

# STRATEGIC FLOOD RISK ASSESSMENT — LEVEL 2



PREPARED FOR THE LONDON BOROUGH OF BARNET

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# CONTENTS

<b>1</b>	<b>INTRODUCTION</b>	<b>5</b>
<b>1.1</b>	<b>BACKGROUND</b>	<b>5</b>
<b>1.2</b>	<b>POLICY</b>	<b>5</b>
<b>1.3</b>	<b>REPORT STRUCTURE</b>	<b>6</b>
<b>2</b>	<b>SITE ASSESSMENT</b>	<b>7</b>
<b>2.1</b>	<b>PURPOSE</b>	<b>7</b>
<b>2.2</b>	<b>LOCATIONS ASSESSED</b>	<b>7</b>
<b>3</b>	<b>METHODOLOGY</b>	<b>9</b>
<b>3.1</b>	<b>SITE SELECTION</b>	<b>9</b>
<b>3.2</b>	<b>ANALYSIS</b>	<b>9</b>
<b>3.3</b>	<b>ASSESSMENT TEMPLATE</b>	<b>10</b>
<b>3.4</b>	<b>DATA SOURCES</b>	<b>11</b>
<b>4</b>	<b>GENERAL REQUIREMENTS</b>	<b>13</b>
<b>5</b>	<b>APPENDICES</b>	<b>15</b>
	<b>APPENDIX A – DATA SOURCES</b>	<b>15</b>
	<b>APPENDIX B – SITE ASSESSMENTS</b>	<b>17</b>
	SITES TRIGGERED BY FLUVIAL RISK	17
	SITES TRIGGERED BY SURFACE WATER RISK	17
	<b>APPENDIX C – WINDFALL SITE SELECTION &amp; ASSESSMENT GUIDANCE</b>	<b>18</b>
	INTRODUCTION	18
	SITE SELECTION CRITERIA	18
	SEQUENTIAL TEST	18
	SITE-SPECIFIC FLOOD RISK ASSESSMENT	19
	DEVELOPMENT SAFETY FROM FLOOD RISK	19

## FIGURES AND TABLES

*Figure 2.1. Borough map showing the location of the 18 sites targeted within the Level 2 SFRA ..... 8*

*Table 2.1. Site allocations targeted within the Level 2 SFRA ..... 7*

*Table 3.1. Flood Zones as defined by Level 1 SFRA ..... 9*

*Table 3.2. Surface water flood risk hazard rating (HR) categories ..... 10*

*Table 3.3. Site assessment proforma details ..... 10*

*Table 3.4. Summary of Maps ..... 11*

*Table 3.5. Summary of Datasets ..... 12*

*Table 4.1. Mitigation Requirements for Sites ..... 13*

## ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
AEP	Annual Exceedance Probability
Barnet	London Borough of Barnet
CDA	Critical Drainage Area
DTM	Detailed Terrain Model
EA	Environment Agency
GIS	Geographic Information System
IPEG	Increased Potential for Elevated Groundwater
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
OS	Ordnance Survey
PPG	Planning Practice Guidance
RoFSW	Risk of Flooding from Surface Water
SFRA	Strategic Flood Risk Assessment
TW	Thames Water Utilities Limited
WMS	Web Mapping Service

# 1 INTRODUCTION

The [National Planning Policy Framework \(NPPF, 2019\)](#) requires that Local Planning Authorities (LPAs) develop Strategic Flood Risk Assessments (SFRAs) to inform future development in their areas. In accordance with this, the London Borough of Barnet (Barnet) has commissioned a Level 2 SFRA to build upon its [Local Plan](#).

A Level 2 SFRA is a detailed assessment of all sources of flood risk for specified sites requiring targeted assessment. Flood sources studied included fluvial, surface water, sewer, groundwater and reservoir failure floods. A total of 18 sites were assessed as part of this Level 2 SFRA.

The purpose of this assessment is to provide the information necessary for application of the Exception Test where appropriate. It also provides spatial planning and site-specific recommendations to support any potential development opportunities for prospective developers, ensuring that planning policy requirements are met.

The outputs of the Level 2 SFRA include detailed assessments for each flood source, planning considerations, and potential mitigation measures for each assessed site. These outputs enable developers to produce appropriate flood risk mitigation actions for each assessed site.

