting and amending long-term targets, and to have an Environmental Plan that outlines the steps necessary to improve the natural environment over a period of at least 15 years.

The Environment Act (2021) also introduced the mandatory Biodiversity Net Gain (BNG) requirements for new housing and commercial development in England, which was implemented in 2023. BNG is a requirement for developers to contribute to nature recovery through ensuring wildlife habitats are improved comparative to the state in which it was in prior to the development. The inclusion of SuDS or Natural Flood Management (NFM) in developments as per the local and national policies and guidance outlined in this SFRA can be used towards incorporating BNG through their greening of urban infrastructure and encouragement of wildlife. Further information, including a list of developments that may be exempt can be found [here](#).

2.2.5 UK Climate Change Risk Assessment (2022)

The 2022 [UK Climate Change Risk Assessment](#) (CCRA) is the third five-yearly review of the risks of climate change on the UK, succeeding the previous 2017-2022 version. The Climate Change Committee prepares the CCRA's, which must align with requirements of the Climate Change Act 2008.

The CCRA considers 61 nationwide climate opportunities and risks and lists eight risk areas as priorities for action in the next two years. These include:

- risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards.
- risks to soil health from increased flooding and drought
- multiple risks to the UK from climate change impacts overseas.



The UK Government's approach to the eight priority risk areas is detailed further within Annex 1 of the CCRA.

2.2.6 Flood Risk and Coastal Change Planning Practice Guidance (2025)

The 'Flood Risk and Coastal Change' section of the [Planning Practice Guidance](#) (PPG) is a living document that was first published in 2014 and operates alongside the [NPPE](#). The most recent update was published in September 2025, aligned this policy with changes introduced in the December 2024 [NPPE](#) update (minor amendment issued in February 2025).

This section of the [PPG](#) outlines how flood and coastal risks should be considered and addressed within the planning system. It provides practical guidance for local planning authorities (LPAs) on applying a sequential approach to site selection, assessing flood risk, incorporating SuDS, and improving flood resistance and resilience of new and existing development. It also provides up-to-date directions on how to prepare a SFRA in line with national policy.

The 2025 update brought clarity to the Sequential Test, including:

- The sequential approach must now explicitly consider all sources of flood risk, including:
 - Surface water
 - Fluvial
 - Groundwater
 - Sewer and drainage systems
 - Reservoirs and canals
- A site-specific FRA can now remove the need for a sequential test if it proves:
 - Safety from surface water flood risk for the lifetime of the development
 - No increase in flood risk elsewhere

The Exception Test section was also updated:

- The exceptions test still consists of two parts, both of which should be satisfied.
 - Sustainability benefit: The development must provide wider sustainability benefits to the community that outweigh the flood risk



- Safety and Risk Management: A site-specific FRA should demonstrate: the development will be safe for its lifetime, it will not increase flood risk elsewhere, it will ideally reduce flood risk overall.
- The exception test must now consider all sources of flooding not just fluvial or tidal.

Additional updates introduced in the 2025 version of the [PPG](#) include:

- Climate change emphasis The FRA must now explicitly account for future climate change impacts, including increased rainfall activity, sea level rise, groundwater level changes.
- LLFAs and the EA are now expected to scrutinise FRAs more vigorously and ensure exception test criteria are met more consistently across all applications.

2.2.7 National Planning Policy Framework (2025)

The [NPPF](#), most recently revised in February 2025, outlines the Government's planning policies across England and how these should be applied. The [NPPF](#) provides a framework within which plans for housing and other developments can be produced by Local Planning Authorities (LPA's) and provides guidance for prospective applicants for submitting planning applications. The planning system serves to contribute to achieving sustainable development. The [NPPF](#) replaced individual Planning Policy Statements into a single, cohesive document.

The [Government's 2017 White Paper](#), Fixing Our Broken Housing Market, introduced a series of planning reforms focused on "planning for the right homes in the right places." Many principles from this White Paper have been carried through into the current [NPPF](#), particularly in relation to planning and flood risk. In addition to the strategic requirements outlined in Paragraph 166, the White Paper reinforced the importance of sustainable, flood-resilient development in tackling both housing and environmental challenges.

Ongoing revisions to the [NPPF](#) are intended to improve both plan-making and decision-making processes. Several updates introduced in the 2024 revision remain directly relevant to this Strategic Flood Risk Assessment (SFRA):

- Requiring that all sources of flood risk are considered during plan preparation.
- Strengthening sequential test requirements.
- The NPPF require climate change impacts be factored into FRAs Incorporation of the Flood Risk Vulnerability Classification within Annex 3 of the [NPPF](#).



- The SFRA must identify functional floodplain areas (Flood Zone 3b) and protect them from inappropriate development.
- [NPPF](#) now expects SuDS to be integrated into all developments not just major ones.

2.2.8 Planning and Flood Risk – Chapter 14 of the NPPF

[Chapter 14 of the NPPF](#) focuses on “Meeting the challenge of climate change, flooding, and coastal change.” Paragraphs 165–175 specifically address planning and flood risk. Paragraph 166 is of particular relevance:

“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.”

Paragraphs 167–174 further outline the Sequential Test and Exception Test, which aim to steer new development towards areas of lowest flood risk. This SFRA forms the evidence base for applying these tests, with detailed guidance included in Section 6 of this report.

2.3 Regional Policy

2.3.1 Thames Catchment Flood Management Plan (2009)

The EA published the [Thames Catchment Flood Management Plan \(CFMP\)](#) in December 2009. This document provides an overview of the present and future extent and scale of flooding within the River Thames catchment, looking ahead over the next 50 to 100 years with consideration for the impacts of climate change. It outlines approaches and policies aimed at managing flood risk in a sustainable way.

Within the Thames CFMP, Greenwich is located within sub-area 9, which is categorised as ‘London Catchments’. This sub-area is associated with Policy Option 4, which serves as a strategic guide for managing flood risk in urban areas where some flood defences are already in place.

The Policy option for sub-area 9 is as follows:

- Policy option 4: “Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.”

While these options do not constitute planning policy themselves, they help to shape future decision-making on flood risk management.

According to the CFMP, Greenwich contains areas where significant numbers of properties may be at risk from a 1% Annual Exceedance Probability (AEP) fluvial



flood. The plan identifies sustainable approach to managing future flood risk in this sub-area as encouraging adaptation to climate impacts. This includes retaining open spaces within the floodplain, enhancing the flood resilience of the built environment, and integrating flood risk considerations into the design of new developments. Through these measures, future development in Greenwich can help reduce overall flood risk and mitigate the consequences of flooding.

2.3.2 The London Plan (2021)

[The London Plan](#) is the spatial development strategy for Greater London, published by the Mayor as required under the Greater London Authority (GLA) Act 1999. It provides an integrated strategic framework to guide London's environmental, economic, transport, and social development from 2019 to 2041. Since its original publication in 2004, the Plan has undergone several reviews and updates, with the current version being adopted in March 2021.

Chapter 9 of the London Plan focuses on Sustainable Infrastructure and includes various policies related to climate change, flood risk, and water management. These include:

- Policy SI 12: Flood Risk Management

Current and future flood risk from all sources across London should be managed in a sustainable and cost-effective way. This should involve collaboration between LLFAs, the EA, developers, and infrastructure providers. The policy also outlines specific requirements for Development Plans and development proposals.

- Policy SI 13: Sustainable Drainage

This policy introduces an updated drainage hierarchy (replacing the hierarchy under the previous Policy 5.13), which all development proposals must follow to manage surface water runoff. Proposals should aim to replicate greenfield runoff rates and manage runoff as close to source as possible, using SuDS that deliver multiple benefits. LLFA document such as Local Flood Risk Management Strategies (LFRMS) and Surface Water Management Plans (SWMP) should highlight priority areas and guide risk reduction.

- Policy SI 17: Protecting London's Waterways

New development should support the restoration of rivers and watercourses. Proposals that protect, enhance, or help restore London's water spaces and their unique characteristics are encouraged.

- Policy GG6: Increasing Efficiency and Resilience

All development and infrastructure should be designed to adapt to climate change, reduce flood risk, and ensure efficient use of water and other resources.

- Policy D11: Safety, Security and Resilience to Emergency



Development proposals should maximise building resilience and minimise potential physical risks that may arise from various hazards, including flooding.

- Policy G1: Green Infrastructure

LPAs should prepare green infrastructure strategies that integrate natural features into the urban environment, supporting biodiversity, flood management, and wellbeing.

- Policy G5: Urban Greening

Major developments should contribute to urban greening through measures such as green roofs, high-quality landscaping, and nature-based SuDS. Boroughs should apply an Urban Greening Factor to ensure the required greening in new developments.

2.3.3 Thames River Basin District Flood Risk Management Plan (2022)

The most recent version of the [Thames River Basin Flood Risk Management Plan](#) (TRBD FRMP) was published in December 2022, succeeding the previous FRMP that was published in 2016. The production of the TRBD FRMP is in line with the EU Floods Directive's requirements for RMAs to produce FRMPs. In the UK, the Directive's requirements are legislated through the FRR 2009. This plan outlines how RMAs will plan for and manage the risk of flooding to all communities within the TRBD during the current cycle, which runs from 2021 to 2027.

Within the current FRMP cycle, there are 18 national objectives. These all apply to the TRBD area and outline the primary areas in which RMAs should aim to make improvements. These objectives are outlined within the FRMP national overview and are all within one of three categories that are consistent with the National FCERM Strategy ambitions of:

- Climate resilient places.
- Today's growth and infrastructure resilient in tomorrow's climate.
- A nation ready to respond and adapt to flooding and coastal change.

Within the TRBD area, eight specific measures have been identified for local flood risk management, alongside 504 measures targeted at managing flood risk in nationally identified Flood Risk Areas. Further details of these measures can be found within the 'Second cycle objectives and measures' chapter of the TRBD FRMP.

According to the 2022 TRBD FRMP, of the measures set out in the first cycle FRMP (2015-2016):

- 21.6% have been completed
- 55.8% are ongoing



- 22.5% were not implemented, due to constraints such as lack of funding or feasibility issues.

Despite these challenges, the first cycle measures have delivered positive outcomes, contributing to the social environmental and economic well-being of the TRBD. Several ongoing measures from the first cycle have been carried forward and integrated into the second cycle, ensuring continuity in flood risk management efforts.

2.4 Local Policy

2.4.1 Greenwich Local Plan

[Greenwich's Local Plan](#) (Core Strategy) was adopted in July 2014 and set out the Borough's core policies and planning strategies for the period of 2013-2028. The Local Plan aims to manage and deliver sustainable growth while preserving the Borough's existing character. It focuses on regenerating key areas such as Woolwich, Charlton Riverside, and Thamesmead.

Key objectives include delivering affordable housing, supporting local employment and economic development, enhancing transport connections such as the Elizabeth Line and improvements to cycling and walking infrastructure, and safeguarding green spaces like Oxleas Wood, the Thames Path and Metropolitan Open Land. The plan also promotes environmental sustainability, climate resilience, and high-quality design, ensuring that Greenwich grows in a way that supports its heritage and diverse communities.

The Level 2 SFRA will provide site-specific recommendations to help developers meet these policy aims, supporting well-informed planning decisions and the delivery of resilient, sustainable development throughout the borough.

The new Local Plan, for which Regulation 19 Consultation is expected to be published in July 2026, which will then cover the period from 2025-2040. Policy EN6 (Flood Risk and Sustainable Drainage) emphasises the importance of ensuring a sufficient flood resilient design of buildings, with Policy EN6 requiring:

- All proposed developments to apply sequential and exceptions tests,
- Minimise the risk of flooding from all sources and not increase flood risk elsewhere.
- Developments proposing highly vulnerable uses, including sleeping accommodation and basement dwelling shall not be permitted in Flood Zone 3 or Critical Drainage Areas (CDAs).
- All major and non-major developments involving new buildings must incorporate SuDS, which must follow National SuDS standards.



- Developments should aim to achieve greenfield runoff rate and all opportunities to minimise site runoff have been taken.

2.4.2 Local Flood Risk Management Strategy (2015)

[Greenwich LFRMS and Action Plan](#) were completed in 2015 and are in the process of being updated to align with the requirements of the [National FCERM strategy](#) and [FWMA](#), to be completed in 2026. The objective of this document is to manage flood risk to maximise the benefits for Greenwich residents, businesses and environment. The LFRMS outlines Greenwich's approach to limiting the impacts of localised flood risk sources throughout the borough through various objectives and actions required to achieve them. The document sets out five key objectives while the strategy is active, these objectives are:

- Reduce and better manage all sources of local flood risk within Greenwich
- Communicate flood risk with affected communities
- Manage development to reduce flood risk and encourage sustainable drainage
- Provide local advice and guidance to help residents and business understand their flood risk and be resilient
- Engage with residents and business to make sure decisions are made using best and most up to date information available

The LFRMS and its associated action plan derived from the objectives were developed from the wider objectives of Greenwich and were in line with the SEA objectives.

2.4.3 Greenwich Climate Change Action Plan

In November 2019, Greenwich declared a Climate Emergency, joining many other local authorities in recognition of the urgent need for action to address climate change. This declaration followed the UK Parliament's national Climate Emergency declaration in May 2019 and acknowledged the growing body of evidence on climate risks.

Following the declaration, Greenwich Council published its [Carbon Neutral Plan](#) in 2021, outlining the Borough's ambition to become carbon neutral by 2030. The Plan sets out a comprehensive framework for reducing emissions and building resilience, both within Council operations and across the wider borough. It highlights several priority action areas including improving air quality, enhancing green infrastructure, promoting active and sustainable travel, retrofitting buildings, and developing a circular economy.

[The Plan](#) also addresses climate adaptation and flood risk management, recognising the increasing risk of surface water and fluvial flooding as rainfall



patterns change. Sustainable Drainage Systems (SuDS) and other nature-based solutions are promoted to reduce flood risk and improve resilience across Greenwich.

2.4.4 Draft Climate Resilience SPD

Greenwich's [Climate Resilience Supplementary Planning Document](#) (SPD) was consulted on between September and November 2025 and was adopted on 25th March 2026. The Climate Resilience SPD provides information and guidance on how sustainable drainage systems and urban greening can alleviate flood risk in Royal Greenwich. It is a material consideration in assessing planning applications.



3 Data Sources and Mapping

3.1 Mapping

The maps associated with this SFRA are predominantly provided in a web map format, other than the BGS Potential for Groundwater Flooding map which is provided in the Appendix. The maps provide information on the various sources of flooding that impact the borough.

