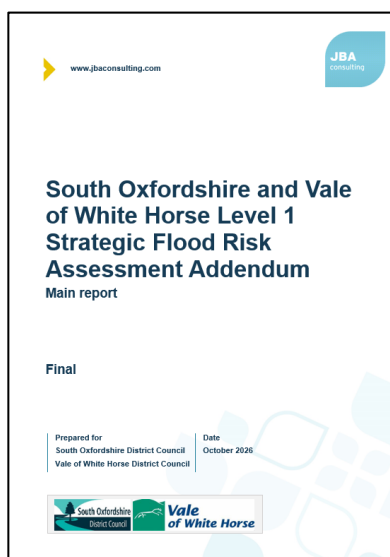


Cover note for the:

South Oxfordshire and Vale of White Horse Level 1 Strategic Flood Risk Assessment Addendum (October 2026)



This is an updated addendum to our September 2024 South Oxfordshire and Vale of White Horse Level 1 Strategic Flood Risk Assessment (SFRA) (examination library references [CEQ11](#) and [CEQ11.1](#)). It replaces the previous addendum completed in September 2025 ([examination library reference LPA44](#)).

This addendum applies a revised methodology for delineating the functional floodplain as agreed in our June 2026 statement of common ground with the Environment Agency ([examination library reference LPA67](#)). It also takes account of further updates made to the Environment Agency's national flood risk mapping in July 2026.

This addendum should be read alongside our September 2024 Level 1 SFRA. Work on an updated Level 2 SFRA is underway and this will be submitted to the examination as soon as possible.

The following table summarises the status of the SFRA documents in the examination library:

Reference	Document Title	Date	Status
CEQ11	Level 1 Strategic Flood Risk assessment – Final Report	September 2024	Partially superseded. Should be read alongside the latest Level 1 SFRA Addendum.
CEQ11.1	Level 1 Strategic Flood Risk assessment – Appendices	September 2024	Partially superseded. Should be read alongside the latest Level 1 SFRA Addendum.
CEQ12	Level 2 Strategic Flood Risk assessment – Main Report	September 2024	Superseded
CEQ12.1	Level 2 Strategic Flood Risk assessment – Appendices	September 2024	Superseded
LPA44	Level 1 Strategic Flood Risk Assessment Addendum	September 2025	Superseded
LPA45	Level 2 Strategic Flood Risk Assessment Update	September 2025	Now out of date. An updated Level 2 SFRA will be provided to the examination shortly, which will reflect the latest flood risk information (including the latest delineation of the functional floodplain) and will align with the October 2026 Level 1 SFRA Addendum.
TBC	Level 1 Strategic Flood Risk Assessment Addendum	October 2026	Up to date. Should be read alongside the September 2024 Level 1 SFRA.



South Oxfordshire and Vale of White Horse Level 1 Strategic Flood Risk Assessment Addendum

Main report

Final

Prepared for
South Oxfordshire District Council
Vale of White Horse District Council

Date
October 2026



Document Status

Issued	October 2026
Issued to	Rebekah Goodwill
BIM reference	TFZ-JBA-XX-XX-RP-EN-0005
Revision	P03
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Contract

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This report describes work commissioned by South Oxfordshire District Council and Vale of White Horse District Council by an instruction dated 11 August 2026. The Client's representative for the contract was Rebekah Goodwill of South Oxfordshire and Vale of White Horse District Councils. Laura Thompson-Jones of JBA Consulting carried out this work.

Purpose and Disclaimer

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JBA has no liability for any use that is made of this Report except to South Oxfordshire and Vale of White Horse Joint Local Plan Team for the purposes for which it was originally commissioned and prepared.

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The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken between August 2026 and October 2026 and is based on the conditions encountered and the information available during the said period. The scope of this Report and the services are accordingly factually limited by these circumstances.

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 JBA has not been independently verified by JBA, unless otherwise stated in the Report.

Acknowledgements

JBA would like to thank the representatives of South Oxfordshire District Council, Vale of White Horse District Council and the Environment Agency for information provided to inform this assessment.

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Abbreviations

AEP	Annual Exceedance Probability
EA	Environment Agency
FMfP	Flood Map for Planning
FRA	Flood Risk Assessment
JLP	Joint Local Plan
NaFRA2	National Flood Risk Assessment 2
NNM	New National Model
NPPF	National Planning Policy Framework
PPG	Planning Policy Guidance
SCG	Statement of Common Ground
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
WFD	Water Framework Directive

1 Introduction

JBA Consulting were commissioned to produce a Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA) for South Oxfordshire and Vale of White Horse District Councils (the Councils) to support their Joint Local Plan (JLP). The SFRAs were finalised in September 2024. In March 2025, the Environment Agency (EA) published the first outputs from their National Flood Risk Assessment 2 (NaFRA2) project, significantly updating the national flood risk mapping for England.

In June 2025, a Statement of Common Ground (SCG) was established between the Councils and the EA as part of the JLP examination process. The EA raised a need to update the Level 1 and Level 2 SFRAs to account for changes to the Flood Map for Planning (FMfP) within the study area to account for the NaFRA2 outputs.

It was agreed with the EA that an addendum to the 2024 Level 1 SFRA would be produced to understand any changes to flood risk within the districts. The addendum was finalised in September 2025. The September 2025 addendum provided an overview of the NaFRA2 mapping, outlined changes to national planning policy since the completion of the Level 1 SFRA and summarised updates to the appendices. The Level 2 SFRA was also updated and finalised in September 2025.

The Councils have continued to engage with the EA in updating the SCG. In April 2026, the EA advised the Councils to carry out an update to the functional floodplain, previously updated through the September 2025 Level 1 SFRA Addendum. An [updated SCG](#) was signed in June 2026, in which it was agreed that the functional floodplain would be updated.

The Councils therefore commissioned JBA Consulting to update the September 2025 Level 1 SFRA Addendum and the Level 2 SFRA, to include for the updates to the functional floodplain, updates to the FMfP, including for the new national surface water mapping dataset, the 'Flood Map for Planning – Surface Water Spatial Planning' dataset, and to incorporate localised flood modelling provided by the Councils in East Hanney and in Wheatley.