## 1.1 Background

The West London Boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon, and Hounslow carried out a [Level 1 Strategic Flood Risk Assessment](#) to assess the risk of flooding from all sources in the region, now and in the future. The SFRA was conducted in line with the [NPPF](#) and the accompanying [Flood Risk and Coastal Change Planning Practice Guidance](#) (PPG). The documents provide evidence to guide planned development and proposed land use changes away from the areas most at risk of flooding. It is used by boroughs for strategic planning and enables developers to have a better understanding of flood risk and the planning requirements for the area.

The PPG recommends that a Level 2 SFRA is carried out when the *“Level 1 Assessment shows that land outside flood risk areas cannot appropriately accommodate all the necessary development”*. Barnet, in conjunction with the Environment Agency (EA), have identified eight sites which require assessment due to fluvial flood risk. There are a further ten sites which have triggered an assessment due to the significance of surface water flood risk.

## 1.2 Policy

This Level 2 SFRA has been produced in line with national, regional, and local policy. The purpose of these policies is to ensure that development does not increase the risk of flooding, and to ensure that property development is steered away from areas of greater flood risk to keep people safe from flooding. Although policy referenced as part of the Level 1 SFRA is relevant to the Level 2 SFRA, there are several policy documents that provide specific guidance and requirements that relate to Level 2 assessments.

The [NPPF](#) and the accompanying [PPG](#) provide national policy that guides the requirements of SFRA. They introduce the purpose and requirements of the Sequential and Exception Tests.

The Sequential Test is designed to steer development proposals to the lowest flood risk probability areas. The Level 1 West London SFRA provides the basis for the application of this test. The Exception Test is designed to follow the Sequential Test where necessary. It should be applied if it has been determined that a development cannot be in an area with a lower risk of flooding. The Exception Test needs to demonstrate that the proposed flood risk management measures will be satisfactorily applied to ensure both people and the property will be safe for the lifetime of the development. This Level 2 SFRA is structured to provide the basis for the application of this test. The Level 1 SFRA provides further [guidance](#) on the application of these tests.

Policy SI 12 of the [London Plan \(2020\)](#) highlights that Local Authorities should utilise SFRA to identify areas with flood risk issues, and develop actions and policies to reduce these risks. These actions must be informed by the [Thames River Basin District Flood Risk Management Plan](#).

Policy CS13 of the Barnet Local Plan highlights that new development should manage its runoff so as to not increase the potential for flooding. The Level 2 SFRA will provide site-specific recommendations to help developers meet this policy's aims.

The Level 1 West London 1 SFRA provides a section on [Planning and Policy Framework](#). This section provides an informative breakdown of the national, regional, sub-regional and local policy that LPAs, planners, and developers should follow as part of the development proposal process.

### 1.3 Report Structure

This Level 2 SFRA has been produced to assess risk from all sources to 18 sites in detail. To meet the objectives of the assessment, this document has been structured as follows:

- **Section 1 (Introduction)** defines the Level 2 SFRA and outlines who the document is primarily for. This section provides the background of this Level 2 assessment and highlights key and influential policy.
- **Section 2 (Site Assessment)** provides an overview of the site assessments conducted. This section lists the 18 sites assessed.
- **Section 3 (Methodology)** provides details on the methodology used to complete each site assessment. Each section on the site-assessment template is covered, alongside assessment data sources and the developable areas.
- **Appendices** contains data source information and full details for each individual site assessment conducted as part of the Level 2 SFRA. It also incorporates additional content produced to support Barnet with future flood risk mitigation for development, specifically regarding windfall development.

## 2 SITE ASSESSMENT

### 2.1 Purpose

The Level 2 SFRA has three major purposes:

- Help LPAs apply the Sequential Test so that development is directed to areas that are least at risk of flooding.
- Provide information needed to apply the Exception Test, checking whether a development can be built in a higher flood risk area.
- Establish whether windfall sites can be made safe for development throughout their lifetime without increasing flood risk elsewhere.

The site assessments also provide recommendations and considerations for LPAs and prospective developers, to be used in conjunction with the guidance provided in [Section 4](#) of the Level 1 SFRA. For further information on the Level 2 SFRA methodology, refer to [Section 3](#) of the document.