The [web map](#) and Appendix detailed as part of this SFRA and the data they contain are as follows:

- **General**
 - Borough Boundary
 - Main Rivers
 - Site Allocations
- **Policy Map**
 - EA Flood Zones 2 and 3
 - Flood Zone 3b
 - Flood Storage Areas
 - Catchment Drainage Areas
- **Surface Water Flood Risk**
 - Risk of Flooding from Surface Water Extent, Depth, Hazard and Velocity
 - Risk of Flooding from Surface Water Extent, Depth, Hazard and Velocity – Climate Change
- **Fluvial and Tidal Flood Risk**
 - Flood Zones: EA Flood Zones 2 and 3, FZ3b
 - Flood Storage Areas
 - Historic Flood Map
 - Flood Warning Areas
 - Flood Alert Areas
 - EA Risk of Flooding from Rivers and Sea Extent and Depth
 - EA Risk of Flooding from Rivers and Sea Extent and Depth – Climate Change
- **Tidal Modelled Data**

Tidal Upriver Breach (2017):

 - 2005 Main Area – Outline, Depth, Hazard and Velocity
 - 2100 Main Area – Outline, Depth, Hazard and Velocity

Thames Tidal Downriver Breach (2018)

 - 1 in 200 year (2005) – Outline, Depth, Hazard and Velocity
 - 1 in 1000 year (2005) – Outline, Depth, Hazard and Velocity
 - 1 in 200 year (2115) – Outline, Depth, Hazard and Velocity



- 1 in 1000 year (2115) – Outline, Depth, Hazard and Velocity
- **Fluvial Modelled Data**
 - River Ravensbourne 1 in 100-year (including climate change scenarios) – Outline, Depth, Hazard and Velocity
 - Marsh Dykes 1 in 100-year (including climate change scenarios) – Outline
- **Groundwater, Sewer and Artificial Flood Risk**
 - Thames Water Sewer Flooding records per postcode
 - Bedrock Geology
 - Superficial Geology
 - Special Protection Zones
 - EA Historic Landfill Locations
 - EA Reservoir Flood Extents (Dry Day)
 - EA Reservoir Flood Extents (Wet Day)
 - BGS Potential for Groundwater Flooding
- **Flood Management Infrastructure**
 - Topography
 - EA Flood Defences



4 Applying Climate Change Scenarios

4.1 Overview

The Environment Agency's third adaptation report under the [Climate Change Act \(2008\)](#) titled '[Living Better with a Changing Climate](#)', was published in 2021. Building on the previous 2016 report, 'Adapting to a Changing Climate', this report outlined the growing impacts of climate change across the UK, noting the increasing risks from flooding, water scarcity, and ecosystem degradation. It reinforces findings from [the UK Climate Projection 2018 \(UKCP18\)](#), which indicates significant regional and seasonal shifts in weather patterns, such as drier, hotter summers and wetter winters, along with a growing likelihood of extreme weather events. The report also notes that properties on floodplains could double by 2060, and that climate-related incidents are expected to become more frequent and severe.

In recognition of the deepening climate crisis, the UK Parliament declared a national climate emergency in May 2019, prompting numerous local authorities to follow. This included the Royal Borough of Greenwich where in June 2019, the council set a goal to achieve net-zero carbon emissions by 2030 (Section 2.4.3).

National planning policy has also evolved in response to these challenges. Paragraph 153 of the [NPPF](#) advocates for a proactive and integrated approach to climate mitigation and adaptation in plan-making. It states that:

"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures."

Furthermore, the [NPPF](#) highlights the importance of building resilience into both communities and infrastructure, ensuring that climate considerations are embedded within all relevant risk assessments and development strategies.

4.2 Climate Change Guidance

4.2.1 Updates

In 2016, the Environment Agency (EA) published its Flood Risk Assessments (FRAs): Climate Change Allowances guidance. This document sets out how climate change allowances should be applied in both SFRAs and site-specific Flood Risk Assessments, ensuring that development decisions account for future climate impacts.



Since 2019, the EA has progressively updated these allowances to reflect the UK Climate Projections 2018 (UKCP18). The most recent revisions, as of December 2025, were the August 2025 updates. This includes changes to the Global Warming Levels methodology for the UKCP18 regional and probabilistic elements. The update also included revisions to the guidance pages. A key earlier update in May 2022 reduced the number of future climate epochs from three to two, simplifying the planning process.

One significant change is that the peak rainfall intensity allowances are now defined at the Management Catchment level (sub-catchments within larger River Basin Districts) providing more regionally specific guidance. Under the latest approach, the central allowance should be applied to developments with lifetimes up to 2100, while the upper-end allowance is used for developments with lifetimes extending between 2100 and 2125, supporting long-term resilience planning.

Greenwich falls within the Thames River Basin District, specifically within the Thames Estuary catchment area. The borough is also located within Greenwich Policy Unit of the Thames Estuary 2100 (TE2100) Plan, which outlines long-term tidal flood risk management strategies in response to sea level rise and other climate pressures. The area is currently designated under a P5 Policy, requiring maintenance and further action to reduce the risk of flooding to sustain a high standard of protection.

It is recommended that these updated peak rainfall allowances and tidal flood risk policies are incorporated into new Local Plan policies, SFRAs, and planning guidance to ensure that planning decisions across Greenwich remain aligned with the most up-to-date climate science and national flood risk management frameworks.

UKCP18 builds on the previous UKCP09 projections, providing an enhanced understanding of how the UK's climate may evolve over the 21st Century. Key advancements in UKCP18 include:

- Updated projections of UK climate trends across different emissions scenarios and timescales
- Refined probabilistic projections over land, supporting more detailed risk-based planning
- High-resolution, spatially coherent climate models at a 60km scale globally, and a 12km scale for the UK
- Further downscaling to a 2.2km resolution, enabling a more realistic simulation of localised high-impact events such as intense rainfall and flash flooding
- Enhanced marine projections, including storm surge and sea-level rise data



Planners, developers and consultants are advised to consult the latest UKCP18 guidance and datasets when preparing Flood Risk Assessments. Additionally, the [UK Climate Projections: Headline Findings \(August 2022\)](#) summarise the key conclusions of the UKCP18 and provide a useful reference for decision-making.

4.2.2 Applying the Updated Climate Change Guidance

Applicants must understand the information below to correctly apply the latest climate change guidance:

- As per the [PPG](#) Residential development can be assumed to have a lifetime of at least 100 years, unless there is specific justification for considering a different period. For example, the time in which flood risk or coastal change is anticipated to affect it, where a development is controlled by a time-limited planning condition. The lifetime of a non-residential development depends on the characteristics of that development, but a period of at least 75 years is likely to form a starting point for assessment.’ This should be highlighted by applicants in the Flood Risk Assessment (FRA), with justification provided as to why they have adopted a given lifetime for the proposed development. For developments expected to extend beyond 2125, applicants should consider applying upper-end allowances or sensitivity testing with more extreme scenarios where appropriate.
- The proposed development’s vulnerability classification should be identified as per [Table 2 of the ‘Flood Risk and Coastal Change’ PPG](#).
- The relevant epoch period for peak rainfall intensity should be used in accordance with [‘Flood Risk Assessments: Climate Change Allowances’](#) and the peak rainfall allowances map. Greenwich is situated within the Thames Estuary 2100 catchment as well as the London Management Catchment, where peak rainfall allowances are provided in Table 4-1. The 2050’s epoch should be used for developments with a lifetime up to 2060 and the 2070’s epoch should be used for developments with a lifetime between 2061 and 2125. These allowances will differ according to which rainfall intensity scenario (either 3.3% or 1% AEP) is being considered, as per Table 4-1.
- Greenwich is also situated within the Thames Estuary Management Catchment, where peak rainfall allowances align with the Thames River Basin District figures and are complemented by tidal flood risk considerations under the [Thames Estuary 2100 \(TE2100\) plan](#). Applicants should apply the appropriate allowances according to the lifetime of the development, with consideration of the 2050s and 2070s epochs, and factor in tidal flood risk as advised in local policies.



- All FRAs requiring peak river flow allowances should use the percentages for their development area as per the information within 'Flood risk assessments: climate change allowances' and the peak river flow map. Greenwich falls within the London Management Catchment, where the peak river flow allowances are provided in Table 4-2.
- Appropriate climate change allowances must be applied, and applicants must consider the flood risk vulnerability classification of their proposed development and the flood zone in which it falls.
- Greenwich also falls within the Thames River Basin District, and applicants must apply the appropriate climate change allowances, considering the development's flood risk vulnerability classification, flood zone, and tidal flood risk management policies such as those in TE2100.
- Applicants should consider compound flooding risks (the combined impacts of river, surface water, tidal, and groundwater flooding). This is particularly relevant for developments in coastal and estuarine areas such as Greenwich.
- It is recommended that applicants reference the latest Local Plan policies and this SFRA for Greenwich to ensure alignment with up-to-date catchment-specific guidance, the TE2100 plan, and climate change allowances.

Table 4-1: London Management Catchment Peak Rainfall Allowances

Epoch	Central	Higher	Upper
2020s	10%	14%	26%
2050s	7%	14%	30%
2080s	17%	27%	54%

Table 4-2: London Management Catchment peak river flow allowance

Return Period	Epoch	Central allowance	Upper end allowance
3.3% annual exceedance rainfall event	2050s	20%	35%
	2070s	20%	35%
1% annual exceedance rainfall event	2050s	20%	40%
	2070s	25%	40%



4.3 Adapting to Climate Change

The [PPG](#) emphasises that managing the future effects of climate change is a fundamental principle of land use planning, as outlined in the [NPPE](#). This principle should underpin both plan and decision-making processes. The [PPG](#) offers practical guidance on incorporating climate resilience into planning, helping local authorities and applicants to implement effective adaptation and mitigation measures.

In Greenwich, where both tidal and surface water flood risks are present, it is particularly important to:

- Assess future climate risks when allocating land for development, ensuring long-term resilience across the development's lifetime.
- Address current and future flood risk, including tidal flooding from the Thames, and design developments that can respond to coastal and fluvial change.
- Consider the long-term availability and resilience of water infrastructure, integrating water-efficient designs that protect water quality.
- Promote adaptive approaches in design policies for developments and the public realm.

Greenwich extends for 13.7 km along the Thames Riverside and will be aiming to reduce the tidal risk in the north of the borough through producing their Riverside Strategy by 2030 which will map a way forward for managing the risk of tidal flooding. This will provide the opportunity to create additional benefits in line with the [TE2100](#) plan.

The [PPG](#) also encourages the integration of adaptation and mitigation measures, such as multi-functional green infrastructure. In Greenwich, this could include implementing SuDS and nature-based solutions, which help manage flood risk, support biodiversity, reduce the urban heat island effect, and improve community wellbeing. By embedding these principles into local planning, Greenwich can ensure new developments contribute to climate resilience and deliver sustainable, future-proofed places.



5 Assessment of Flood Risk

5.1 RMA Responsibilities

Table 5-1 outlines the specific responsibilities of different Risk Management Authorities (RMAs) in relation to flood risk. These responsibilities vary depending on the role and jurisdiction of each RMA.

Table 5-1 Responsibilities of each RMA in relation to flood risk.

Risk Management Authority	Responsibility (within an SFRA context)
Department for Environment, Food and Rural Affairs (DEFRA)	Responsible for overall national FCERM Policy in England, alongside providing flood risk management funding.
Environment Agency (EA)	Supervises and works collaboratively to manage flood risk and coastal erosion from main rivers, the sea and reservoirs. The EA's various responsibilities include: • Providing LPAs with flood risk advice regarding development proposals in Flood Zones 2 and 3. • Carrying out works to manage fluvial and coastal flood risk. • Issuing and operating flood warning systems. • Issuing consent to enable works on or near main rivers, and works affecting watercourses, flood and sea defences and other structures protected by its byelaw. • Providing advice on development proposals (see Section 5).
Lead Local Flood Authorities (LLFAs)	Greenwich is an appointed LLFA under the FWMA (2010). LLFAs are responsible for managing flood risk from surface water, ordinary watercourses, and groundwater sources ('local flood risk sources'). LLFA responsibilities include: • Development, application, maintenance, and monitoring of LFRMSs. This includes involvement in SFRA preparation. • Preparing and maintaining a PFRA, flood risk maps, flood hazard maps, and flood risk management plans. • Designating features and structures that may affect the risk of local flooding or coastal erosion. • Investigating and reporting of flood incidents that reach a certain threshold. • Creating guidelines and policies to ensure effective flood risk management work. • Providing advice on major development proposals with surface water drainage implications (see Section 5 for further details).



5.2 Types of Flood Risk

5.2.1 Fluvial and Tidal Flood Risk

Fluvial flooding occurs when watercourses exceed their hydraulic capacity as a result of heavy or prolonged rainfall. The main source of fluvial flood risk is from Main Rivers. A Main River is defined by the EA (see [Main River Map](#)). A principal criterion for defining a watercourse as a Main River, as per [EA guidance](#), is if there are a significant number of people and / or properties liable to flooding consequences from the watercourse. A map of Greenwich's Main Rivers can be found in the online web maps.

Main rivers that influence fluvial flood risk in Greenwich include:

- The River Thames
- The River Ravensbourne
- The River Quaggy
- Butts Canal
- Culverted Wickham Valley Watercourse and March Dykes

A map of fluvial flood risk in Greenwich can be found in the Fluvial and Tidal Flood Risk online web map. This mapping shows that fluvial flood risk in Greenwich is primarily associated with the River Thames and its tributaries. The River Thames runs along the north side of the borough boundary. There are significant areas of fluvial flood risk along this boundary, particularly in the northeast and northwest of the borough. Flood Zone 3 extends significantly into Greenwich covering the Greenwich Peninsula, East Greenwich, Charlton Riverside, Thamesmead.

Flood risk from the River Thames arises from several key factors:

- Daily tidal fluctuations: The Thames has a large tidal range (over seven metres on spring tides). Without the extensive network of river walls and embankments, many low-lying areas would be inundated twice daily by the normal tidal cycle
- Surge tides: A storm tide happens when there is a storm in the North Sea. High winds and changes in atmospheric pressure can cause extremely high water levels, making tides much higher than usual.
- Fluvial flooding: This results from prolonged rainfall across the upper Thames Catchment area.

The highest risk occurs when tidal surges, high tides and fluvial flooding all coincide to amplify the potential of flooding.



To mitigate this risk, the Thames Tidal Defence System, which includes the Thames Barrier and river walls, provides the borough with a high Standard of Protection (SoP) against combined tidal and fluvial flooding up to a 1-in-1000-year event. Despite the robust nature of these hard-engineered structures, it is important to recognise their limitations. They are designed to withstand specific conditions, but they may experience mechanical failure and have a finite lifespan. As such, residual flood risk remains, particularly from:

- Overtopping during events more extreme than those anticipated in the design.
- Structural breaches due to the failure of the defence.

Though the probability of the residual risks occurring is low the potential consequences are high due to the densely populated nature of the Greenwich riverside area. A breach in defences could cause significant flooding of Thamesmead, New Charlton and Greenwich Peninsula.