The following components of the 2025 Level 1 SFRA Addendum have been superseded by the documents within this addendum:

- Level 1 SFRA Addendum Report
- Functional floodplain extent and technical note - Appendix A.
- Site screening assessment spreadsheet - Appendix B.
- Site screening assessment summary document - Appendix C.
- Cumulative impact assessment methodology report - Appendix D.

The Level 2 SFRA has been updated separately to this Level 1 SFRA Addendum.

1.1 Latest datasets

The latest datasets used in this Level 1 SFRA Addendum are described below.

1.1.1 EA detailed flood modelling

The latest EA detailed flood models were requested at the outset of the SFRA update. The following was requested from the EA:

- Detailed models that have been updated since the previous SFRA addendum in 2025
- Detailed models that were not provided for consideration in the 2025 SFRA addendum
- Merge Max Zones (where available)

The models shared by the EA were used as the best available representation of fluvial flood risk across the Councils' authority areas.

1.1.2 EA Flood Map for Planning

The EA published a significant update to the [Flood Map for Planning \(FMfP\)](#) on the 25 March 2025, which was used to inform the 2025 Level 1 SFRA Addendum. A further update was carried out in July 2026. This addendum accounts for the July 2026 FMfP.

The FMfP includes several layers of information, including Flood Zones data which shows the extent of land at present day and future risk of flooding from rivers, ignoring the benefits of defences, across both districts. The Flood Zones are a composite dataset including national and local modelled data, and information from past floods.

The FMfP now includes for surface water flood risk for both present day and including the impacts of climate change.

1.1.2.1 Present day risk from rivers

The Flood Map for Planning - Flood Zones - Present Day dataset includes the following present day scenarios:

- Flood Zone 1 – Land having a less than 0.1% (1 in 1000) annual exceedance probability (AEP) of flooding from rivers.
- Flood Zone 2 – Land having between 0.1% - 1% (1 in 100 to 1 in 1000) AEP of flooding from rivers and accepted recorded flood outlines.
- Flood Zone 3 – Areas shown to be at a 1% (1 in 100) or greater AEP of flooding from rivers.

1.1.2.2 Future risk from rivers

The Flood Map for Planning - Flood Zones plus Climate Change dataset shows how the combined extent of Flood Zones 2 and 3 could increase with climate change over the next century, ignoring the benefits of any existing flood defences, using the 'Central' allowance for the 2080s epoch (2070-2125) for risk of flooding from rivers.

1.1.2.3 Present day risk from surface water

The Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset shows the extent of land at risk of flooding from surface water to a defined AEP or chance of flooding each year, including the following scenarios:

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

1.1.2.4 Future risk from surface water

The Flood Map for Planning – Surface Water Spatial Planning Extents – Climate Change dataset includes the same scenarios as present day but accounts for the possible effects of climate change using the 'Upper End' allowance for the 2070s epoch (2061-2125). The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5.

1.1.3 EA Rivers and Sea 3.3% defended flood risk extents

This dataset accounts for the 3.3% AEP (1 in 30) defended event scenario for flooding from rivers for both present day and accounting for the impacts of climate change. The present day dataset has been used, along with available detailed flood modelling outputs, to update the functional floodplain. The plus climate change dataset has been used to update the future functional floodplain.

1.1.4 Additional local modelling

The Councils provided localised fluvial modelling outputs for Letcombe Brook, Childrey Brook, and several small tributaries in East Hanney, and also for an unnamed, largely culverted, tributary to the River Thames, in Wheatley. The available event scenarios were mapped and included in the updates to the functional floodplain.

1.2 Recommendations for developers

It is recommended that developers use the Level 1 SFRA and this accompanying addendum, alongside the Level 2 SFRA where appropriate, as a starting point to assess the flood risk to their sites and to identify the requirements for site-specific Flood Risk Assessments (FRAs) and any further work that might be required. The EA data available [online \(data.gov\)](https://online.data.gov) should be referred to for the latest flood risk data.

Developers should consult with the EA as early as possible in the planning process to understand the requirements for a site-specific FRA and additional assessments they may need to undertake in the interim before publication of additional datasets.

2 Policy and Guidance Updates

2.1 National Planning Policy Framework

In addition to the updated datasets described in Section 1.1, there has been a significant update to the [National Planning Policy Framework \(NPPF\)](#) since the finalisation of the September 2025 Level 1 SFRA Addendum. The updated NPPF was published in August 2026, replacing the December 2024 version.

However, the South Oxfordshire and Vale of White Horse JLP is being examined against the December 2023 version of the NPPF; though, the latest version should still be considered within planning applications.

2.2 How to prepare a strategic flood risk assessment

The EA's [How to prepare a strategic flood risk assessment](#) guidance was updated 27 August 2026. The updates to this guidance since April 2025 have incorporated the recent changes to the Flood Map for Planning, references recent policy changes to the NPPF and new national standards for sustainable drainage systems (SuDS).

2.3 National standards for sustainable drainage systems

The [National standards for sustainable drainage systems \(SuDS\)](#) was last updated 30 July 2025. The revised national standards represent a significant evolution from the original 2015 version. The latest publication of the NPPF in August 2026 requires SuDS to be designed in accordance with these standards.

3 Level 1 SFRA appendix updates

The Level 1 SFRA appendices documents that have been updated are discussed in the subsequent sections.

3.1 Functional floodplain

The South Oxfordshire and Vale of White Horse functional floodplain (Flood Zone 3b) extent was updated as part of the Level 1 SFRA Addendum, September 2025. The EA has recommended for an update to the existing functional floodplain to account for the latest data and guidance. The Councils and the EA agreed on the following hierarchy of datasets to include in this update:

- 3.3% AEP event modelled flood outlines (MFO), where available from local models.
- A proxy MFO (such as the 1% AEP event), where local modelling is available but does not include the 3.3% AEP event.
- EA Rivers and Sea 3.3% AEP event defended flood risk extents - present day, where local detailed modelling is not available.
- EA FMfP Flood Zone 3, where the Rivers and Sea 3.3% AEP event defended flood risk extent has been identified to be misrepresentative of the functional floodplain at a site-specific scale.
- 8m buffer from the statutory main river line, where flood extents are expected but not present (i.e. a main river that has not been captured by local or national modelling).