### 2.2 Locations Assessed

18 sites were assessed as part of this Level 2 SFRA. These are listed in [Table 2.1](#) and mapped in [Figure 2.1](#).

**Table 2.1.** Site allocations targeted within the Level 2 SFRA

Site ID	Site Name	Proposed Use	Area (ha)
03	Osidge Lane Community Halls	Residential, community space	0.44
05	Edgware Hospital	Residential, community space	6.40
06	Watling Avenue Carpark and Market	Residential, mixed use	1.47
07	Beacon Bingo	Residential, leisure	0.78
08	Broadway Retail Park	Residential, retail, community	2.76
09	Colindeep Lane	Residential	0.86
11	KFC/ Burger King Restaurant	Residential, retail	0.44
12	McDonald's Restaurant	Residential, retail	0.48
13	Public Health England	Residential	3.57
14	Sainsbury's The Hyde	Residential, mixed use	3.26
15	Tesco Coppetts Centre	Retail	3.12
19	East Barnet Shooting Club	Residential	0.26
22	Sainsbury's (New Barnet Town Centre)	Residential, retail	1.02
25	East Finchley Substation	Residential	0.19
28	Edgware Underground and Bus Stations	Transport operations	8.17
30	Finchley Central Station	Residential, mixed use	6.74
44	High Barnet Station	Residential, mixed use	1.49
55	Woodside Park Station East	Residential, car parking	0.46