The risk of flooding from rivers and the sea across the borough is illustrated in the web mapping. This map delineates the probability of flooding into three Flood Zones, as defined by the EA and described in Table 5-2. Flood Zone 3 is additionally delineated into Flood Zone 3a (high probability area) and Flood Zone 3b (known as the functional floodplain, where water must flow or be stored in times of flood).

Table 5-2 Flood Zone Definitions (as defined in the NPPF)

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 flooding. (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 a functional floodplain should take into account of local circumstances and not be defined solely on rigid probability parameters. A 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.

Other rivers within Greenwich also pose a risk of flooding. The River Ravensbourne, which runs along the western boundary of the borough, flowing from the south-east of the borough towards the Thames, also contributes to fluvial flood risk within Greenwich, particularly in the Deptford area. The River Quaggy (a tributary of the River Ravensbourne) flows through the southern end of the borough, including Mottingham, Eltham, and Lee Green. This river often flows through culverts; however can be seen in green spaces such as Sutcliffe Park (which is located in Flood Zone 3) and the surrounding Eltham area.

The Marsh Dykes catchment covers an area of approximately 20km², and includes the following five major watercourses: the Butts Canal, Great Breach Dyke, Green Level Dyke, Horsehead Dyke and Corinthian Dyke. An [integrated fluvial, surface water and sewer model](#) was produced in 2020 by the EA to enable a better understanding of flood risk within the catchment and enhance flood risk management of the watercourses. The model outputs provide representation of the integrated flood risk mechanisms operating within the entire catchment. It was suggested that the model is further developed should an assessment be required with a high level of certainty, to represent the relevant flood mechanisms at an appropriate scale and level of detail.

5.2.2 Surface Water and Ordinary Watercourse Flood Risk

Surface water flooding occurs during heavy or prolonged periods of rainfall, when the volume of water exceeds the capacity of the drainage network, and the water cannot drain away at a sufficient rate via infiltration resulting in ponding and overland flows. The surface water web map shows the risk of flooding from surface water within Greenwich.

Surface water flood risk is distributed throughout Greenwich and generally follows the topography of the borough which generally slopes northward and eastward towards the River Thames. Surface water flow paths are also influenced by local railway embankments and highways, such as the North Kent Railway line, that dissect natural flow paths.

The Risk of Flooding from Surface Water ([RoFSW](#)) extent map shows multiple areas susceptible to high surface water flood risk defined in Table 5-3, with concentrations in the southwest. This map is also available for depth. Key areas at high risk of surface water flooding include:

- Sutcliffe Park
- Westthorne Avenue
- Wynford Park



- Woodbrook/Waterdale Road Junction
- Brookhill Road
- Westfield/Eastmoor Street Junction

See web maps for information on surface water flood risk and climate change scenarios, which takes into account the central climate change allowance (2040-2060).

Table 5-3 RoFSW map High, Medium, and Low extent definition

Extent	Definition
High Chance	More than 3.3% chance each year
Medium Chance	Between 1% and 3.3% chance each year
Low Chance	Between 0.1% and 1% chance each year

Factors that contribute to the high risk of surface water flooding within these areas include low lying ground, surrounding watercourses, and impermeable ground conditions such as London Clay. Increasing impermeable surfaces through change of land use, for example by paving over front gardens, can also increase surface water flood risk.

Ordinary watercourses are channels through which water can flow and that do not form part of the classified main rivers network (i.e. not shown on the EA's Statutory [Main River map](#)). They include streams, drains, open ditches, cuts, culverts, sluices, dykes and surface water sewers (other than public sewers). Flood risk from ordinary watercourses arise from extreme weather conditions, causing a sudden increase in water levels and overflow. Unlike main rivers, the Greenwich LLFA have the responsibility and powers over ordinary watercourses.

In Greenwich, there are several ordinary watercourses which contribute towards fluvial flood risk (see Fluvial and Tidal Flood Risk online web map). The Wickham Valley Watercourse, otherwise known as the Wogebourne or Plumstead River, is a tributary of the River Thames located in the east of the borough. As seen in the Fluvial and Tidal Flood Risk web map, there is a high risk of flooding in the areas surrounding the Wickham Valley watercourse.

Below Wickham Valley Watercourse is the River Shuttle, a small tributary crossing through Avery Hill into London Borough of Bexley. As shown in the same map, the Shuttle puts a large portion of its nearby neighbourhoods and Avery Hill Park at high risk from flooding.

5.2.3 Groundwater Flood Risk

Groundwater flooding occurs when prolonged rainfall causes the water table to rise which then emerges through the ground. If the water table is too high, surface



water is no longer able to infiltrate into the ground, causing flooding. In extreme circumstances, flooding can be caused by groundwater emerging directly from the ground. An area's risk of groundwater flooding is closely tied to ground composition and presence of aquifers. The bedrock in Greenwich is comprised of a mix of the Thames Group in the centre, with bands of the Lambeth Group, Thanet Sand Formation and White chalk occurring to the north of the borough towards the River Thames. The geology of Greenwich is comprised of sand and gravel to the south and west of the borough, with clay, silt and sand becoming more prevalent in the north of the borough towards the River Thames.

Greenwich has limited potential risk of groundwater flooding, however, the risk of groundwater flooding increases in the north and west of the borough to increased potential for groundwater flooding for properties situated below ground level and for ground water flooding to occur at the surface, particularly near Woolwich and around Sutcliffe Park. Stretching along the northern end of the borough there is a consolidated aquifer which will likely increase flood risk due to high groundwater levels.

5.2.4 Sewer Flood Risk

Sewer flooding can occur when the volume of rainfall exceeds the capacity of the sewer system, resulting in the system surcharging and flooding. A blockage in the sewer system can also cause water to back up within the network, causing flooding. A lack of capacity in the sewer networks may be due to:

- An increase in flow (such as climate change impacts on rainfall and / or new developments).
- Having to sustain rainfall events larger than the system is designed for.
- The failure of key infrastructure such as pumps or valves.
- A watercourse having been fully culverted or incorporated into the drainage network.
- A lack of maintenance which can sometimes lead to total blockage.
- Groundwater infiltration into pipe networks in poor condition; and
- Limited outflow from the sewer network due to high water levels in receiving watercourses.

The online web maps show the number of sewer flooding incidents by postcode. The north end of the borough has experienced higher amounts of sewer incidents per postcode ranging from 5-8 incidents. The west and south of the borough have experienced less sewer flooding incidents ranging from 0-3. The majority of areas in Greenwich identified in Thames Water Utilities Limited (TWUL) Capacity Assessment Framework (CAF) are predicted to experience surcharging from 2020



onwards during a 1-in-2-year storm event. Key areas identified at high risk are Deptford, Thamesmead, North Greenwich, and Plumstead. However, several areas lack sufficient data. Sewer flooding is the responsibility of TWUL and not Greenwich council.

5.2.5 Artificial Sources of Flood Risk

Artificial flooding occurs when the failure of infrastructure or human intervention results in flooding. Artificial flood sources include:

- reservoirs,
- canals,
- water retention ponds,
- docks,
- other artificial structures.

While risk of structural failure is low, flooding from artificial sources could cause significant damage.

One artificial feature is the Broadwater (Formerly Royal Arsenal Canal, Pilkington Canal, or Ordnance Canal), now an aesthetic water feature in North Greenwich with minimal flood risk, as reflected in the Groundwater, Sewer and Artificial Flood Risk web map. Reservoir flooding maps show no risk of flooding in dry day scenarios, and wet day scenarios show risk in the northwest area of the borough.

5.2.6 Residual Flood Risk

Residual flood risk in Greenwich largely stems from the potential failure of the River Thames Tidal defences. A key risk is failure of the Thames Barrier, which protects London from tidal surges. Failure of the barrier could lead to flooding in areas such as Thamesmead, New Charlton, and the Greenwich Peninsula as shown in the [TE2100 Greenwich Policy Unit](#) map. It has been identified that the [Thames Barrier will need to be replaced by 2070](#). This will involve raising the height of the barrier and moving it to a new downstream location.

Flood alerts are available for the following within Greenwich: the [Tidal Thames](#), [Ravensbourne](#) and flood alerts are also available for [Groundwater Flooding](#). Flood warnings are also available for Greenwich from the [Government Check For Flooding site](#).

5.3 Historic Flooding

Historic flooding information is available for multiple sources across Greenwich. Local records of flood incidents, compiled through the Borough's Local Flood Risk Management Strategy (LFRMS) and provided by the Environment Agency (EA), Thames Water Utilities Limited (TWUL), and other stakeholders, have been incorporated within this SFRA.



Greenwich has experienced recorded flooding from a variety of sources, including surface water, groundwater, fluvial, and sewer flooding. Surface water flooding incidents, particularly during heavy rainfall events, have occurred across various locations in the borough, with internal and external property flooding recorded in key low-lying or topographically confined areas.

The EA's Historic Flood Map identifies historic flood outlines from flooding from main rivers in Greenwich in 1965 and 1968. In 1965, the River Quaggy overflowed flooding the area west of the Eltham Green junction. In September 1968, a number of areas across London flooded. In Greenwich, heavy rainfall caused the Rivers Quaggy and Kyd Brook to flood parts of southwest Greenwich, including areas near Blackheath Park and Eltham Green.

- The EA's Historic Flood Map has been referenced in this SFRA and includes the maximum extent of previously recorded flood outlines. This data captures the spatial extent of historic flood events, particularly those associated with fluvial flooding along the River Thames, the Ravensbourne, and smaller tributaries or drainage channels and can be found in the Fluvial and Tidal Flood Risk online web map.

In addition, TWUL has provided historic records of sewer flooding incidents based on postcode sector analysis. These historic records of sewer flooding can be found in the online web maps.

As part of the planning and development process, applicants are encouraged to consult historic flooding datasets along with other relevant local and national sources, such as the [LFRMS](#), PFRA and SWMP. Applicants should also consult the Royal Borough of Greenwich or Thames Water if they have any outstanding questions related to past flooding incidents or local drainage capacity. Further guidance on site-specific Flood Risk Assessments (FRAs) is provided in [Section 6](#) of this SFRA.

5.3.1 Flood Investigations

Under [Section 19 of the FWMA](#), the LLFA must investigate flood events where necessary, identify the relevant risk management authorities involved, and assess their actions. Once completed, the LLFA must publish the findings and inform the relevant authorities. A Section 19 flood investigation is required to take place should at least one of the following criteria be met:

- Flooding has affected critical infrastructure for a period in excess of three hours from the onset of flooding; or
- Internal flooding of a building (residential or commercial) has been experienced on more than one occasion in the last five years; or
- Internal flooding of five buildings (residential or commercial) in close proximity has been experienced during one single flood incident.

Recently completed Section 19 Investigations for Greenwich include:



- April 2023 - Section 19 investigation to investigate property level flooding experienced on Woodbrook Road (SE2 0PE) and Waterdale Road (SE2 0XT) during 6th November 2022 This was caused by a blocked trash screen at Marsh Dykes.
- A borough wide Section 19 was also produced to investigate the flood events from November 2023 to May 2024. The locations examined were:
 1. **Kingsground**, Middle Park, including areas around King John's Walk: Causes – steep topography, drainage channel along King John's Walk had become heavily silted, blocked gullies.
 2. **Nathan Way**, Plumstead (east of the borough), including areas around Magpie Lane, Ridgeway and White Hart Road: Causes – steep topography, blocked gullies, drainage network had backed up due to Crossness Pumping Station not discharging.
 3. **Plumstead Road**: Causes – low lying topography, many gullies had large inlets allowing debris to enter and block drainage network.
 4. **Plumstead High Street**: Causes – steep topography, gully maintenance (issue with swan neck inlet gully)



6 Flood Risk Assessment Guidance

6.1 Overview

Applicants and LPAs must consider flood risk to and from proposed developments within all planning proposals. To assess this, applicants should undertake a site-specific FRA (required for developments in Flood Zones 2, 3a, and 3b, and some developments within Flood Zone 1) and/or SuDS Strategy, which should demonstrate that the proposed development will suitably manage different flood risk sources throughout the entirety of the development's lifetime. Table 6-2 provides further guidance on the circumstances where a site-specific FRA is required. The timescale for the lifetime of the proposed development should be identified and justified by applicants in consultation with Greenwich Council. The assumed starting points for assessing the development lifetime are outlined in the 'Flood Risk and Coastal Change' section of the [PPG \(Paragraph 6\)](#).

Applicants must demonstrate that the development will not increase flood risk elsewhere or be at risk of flooding itself, and that developments are appropriately resilient to potential climate change impacts. The site-specific information supplied for any development application should be proportionate to the identified flood risks and appropriate to the development's nature, scale, and location. Complying with the [NPPF](#) and policies from the [London Plan](#) (Policy SI 13) and Greenwich's new Local Plan (Policy EN6) is mandatory. Applicants should also consider the [National Standards for SuDS](#) for developments to reduce local flood risk and to manage runoff.

Applicants must prioritise SuDS when proposing measures to reduce local flood risk and should propose measures that manage runoff as close to the source as possible and contribute to the four pillars of SuDS (amenity, biodiversity, water quality and water quantity). These key principles must be applied at the site level for development proposals and site allocations, and at the strategic level for borough-wide planning.

The designation of land that is likely to be needed for flood risk management and structures will reduce downstream flood risk should they be implemented, which would unlock land downstream for development and maximise the potential for flood storage and conveyance within these developments. Using the planning process to increase flood water storage potential and ensure that SuDS are incorporated within developments feeds into the NFCERM Strategy's discussion of opportunities to boost resilience (see Section 2.2.3).

This section provides guidance on site-specific FRAs for applicants (Section 6.5), and guidance for the LPA on both Development Management (Section 6.6) and Planning Policy (Section 6.7).



6.2 Sequential and Exception Tests

6.2.1 Plan Making

The Level 1 and Level 2 SFRA reports support the development of the Local Plan. While their primary role is to guide site allocations using the sequential approach, they also play a vital part in shaping strategic policies throughout key stages of the Local Plan process, including Regulation 18 and Regulation 19 consultations.

Mapping produced through the SFRA is essential for preparing and submitting Local Plans. It identifies areas at risk of flooding from various sources and informs related policy decisions. The Level 1 and Level 2 SFRA reports are intended to be treated as ‘living documents’, providing ongoing guidance following the adoption of the Local Plan, particularly in response to changes in flood risk or policy.

Additionally, SFRAs can help define the scope of the Sustainability Appraisal during consultation stages. This appraisal, in turn, supports land allocation decisions in line with the Sequential Test. Further details are available in the Guidance on Sustainability Appraisals for Local Plans.