Appendix A documents the methodology used to update the functional floodplain and future functional floodplain through this Level 1 SFRA addendum, including a tabulated list of the EA models and event scenarios used in the update.

3.2 Site screening assessment

The Councils provided a dataset containing 64 JLP potential development sites for assessment in the September 2025 addendum. The same dataset has been assessed in this latest addendum.

The screening assessment completed as part of this Level 1 SFRA Addendum uses the latest flood risk data available from the EA, as discussed in Section 1.1. It also considers the latest functional floodplain extent, as delineated through this SFRA Addendum, which includes for additional modelling provided by the Councils. Each site was assigned one of two strategic recommendations to assist the LPAs in carrying out the Sequential Test and to highlight those sites at greatest flood risk:

- Strategic Recommendation A - recommend for withdrawal if built development cannot avoid Flood Zone 3b.

- Strategic Recommendation B - Level 2 SFRA required due to high and/or medium fluvial and/or surface water flood risk, accounting for climate change. Exception Test required if site is at high fluvial risk and categorised as more vulnerable.

The outcomes of this assessment can be found in the site screening spreadsheet in Appendix B and the site assessment summary report in Appendix C.

3.3 Cumulative impact assessment

The catchment-level cumulative impact assessment, previously updated through the September 2025 Level 1 SFRA Addendum, has been updated to account for the documented changes in the flood risk data described in Section 1.1. The methodology used to undertake the cumulative impact assessment is documented in Appendix D.

Of the 51 Water Framework Directive (WFD) catchments that are either wholly or partially within the plan area, 23 have changed sensitivity score as a result of the updated national flood risk data to either a higher or lower sensitivity. Table 3-1 documents these changes.

Table 3-1: Cumulative impact assessment catchment changes

Catchment	2025 sensitivity score	2026 sensitivity score
Baldon Brook (South of Oxford)	Low	Medium
Bayswater Brook	Low	Medium
Berrick Stream and Lady Brook	Medium	Low
Chalgrove Brook (Watlington to Thame)	Medium	High
Childrey Brook and tributaries	Low	High
Chinnor Brook and Upper Cuttle Brook	Low	Medium
Cole (Bower Bridge to Thames) including Coleshill	Low	High
Cole and tributaries at Sevenhampton	Low	Medium
Frilford and Marcham Brook	Low	High
Haseley Brook (Latchford Brook to Thame)	Low	Medium
Lewknor Brook	Low	Medium
Mill Brook and Bradfords Brook system, Wallingford	High	Low
Oxon Ray (upstream A41 to Cherwell) including Otmoor	Medium	High
Radcot Cut	Medium	Low
Scotsgrove Brook (upstream Kingsey Cuttle Brook)	Low	Medium
Sulham Brook	High	Medium
Thame (Aylesbury to Scotsgrove Brook)	Low	High
Thame (Scotsgrove Brook to Thames)	Low	High
Thames (Reading to Cookham)	Medium	High
Thames Wallingford to Caversham	High	Medium

Catchment	2025 sensitivity score	2026 sensitivity score
Tuckmill Brook and tributaries	Medium	High
Upper Cuttle Brook and tributaries	Low	Medium
Wadley Stream (Source to Thames at Duxford)	Low	Medium

4 Level 2 SFRA

Following the Councils' application of the Sequential Test to the assessed sites, where development cannot be appropriately accommodated in low-risk areas, the Councils may need to show that allocated sites can be safe for their lifetime. Some sites may also require application of the Exception Test. In these circumstances, a Level 2 SFRA is required to assess in more detail the nature and implications of the flood characteristics in order for the LPAs to allocate such sites in the JLP.

The 2025 Level 2 SFRA has been updated to account for the updated datasets described in Section 1.1, entailing updates to the Level 2 SFRA Main Report, and the 21 individual site assessment reports.

A Appendix A - Functional Floodplain Delineation

An update to the technical note explaining the methodology behind the delineation of the functional floodplain (Flood Zone 3b) and the future functional floodplain for this Level 1 SFRA Addendum.

B Appendix B - Site Screening Assessment

Excel spreadsheet containing an updated screening assessment of flood risk to the potential JLP site allocations based on the functional floodplain, as updated through this Level 1 SFRA Addendum, FMfP Flood Zones 1, 2 and 3, and the FMfP Surface Water Spatial Planning Extents. Climate change was also considered for both fluvial and surface water flood risk. Each site is assigned a strategic recommendation based on the level of flood risk, vulnerability and subsequent developability.

C Appendix C - Site Assessment Summary

Summarises the outcomes of the updated sites screening process recorded in Appendix B.

D Appendix D - Catchment-level Assessment of Cumulative Impacts of Development on Flood Risk

Updated cumulative impact assessment report outlining the methodology and results of the assessment.

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South Oxfordshire and Vale of White Horse Level 1 SFRA Addendum

Appendix A - Functional Floodplain Delineation Methodology

Final

Prepared for
South Oxfordshire District Council
Vale of White Horse District Council

Date
October 2026



**Vale
of White Horse**

Document Status

Issue	October 2026
Issued to	Rebekah Goodwill
BIM reference	TFZ-JBA-XX-XX-RP-EN-0006
Revision	P02
Prepared by	Laura Thompson BSc FRGS Senior Analyst
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1 Introduction

The [Planning Practice Guidance: Flood Risk and Coastal Change](https://www.gov.uk/government/publications/planning-practice-guidance-flood-risk-and-coastal-change) (gov.uk) states that local planning authorities (LPA) should identify and assess, in their Strategic Flood Risk Assessments (SFRA), areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency (EA). The South Oxfordshire and Vale of White Horse functional floodplain (Flood Zone 3b) extent was updated as part of the Level 1 SFRA Addendum, completed in September 2025. The EA has recommended for an update to the existing functional floodplain to account for the latest data and guidance. This methodology note explains the delineation process.

Note that the functional floodplain (Flood Zone 3b) is not included in the Flood Map for Planning. Although the EA now provides the Rivers and Sea 3.3% AEP defended flood risk extents - present day dataset, the functional floodplain should also account for other available data indicating land where water has to flow, or which stores water, in times of flooding. This SFRA therefore sub-divides Flood Zone 3 into Flood Zone 3a and Flood Zone 3b (functional floodplain). This distinction is for the use of LPAs and developers in development planning and management. Flood Zone 3a is Flood Zone 3 of the Flood Map for Planning that is not functional floodplain.