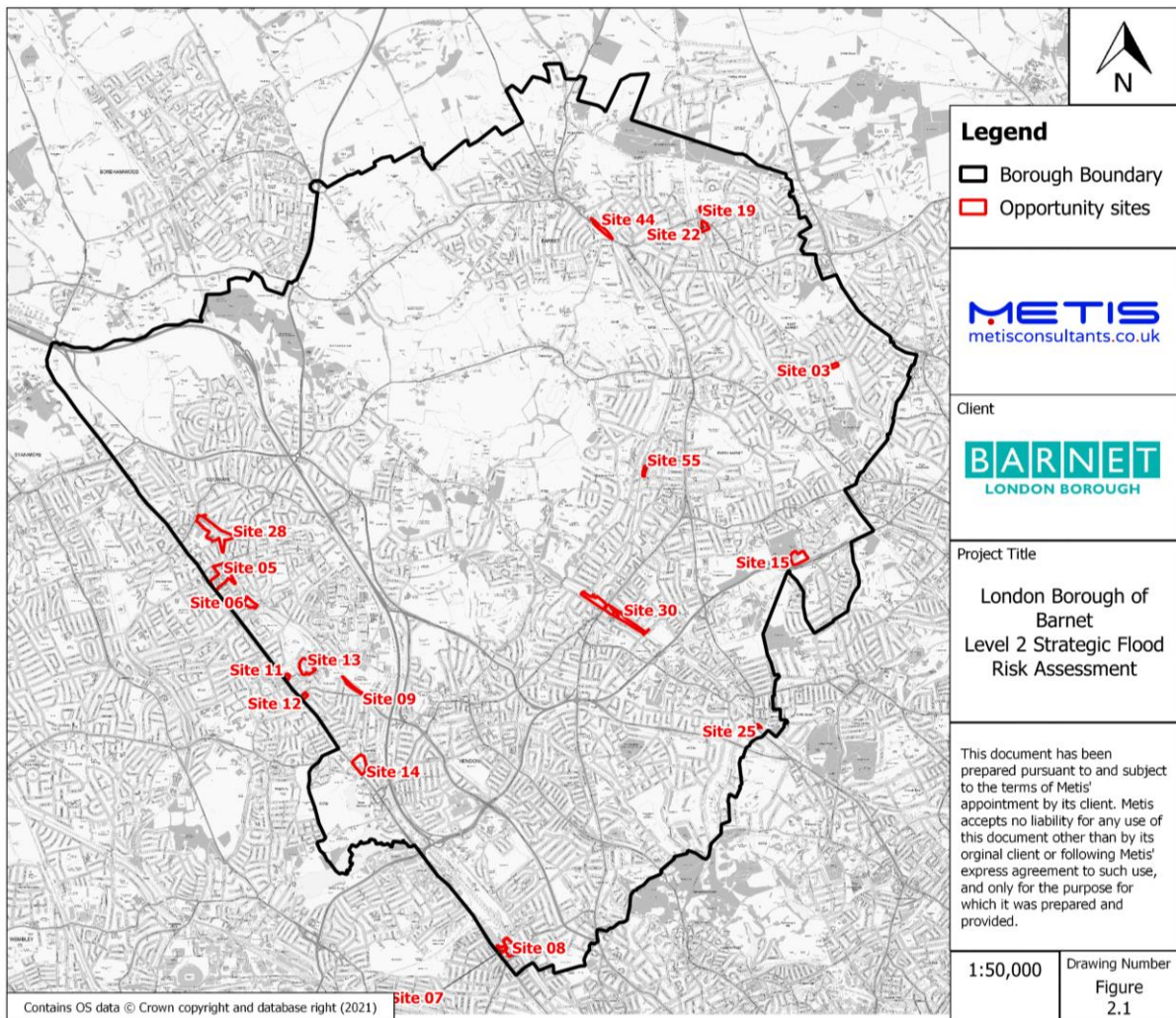


Figure 2.1. Borough map showing the location of the 18 sites targeted within the Level 2 SFRA



## 3 METHODOLOGY

### 3.1 Site Selection

18 sites were assessed as part of this Level 2 SFRA, selected from the 67 priority sites for development identified by Barnet’s Local Plan. Eight of the assessed sites were triggered by fluvial risk. These were selected for study by the EA. The remaining ten sites, triggered by surface water risk, were chosen using a prioritisation process. The list of selected sites was then ratified by Barnet. Sites for study were prioritised using the following order:

1. Sites with greatest percentage of area lying within the Risk of Flooding from Surface Water (RoFSW) extents (3.33%, 1%, and 0.1% AEP)
2. Sites with shortest timescales to development
3. Sites with highest proposed residential capacity

### 3.2 Analysis

Site assessments were carried out using datasets from the West London SFRA [Web Maps](#) as well as data provided by Barnet. Flooding from surface water, sewer, fluvial/tidal, groundwater and artificial sources was analysed using the predicted proportion of each flood risk type within each site. The assessments for fluvial, tidal, and surface water flood risk are based on the Flood Zones defined in the Level 1 SFRA. These are outlines of floods in an undefended scenario. The Flood Zones [are mapped](#) in the West London SFRA, and are explained in further detail in *Table 3.1*. The flood hazard rating, used in some of the assessments, can be interpreted as shown in *Table 3.2*.

**Table 3.1.** Flood Zones as defined by Level 1 SFRA

Zone	Definition
Flood Zone 2	<ul style="list-style-type: none"> <li>• Land within EA modelled fluvial flood risk extents predicted for 1% to 0.1% AEP events (<b>fluvial</b>).</li> <li>• Land within EA modelled tidal flood risk extents predicted for 0.5% to 0.1% AEP events (<b>tidal</b>).</li> </ul>
Flood Zone 3a (fluvial and tidal)	<ul style="list-style-type: none"> <li>• Land within EA modelled fluvial flood risk extents predicted for up to and including 1% AEP events (<b>fluvial</b>).</li> <li>• Land within EA modelled tidal flood risk extents predicted for up to and including 0.5% AEP events (<b>tidal</b>).</li> </ul>
Flood Zone 3a (surface water)	<ul style="list-style-type: none"> <li>• Land within EA modelled surface water flood risk extents predicted for up to and including 1% AEP events (<b>surface water</b>).</li> </ul>
Flood Zone 3b (fluvial and tidal)	<ul style="list-style-type: none"> <li>• Land within EA modelled fluvial and tidal flood risk extents predicted for up to and including 5% AEP events allowing for the impact of flood defences (<b>fluvial / tidal</b>).</li> <li>• Land which is included within the EA’s Flood Storage Areas dataset (<b>fluvial / tidal</b>).</li> </ul>

**Table 3.2.** Surface water flood risk hazard rating (HR) categories

Figure		Definition
Low	$0.5 \geq HR < 0.75$	Caution – Flood zone with shallow flowing water or deep standing water
Moderate	$0.75 \geq HR \leq 1.25$	Dangerous for some (i.e. children) – Danger: flood zone with deep or fast flowing water
Significant	$1.25 > HR \leq 2.0$	Dangerous for most people – Danger: flood zone with deep fast flowing water
Extreme	$HR > 2.0$	Dangerous for all – Extreme danger: flood zone with deep fast flowing water

### 3.3 Assessment Template

Site assessments were conducted on a specifically designed proforma. The sections included are summarised in *Table 3.3*.