6.2.2 Applying the Sequential and Exceptions Tests

The [NPPF](#) requires that a sequential, risk-based approach to the location of development is applied to avoid the risk of flooding to people and property where possible. The approach must consider all sources of flood risk and the current and future impacts of climate change. Applicants may be required to undertake the Sequential and Exception Tests as part of their site-specific FRA to demonstrate that they have made suitable efforts to steer development towards areas on their site with the lowest flood risk.

The Sequential Test requires that proposed development sites are situated within areas of the lowest flood risk. Alternative sites situated within areas that may potentially be at risk of flooding can only be considered for development if applicants can demonstrate that the wider search area does not contain any other suitable sites at a lower risk level. The ‘wider search area’ is defined as the entire borough extent for this SFRA, although locally defined search area exceptions managed and governed by the LPA exist depending on the type and location of the proposed development. Section 6.5 discusses information on search area exceptions in further detail.

The [NPPF](#) recognises that it may not always be possible for developments to be situated within areas that have a lower flood risk, such as in cases where developments may be proposed within established communities that require continued development to grow. The [NPPF](#) provides the Exception Test for these types of proposals, which is a means of demonstrating and ensuring that there will be satisfactory management of flood risk to people and property whilst permitting necessary development in situations where there are no suitable sites at a lower flood risk available. For the Exception Test to be passed, applicants must



demonstrate that the development passes the two below conditions, in line with [paragraph 164 of the NPPF](#):

- The development would provide wider sustainability benefits to the community that outweigh the flood risk; and
- The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

LPA Development Management officers should note that wider sustainability benefits that could be considered to outweigh flood risk include, but are not limited to:

- An overall flood risk reduction to the wider community through the financial contribution to or provision of flood risk management infrastructure.
- The re-use of suitable brownfield land as part of a local regeneration scheme.
- The provision of multifunctional SuDS that integrate with other green infrastructure.

If a site passes the Exception Test, the applicant should prioritise development in areas of the site which are at a lower flood risk. If a site lacks suitable space for development within a low flood risk zone, less vulnerable use classes should be situated in zones of higher flood risk whilst more vulnerable use classes should be situated in zones of lower flood risk. Additionally, sites with higher flood risk could take measures such as prioritising low vulnerability uses within ground floor development, with higher vulnerability uses on the first floor and above.

Table 6-1 and Section 6.5 provide further guidance on applying the Sequential and Exception Test for developers and applicants. LPA Development Management and Planning Policy guidance on the Sequential and Exception Tests can be found in Sections 6.6 and 6.7.

Figure 6-1 and Figure 6-2 show the approaches that should be taken to Sequential and Exception Tests as discussed within this report, as per the guidance in [Diagram 2](#) and [Diagram 3](#) of the [PPG](#).



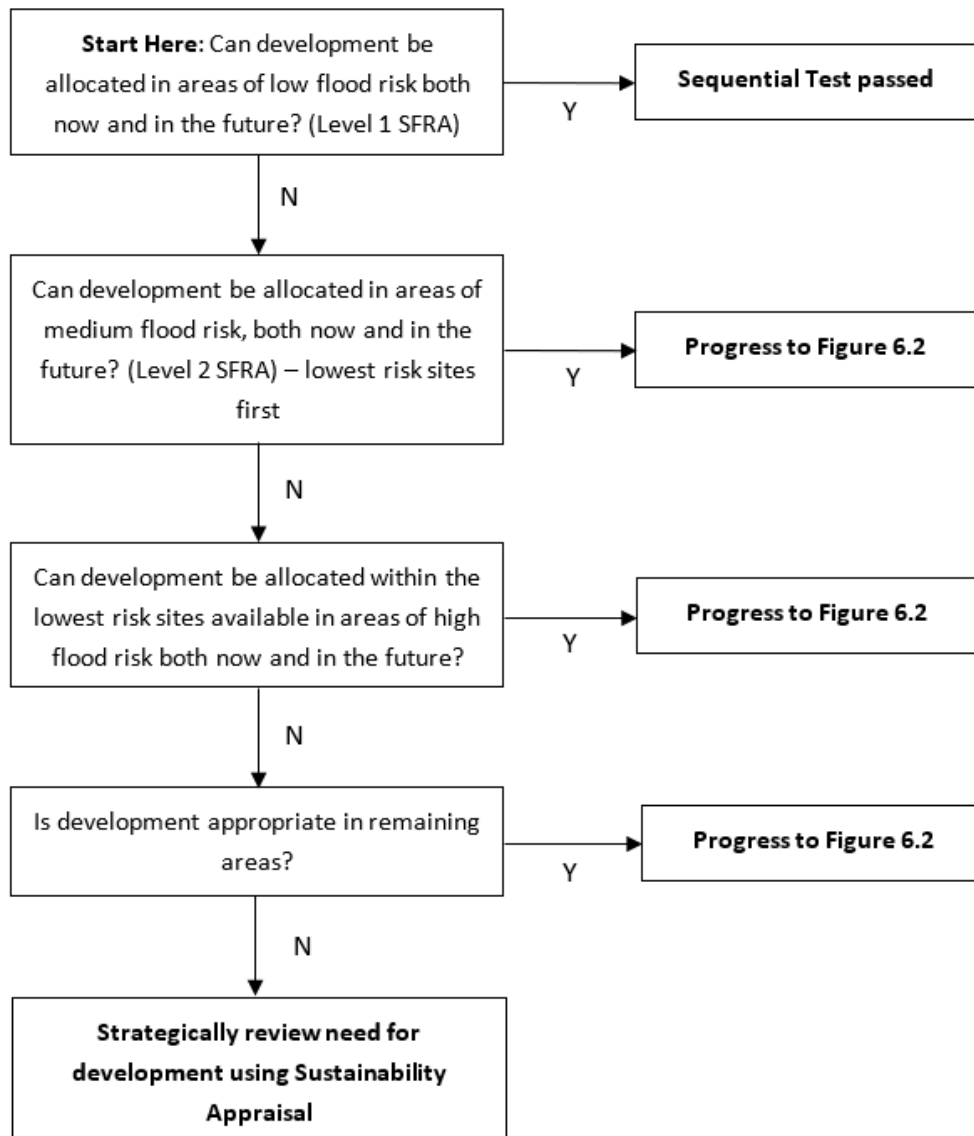


Figure 6-1 Sequential Test Methodology



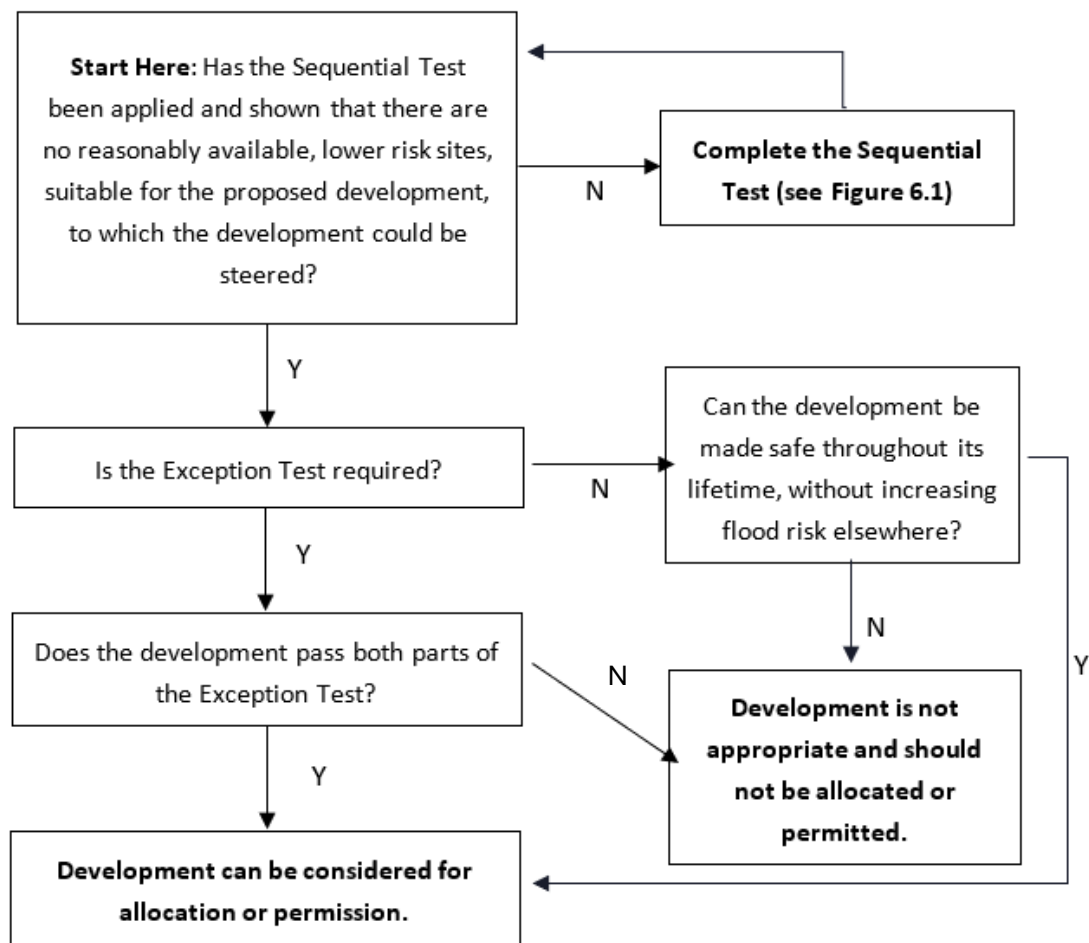


Figure 6-2 Exceptions Test Methodology

6.3 Planning Application and Development Requirements

Under [Section 57 of the Town and Country Planning Act 1990](#), planning permission is required for any work classified as 'development' under [Section 55](#), unless it qualifies as a permitted development. [Planning application definitions \(PPG paragraph 51\)](#) for development types are as below:

Major Developments: For residential developments, over 0.5 hectares or 10+ dwellings. Non-residential developments over at least 1,000m².

Non-major Developments: Below major thresholds but excluding minor development. For example, 8 dwellings, an office building creating 750m² of floor space, or a 0.4-hectare site.

Minor Developments (in relation to flood risk): Minor non-residential extensions (industrial/commercial/leisure etc): extensions with a floorspace not more than 250m². Alterations (developments that do not increase the size of building) and Householder development: for example, sheds, garages, games room etc.



The information presented in Table 6-1 and Table 6-2 are a combination of best-practice and legislative and requirements from various sources including the [PPG](#), the [NPPF](#), the [London Plan](#), and the Local Plan.



Table 6-1 Planning Application and Development Requirements for All Developments (flood Zones 1, 2, 3a and 3b)

Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
Land Uses and Development Restrictions (Information is sourced from the Flood Risk and Coastal Change PPG)	PPG Table 2 (Flood Risk Vulnerability and Flood Zone 'Incompatibility') highlights that planning permission may only be granted to 'Essential Infrastructure' and 'Water Compatible' developments. As the functional floodplain, land in Flood Zone 3b will be protected by not permitting any development on undeveloped sites unless it is for 'Essential Infrastructure' or 'Water Compatible' development. 'Essential Infrastructure' that has passed the Exception Test, and 'Water Compatible' uses, should be designed and constructed to ensure that: - The proposed infrastructure will remain operational and safe in times of flood. - There will not be a net loss of floodplain storage. - Water flows are not impeded. - Flood risk elsewhere is not increased.	Table 2 (Flood Risk Vulnerability and Flood Zone 'Incompatibility') in the PPG highlights that land use is restricted to 'Less Vulnerable', and 'Water Compatible' development. 'Essential Infrastructure' and 'More Vulnerable' development is permitted where the development has passed the Exception Test. 'Highly Vulnerable' developments are not a permitted development type in Flood Zone 3a. Proposals should also demonstrate that essential infrastructure in Flood Zone 3a should be designed and constructed to remain operational and safe during flood events.	The Exception Test is required for 'Highly Vulnerable' development. There are no land use restrictions for all other development types.	There are no land use restrictions in this Flood Zone.
Sequential and Exception Tests (Information is sourced from the Flood Risk and Coastal Change PPG and the NPPE – Refer to Section 6.2 and	The Sequential and Exception Tests do not need to be applied to developments in the following cases: Is a 'minor development in relation to flood risk', including: - non-residential (industrial, commercial, leisure etc.) extensions with a footprint measuring below 250 m². - development that does not increase the building size (e.g. external appearance alterations). - householder development within the existing dwelling's curtilage (e.g. sheds, garages, games rooms), and physical extensions to the existing dwelling itself. - Is a change of use development – excluding caravans, camping, chalet sites, mobile homes, and park home sites.			