The LPA, Lead Local Flood Authority (LLFA) and the EA must all be consulted on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the LPA, LLFA and EA is therefore fundamental in defining the functional floodplain as robustly and realistically as possible.

2 Functional floodplain definition

The EA's [SFRA guidance](#) (2026) states that the Level 1 SFRA should include the functional floodplain extent on maps with a detailed explanation of how the functional floodplain was defined. This methodology note provides this definition.

The EA's [SFRA guidance](#) (2026) states that functional floodplain should show land that:

"Would flood from rivers or the sea with an annual probability of 1 in 30 (3.3%), with flood risk management features and structures operating effectively

Would normally form the river channel

Is designed to flood (such as flood attenuation schemes), even if it would only flood in more extreme events (such as 0.1% annual probability)"

How to Prepare an SFRA, Environment Agency, 2026

Regarding the impact of defences on the functional floodplain, the EA's guidance states:

"In any modelling used to identify the functional floodplain, include existing defences and other flood risk management features and structures.

You may not need to designate the functional floodplain in locations where evidence shows flooding would be prevented by existing flood defences, flood risk management features or structures, or buildings"

How to Prepare an SFRA, Environment Agency, 2026

Regarding the impact of existing buildings on the functional floodplain, the EA's guidance states:

"The footprints of existing buildings may be removed from functional floodplain extents. However, it may be simpler to include existing buildings and use local policies to control the redevelopment or changes of use that may be acceptable.

Use local policies or guidance to explain the approach you will take when buildings are demolished in functional floodplain. It may be reasonable to assume that sites revert to functional floodplain when buildings have been demolished for more than a year."

How to Prepare an SFRA, Environment Agency, 2026

If there is not enough detailed modelled information available to identify the functional floodplain, this should be made clear on the Level 1 SFRA maps to ensure risk is not underestimated. In these areas, site-specific flood risk assessments should determine whether a site is affected by functional floodplain through additional modelling. If sites are proposed for development in such areas in the local plan, a Level 2 SFRA will be required to robustly map the functional floodplain extent.

2.1 EA recommended hierarchy for functional floodplain delineation

Advice was sought from the EA on the approach to delineating the functional floodplain at the outset of the SFRA update. The below approach was recommended through continuing engagement with the EA:

- 3.3% AEP event modelled flood outlines (MFO), where available from local models
- A proxy MFO (such as the 1% AEP event), where local modelling is available but does not include the 3.3% AEP event
- EA Rivers and Sea 3.3% AEP event defended flood risk extents - present day, where local detailed modelling is not available
- EA FMfP Flood Zone 3, where the Rivers and Sea 3.3% AEP event defended flood risk extent has been identified to be misrepresentative of the functional floodplain at a site-specific scale
- 8m buffer from the statutory main river line, where flood extents are expected but not present (i.e. a main river that has not been captured by local or national modelling).

3 Available datasets

3.1 EA detailed flood modelling

Based on the hierarchy outlined in Section 0, the MFOs listed in Table 3-1 below were provided by the EA and used to update the functional floodplain extent.

Table 3-1: Available EA detailed models and MFOs

Model	Year	Annual Exceedance Probability	Defended?
Letcombe Brook	2009	1% AEP	Yes
Stert A34 to Thames Confluence	2012	1% AEP	Yes
Chalgrove Brook Watlington	2016	3.3% AEP	No defences exist
Ginge Brook	2018	3.3% AEP	Yes
Moor Ditch Didcot	2007	1% AEP	No defences exist
Cole South Marston Brook	2011	1% AEP	No defences exist
Northfield Littlemore Brooks	2011	1% AEP	No defences exist
Assendon Stream	2014	3.3% AEP	No defences exist
Pang Sulham Brook	2016	1% AEP	Yes
Thames (Sandford to Pangbourne)	2018	3.3% AEP	No defences exist
Thames (Eynsham to Sandford)	2018/2021	2% AEP	No defences exist
Didcot Valley Park FMC	2019	1% AEP	No
Eweleme Stream Benson	2019	3.3% AEP	No defences exist
South Moreton FMC	2019	1% AEP	No
Chalgrove Brook	2022	3.3% AEP	Yes
Ock (East Hanney to Thames Confluence)	2017	3.3% AEP	No defences exist
Thames (MRL to St Johns)	2014	2% AEP	Yes

Model	Year	Annual Exceedance Probability	Defended?
Thames (Pangbourne to Sonning)	2019	3.3% AEP	No defences exist
Thames (Shifford to Eynsham)	2011	No appropriate model output to use	-
Thames (Sonning to Hurley)	2019	3.3% AEP	No defences exist
Thames (St Johns to Shifford)	2011	1% AEP	Yes
Where no defences exist, it indicates that there are no defences present along the watercourse. The defended event would be used in preference to the undefended event where available.			

3.2 Rivers and Sea 3.3% defended flood risk extents

The EA has produced a defended 3.3% (1 in 30) AEP dataset to support conversations related to the functional floodplain. It is the responsibility of the developer to assess whether the 3.3% AEP extent shown on the Flood Map for Planning is suitable for use in a site-specific flood risk assessment. Where this extent is found to be unsuitable, a suitable definition of the functional floodplain must be agreed with the Environment Agency.

The defended scenario considers the presence of flood defence infrastructure and assumes such infrastructure operates in the way it was designed to function. This scenario does not include for any asset failure or removal scenarios.

The Rivers and Sea 3.3% AEP defended event flood risk extents - present day dataset has been used to represent the functional floodplain in areas where no suitable detailed modelling is available, as stated in the hierarchy.