**Table 3.3.** Site assessment proforma details

Section	Contents
Current and proposed use	Development use of each site assessed
Risk summary	Percentage of site area under each risk level for different types of flooding
Exception test	Shows whether or not sites can be developed based on Exception Test criteria
Risk assessment	Data on risk from each flooding source, including flood depth, speed, hazard, duration, etc.
Flood mechanisms	For each flood source, how flood water behaves within the site
Site access/egress routes	Where flood-safe entry and exit routes should be located
Mitigation requirements	For each flood source, a list of mitigation measures to alleviate the flood risk for potential developments at the site. To be used in conjunction with the guidance provided in <a href="#">Section 4</a> of the Level 1 SFRA
Site-specific requirements	Tailored flood mitigation requirements for developers, based on PPG <a href="#">Site-Specific FRA guidance</a> and EA's <a href="#">FRA for Planning Application guidance</a> .
Safety of development	Analysis of how secure the development is against future flooding, including climate change considerations and the effect of nearby development

The role of flood defences was also analysed in the risk assessment section. This proved only relevant to sites along the Silk Stream, as that was the sole river with flood defences in the borough.

Seven site-specific maps are appended to each assessment proforma. These are summarised in *Table 3.4*. Further information, such as [Flood Zones](#) for each site and the [0.1% AEP RoFSW](#) maps, can be found on the West London SFRA website (hyperlinked above).

**Table 3.4.** Summary of Maps

No.	Figure	Description
1	Fluvial Flood Depth (1% AEP + 70% Climate Change Allowance Event)	Provides the maximum flood depth for the fluvial defended 1% AEP + 70% climate change flood event. Data was extracted from EA models for Silk Stream and River Lee. The 70% climate change event was chosen to review the maximum fluvial flood depth at the sites as it represents the ‘worst case’ upper end <a href="#">peak river flow allowance</a> for the Thames River Basin District.
2	Fluvial Flood Hazard (1% AEP + 70% Climate Change Allowance Event)	Provides the maximum flood hazard for the fluvial defended 1% AEP + 70% climate change flood event. Data was extracted from EA models for Silk Stream and River Lee.
3	Surface Water Flood Depth (1% AEP Rainfall Event)	Provides the predicted surface water flood depth across a site using EA RoFSW data for a 1% AEP event. This is a more detailed representation of the Flood Zone 3a (Surface Water) extent as defined in the Level 1 SFRA and <i>Table 3.1</i> .
4	Surface Water Flood Hazard (1% AEP Rainfall Event)	Provides information on the predicted hazard of surface water flooding, based on EA RoFSW mapping for a 1% AEP event. This is a more detailed representation of the Flood Zone 3a (Surface Water) extent as defined in the Level 1 SFRA and <i>Table 3.1</i> . Details about how hazard can be interpreted are shown in <i>Table 3.2</i> .
5	Thames Water (TW) Sewer Flooding Records	Provides the sewer flood incidences recorded by TW at four-digit postcode resolution.
6	Areas Susceptible to Groundwater Flooding	Provides the strategic scale map of groundwater flood areas on a 1km grid and the increased potential for elevated groundwater (IPEG) to rise sufficiently to interact with or be within 2m of the ground surface.
7	Reservoir Flood Risk: Maximum Flood Depth	Provides maximum depth of the area that might be flooded if a reservoir were to fail and release the water it holds.

### 3.4 Data Sources

Risk assessments for each site were completed by conducting detailed reviews of potential flood risk impacts using data from the EA, Ordnance Survey (OS), TW, and Barnet. Information on the sources, uses and limitations of each dataset are found in *Appendix A*. *Table 3.5* shows a summary of data sources used in the site assessments.