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
Section 6.6.1 for specific guidance on the application of these at the site-specific scale)	The Sequential and Exception Tests must be applied for all major developments, non-major developments as detailed below. These developments are defined in Section 6.3.			
	Developments categorised as ‘Essential Infrastructure’ can only be considered after the Sequential and Exception Tests have been applied and passed. Application of the Sequential and Exception Tests do not apply to developments categorised as ‘Highly Vulnerable’, ‘More Vulnerable’, and ‘Less Vulnerable’, as these are not permitted within Flood Zone 3b (see ‘Land Uses and Development Restrictions’ section of this table).	The Sequential Test is required for all developments except for those categorised as ‘Highly Vulnerable’, which are not a permitted development type (see ‘Land Uses and Development Restrictions’ section of this table). ‘Essential Infrastructure’ and ‘More Vulnerable’ developments are required to apply and pass the Exception Test in order to be considered, once they have passed the Sequential Test.	The Sequential Test is required for all development vulnerability types. Developments categorised as ‘Highly Vulnerable’ are required to apply and pass the Exception Test to be considered, once they have passed the Sequential Test.	The Sequential Test does not need to be applied for development proposals in Flood Zone 1, unless the SFRA or other information indicates there may be either current or future flood issues (see Table 6-2).
Site-specific FRA (Information is sourced from the Flood and Coastal Change PPG , the NPPE and Policy E2 of Greenwich’s Local Plan)	A site-specific FRA is required for all development proposals situated in Flood Zone 3b, which must demonstrate compliance with standing advice for all relevant vulnerable development, and Government guidance on flood resilient construction.	All developments in Flood Zone 3a require a site-specific FRA, which must demonstrate compliance with standing advice for all relevant vulnerable development, and Government guidance on flood resilient construction.	All development proposals in Flood Zone 2 require a site-specific FRA, which must demonstrate compliance with standing advice for all relevant vulnerable development, and Government guidance on flood resilient construction.	A site-specific FRA is not required for development proposals located within Flood Zone 1, unless: • There is a total site area measuring above 1 hectare. • The site is situated within an area with critical drainage problems as notified by the EA. • There is evidence of non-fluvial flood risk sources (e.g. surface water,



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
				groundwater, and sewers). There is a change of use to a more vulnerable class.
	An assessment of flood risk from all sources should be undertaken, including the potential climate change impacts that may occur over the development's lifetime. The EA's climate change allowances (created in 2016 and subsequently updated) that were most recently updated in May 2022 (at the time of writing this report in December 2025) must be used when assessing peak river flows, sea level rises and peak rainfall intensities.			
SuDS Strategy <i>(Refer to Section 6.5.2 for further guidance)</i>	A SuDS Strategy is required for all major developments . Minor developments and change of use developments that impact a site's existing drainage regime also are required to provide a SuDS Strategy as part of the proposal. All developments should aim to achieve betterment on the existing drainage situation in accordance with the drainage hierarchy to minimise surface water runoff.			
	To align with the London Plan , the SuDS Strategy must provide details of the proposed SuDS features and the destination of surface water runoff. - To demonstrate that the proposed measures are to be implemented as high up the drainage hierarchy as possible, each stage of the drainage hierarchy should be appropriately assessed with supporting information. Infiltration testing to BRE 365 standards should be conducted, and the outcome of this infiltration testing should be provided where applicable at condition stage. As a minimum, at the discretion of the LPA, a desktop study to assess the feasibility of infiltration should be conducted, alongside a suitable alternative non-infiltration drainage solution also proposed, with on-site testing required through conditioning. - Supporting calculations on the greenfield and proposed peak discharge rates are also required within the SuDS Strategy. - The water storage attenuation volumes that are required to manage runoff for different rainfall events with climate change allowances must also be provided. These calculations must ensure that proposed developments are designed to meet the National Standards for Sustainable Drainage Systems. - The proposals must also include the maintenance and operation requirements of the proposed SuDS features to ensure their lifetime management, in accordance with Written Ministerial Statement HCWS161. For all planning applications that require a SuDS Strategy, a Greenwich SuDS Proforma should also be provided. Applicants should contact TWUL to seek permission to connect to the local sewer network and pipes, including written confirmation that the network has sufficient capacity for their proposal.			
Basements (National Flood Risk Policy Requirement)	Basements should not be permitted in Flood Zone 3b.	The NPPE categorises basement dwellings as 'Highly Vulnerable' infrastructure and should not be permitted within Flood Zone 3a as	As 'Highly Vulnerable' infrastructure, residential basement dwellings proposed in Flood Zone 2	A site-specific FRA is required for new and existing basement dwelling proposals where there is



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
		per the '<i>Land Uses and Developments</i>' section of the Flood Risk and Coastal Change PPG. Other new basement developments are therefore restricted to 'Less Vulnerable' / 'Water Compatible' uses only. These include restricting basements solely to non-residential uses. All basement rooms must have internal access and egress to a higher floor that is situated above the design flood level (1 in 100 years [1% AEP] plus an appropriate climate change allowance) which can be utilised as part of emergency evacuation procedures. All basements, including vents and lightwells that could allow water inundation, must have access thresholds raised 600mm above the design flood level (1 in 100 years [1% AEP] plus an appropriate climate change allowance). Evidence needs to be submitted to confirm the local water table level as part of any assessment.	must apply and pass the Exception Test in order to be permitted. Non-residential basements do not fall under the 'Highly Vulnerable' infrastructure classification and are therefore permitted within Flood Zone 2 without a requirement for the Exception Test to be passed. All basement rooms must have internal access and egress to a higher floor that is situated above the design flood level (1 in 100 years [1% AEP] plus an appropriate climate change allowance) which can be utilised as part of emergency evacuation procedures. All basements, including vents and lightwells that could allow water inundation, must have access thresholds raised 600mm above the design flood level (1 in 100 years [1% AEP] plus an appropriate climate change allowance).	evidence of flood risk from surface water, groundwater and/or sewer flooding sources in the area (See 6.6.2). Flood mitigation measures for these sites must demonstrate that the development will not be impacted by flooding (from all sources) and that the development will not have any adverse impacts on local hydrogeology. Evidence needs to be submitted to confirm the local water table level as part of any assessment.



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
			Evidence needs to be submitted to confirm the local water table level as part of any assessment.	
	A Basement Impact Assessment is required for all basement developments where stipulated by the LPA. It should provide, but is not limited to, the following information: • A detailed geotechnical site investigation. • Site plans outlining the subsurface structure. • Engineering information detailing the potential impacts of the proposed development. • Demonstration that the level of risk posed to neighbouring properties and the wider environment is low. • Detailed borehole information on-site or from nearby to the development site. At least two data recordings should take place within at least a 12-month period to demonstrate any potential seasonal variations. The subterranean measurements should identify the geological conditions on or close to the development site, the infiltration potential, and the height of any local groundwater. • Mitigation of the identified potential impacts of the proposed subsurface development are not acceptable. Flood risk must not be worsened as a result of the proposed development. Examples of flood risk mitigation include, but are not limited to, underground corridors with a high permeability or controlled subsurface structure drainage systems. The Basement Impact Assessment must be carried out by a relevant chartered professional who can carry out the required assessment(s).			
Finished Floor Level (National Flood Risk Policy Requirement)	The required finished floor levels for developments are based upon their Flood Risk Vulnerability Classification. Finished ground floor levels must be set at 600mm above the 1 in 100-year (1% AEP) event (with a suitable climate change allowance) for any new 'Essential Infrastructure', 'Highly Vulnerable', 'More Vulnerable' and 'Less Vulnerable' development, and for any change of use developments that increase the vulnerability classification. There may be a possibility to reduce this to 300mm if there is a high level of certainty about your estimated flood level. If there is a particularly high level of uncertainty it may need to be increased. The EA's 2022 climate change allowances (and subsequent updates) must be used to incorporate the appropriate climate change allowances.			
Flood Compensation Storage (National Flood Risk Policy Requirement)	Permissible developments that decrease fluvial floodplain volume should address flood storage compensation through the following step-approach. This is required within Flood Zone 3a and 3b, and the fluvial flood risk extent for the 1 in 100 year (1% AEP) plus climate change allowance (which covers parts of Flood Zone 2). Step 1 must be followed unless it can be sufficiently evidenced that this is not reasonably practical. Step 2 must be followed if Step 1 is not reasonably practical. This process repeats until Step 4, which is the minimum requirement and is only appropriate if sufficient justification and evidence has been provided.			N/A



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
	1. The development must be situated within the areas of lowest risk on the site, mitigating the need for flood storage compensation. 2. A sequential approach should be applied, with as much of the development as possible being situated within the areas of lowest risk on site. For parts of the development that are not in an area of low risk, supplementary direct volume-for-volume and level-for-level flood storage compensation must be provided. 3. The development must provide direct volume-for-volume and level-for-level flood storage compensation for the entire proposed development. 4. As much of the development as possible must provide direct volume-for-volume and level-for-level flood storage compensation. The development can supplement floodplain compensation with voids as a last resort measure, discussed in the subsequent row of this table. The EA's 2016 climate change allowances (including subsequent updates) must also be incorporated to assess and calculate floodplain storage compensation. Section 6.5.4 outlines flood storage compensation in further detail.			
Voids (National Flood Risk Policy Requirement)	Voids will only be considered if an applicant has followed the flood storage compensation stepped approach outlined in the above row of this table and provided sufficient justification within an FRA. Introducing voids may be a suitable alternative only if permissible development decreases a fluvial floodplain's volume and flood compensation storage cannot be provided. Voids should not usually be relied upon for floodplain compensation and are to be used as a last resort for flood storage mitigation. Voids may be suitable where achieving all the direct compensation required is not possible, or where small-scale developments can find difficulty in achieving full compensation. There is usually enough space for the below provision of voids when setting finished floor levels at 600mm above the design flood level (1 in 100 years [1% AEP] plus a suitable climate change allowance). <u>If considering voids, the below mitigation specification must be followed:</u>		N/A	N/A



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
	1. The void openings should open from existing ground levels, and the proposed void's underside should be set to a minimum of the 1 in 100-year (1% AEP) event (plus a suitable climate change allowance) flood level. 2. Void openings should be provided along all external walls, and a minimum of 1m of open void length per 5m length of wall should be provided. 3. 10mm diameter vertical bars set at 100mm centres can be incorporated into the void openings where security issues arise. Voids should only be used if the LPA are satisfied that they can be maintained for the lifetime of the development. To ensure they remain open for the development's lifetime a legal agreement or planning condition and maintenance plan will typically be required for the use of under-floor voids. Different design criteria may be acceptable for small-scale development. On undeveloped sites, it is not acceptable for the use of under-floor voids to be relied on solely to address the loss of floodplain storage capacity.			
Impedance of Flood Flows (National Flood Risk Policy Requirement)	Features that may obstruct flows from all sources of flood risk including embankments, raised land, walls, and fencing, should be minimised or removed to ensure that flood risk is not increased on-site or off-site. This could be achieved by providing openings to allow water to flow through structures (such as through permeable fencing), or through relocating these obstructions.			
Emergency Planning (Information is sourced from the Flood Risk and Coastal Change PPG)	All Major Developments must incorporate measures that effectively manage residual and actual flood risk. Where the site is on a 'dry island' (area within a flood risk area that is surrounded by areas at higher risk of flooding) but not necessarily at high risk itself, an emergency plan must still address this risk and provide safe access and egress should a flood event occur. These measures should be designed for the lifetime of the development, with climate change impacts factored in. The location of dry islands within Greenwich can be found on the online web maps. If the planning application is permitted, the onus to train, test and implement the stated measures become the responsibility of the applicant and ultimately the building owner, management company, or the adopter of a site for temporary use.			
	'Essential Infrastructure' and 'Water Compatible' use development as defined in the Flood Risk and Coastal Change PPG must remain operational and safe in times of flood. As these structures may assist in	'Essential Infrastructure' use development as defined in the Flood Risk and Coastal Change PPG must remain operational and safe in times of flood. As these structures	N/A	N/A



Requirement Area	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1
	flooding evacuations, Emergency Plans must reflect this.	may assist in flooding evacuations, Emergency Plans must reflect this.		
Residual Risk (Information is sourced from the Flood Risk and Coastal Change PPG)	The Exception Test requires demonstration that proposed developments will be safe for their lifetime, and that they can satisfactorily overcome any residual risks. Residual risk should be mitigated through flood resilient and flood resistant designs, alongside emergency planning measures (including the provision of safe access and escape routes and flood warnings) to ensure that suitable measures are in place to offer protection.			
Main River Buffer Zone (National Flood Risk Policy Requirement)	Developments should be set back from tidal rivers (including their associated riverbanks, culverts, and existing flood defence infrastructure) by sixteen metres. Building on top of existing main river culverts will not be permitted. Where culverts are present on site, the restoration of culverted watercourses to open channels should be actively pursued. A Flood Risk Activity Permit may be required in addition to planning permissions for developments sites situated within specified distances of main rivers. Flood risk activity permits may be required for non-tidal main rivers if development sites are situated within eight metres of a main river, riverbank, flood defence structure or culvert. The EA holds additional details on obtaining Flood Risk Activity Permits.			
Ordinary Watercourse	In addition to planning permissions, an approved ordinary watercourse consent is required for development sites that are situated within 6m of ordinary watercourses due to their potential to obstruct flow.			



Table 6-2 Planning Application and Development Requirements for Individual Sites (Other Flood Risk Sources)

Flood Risk Source	Planning Application and Development Requirements
Groundwater Flooding	For all major and minor development proposals where there is a risk of groundwater flooding (where the development site intersects with an area where there is potential for groundwater flooding to occur at surface or of property situated below ground level), the applicant is required to address this issue by carrying out a screening study (as a minimum) to establish whether any subterranean flood risk issues exist that may necessitate further investigation. The screening study should either advise of the potential impact level and the associated mitigation actions proposed if the risk level is high or confirm that no further work is needed if the potential impacts risk level posed by the proposed development is low. The study and any other associated assessments should be prepared by a chartered professional or specialist. These include geologists, hydrogeologists, and geotechnical specialists. Screening Assessments for developments that include a basement are required to include the following as a minimum: • Description of the proposed basement development. • The proposed construction methods. • Site characteristics, including topography and geology (superficial deposits, bedrock, and aquifer confirmation). • Site borehole information with water levels. If historical borehole data is used, the borehole location must have been conducted within the last 20 years and be situated within 100m of the site to capture the current local conditions most accurately. As throughflow and groundwater flow may be subjected to seasonal influences, singular borehole measurements may not provide accurate information on how subterranean conditions may vary throughout the year. It is therefore necessary to monitor subterranean water levels over a period of time in areas that may be more susceptible to groundwater and throughflow. • Details of potential impacts (including on water quality, hydrology, soils, and land use), with descriptions of the scale and nature of impacts, and the impacted area's extent. • Details of mitigation measures (where appropriate). The Groundwater, Sewer and Artificial Flood Risk web map provides further information on the $\geq 25\%$ groundwater susceptibility.
Sewer Flooding	For all major and minor development proposals, the applicant must consult with TWUL to confirm whether flooding has occurred on the site historically where the development site intersects with an area that has one or more records of sewer flooding. Where historic flooding has occurred, the applicant must demonstrate how they will effectively manage this risk for the lifetime of the development. Where the site is not at risk of sewer flooding, the applicant must provide proof that TWUL has agreed in principle to any proposed new sewer connections.



Artificial Sources Flooding – Reservoirs	For all major and minor development proposals where the application site intersects the area defined to be at risk of flooding from reservoirs, the applicant must: • Identify the reservoirs that are the risk sources using the Groundwater, Sewer and Artificial Flood Risk web map • Include information describing how the proposed risk management measures address the implications of sites which are encircled by flood water but are not necessarily at direct risk. • Propose risk measurement measures that are proportionate and appropriate.
Artificial Sources Flooding – Other	For all major and minor development proposals, the applicant must identify where other sources of artificial flood risk (including ponds or small lakes) exist within or immediately adjacent to the development site. The applicant must also propose appropriate risk management measures.



6.4 Water Framework Directive (2000)

The [Water Framework Directive 2000 \(WFD\)](#) is a European Directive which introduced a strategic planning process to protect, manage and improve the water environment. The WFD was transposed into UK law through [The Water Environmental Regulations 2003](#). Greenwich has a responsibility to manage the requirements of the WFD. The requirement of the directive is that all waterbodies in the UK must achieve a "Good" ecological status by 2027. The definition of a waterbody's status is a complex assessment, taking into account water quality standards and ecological requirements. "Good" status for a waterbody means that it is in a condition of good ecological quality, with little deviation from the natural, undisturbed condition. This is defined in Table 6-4. The WFD also assesses chemical status, which is calculated by reviewing 52 different chemical elements (individual and groups of chemicals). Water bodies are classified as good or failing.