4 Functional floodplain delineation methodology

4.1 GIS methodology

The below steps summarise the methodology used to delineate the functional floodplain:

- All EA detailed models supplied for consideration within this assessment were included within the functional floodplain extent where appropriate outputs were available i.e. 3.3% AEP event MFO, where available, or a proxy MFO (see Table 3-1), where the 3.3% AEP event MFO was unavailable.
- The EA Rivers and Sea 3.3% defended flood risk extents - present day dataset was used to define the functional floodplain in areas not subject to detailed modelling.
- EA FMfP Flood Zone 3, where the Rivers and Sea 3.3% AEP event defended flood risk extent has been identified to be misrepresentative of the functional floodplain at a site-specific scale.
- All main river channels not included in local or national modelling, including culverted sections of main river, were added to the functional floodplain outline using an 8m buffer of the watercourses to dissuade development to allow for access to the channels for maintenance. At a local scale, this may lead to some inaccuracies, especially in hydrologically complex areas where there are man-made interactions or interactions with other bodies of water such as reservoirs or canals. Recognising this, functional floodplain policy relates to the river and not the mapping where they are different.
- Each polygon within the functional floodplain outline has been attributed with the source dataset so it is possible to ascertain which dataset each polygon within the outline is sourced from.
- Checks on the geometry of the functional floodplain outline were carried out to ensure geometric correctness in GIS.

4.2 Culverted rivers

The EA Statutory Main River Map includes a high-level and approximate representation of culverted sections of watercourses. These sections are subject to a higher degree of uncertainty as it is more challenging to identify and verify below ground alignments. Within culverted sections, functional floodplain policy relates to the actual confirmed alignment of culverted sections, as identified through site investigation, rather than the alignment shown in the functional floodplain where it differs. The EA or LLFA may be able to advise on the locations of culverted sections of main rivers in the functional floodplain.

It is recommended that investigations of onsite culverted watercourses to establish their full route, condition and capacity are carried out through a site-specific flood risk assessment and incorporated into the surface water sustainable drainage strategy, as required.

4.3 Waterbodies

The EA Statutory Main River Map contains open river channels and culverted sections of channel only and does not include for other types of waterbody such as reservoirs, canals, lakes or ponds. Waterbodies are only included in the delineated functional floodplain where they are present within the EA Rivers and Sea 3.3% defended flood risk extents - present day dataset or detailed model outputs.

4.4 Buildings and infrastructure

Buildings and infrastructure within the functional floodplain have been retained within the outline, i.e. they have not been removed on the assumption that floodwater ingress may occur. The EA's SFRA guidance states that you do not need to designate functional floodplain in locations where evidence shows flooding would be prevented by existing buildings, however it is considered simpler to include existing buildings and use local policies to control the redevelopment or changes of use that may be acceptable. Such policies could include 'no increase in development footprint for buildings within the functional floodplain', 'converting disused buildings to greenspace' or 'the installation of resilience measures'.

4.5 Dry islands

Areas of higher land shown as 'dry islands' within the functional floodplain should also be considered undevelopable where safe access and escape routes are unachievable. The only exception to this is for water compatible or essential infrastructure uses where the exception test has been passed. It has been assumed that any 'dry islands' within the functional floodplain outlines should be considered as functional floodplain where these areas are located within Flood Zone 3 of the EA's Flood Map for Planning.

5 Future functional floodplain

In addition to the present day functional floodplain outline, a future functional floodplain outline, as advised in EA guidance, has been delineated. No suitable 3.3% AEP defended event climate change modelling was available within the supplied EA detailed models, therefore the EA's Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used to represent the future functional floodplain. The climate change allowances used to produce this dataset are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5.

The future functional floodplain indicates areas that may be within the functional floodplain in the future. The future functional floodplain extent should not be included in the functional floodplain designation and is not included in any policy for planning decisions. The NPPF does not include for the future functional floodplain designation in its policy definitions. However, it does recommend more generally that development plans and planning decisions should consider the impact of climate change. Therefore, the future functional floodplain should be considered in site allocation decisions and site masterplanning and layout design. Opportunities should be sought to safeguard these areas for future flood conveyance, flood storage, natural flood management, biodiversity enhancement and adaptation to climate change.

6 Recommendations

The functional floodplain outline has been assessed and agreed upon by the LPA, LLFA and the EA. The extent of the functional floodplain outline produced from this Level 1 SFRA addendum should always be assessed in greater detail where any more detailed study such as updated hydraulic modelling, a Level 2 SFRA or site-specific FRA are undertaken.

Were additional information to be made available, such as photographic evidence of main river flooding, the functional floodplain update can be updated to reflect this. However, given the functional floodplain extent represents main river flooding, the EA should be consulted on any future updates.

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South Oxfordshire and Vale of White Horse Level 1 SFRA Addendum

Appendix C - Joint Local Plan Sites Assessment Summary

Final

Prepared for
South Oxfordshire District Council
Vale of White Horse District Council

Date
October 2026



**Vale
of White Horse**

Document Status

Issued	October 2026
Issued to	Rebekah Goodwill
BIM reference	TFZ-JBA-XX-XX-RP-EN-0004
Revision	P04
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1 Joint Local Plan Sites Assessment

This document provides a strategic assessment of the suitability, relative to flood risk, of the sites to be considered for allocation in South Oxfordshire and Vale of White Horse District Councils' (the Councils) Joint Local Plan (JLP), summarising the outcomes of the screening assessment presented in Appendix B.

The information and guidance provided in this Appendix (also supported by the web-based SFRA mapping on the Councils' websites) can be used by the Local Planning Authorities (LPAs) to inform the application of the sequential test in the allocation of sites in the JLP, and the development management process.

The LPAs must use the spreadsheet in Appendix B to record their decisions on how to take each site forward for allocation or whether to withdraw a site from consideration, based on the evidence and strategic recommendations provided. Recording decisions in the Sites Assessment Spreadsheet demonstrates that a sequential, sustainable approach to development and flood risk has been adopted.

South Oxfordshire and Vale of White Horse District Councils provided a GIS layer containing JLP potential development site allocations. The total number of sites assessed is 64. In order to inform the sequential test to the allocation of development through the Joint Local Plan, this assessment entails a high-level GIS screening exercise overlaying the potential development sites against Flood Zones 1, 2, 3a and 3b (the functional floodplain), calculating the area of each site at risk. Flood Zones 1, 2 and 3 are sourced from the Environment Agency's (EA's) latest version of the [Flood Map for Planning](#) (FMfP), downloaded in August 2026 for this Level 1 SFRA addendum. Flood Zone 3 is split into Flood Zone 3a and Flood Zone 3b (functional floodplain) as part of this Level 1 SFRA addendum, as required by the National Planning Policy Framework (NPPF), 2026.