**Table 3.5.** Summary of Datasets

Figure	Dataset	Description	Source
All Figures	OS MasterMap	Background mapping for all figures	OS 2021
	Borough boundary	Barnet borough boundary	OS Open Data
	Barnet site allocations	Sites reviewed for the Level 2 SFRA	Barnet 2020
1	National flood defences*	National spatial flood and linear defences that act to prevent flood water from flowing inland	EA 2020
	Areas benefitting from flood defences*	Areas benefitting from the presence of defences in a 1% chance of flooding each year from rivers, or 0.5% chance of flooding each year from the sea	EA 2020
	Detailed River Network **	Classification and pathway of main rivers and watercourses, both overground and culverted	EA 2020
	River Lee model data	1% AEP plus 70% climate change maximum flood depth for River Lee	EA 2017
	Silk Stream model data	1% AEP plus 70% climate change maximum flood depth for Silk Stream	EA 2019
2	River Lee model data	1% AEP plus 70% climate change flood hazard rating for River Lee	EA 2017
	Silk Stream model data	1% AEP plus 70% climate change flood hazard rating for Silk Stream	EA 2019
3	RoFSW Depth: 1% AEP event	Depth of flooding from surface water from a flood with a 1% chance of happening in any given year	EA 2017
4	RoFSW Hazard: 1% AEP event	Flood hazard rating surface water floods with a 1% chance of happening in any given year	EA 2017
5	Sewer flooding records	Number of historic flood incidents by postcode	TW 2021
6	Susceptibility to groundwater flooding	Strategic scale map of groundwater flood areas on a 1km grid	EA 2017
	IPEG	Shows the increased potential for groundwater to rise sufficiently to interact with or be within 2m of the ground surface	Drain London 2011
7	Risk of Flooding from Reservoirs Depth:	Maximum depth of the area that might be flooded if a reservoir were to fail and release the water it holds	EA Web Mapping Service (WMS)

\* Datasets included within Figure 1 and Figure 2

\*\* Dataset included within Figures 1 - 4

## 4 GENERAL REQUIREMENTS

This section lists the general requirements that all sites within this Level 2 SFRA must follow (*Table 4.1*). These are cross referenced in the individual site assessments to highlight them where appropriate.

The site assessments use a climate change allowance of 70% to set out recommendations. This allowance is used for master planning purposes only. For developers submitting planning applications, design can be done using a 35% climate change allowance.

**Table 4.1.** Mitigation Requirements for Sites

No.	Mitigation Requirement	Applicable Area	
		Fluvial	Surface Water
4.1	A net reduction in flood risk is required for new development. Only essential infrastructure (subject to the Exception Test) and water compatible infrastructure are permitted.	Flood zone 3b	N/A
4.2	Finished floor levels must be at least 0.3m above predicted flood level at that point.	Flood zone 3a + climate change	0.1% AEP flood extent
4.3	Flood resistance measures must be adopted in developments in areas with less than 0.3m depth of predicted flood. Where predicted depths exceed 0.6m, flood resilience measures must be implemented. For depths between 0.3m and 0.6m, the need for resilience measures must be analysed on a case-by-case basis.	All flood zones (with climate change allowance)	Entire area at risk
4.4	Developments must provide compensatory flood storage that is equal to, or exceeds, the flood depths from these events. This means that any loss in flood storage due to development must be offset by providing additional land or sustainable drainage features (over and above any additional storage being proposed to reduce surface water runoff rates) that can store an equivalent amount of water. This ensures there will be no net loss of flood storage, and is required on a level for level and volume for volume basis.	Flood zone 3a + climate change	1% AEP flood extent
4.5	Residual flood risk must be considered, including flood from flood defences being breached, blockage of sewer network, overtopping storage area, pump failure, reservoir failure, and flood events that exceed design standard.	All flood zones (incl. climate change)	Entire area at risk
4.6	Proposed new development must be at least 8m away from the Main River. If the site is already developed within 8m of a Main River and changes are proposed, then consultation with the EA must be completed and a Flood Risk Activity	8m buffer area around Main Rivers	

	Permit may be required. Any new development should be avoided where practical within this 8m buffer area.	
4.7	Proposed new development must be at least 5m away from an Ordinary Watercourse. If the site is already developed within 5m of an Ordinary Watercourse and changes are proposed, then consultation with the Lead Local Flood Authority must be completed and an Ordinary Watercourse Consent may be required. Any new development should be avoided where practical within this 5m buffer area.	5m buffer area around ordinary watercourses