Developments must ensure that any water discharged into a waterbody would not degrade the waterbody status to ensure the water quality is maintained. The current ecological and chemical status of waterbodies can be found in the [EA data mapping](#) and in Table 6-3.

Table 6-3 : Watercourses WFD Status

River	WFD Ecological Status	WFD Chemical Status
Ravensbourne (Catford to Deptford)	Moderate	Fail
Pool River	Moderate	Fail
Ravensbourne (Keston to Catford)	Moderate	Fail
Marsh Dykes	Moderate	Fail
Shuttle Water Body	Moderate	Fail
Thames	Moderate	Fail

Table 6-4 Ecological Status definitions

Classification	Description
High	Natural or almost natural state with no, or only minor evidence of distortion.
Good	Slight change from natural state as a result of human impact.
Moderate	Moderate change from natural state as a result of human impact.
Poor	Major change from natural state as a result of human activity.



Classification	Description
Bad	Severe change from natural state as a result of human activity.

6.5 Planning Applicants

This section sets out specific guidance on the key flood risk management requirements for planning applications, providing information to ensure that development proposals are compliant.

6.5.1 Application of Sequential and Exceptions Tests

It is essential to implement a sequential, risk-based approach in determining site suitability for development in relation to flood risk. This SFRA document provides the basis for applying the Sequential Test (and in some instances, the Exception Test) at a site-specific level for proposed development sites that require the application of these tests.

Proposed development sites that are situated within multiple flood risk zones are classed under the highest risk Flood Zone that is present on site. For example, a site that falls partially within Flood Zone 1 and partially within Flood Zone 2 is formally classified as a site in Flood Zone 2. The Flood Zone in which each proposed site falls helps to inform the approach required for the site and the information needed for the planning application. The Sequential Test must be applied to steer development on the entire proposed site to the areas with the lowest risk of flooding. Where the Exception Test is required, the application is based on the highest Flood Zone in which the site is situated and will need to be passed for the planning application.

Sequential Test

The Sequential Test ensures that new development is steered towards areas with the lowest probability of flooding through following a sequential approach. A site-specific Sequential Test is necessary for sites that require this test but have not undergone Sequential Testing as part of the site allocations identified in Greenwich's new Local Plan. The search area and definition of reasonably available alternative sites must be established in line with the guidance below, in consultation with the LPA. Any scope should be shared with the LPA for review and agreement ahead of undertaking the Test. The scope is not limited to, but should include the following points:

Search area: The default area should be the entire borough but can be reduced where agreed with the LPA and justified by the relevant objectives of the Local Plan or the development's functional requirements. Examples of these include:



Local Plan objectives: The regeneration of a specific area may be targeted based on the objectives detailed in the Local Plan.

Functional requirements: Infrastructure or industrial developments that may service an area beyond Greenwich's borders. Developments which only service part of the borough, for example a school or GP practice which service a specific catchment area.

Reasonably available sites: These typically include sites that are suitable (in which applicants can accommodate a proposed development's requirements), developable, and deliverable. As per [Paragraph 28 of the Flood Risk and Coastal Change PPG](#), sites do not need to be owned by the applicant to be considered 'reasonably available'. These sites could be selected from various sources, including the following:

- A list of sites that has been prepared as part of the evidence base or background documents produced to inform the Local Plan.
- Sites that are listed under a Local Authority's brownfield land register, which provides information on the previously developed sites that are appropriate for residential development and includes sites with and without planning permission.
- Following the September 2025 update the definition of reasonable available sites must now meet the same development needs as the original site, no longer require applicants to consider part of a larger site.

Exception Test

Application of the Exception Test should be taken if it is concluded, following the application of the Sequential Test that the proposed development can't be situated within an area of lower flood probability. The Exception Test is designed to help ensure that flood risk to people and property will be managed across the proposed development's lifetime. The [PPG](#) outlines two considerations that must be achieved in order to pass the Exception Test, with satisfactory demonstration of both considerations to the LPA being necessary for the development to be allocated or permitted. The considerations are:

- The development provides wider sustainability benefits to the community that outweigh flood risk (informed by a SFRA where one has been prepared); and
- The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Evidence demonstrating the wider sustainability benefits that the development would bring at the specific site must be provided for the development proposal to



satisfy the Exception Test. This may include demonstrating the re-use of sustainable brownfield land as part of a local regeneration scheme, or the provision of multifunctional SuDS which integrate with other green infrastructure. This would enable [NPPF](#) Policy requirements for SuDS, such as seeking to achieve greenfield runoff rates and volumes, to be significantly exceeded. The planning and design of the development must demonstrate that flood risk elsewhere will not be increased due to the development, and that the site will remain operational and safe during a flood event. This may involve:

- Designing buildings to avoid flooding, including through raising floor levels.
- Implementing resilient and/or resistant features to reduce a flood's impact. Resilient features are designed to ensure that a property's internal elements can be recovered quickly and at a low cost and include the installation of electrical equipment above flood levels. Flood resistant features are designed to ensure that water up to a given height does not enter a property and include the installation of flood doors and barriers.
- Utilising SuDS as a priority, especially where they can manage flood risk above the usual standard and beyond the proposed site through removing surface water from existing combined sewers.
- Mitigating the potential impacts of flooding through design and application of a sequential approach within the development site, including ensuring that more vulnerable development is situated within the parts of a site that are at a lower flood risk, and incorporating flood resilient and resistant construction.
- Increasing space for the flow and storage of flood water, through incorporating green infrastructure within the development's layout and form. This should achieve other benefits such as urban cooling, minimising water pollution, and improving biodiversity.
- Developing emergency evacuation procedures, which should be considered within the proposed development's design and layout alongside the flood warnings and/or flood alerts.
- Providing or making contributions to flood risk management infrastructure that will increase benefits to existing communities and/or by safeguarding the land required to deliver it.
- Leaving space within developments for flood risk management infrastructure to be maintained and enhanced.
- Providing adequate flood risk management infrastructure that will be maintained during the development's lifetime.



- Not increasing the built footprint size or only doing so through undertaking the appropriate flood compensation methods as detailed in Table 6-1.

For a proposal to develop a Local Plan site allocation within a flood risk area, the specific Exception Test guidance should be used which is set out in the SFRA Level 2 Report and Figure 6-2.

The PPG [Flood Risk Vulnerability and Flood Zone Incompatibility](#) table sets out some circumstances in which the Exception Test must be applied following the Sequential Test.

Application Exceptions

Paragraph 168 of the 2024 [NPPF](#) highlights the planning application exceptions to Sequential and Exception Tests. Minor developments and change of use development proposals that fall under one of the following criteria should not be subject to the Sequential and Exception Tests:

- Householder developments within the existing dwelling's curtilage.
- Small non-residential extensions (with a footprint below 250m²).
- Change of use developments (except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site).
- Development proposals that fall under one of these criteria should still meet the requirements for site-specific FRAs as set out in this SFRA, the [NPPF](#) and the accompanying PPG.

6.5.2 SuDS Strategies

Where a site-specific FRA is not required, it may still be necessary to provide evidence of how surface water runoff generated by the proposed development will be managed. In such cases, a separate SuDS Strategy should be prepared. This strategy should demonstrate how surface water runoff could impact both the site and surrounding areas following development.

The SuDS Strategy must include comprehensive details of all the proposed drainage features, such as dimensions, cover and invert levels. It should explain how these features will improve existing runoff conditions. It should also set out long-term arrangements for the management and maintenance of the drainage system.

A SuDS strategy is required for:

- All major developments, including those located on sites with a history of surface water flooding or those identified as being at risk
- Minor developments



- Change of use developments where the surface water drainage regime will be modified

The SuDS Strategy must:

- Demonstrate how surface water is expected to behave in the site, accounting for topography, underlying geology, and the existing/proposed drainage infrastructure.
- Assess the site's infiltration potential, existing and proposed runoff rates, and the surface flow pathways.
- Incorporate a suitable allowance for climate change.
- Confirm that the proposed development will not increase flood risk to adjacent or downstream areas.
- Include a completed SuDS Proforma.

The primary objective of the SuDS Strategy should be to achieve greenfield runoff rates and volumes as per the [London Plan](#) Policy SI13. Where this is not feasible, the opportunity to meet the standard shall be maximised and supported by clear justification for why greenfield targets cannot be met. This requirement helps to mitigate the cumulative impact of a development on flood risk, which can arise from increased pressure on drainage infrastructure and a reduction in surface permeability.

Further SuDS requirements and implementation to address the impact of future growth can be found in Section 6.5.3.

6.5.3 Sustainable Drainage Systems (SuDS)

To comply with Policy EN6 (Flood Risk and Sustainable Drainage) of the Greenwich Local Plan, the [National standards for sustainable drainage systems](#), and Policy SI 13 (Sustainable Drainage) of the [London Plan](#), all proposed developments must incorporate a range of effective Sustainable Drainage Systems (SuDS) measures into the layout and design of the scheme.

SuDS features should be used to manage surface water runoff as close to the source as possible, reducing both the volume and rate of runoff, and helping to mimic natural hydrological processes. A variety of attenuation and source-control features (such as green roofs, swales, rain gardens, and permeable paving) should be incorporated to manage rainfall sustainably and provide additional benefits such as biodiversity enhancements and urban greening.

Developments on greenfield and brownfield sites must ensure that post-development surface water runoff rates and volumes do not exceed greenfield conditions ([London Plan](#) Policy SI13). Where this is not feasible, the opportunity to



meet the standard shall be maximised and supported by clear justification for why greenfield targets cannot be met.

SuDS must be designed in accordance with:

- The London Sustainable Drainage Action Plan (LSDAP)
- CIRIA guidance, including the SuDS manual and Guidance on the Construction of SuDS
- [The National Standards for SuDS](#)

All planning applications must clearly set out the proposed SuDS measures and demonstrate how these connect to the wider drainage network, particularly if infiltration-based methods are not feasible for the site. In line with Policy SI 13 of the London Plan, applicants must show adherence to the drainage hierarchy, which prioritises sustainable methods of managing rainfall. Surface water management methods higher up the drainage hierarchy should be incorporated as a first priority:

1. Rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. Rainwater infiltration to ground at or close to source
3. Rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. Rainwater discharge direct to a watercourse (unless not appropriate)
5. Controlled rainwater discharge to a surface water sewer or drain
6. Controlled rainwater discharge to a combined sewer

Where information is available on the site's geology or soil characteristics, potential opportunities or limitations for infiltration SuDS should be identified. If infiltration is not proposed, despite it being potentially feasible, site-specific evidence must be provided, including borehole logs or infiltration test results, to justify the proposed approach.

Following the implementation of Schedule 3 of the Flood and Water Management Act (FWMA) 2010, a SuDS Approval Body (SAB) will be responsible for assessing and approving drainage systems associated with applicable developments. Approval will be required before construction begins, and drainage designs must comply with new national SuDS standards. The SAB will evaluate applications based on their alignment with the drainage hierarchy, performance standards, and ability to manage flood risk and water quality, while also delivering biodiversity and amenity benefits. Further details on Schedule 3 can be found in Section 2.4.1.



Not all developments will significantly alter flood risk or the existing drainage regime. For instance, minor schemes that do not increase the built footprint or modify the landscape. However, all developments must demonstrate compliance with Policy SI 13 of the London Plan and Policy EN6 of Greenwich's new Local Plan, showing that surface water discharge is equal to greenfield rates.

Where improvements to drainage are not feasible on-site, developers should still consider potential wider flood risk impacts, and opportunities to enhance drainage systems should be explored where possible. For further guidance, refer to Table 6-1 or contact Greenwich's LLFA for site-specific advice.

6.5.4 Flood Storage Compensation and Mitigation

In Greenwich, developments proposed within the floodplain must be designed to ensure that they do not reduce natural ability of the floodplain to store water during flood events. The construction of buildings, structures, or the raising of ground levels can displace floodwater, increasing flood risk to nearby land and properties by forcing water elsewhere.

To mitigate this risk, any loss of floodplain storage must be directly compensated on a 'level for level' and 'volume for volume' basis. This means that for every volume of floodplain lost to development, an equivalent volume must be created at the same height intervals, extending from the lowest point of ground disturbance up to the 1 in 100-year (1% Annual Exceedance Probability) flood level, including an appropriate climate change allowance, as defined in current national guidance.

The preferred method of mitigation is level-for-level floodplain compensation, as it provides the most reliable and sustainable means of preserving flood storage. Alternative approaches, such as the use of voids beneath buildings or raising structures on stilts, are generally discouraged due to the long-term risks of blockages from silt, debris or storage of domestic materials, which can significantly reduce their effectiveness overtime.

Where level-for-level compensation is not feasible, alternative mitigation measures may be considered, subject to agreement with Greenwich and its Local Planning Authority and LLFA. In such cases, a detailed Flood Risk Assessment (FRA) must:

- Demonstrate that level-for-level compensation was explored and explain why it is unachievable.
- Provide a robust justification for the alternative approach.
- Identify how the chosen mitigation will manage flood risk effectively.
- Outline any measures to reduce the likelihood of mitigation failure.



Voids must be floodable if proposed as an alternative form of mitigation in worst-case scenarios, with the level of the void's underside being above the 1 in 100-year (1% AEP) flood level (with a suitable climate change allowance). The LPA must also be satisfied that an adequate maintenance plan is in place to ensure the voids remain open for the development's lifetime and that they can enforce a condition to maintain the voids as designed.

Applicants should alter their development proposals to ensure that the built footprint does not increase in size if the LPA are unsatisfied that alternative mitigation measures are appropriate. Refer to Table 6-1 for further guidance on floodplain compensation and acceptable mitigation approaches in Greenwich.

6.6 Local Planning Authority – Development Management

This section details the Development Management specific guidance to ensure effective evaluation and assessment of the key requirements for individual planning applications. Development proposals should be assessed within the context of the broader flood risk management strategy. The guidance below accompanies the information presented in Table 6-1. CDA's and the Catchments and Sub-Catchments identified highlight locations where SuDS may be particularly suitable. These designations can help assess the feasibility of proposed schemes and support strategic planning.

6.6.1 Application of Sequential and Exception Tests

To determine site suitability for development in relation to flood risk, a sequential, risk-based approach must be applied. Section 6.5.1 outlines guidance for applicants on how to apply the Sequential and Exception Tests. LPAs are required to provide evidence that the Sequential Test (and the Exception Test where necessary) have been applied to proposed development sites. LPAs must then assess whether the criteria of these tests have been satisfied.

This SFRA document, along with the accompanying flood risk maps provided, gives a foundation for the site-specific application of these tests. In London, planning guidance has elevated certain considerations in development prioritisation. The [London Plan \(2021\)](#) highlights the importance of small site developments in meeting housing targets (See Policy H2: Small Sites). Additionally, a sequential approach should be adopted for developments in town centres, in line with Policy SD7: 'Town Centres- Development Principles and Development Plan Documents'. These factors should be integral to borough-level decision-making when assessing new development proposals.