The impacts of climate change have also been included in the sites screening process using the delineated 'future functional floodplain' extent and the FMfP Flood Zones plus Climate Change dataset to represent fluvial climate change for watercourses. None of the detailed EA models contain suitable detailed climate change modelling. All flood zones are displayed on the Councils' interactive web-mapping portals.

Surface water risk to assessed sites is analysed by way of the EA's latest version of the national scale Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset, downloaded in August 2026.

The FMfP - Surface Water Spatial Planning Extents - Climate Change dataset includes mapping representing the 2070s Upper End climate change allowance scenario for peak rainfall. The impacts of climate change on surface water have been assessed using this dataset.

It is important to consider that each individual site will require further investigation, following this assessment, as local circumstances may dictate the outcome of the strategic

recommendation. Such local circumstances are discussed in Section 1.1. The outcomes of the site assessments are presented in the Sites Screening Assessment Spreadsheet in Appendix B.

1.1 Sequential testing and flood risk data

It is important to ensure that future development is not placed at unnecessary risk from any flood source. However, it is recommended that the Groundwater Emergence Map and the Reservoir Flood Map datasets referred to in this Level 1 SFRA Addendum are not considered in the sequential test on the basis that these datasets do not provide the confidence or certainty required to undertake the sequential test. As the available mapping does not provide competent evidence on the relative risk of flooding, it could potentially result in inappropriate allocations if used without understanding the limitations of the data. Therefore, groundwater and reservoir flood risk should be considered on a site-by-site basis in development planning and investigated further either at the Level 2 SFRA stage or the site-specific FRA stage.

1.2 Screening of potential sites

This section of the report draws together the results included in Appendix B. The LPAs should use the spreadsheet to assist them in carrying out the sequential test. If sites cannot be directed to areas of low flood risk, or where wider strategic objectives require development in areas identified through this Level 1 SFRA addendum to be at medium or high risk from flooding now or in the future, then the LPAs should consider the flood risk vulnerability classifications and flood zones included in Annex F of the NPPF. The LPAs must consider whether a more detailed Level 2 SFRA (including for application of the exception test where applicable) will be required before finalising sites for allocation in the Joint Local Plan. Strategic recommendations are provided for each site, based on Annex F of the NPPF.

The decision-making process on site suitability should be transparent and information from this Level 1 SFRA addendum should be used to justify decisions to allocate land in areas shown to be at high or medium risk of flooding (Table 1-1), from any source, now or in the future.

Table 1-1: Flood risk categories

Risk	Fluvial	Surface water
High	Flood Zone 3	3.3% AEP event
Medium	Flood Zone 2	1% AEP and 0.1% AEP events
Low	Flood Zone 1	Outside of 0.1% AEP event

The Appendix B Sites Assessment Spreadsheet provides a breakdown of each site and the area (in hectares) and percentage coverage of each fluvial and surface water flood zone. Flood Zones 3b, 3a and 2 have been assessed separately, with site areas at risk attributed

to the highest applicable flood risk zone, where these overlap. Similarly for surface water risk, the 3.3% AEP, 1% AEP and 0.1% AEP events are all considered in isolation. This allows for the sequential assessment of risk at each site by addressing those sites at higher risk first. The effects of climate change on fluvial and surface water flood risk have been assessed to inform on the potential additional risk in the future. Section 1.2.1 provides further details.

Table 1-2 and Table 1-3 show the proposed use of the sites and the number of sites at risk from present day and additional future fluvial flooding respectively. Where a site has been identified as being at additional risk from future fluvial flooding, this indicates that a greater area of the site is predicted to be affected by flooding in the future compared with the equivalent present day flood event. The additional risk area has been defined by discounting the area of present day flooding from the future flood extent for a comparable event, and the resulting dataset being used to screen against each site.

Table 1-2: Number of sites at risk from present day fluvial flooding

Proposed use	Number of sites within each flood zone			
	Flood Zone 1*	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Residential	19	20	18	18
Employment	8	6	6	5
Educational & Leisure	1	0	0	0
Mixed Use	4	5	3	3
TOTAL	32	31	27	26
*Sites with 100% area within Flood Zone 1. Note: sites may be in more than one flood zone. A site in Flood Zone 3a will also be within Flood Zone 2.				

Table 1-3: Number of sites at additional risk from future fluvial flooding

Proposed use	Number of sites within each flood zone		
	Flood Zones + climate change†	Modelled 1% AEP + climate change†	Future functional floodplain†
Residential	19	8	18
Employment	6	4	5
Educational & Leisure	0	0	0
Mixed Use	5	2	3
TOTAL	30	14	26
†Sites with additional risk from climate change. Note: the table shows the number of sites where there is additional modelled fluvial risk as a result of climate change for a particular flood event, therefore sites may be counted in more than one column.			

Table 1-4 shows the proposed use of the sites and the number of sites at risk from present day and additional future surface water flooding.

Table 1-4: Number of sites at risk from surface water flooding

Proposed use	Number of sites within each surface water risk category				
	<0.1% AEP zone*	0.1% AEP zone	1% AEP zone	3.3% AEP zone	1% AEP plus 2070s Upper End Climate Change zone†
Residential	0	39	39	38	39
Employment	0	15	15	15	15
Educational & Leisure	0	1	1	1	1
Mixed Use	0	9	9	9	9
TOTAL	0	64	64	63	64
†Sites with additional risk from climate change. *Sites with 100% area outside of the 0.1% AEP zone Note: sites may be in more than one surface water risk category. A site in the 3.3% AEP zone will also be in the 1% and 0.1% AEP zones					

1.2.1 Assessment of climate change

The Site Assessment Spreadsheet highlights the potential additional risk to sites, where applicable, as a result of climate change. To represent the increased flood risk from rivers due to climate change, a future functional floodplain has been delineated through this Level 1 SFRA. The EA Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used to create the future functional floodplain, in the absence of suitable detailed modelling.

The Spreadsheet highlights the additional risk to the potential development sites from fluvial climate change, including areas at risk in the future that may not at risk in the present day. The Risk of Flooding from Fluvial Climate Change columns indicate the area of each site that intersects with each flood extent. No additional modelling has been carried out for this Level 1 SFRA.