## 5 APPENDICES

### Appendix A – Data Sources

Category	File name	Description	Data source	Purpose within SFRA
Base map	Basemap	Polygons of streets, buildings, and other features in the area	OS Master Map	Map creation
	Barnet_Boundary	Polygon demarcating the boundary of Barnet	OS Open Data	Defining study area; geographical bound for other data needed
	Site_Allocations_Reg_18	Polygons giving outlines of 67 priority sites in borough	Barnet 2020	Conducting site-level assessments
	Schedule_of_Site_Proposals	Database of priority site ownership, current and proposed site uses, and development timescales	Barnet 2021	Prioritising sites for assessment
Digital Terrain Model	LiDAR	Raster containing ground elevation data derived using LiDAR technology	EA 2017	Determining low elevation areas susceptible to surface water flooding
Detailed River Network	EA_DRN	Line files showing main rivers and ordinary watercourses, both overground and culverted.	EA 2012	Determining central points for fluvial flooding
Flood defences	Spatial_Flood_Defences	Lines of EA-owned flood defences	EA WMS	Analysing defended and undefended flood scenarios (i.e., how flood defences affect current and future fluvial and surface water flooding); applying exception test
	Areas_Benefitting_From_Defences	Polygons showing the areas that would benefit from the presence of defences in a 1% chance of flooding each year from rivers	EA WMS (open data)	
Groundwater	Areas_Susceptible_to_GW_flooding	Polygons categorising borough into 1km <sup>2</sup> tiles where geological and hydrogeological conditions show that groundwater might emerge	EA 2017	Analysing current and future groundwater flood risk

Category	File name	Description	Data source	Purpose within SFRA
	IPEG	Increased potential for elevated groundwater: large polygon classifying areas by ground cover type, which indicates vulnerability to groundwater flooding	Greater London Authority Drain London 2011	
Flood Map for Planning	Flood_Zone_2	Polygons showing land with annual probability of river flooding between 1% and 0.1%	EA WMS	Prioritising sites for assessment
	Flood_Zone_3	Polygons showing land having a 1% or greater annual probability of river flooding		
Risk of Flooding from Surface Water	RoFSW_1inXX_Extent	Polygons showing flood extent, depth, and hazard values for rainfall scenarios with a 1 in 30 (3.33% AEP), 1 in 100 (1% AEP) and 1 in 1000 (0.1% AEP) chance of occurring in any given year. Hazard calculated from flood depth and velocity.	EA 2017	Prioritising sites for assessment; Analysing current and future surface water flood risk; Creating surface water flood risk mitigation plan; Applying Exception Test
	RoFSW_1inXX_Depth			
	RoFSW_1inXX_Hazard			
Risk of Flooding from Reservoirs	Reservoir_WMS	Map showing the largest area that might be flooded if a reservoir were to fail and release the water it holds	EA WMS	Analysing current and future flood risk from reservoir breach
Sewer flood records	Sewer_records	Database of historic sewer flooding incidents by postcode	TW 2021	Sewer flood risk assessment
River model data	River Brent	Data from EA-generated models of three main rivers in Barnet.	EA 2017	Fluvial flood risk assessment (current and future); Creating fluvial flood risk mitigation plan; Applying exception test
	River Lee		EA 2017	
	Silk Stream		EA 2019	



## Appendix B – Site Assessments

### Sites triggered by fluvial risk

- Site 03: Osidge Lane Community Halls
- Site 05: Edgware Hospital
- Site 06: Watling Avenue Carpark and Market
- Site 09: Colindeep Lane
- Site 13: Public Health England
- Site 14: Sainsbury's The Hyde
- Site 15: Tesco Coppetts Centre
- Site 28: Edgware Underground and Bus Stations

### Sites triggered by surface water risk

- Site 07: Beacon Bingo
- Site 08: Broadway Retail Park
- Site 11: KFC/Burger King Restaurant, Colindale
- Site 12: McDonald's Restaurant, Colindale
- Site 19: East Barnet Shooting Club
- Site 22: Sainsbury's (New Barnet Town Centre)
- Site 25: East Finchley Substation
- Site 30: Finchley Central Station
- Site 44: High Barnet Station
- Site 55: Woodside Park Station East

## Appendix C – Windfall Site Selection & Assessment Guidance

### Introduction

Barnet is aiming to provide 5,100 homes on small sites to meet their London Plan housing targets. Small sites not formally identified (windfall sites) are expected to go towards achieving this target. The term 'windfall sites' is used to refer to sites which become available for development unexpectedly and are not included as allocated land in an LPA's development plan. It is difficult to predict where and when these sites may arise for development. This guidance will assist developers and planners in assessing windfall sites in relation to flood risk.