6.6.2 Site-specific Flood Risk Assessments

A site-specific FRA must demonstrate how flood risk will be managed both now and throughout the lifetime of the proposed development. It should consider the vulnerability classification of the development and the projected impacts of



climate change. An FRA is required for planning applications in the following scenarios:

- All developments that are within Flood Zones 2 and 3 including changes of use, minor developments (e.g. extensions exceeding Permitted Development Limits), and property sub-divisions (as defined by Section 55 of the Town and Country Planning Act 1990).
- Developments in Flood Zone 1 that cover an area of 1 hectare or more.
- Proposals involving a change of use to a more vulnerable classification, or where the site may be affected by flooding from sources other than rivers or the sea.
- Proposals that may alter the site's drainage regime or increase vulnerability to non-fluvial flood sources.

Development Management should refer applicants to this SFRA and the flood mapping (to identify key flood risk areas that may affect proposals. Under the [Town and Country Planning \(Development Management Procedure\) \(England\) Order 2015](#), LPAs must consult the EA for developments at risk of fluvial flooding before granting planning permission. The [PPG](#) site-specific [FRA checklist](#) and the [EA's Standing Advice](#) offer further support in reviewing FRAs.

6.6.3 SuDS Strategies

Applicants may be required to submit a SuDS Strategy to demonstrate how surface water runoff will be managed and how it may affect the site and surrounding areas. A SuDS Strategy is mandatory for:

- All major developments
- Minor developments and change of use proposals that alter existing surface water drainage.

All major development proposals that have been identified as requiring a SuDS Strategy will also need to provide a completed SuDS Proforma, which requires applicants to demonstrate:

- Project & Site Details – Details of the existing site, the existing drainage system, and the proposed development.
- Proposed Discharge Arrangements – Details regarding the site's infiltration feasibility, the use of the Drainage Hierarchy (based on Policy SI 13 of the current London Plan), and the proposed surface water discharge method.
- SuDS Strategy – Details of the greenfield, existing brownfield (where relevant), and proposed discharge rates for 1 in 1 (100% AEP), 1 in 30 (3.3% AEP), and 1 in 100 year (1% AEP) (plus a 40% climate change



allowance) return periods. This section also requires information regarding the proposed SuDS measures, their proposed catchment areas, and their proposed storage capacities.

- Supporting Information – Details regarding the evidence and supporting information for the information provided in the Proforma’s previous sections, including the proposed maintenance approaches.

The strategy and proforma must demonstrate significant betterment in surface water runoff rates to mitigate cumulative flood risk impacts. Applications should also refer to the National standards for sustainable drainage systems (SuDS) (2025). The document’s standards, which an application should refer to, include:

1. Runoff destinations
2. Management of everyday rainfall (interception)
3. Management of extreme rainfall and flooding
4. Water quality
5. Amenity
6. Biodiversity
7. Design of drainage for construction, operation, maintenance, decommissioning and structural integrity

The standards should be used when assessing the SuDS Strategy and its accompanying SuDS Proforma submitted with planning applications.

6.6.4 Sustainable Drainage Systems (SuDS)

All developments should incorporate sustainable drainage systems (SuDS) measures in accordance with DEFRA’s National standards SuDS and Greenwich’s new Local Plan (Section Greenwich Local Plan 2.4.1). With the upcoming implementation of Schedule 3 of the FWMA in England, the anticipated forthcoming SAB will be responsible for approving new developments. Approval will be contingent on the inclusion of SuDS features designed to the required standards (Section 6.6.3).

Since 2015, LLFAs have been statutory consultees for major planning applications. The associated Written Ministerial Statement HCWS161 together with the London Plan highlights the importance of incorporating SuDS into development proposals. LPAs are therefore required to consult LLFAs for technical advice and expertise regarding surface water management before a decision on major planning applications can be reached, under the Town and Country Planning (Development Management Procedure) (England) Order 2015. SuDS are considered a ‘material planning consideration’ for all major developments, as stated in Written Ministerial Statement HCWS161 and evidence of their implementation is required to ensure



safe and sustainable surface water management. Further guidance on material planning considerations and the planning decision process is available at the [Determining a Planning Application](#) page.

6.7 National Flood Risk Standing Advice

The [National Flood Risk Standing Advice](#) provides specific guidance on when LPAs should apply standing advice or consult the EA and LLFAs regarding planning applications and site-specific FRAs. This guidance applies to various application types, including full, outline, reserved matters, change of use, prior approvals, permission in principle, and technical details consent. LPAs must ensure applicants have followed the [standing advice for vulnerable developments](#) with the following vulnerability classifications:

- ‘Water Compatible’ (including essential accommodation situated within a development defined as water compatible).
- ‘More Vulnerable’ (if the development is not a caravan site, a camping site, a waste facility site, or a landfill).
- ‘Less Vulnerable’ (if the development is not a water or sewage treatment plant, a waste treatment site, or a mineral processing site).

Key requirements for the relevant vulnerable developments include:

- Finished floor levels at least 600mm above the higher of the site’s average ground level or adjacent road/flood level.
- Floor levels can be reduced to 300mm if there is a high level of certainty about your estimated flood level
- Where this is not feasible, additional flood resistance/resilience measures must be incorporated, and vulnerable uses relocated to upper floors.
- Flood resilience plans should follow the [CIRIA Property Flood Resilience Code of Practice](#), and the [standards for the installation and retrofit of resistance measures](#) should be followed.
- Emergency plans must comply with [Flood Risk Emergency Plans for New Development guidance](#), ensuring safe access and egress routes are provided, that people are not exposed to hazardous flooding and residual risks have been incorporated.
- SuDS must be incorporated into all developments involving surface water drainage in flood risk areas and major developments involving surface water drainage.
- For developments classified as ‘minor extensions’, LPAs should ensure that applicants have followed the [standing advice for minor extensions](#).

LPAs should ensure that the standing advice has been followed and should consult the LLFA for major developments on surface water drainage matters. LPAs should consult the EA if a proposed development is not categorised as minor and is situated within Flood Zone 1 but within 20 metres of a main river or are identified by the EA as having critical drainage problems. LPAs should also contact applicants to confirm whether they require a separate permit or consent, which may be needed if the development is situated within 20 metres of



a main river (or flood defence or flow control structure) and/or if it directly affects a watercourse that is not a main river. The LPA should direct the applicant to the appropriate [guidance](#) regarding this additional permit or consent.

Further details of standing advice for LPAs can be accessed on the associated [guidance webpage](#).

6.8 Emergency Planning

Under the [Civil Contingencies Act 2004](#), Greenwich is classified as a Category 1 Responder. This designation requires the borough to evaluate potential risks and take appropriate action in the event of an emergency, including major flooding incidents.

The Borough's responsibilities under the Act include:

- Assess the risk of emergencies occurring and use this to inform contingency planning
- Put in place emergency plans
- Put in place business continuity management arrangements
- Put in place arrangements to make information available to the public about civil protection matters and maintain arrangements to warn, inform and advise the public in the event of an emergency
- Share information with other local responders to enhance co-ordination
- Co-operate with other local responders to enhance co-ordination and efficiency
- Provide advice and assistance to businesses and voluntary organisations about business continuity management (local authorities only)

Section 5 of this Strategic Flood Risk Assessment (SFRA), along with the associated Web Maps, should be used by the [Greenwich Emergency Planning and Business Continuity Team](#) to support response planning in accordance with the [Civil Contingencies Act 2004](#). This information can help tailor emergency planning to reflect specific risks and geographical areas.

6.9 Assessment of Local Plan Policies

Greenwich Council's new draft Local Plan follows on from the 2014 Local Plan mentioned in Section 2.4.1. The key differences related to flood risk in the new Local Plan are as follows:

Highly Vulnerable Uses

- Policy EN6 explicitly prohibits highly vulnerable uses (e.g. sleeping accommodation, basement dwellings) in Flood Zone 3 and Critical Drainage Areas. The old plan did not state an outright ban but required robust mitigation.

Surface Water Flooding



- Policy EN6 requires all developments to reduce surface water flood risk, the previous policy focused on managing residual risk and safeguarding floodplain function rather than requiring reduction for all developments.
- Regulation 19 Policy EN7 strengthens sustainable drainage requirements by requiring major developments to incorporate multifunctional SuDS, seek greenfield runoff rates where feasible, consider rainwater harvesting and similar measures, and ensure basement developments connected to the sewer network use positive pumped devices.



7 Recommendations

7.1 Overview

Climate change has been widely recognised as the most influential factor contributing to increased flood risk across the UK. Alongside this, key influences such as increasing urban development are likely to worsen flood risk, particularly within cities. This is due to the reduction of permeable surfaces, leading to a greater likelihood of surface water flooding.

The growing demand for housing in urban areas is resulting in more developments being proposed within higher-risk Flood Zones, therefore increasing their vulnerability classification. To address flood risk mitigation while supporting housing development, targeted local policies should be employed to manage the influence of future growth on flood risk. A sequential, risk-based approach to the location of development should be applied as per the [NPPF](#) and the accompanying [PPG](#) to avoid potentially subjecting people and property to flood risk whilst considering the impacts of climate change. Furthermore, Policy EN6 (Residual Flood Risk) of Greenwich's new Local Plan (2025) identifies the increasing need to ensure that new developments incorporate climate change impacts into their location, design, and layout to ensure that they are fully adapted and resilient. Greenwich's site-specific policy recommendations detailed in Section 7.6 are underpinned by Local Plan Policy in conjunction with the evidence base presented in this SFRA.

7.2 Impact of Future Growth on Flood Risk

Each LPA's ten-year housing targets are set out within the current [London Plan](#) (2021) for the period from 2019/20 to 2028/29 to help meet future growth demands. These housing targets are set in line with the London Plan Policy H1 'Increasing housing supply', which outlines the actions and requirements to help ensure that these ten-year housing targets are met by LPAs. The [London Strategic Housing Land Availability Assessment](#) (2017) is part of the London Plan evidence base and forms the basis for these housing targets.

Under [London Plan](#) Policy H1, Greenwich has a ten-year net housing completion target of 28,240 homes. This is one of the highest targets among London boroughs due to its strategic growth areas such as Charlton Riverside, Woolwich Town Centre, Thamesmead and Abbey Wood, and Kidbrooke.

[London Plan](#) Policy H2 emphasizes the importance of small sites (under 0.25 hectares) in contributing to housing delivery. Greenwich is expected to deliver a significant portion of its housing target through small sites, although the exact number allocated to small sites is not specified in the documents currently available.

The [London Plan](#) recognises the particularly high risk of surface water flooding that London faces, primarily due to the extensive coverage of impermeable surfaces throughout the city. This high surface water flood risk could be exacerbated further through the delivery of the projected housing targets for the ten-year period, due to associated increases in impermeable surface area. To address this, [London Plan](#) Policies SI 5 'Water infrastructure',



SI 12 ‘Flood risk management’, and SI 13 ‘Sustainable drainage’ outline the requirements to manage and mitigate flood risk whilst considering the requirement for delivering additional housing. The policy requirements match those for Flood Zone 3a (fluvial), helping to manage surface water flood risk across Greenwich whilst addressing the Borough’s need for additional housing. The potential future inclusion of a surface water designation within Flood Zones 3a and 3b, which is recommended in Section 7.6.1 would help to further manage the higher surface water flood risk across Greenwich. Section 5.1 and Section 6.3 provide further information on the Flood Zones and relevant guidance, respectively.

The [PPG](#) and [NPPF](#) acknowledge the increasing development across the country and its implications for flood risk. Both documents require that all new developments demonstrate that they will remain safe for their entire lifespan and not exacerbate flood risk elsewhere.

According to the [PPG](#):

- Residential developments are expected to have a minimum lifespan of 100 years, unless a specific justification is provided.
- Non-residential developments typically have a lifespan of at least 75 years, although this may vary depending on the nature of the development.

As the number of properties continues to grow, developments must also show how they can contribute to reducing overall flood risk wherever feasible. It is therefore crucial to mitigate the impacts of future growth on flood risk to meet these requirements and align with the policies and guidance outlined in Section 2.

To support this, funding contributions should be directed towards the development and implementation of strategic flood risk infrastructure schemes. These contributions may include:

- Planning obligations under [Section 106 of the Town and Country Planning Act 1990](#), allowing developers and local planning authorities (LPAs) to agree on measures that make developments acceptable in planning terms.
- Community Infrastructure Levy (CIL) agreements under Part 11 of the [Planning Act 2008](#), enabling LPAs to fund infrastructure improvements necessary to support area-wide development.

This SFRA should be used to guide appropriate development across the borough by applying its processes, recommendations, and associated mapping tools.

7.3 Property Level Resilience Measures

The [NPPF](#) requires policies to support appropriate measures that ensure the future resilience of communities and infrastructure against the impacts of climate change, to guarantee effective planning for climate change. This includes guaranteeing that developments are to be flood resilient and resistant. The [PPG](#) defines property flood resilience as “*an approach to building design which aims to reduce flood damage and speed*



recovery and reoccupation following a flood”, while flood resistance measures aim to stop water entering a building up to a safe structural limit.

To assist applicants, CIRIA have developed and published the [Code of Practice for Property Flood Resilience](#) (2021). This Code of Practice outlines the six standards that specify what should be achieved for property flood resilience. It provides advice for how property flood resilience measures can be incorporated into new-build and retrofit developments to improve their resilience against various flood risk sources, and includes specific [guidance for Local Authority planners](#). Where required, details of flood resistance and resilience plans must be included within the FRA and/or SuDS Strategy submitted as part of planning applications. *Section 6.3* of this SFRA outlines the EA-approved guidance on flood resistant and resilient measures for Greenwich, including information on finished floor levels.

Policy D11 ‘*Safety, security and resilience to emergency*’ of the current [London Plan](#) (2021) outlines property flood resilience measure requirements, and states that “*Development proposals should maximise building resilience and minimise potential physical risks, including those arising as a result of extreme weather, fire, flood and related hazards*”. In addition, [London Plan](#) Policy GG6 states ‘*Increasing efficiency and resilience*’ states that those involved in development and planning must “*ensure buildings and infrastructure are designed to adapt to a changing climate, making efficient use of water, reducing impacts from natural hazards like flooding and heatwaves, while mitigating and avoiding contributing to the urban heat island effect*”.

The EA’s Flood Risk Standing Advice information for [minor extensions](#) and [vulnerable developments](#) should be taken into account if a proposed development is categorised as such, as they provide additional guidance on appropriate property resilience and resistance measures. This advice is discussed in greater detail in *Section 6.3* of this SFRA.

7.4 Emergency Plans

Cohesive emergency planning at site-specific and strategic levels is essential to minimise the potential impact of an increased flood risk resulting from climate change and urban development.