The climate change scenarios assessed were:

- EA Rivers and Sea 3.3% defended flood risk extents - climate change dataset (future functional floodplain)
- EA FMfP - Flood Zones Extents plus Climate Change dataset (combined 1% AEP and 0.1% AEP event + central climate change allowance)
- EA FMfP - Surface Water Spatial Planning Extents - Climate Change dataset (1% AEP plus 2070s Upper End allowance for peak rainfall).

1.2.2 Assessment of groundwater emergence risk

The Site Assessment Spreadsheet contains comments on potential groundwater emergence risks within each site, informed by the JBA Groundwater Map. This flags the highest risk category present within the site, not the category that covers the most area. This is to help to understand where there may be groundwater issues within the site that may require further investigation.

The JBA Groundwater Map does potentially enable a risk-based approach to be taken as it depicts different levels of risk. However, this is based on the risk of emergence of groundwater and not the risk of flooding due to groundwater. It should be noted that the location of highest risk of emergence might not be coincident with the location at highest risk of flooding.

Therefore, it is recommended that the groundwater flood risk is not considered in the sequential test on the basis that the JBA groundwater flood map does not provide the confidence or certainty required to undertake the sequential test. As the available mapping does not provide competent evidence on the relative risk of flooding, it could potentially result in inappropriate allocations if used without understanding the limitations of the data.

1.2.3 Assessment of reservoir risk

The EA's Reservoir Flood Map (RFM) (2021) shows where water may go in the unlikely event of a reservoir or dam failure. A 'dry day' scenario assumes that the water level in the reservoir is the same as the spillway level or the underside of the roof for a service reservoir and the watercourses upstream and downstream of the reservoir are at a normal level.

The RFM dry day extents have been considered within the Site Assessment Spreadsheet. This is a flag as to whether the site is at potential residual risk from a reservoir breach. The mapping does not describe a risk-based scenario as it does not provide the probability of a dam failure but is intended to describe a 'worst credible case' in the unlikely scenario of a dam failure. Therefore, it is recommended that the RFM is not included in the sequential test as the available data is inappropriate to be used alongside risk mapping from other sources.

A more detailed assessment in a Level 2 SFRA would identify locations where proposed development could result in a change to the risk designation of a reservoir. If proposed sites are located in a zone at reservoir risk, it will be necessary to understand the extent to which the flooding could be made worse and to report on the implications with respect to allocating the land for development. On that basis such an approach is recommended. If proposed development is located in a high hazard zone in the vicinity of an existing dam structure the implications should be considered in a Level 2 SFRA or site-specific Flood Risk Assessment and where appropriate an assessment made of whether alternative sites should be considered in accordance with the sequential test.

1.2.4 Strategic recommendations

The strategic recommendations are intended to assist the LPAs in carrying out the sequential test and to highlight those sites at greatest flood risk and consider the requirements of the NPPF and FRCC-PPG. They do not account for local circumstances, only that any part of a site area falls within a flood risk area. Table 1-5 shows the number of sites each strategic recommendation applies to:

- Strategic Recommendation A - recommend for withdrawal if built development cannot avoid Flood Zone 3b.
- Strategic Recommendation B - Level 2 SFRA required due to high and/or medium risk. Exception Test required if site is at high fluvial risk and categorised as more vulnerable.

Table 1-5: Number of sites per strategic recommendation

Proposed use	Number of sites assigned to each strategic recommendation	
	A	B
Residential	18	21
Employment	5	10
Educational & Leisure	0	1
Mixed use	3	6
TOTAL	26	38

It is important to note that each individual site will require further investigation before being allocated for development, either through a Level 2 SFRA or a site-specific FRA, as local circumstances may dictate the outcome of the strategic recommendation. A Level 2 SFRA does not negate the requirement for a site-specific FRA. Such local circumstances may include the following:

- Modelled flood depths, velocities, and hazards will differ locally to each at risk site therefore such data should be assessed for the relevant flood event at each site.
- The FMfP - Flood Zones and FMfP - Surface Water Spatial Planning datasets are designed to only give an indication of flood risk to an area of land and are not suitable for showing whether an individual property is at risk of flooding. This is because all the details about each property cannot be known.
- For sites identified to be at risk from surface water or at additional risk from climate change based on the FMfP - Surface Water Spatial Planning datasets, a proportionately more detailed assessment of surface water may reveal higher or lower risk to the site. The Lead Local Flood Authority (LLFA) should be consulted when considering development at such sites. The FMfP - Surface Water Spatial Planning datasets do not map flooding less than 0.075m (7.5cm) in depth. Therefore, where the datasets may show no flooding, there may be shallow flooding up to a depth of 0.075m.

- Current surface water drainage infrastructure and SuDS suitability are likely to differ at each site considered to be at risk from surface water flooding. Further investigation would therefore be required for any site at surface water flood risk. The LLFA should require that all planning applications must be accompanied by an appropriate drainage strategy, independent of the requirement for a site-specific FRA.
- If sites have planning permission but construction has not started, the SFRA will only be able to influence the design of the development e.g. finished floor levels.
- It may be possible at some sites to develop around the flood risk. Planners are best placed to make this judgement i.e. will the site still be deliverable if part of it needs to be retained to make space for floodwater? Yields may be impacted.
- Surrounding existing infrastructure may influence the scope for layout redesign/changing of site boundaries to remove areas at risk.
- Some sites not currently shown to be at flood risk may be at residual risk through the failure of defences during a flood event or through blockage/failure of drainage assets such as culverts. Assessment may be required including mitigation measures, emergency plans, flood warnings, and property flood resilience measures.
- Safe and dry access and escape routes must be available at all times during a flood event for emergency response and evacuation. Emergency planners should be consulted and appropriate emergency plans put in place at the planning application stage.
- Current land use. A number of sites included in the assessment are likely to be brownfield and containing exiting development structures, thus the existing development structure and footprint should be considered insofar that additional development should not lead to increased flood risk.
- Existing planning permissions may exist on some sites where the EA may have already passed comment and/or agreed to appropriate remedial works concerning flood risk. Previous flood risk investigations/FRAs may already have been carried out at some sites. The LPA should be consulted.