The NPPF and PPG provide guidance to steer planned development to areas with low flood risk. Windfall sites are unplanned and require additional guidance to ensure they are in areas that are capable of being made safe from flood risk throughout their lifetime without increasing flood risk elsewhere, while taking climate change into consideration. Barnet is committed to providing homes that will be safe from current and future flood risk, including climate change. Developers must follow this guidance when determining whether a site is able to be developed.

### Site Selection Criteria

Windfall sites should be located outside of the 1% AEP plus 70% climate change fluvial flood extent and the 0.1% AEP RoFSW flood extent. Fluvial flood extents include the River Brent, Silk Stream, River Lee and their tributaries.

These flood risk extents are used to ensure that future development is located outside of areas that may be at risk of flooding today and in the future. You can find detailed flood risk maps [here](#) to determine whether your site is within either of these flood extents. If a proposed site is within these flood extents, then a site-specific Sequential Test and a site-specific Flood Risk Assessment will be required.

### Sequential Test

National policy requires that a site-specific [Sequential Test](#) must be carried out if a proposed development lies within Flood Zones 2 or 3. Within Barnet, a site-specific Sequential Test must be carried out if a site is proposed within the [0.1% AEP RoFSW flood extent](#) or the [1% AEP plus 70% climate change fluvial extent](#). If a site is at risk of either fluvial or surface water flooding, a Sequential Test to review alternate sites must be completed.

A site-specific Sequential Test must consider all reasonably available alternative sites within a defined search area. You can find a detailed explanation of how to perform a Sequential Test in [Section 4.2.1](#) of the Level 1 SFRA.

Following the application of the Sequential Test, if a proposed site cannot be located in an area with a low probability of flooding, the [Exception Test](#) must be applied. The Exception Test is designed to ensure that flood risk to people and property will be managed across the lifetime of the proposed development. For more information, the Level 1 West London SFRA provides further [guidance](#) on the application of the Sequential Test and Exception Test.

## Site-Specific Flood Risk Assessment

A proposed development within the 0.1% AEP RoFSW flood extent or 1% AEP plus 70% climate change fluvial flood extents and that passes the Sequential Test must provide a [Site-Specific Flood Risk Assessment](#) (FRA). A site must also provide a FRA if it is within a Critical Drainage Area (CDA), regardless of flood risk present at the site. The FRA can be used to determine whether the site passes the [Exception Test](#). The flood risk assessment must provide information on all types of flood risk and must demonstrate that the development can be made safe throughout its lifetime.

A developer should consider flood risk from all sources, including:

- Fluvial flood risk
- Surface water flood risk
- Groundwater flood risk
- Reservoir and canal (artificial) flood risk
- Sewer flood risk

Fluvial flood risk assessment must include a review of the following:

- Speed of inundation / onset of flooding
- Duration of flooding
- Depth of flooding
- Velocity of flooding
- Flood hazard rating

Detailed fluvial flood risk information can be requested from the [Environment Agency](#).

## Development Safety from Flood Risk

Developments that pass the Exception Test and that must be located in an area of flood risk should consider implementing the following flood mitigation measures:

- Designing buildings to raise floor levels
- Implement flood [resilient](#) and resistant features
- Utilising sustainable drainage systems
- Mitigating the potential impacts of flooding through the design of flood compatible buildings and building uses
- Developing emergency evacuation procedures. Flood warnings and / or flood alerts need to be considered along with the emergency evacuation procedures in the design and layout of the proposed development.
- Leaving space in developments for flood risk management infrastructure to be maintained and enhanced.

Specific flood mitigation measures can be found in [Section 4 – General Requirements](#) as well as within the [Level 1 SFRA](#). Appropriate measures must be taken to ensure that the flood risk on site is managed for future risk and climate change. Developments will also be required to comply with [Flood Risk Vulnerability Classifications](#). These classifications state what building use classification is permitted to be built within each flood zone.