Development must not impede on the emergency services or the response of Greenwich’s [Emergency Planning and Business Continuity Team](#) to any flood events. A borough-wide [emergency plan](#) can provide policy context on the management of emergencies, including flood risk. This plan can help define the emergency response structure, guide deployment and coordination within the borough, and can also provide further policy context for local Flood Warning and Evacuation Plans. Applicants must ensure that appropriate flood evacuation and response procedures that align to the wider strategic plan are set out and actioned where required in order to aid Greenwich’s management of the ‘actual’ and ‘residual’ risks associated with extreme flood events on strategic and site-specific levels.

Greenwich’s Multi-Agency Flood Plan, [Emergency Planning webpages](#) and the [Borough Risk Register](#) detail the emergencies that Greenwich Council are prepared to deal with and their statutory duties during emergencies. Greenwich are designated as a Category 1 responder



and are subsequently responsible for taking various actions during a flood risk emergency. These include, but are not exclusive to:

- Providing emergency assistance through liaising with essential service providers and opening evacuation and rest centres.
- Managing the local transport and traffic networks, including organising road closures and diversions.
- Coordinating the recovery process and restoration to normality through collaborative work with community groups and businesses

7.5 Managing Residual Risk

Residual risks are those that remain after the effects of the mitigating actions have been considered and must be quantified to ensure the continuous safe management of these remaining risks. However, the residual risks from a mitigation measure implemented today may change significantly over time due to climate change-induced alterations to rainfall intensity, duration, and frequency.

The [London Plan](#) (2021) Policy SI12 '*Flood risk management*' identifies the importance of strategies for managing and mitigating residual risk through resistance and resilience, ensuring that safe evacuation and rapid recovery measures are in place to deal with such risks. Greenwich's new Local Plan Policy EN6 also addresses the necessity of developments to manage residual risks through the resistance and resilience measures, particularly in the face of climate change. Climate change projections indicate an increased severity and impact of flooding, which may raise access issues for emergency services during a flood event. Developments should therefore ensure that their designs consider the impacts of climate change to guarantee safe and full access and egress to emergency services during extreme events.

As a residual risk measure, considerations must also be made to ensure that people can remain within affected areas whilst being safe and comfortable should an extreme flood occur. General and residual risks may need to be re-evaluated as the collective understanding of climate change increases to enable the LLFA and management companies to implement further control measures in the future, should this be necessary.

7.6 Recommended Policies

The following policy recommendations for development and flood risk management in Greenwich are based on the evidence presented throughout this Strategic Flood Risk Assessment (SFRA). They establish both strategic and site-specific principles to guide future development in a way that effectively manages flood risk. These policies are intended to be additional to current national policy.

These policies aim to address the cumulative effects of urbanisation on flood risk, while also considering long-term impacts of climate change. At the same time, they support the necessary growth required to help Greenwich meet its housing targets in a sustainable and resilient approach.



7.6.1 Strategic Policies

1. Greenwich should adopt a sequential approach for planning and development to identify areas that are not susceptible to flood risk impacts posed by climate change. Development should be encouraged in these identified areas to make properties more resilient to increasing flood risk and reduce the reliance on property level protection methods.
2. Greenwich should implement measures through their new Local Plan to deal with the Sequential Test acceptability of windfall site development proposals at the strategic level. The measure could set out locations and quantities of windfall sites that would or would not be acceptable in Sequential Test terms (to provide input to the process defined in Section 6.2. This would help create efficiencies in the process.
3. If it is determined by evidence that there are insufficient sites within Flood Zone 1 to meet the Borough's housing development targets, then windfall developments in Flood Zone 2 or 3 might be acceptable and should be considered (preferably with support of a Level 2 SFRA). This would inform an approach determining locations where the Sequential Test would be passed. Conversely, if the borough has sufficient land available in Flood Zone 1 to accommodate windfall development sites, then it may not be possible or prudent to consider windfall development in Flood Zone 2 or 3 as acceptable.
4. Greenwich should consider implementing a Flood Zone 3a for Surface Water Flood Risk to help identify key sites at risk from pluvial flooding, using the medium risk band for surface water flooding.
5. Existing and planned flood alleviation schemes should be incorporated into Borough Infrastructure Delivery Plans (IDPs). Where these IDPs, or similar corporate work programmes (e.g. planned highway improvement works or Green Infrastructure Plans), identify predicted or actual flood risks, new potential strategic level flood alleviation schemes should be developed.
6. Greenwich should investigate the need to make space for water storage by identifying strategic locations that are required for current and future flood risk management. These identified areas of land should be safeguarded via Local Plans to facilitate links between flood risk management and other environmental priorities.
7. Greenwich should adopt a Catchment Based Approach in line with the London Surface Water Strategy to ensure recognition of catchment wide flood issues to justify the collection and use of S106 funding to investigate and develop flood alleviation schemes within the catchment the development falls within. Previous CDAs defined by the Borough or policy sub-areas defined by EA CFMPs (for fluvial / tidal flooding) provide an



established technical basis for this approach. These CDAs could potentially be updated in the future.

8. Greenwich should use their new Local Plan to ensure developments within CDAs provide increased surface water drainage requirements. Examples could include increased storage through the use of SuDS to restrict off-site runoff rates to greenfield rates (or lower).
9. Greenwich should develop standing advice for the assessment of minor development planning applications with surface water implications. This will aid LPAs in making informed and consistent decisions where the EA and / or LLFA has no statutory duty to provide comments as part of an application's review exercise.
10. Greenwich should review the benefits of removing Permitted Development rights for sites which fall within Flood Zones 3a and / or 3b, collaborating on Article 4 Directions where justifiable, defensible and beneficial. This could include provisions around subdivisions, extensions and paving of gardens in specific areas.
11. Greenwich should use their new Local Plan to ensure developments with a high potential for groundwater flooding (as identified in the Sewer, Groundwater & Artificial Flood Risk Interactive Web Map and other available data) demonstrate that increased groundwater mitigation and management measures have been implemented to protect people from groundwater flooding. Any known groundwater and flow routes should be safeguarded to ensure groundwater flood risk is not increased on site or elsewhere.
12. Greenwich should ensure in their new Local Plan that developments meet the greenfield surface water runoff rates or a specified maximum rate.
13. Greenwich should prepare and adopt a comprehensive Riverside Strategy by 2030 to guide long-term development, flood risk management, and climate resilience along the River Thames frontage.

7.6.2 Site-Specific Policies

1. Ensuring that land within development sites are safeguarded for potential flood mitigation use through the active consideration of predicted flood risk mapping from all sources at the master planning stage.
2. Developers must submit completed Flood Risk Assessments and Drainage Strategy (with supporting Checklists) to demonstrate compliance with requirements detailed in Sections 2 and 4 for all Major development proposals.



3. Drainage Strategies with the SuDS proforma must be provided for all Minor developments and for Change of Use proposals if they impact the proposed development's current drainage regime. Site-specific Flood Risk Assessments with the accompanying checklist must be provided for Minor developments and Change of Use proposals if they:
 - a) Are outside of Flood Zone 1.
 - b) Are inside a defined area with a critical drainage problem.
 - c) Change the existing footprint of the building(s).
 - d) Are at risk from any other sources of flooding.
4. As part of a submitted development proposal, developers must provide evidence to the LPA to demonstrate that the Sequential Test has been undertaken. Developers must also provide evidence that an on-site sequential approach has been taken to direct vulnerable uses to the lowest risk parts of the development site.
5. Where development is proposed for sites within Flood Zones 3a (surface water), where this classification has been applied, evidence must be submitted to demonstrate that:
 - a) There will be no increase of flood risk to properties outside of the development boundary.
 - b) Consultation has been undertaken with the relevant LLFA to consider potential wider impacts or benefits the development could have on the local surface water catchment.
 - c) Relevant strategic documents (such as the Thames CFMP and LFRMS) have been reviewed.
 - d) The LLFA has been consulted to determine if the development should contribute to any catchment wide flood alleviation schemes being considered by the LLFA (such as a S106 contribution to wider catchment flood risk management infrastructure).
6. Development should maximise the use of open spaces to ensure spaces for water to flow during times of flood.
7. Developments that seek to increase impermeable surfaces within a site, including small areas such as front gardens, will be resisted where appropriate.
8. Those proposing development in proximity to watercourses should look for opportunities to undertake river restoration and enhancement as part of a development to make space for water. Enhancement opportunities should



be sought when renewing assets (e.g. de-culverting, the use of bio-engineered river walls, raising bridge soffits to take into account climate change).

9. Developers should aim to incorporate permeable paving in hardstanding areas to provide flood mitigation benefits in new and existing developments. In areas where the geology does not facilitate infiltration (e.g. areas underlain with clay), permeable paving should be underlain with gravel or feature an underground storage system.
10. Development proposed in 'dry islands' should be designed for safe access and egress in a flood event. Dry islands are considered as flood risk areas due to the potential loss of important local services during flood events and lack of safe access routes. They require safe access and egress routes to be developed for the lifetime of the property, factoring in the impacts of climate change.

7.6.3 Thamesmead Recommendations

1. New developments should avoid connecting to the existing surface water drainage system within the Thamesmead catchment area, as it is currently at capacity. Collaboration with sewerage undertakers will also be pursued to address this issue.
2. New developments that propose to utilise existing connections into existing surface water drainage systems will be required to discharge at greenfield rates.
3. In the wider Marsh Dykes catchment, new developments that connect into surface water drainage systems that ultimately discharge into the Thamesmead area will be looked at more stringently and no new surface water connections should be made into surface water or foul systems.
4. Greenwich should continue to collaborate with the GLA and Bexley LPA regarding the surface water capacity constraints affecting the Southmere, Great Breach and Thamesmead catchment areas.
5. New development should contribute (financially or in kind) to improve the capacity, sustainability, ecology, amenity and future climate resilience of the existing strategic SuDS system. Development should comply with the soon-to-be-produced catchment strategy.



8 Review and Next Steps

8.1 Review and Updates

8.1.1 Technical Content

The SFRA has been developed using the most recent policy, legislation and information available at the time of writing (December 2025). Updates regarding the draft Local Plan have also been edited in July 2026. The SFRA is intended to be used to assist various parties in considering flood risk when making planning decisions about the location and design of proposed future developments and flood risk management. It is therefore essential that the data contained within the SFRA is as up to date as possible to ensure that decisions are made on the best information available. Events that may trigger a review and update are summarised below:

- Changes to the [NPPE](#) and associated Flood Risk and Coastal Change [PPG](#) which form the basis of the SFRA.
- Updates to any of the overarching legislation which may alter the responsibilities of Greenwich.
- Updates to the available flood risk information used to develop the SFRA. There is a need to ensure developers, applicants and the LPA are provided with the best available information.
- Improved understanding of local flood risk knowledge. There is a need to ensure that site-specific FRAs are informed by the most up-to-date information and planning decisions are made on the best available data.
- Significant updates of baseline flood risk information (such as a major update to the Flood Map for Planning).
- Updates following any significant flood risk investigation work conducted by Greenwich.
- Following a major flooding event within Greenwich.

8.1.2 Mapping

The knowledge of flood risk is constantly changing and improving and the SFRA should reflect this. Not only could this enhanced knowledge highlight risk areas which were not previously at risk, it could also free up areas which may have been at risk but are no longer considered to be so. This could free up land for potential future development.

The Web Maps developed to support this SFRA provide a flexible platform for ensuring the most up-to-date information is available. Several Web Map layers are



maintained externally by the EA and will be updated automatically when the EA publishes revised data – these layers include:

- EA Flood Map for Planning (River and Sea) - Flood Zone 2
- EA Flood Map for Planning (River and Sea) - Flood Zone 3
- EA Flood Map for Planning (River and Sea) - Areas Benefiting from Flood Defences
- EA Flood Map for Planning (River and Sea) - Flood Defences
- EA Flood Storage Areas
- EA Flood Alert Areas
- EA Flood Warning Areas
- EA Historic Flood Map
- EA Special Protection Zones
- Risk of Flooding from Surface Water Extent: 3.3 percent annual chance
- Risk of Flooding from Surface Water Extent: 1 percent annual chance
- Risk of Flooding from Surface Water Extent: 0.1 percent annual chance
- Risk of Flooding from Reservoirs - Maximum Flood Extent

The remaining Web Map layers are current at the date of writing this SFRA (July 2026) and will require updating in the future when revised data is published by the various data sources including TWUL, the EA and Greenwich Council. It should be noted that the Flood Zone 3a and 3b layers are static and will require updating under the following circumstances:

- Updated main river flood extents are made available by the EA. The EA undertake periodic review and updates of main river flood models and associated predicted flood extents.
- Updates to the RoFSW map – If RoFSW data are factored into future Flood Zone 3a and/or 3b extents (as per recommendation 1 in Section 7.6.1, updates would occur when Greenwich undertakes local surface water flood risk studies that provide surface water flood extents to the EA to update national mapping.

8.2 Level 2 SFRA

A Level 2 SFRA is a detailed assessment of all potential sources of flood risk for identified sites that require site-specific assessment. These allocation sites and/or windfall sites are identified as either part of the new Local Plan or through the Level 1 SFRA. The Level 2 SFRA builds on the strategic flood risk information presented in a Level 1 SFRA. If a Level 1 SFRA



identifies that it is not possible to allocate all development outside of flood risk areas, then a Level 2 SFRA may be required. A Level 2 SFRA may also be required if it is believed that developers and applicants will submit a high number of applications on sites that are not identified in the Local Plan. This Level 1 SFRA has identified that not all developments can be located outside of flood risk areas. It is therefore recommended that a Level 2 SFRA is produced to achieve the following:

- Identify the potential development sites that require a site-specific assessment.
- Complete a detailed site-specific FRA for each identified site, assessing all sources of potential flood risk at the site.
- Provide the information needed to apply the Exception Test where appropriate.
- Identify any site-specific requirements, including policy, mitigation measures, and FRA requirements.
- Provide a set of recommendations for each assessed site. The Level 2 SFRA will consider flood risk from all sources both now and in the future with climate change considerations.

In accordance with the [NPPE](#), the Level 2 SFRA will evaluate all sources of flood risk, both current and future, incorporating climate change projections. The [NPPE](#) outlines how the planning system should reduce vulnerability to flooding and enhance resilience to climate impacts. Together with the [PPG](#), it sets out the approach for FRAs to demonstrate effective flood risk management over the lifetime of a development. Site-specific FRAs must apply the latest climate change guidance to assess future risk. The Level 2 SFRA will include detailed information on flood extent, depth, velocity, and hazard ratings as well as safe access and egress routes from the site. Once completed, it will support development proposals by providing the necessary evidence to meet planning requirements.



Appendix

BGS Potential for Groundwater Flooding Map