1.2.4.1 Strategic Recommendation A - recommend for withdrawal if built development cannot avoid Flood Zone 3b

Strategic Recommendation A applies to any site where the following criteria is true:

- Any proportion of the site area is within the functional floodplain. Annex F of the NPPF states that only water compatible uses and essential infrastructure could be permitted in the functional floodplain, though any essential infrastructure must pass the Exception Test and water compatible uses must be designed and constructed to remain operational and safe for users in times of flood; must result in no net loss of floodplain storage; and must not impede water flows and not increase flood risk elsewhere. Development should not be permitted for any proportion of sites within the highly, more, or less vulnerable categories that fall within the functional floodplain.

It is important to state that it may still be possible to deliver a site that has been recommended for withdrawal from allocation where small or isolated areas are at risk, or upon more detailed investigation through a Level 2 SFRA and subsequent updates of the Flood Zone 3b outline through more detailed modelling, if applicable.

Depending on local circumstances, if it is not possible to remove the developable area from Flood Zone 3b to a lower risk zone then the sequential test would be failed, and development should not be allocated or permitted.

26 of the 64 potential development sites have been recommended for withdrawal if built development cannot avoid the functional floodplain.

Any area within Flood Zone 3b should be left as or converted to open green space. For smaller sites, this approach may be challenging to achieve compared to larger sites or strategic sites where there may be enough space to limit the impact through effective flood storage or blue green infrastructure. If this is not possible, the site should be withdrawn.

1.2.5 Strategic Recommendation B - Level 2 SFRA required due to high and/or medium risk. Exception test may be required.

Strategic Recommendation B applies to any site where the following criteria is true:

- Any part of a site is within Flood Zone 3a (high risk)
- Any part of a site is within Flood Zone 2 (medium risk)
- Any part of a site is shown to be at additional fluvial risk due to climate change
- Any part of a site is within a surface water present day zone
- Any part of a site is within the surface water climate change zone

NOTE: the exception test only applies to sites at fluvial flood risk, depending on the vulnerability of the site use (Annex F, NPPF). Less vulnerable uses of land do not require the exception test but may still require a Level 2 SFRA to show the likelihood of remaining safe for the lifetime of development.

According to diagrams 1 and 2 of the FRCC-PPG, any site at high or medium flood risk now and/or in the future should be assessed in more detail through a Level 2 SFRA. Strategic Recommendation B applies to sites where a Level 2 SFRA is required, unless the LPA can state in local plan policy that built development must avoid the risk area. This may be applicable where the proportion of a site at risk is small or where the risk area is spatially isolated to specific areas of a site.

Sites included within Strategic Recommendation B may be subject to application of the exception test as part of the Level 2 SFRA i.e. more vulnerable sites in Flood Zone 3a. However, the sequential test should have been passed first, using this Level 1 SFRA, before the exception test is applied. The LPA should always attempt to avoid risk areas where possible.

Strategic Recommendation B applies to 38 of the 64 potential development sites assessed. 31 of these sites require a Level 2 SFRA to further inform on surface water flood risk only. A Level 2 Scoping Assessment will be required to confirm sites required for Level 2 assessment.

1.3 Summary of site assessment outcomes

There are several consequential development considerations which could come out of the site assessment sequential testing process. Each outcome is discussed below. The LPA should refer to Section 1.1 and Appendix B for details on the site assessments carried out for this Level 1 SFRA.

1.3.1 Rejection of site

A site which fails to pass the sequential test and/or the exception test should be rejected and development not permitted. Rejection would also apply to any built development within the functional floodplain (unless water compatible or essential infrastructure informed by a FRA). However, if the developer can avoid built development within the functional floodplain, part of the site could still be delivered.

In terms of surface water flood risk, if risk is considered significant (i.e. large, sporadic areas at medium or high risk now or in the future with major flow paths) or where the size of the site does not allow for on-site storage or application of appropriate SuDS then such sites could be rejected. The LLFA will be best placed to advise on site-specific surface water flood risk and whether sites can be taken forward or not.

1.3.2 Exception test required

Applies to those sites that, according to Annex F of the NPPF, and diagrams 1, 2 and 3, and Table 2 of the FRCC-PPG, would require the Exception Test. Only less vulnerable land uses would not require application of the exception test in Flood Zone 3a. More vulnerable uses are only permitted if both parts of the exception test are passed. Passing the Exception Test at the plan making stage does not negate the requirement for an FRA at the planning application stage. A Level 2 SFRA will inform the application of the Exception Test

and the likelihood of passing part b of the test. Where any new or updated flood risk data to become available at the planning application stage, then the Exception Test should be reapplied using the new data.

1.3.3 Consideration of site layout and design

The site area would have to be large enough to enable any alteration of the developable area of the site to remove development from a risk area, or to leave space for onsite storage of floodwater. Careful layout and design at the site planning stage may apply to such sites where it is considered viable based on the level of risk. Surface water risk and opportunities for SuDS should also be assessed during the planning stage. Blue green corridors can be used as multifunctional spaces providing mitigation for flood risk management, ecology, biodiversity net gain (BNG), and amenity and social benefits.

Any development within 8 metres of any flood defence structure or culvert on a non-tidal main river is likely to constitute a regulated flood risk activity under Schedule 25 of the Environment Permitting (England and Wales) Regulations 2016. Any site redesign, where Flood Zone 3a is included within the site footprint, should allow water to flow naturally or be stored in times of flood. Similarly, any change or development near to or alteration to an ordinary watercourse within a site would need consent from the LLFA under the [Land Drainage Act 1991](#).

1.3.4 Site-specific Flood Risk Assessment

A site-specific FRA should assess whether a potential development site is likely to be affected by current or future flooding from any source. This should include referencing this Level 1 SFRA to help to establish sources of flooding. Further analysis should be performed to improve the understanding of flood risk including agreement with the LPA and the EA on areas of functional floodplain that may not have been robustly defined within this SFRA due to the absence of appropriate information from the EA. The LLFA should be consulted on risk from surface water and from ordinary watercourses.

Together with the information in the FRCC-PPG, there is further detail and support provided for the LPAs and developers online via:

- [National flood risk standing advice for local planning authorities](#)
- [Preparing a flood risk assessment: standing advice](#)
- [Flood risk assessments: Applying for planning permission](#)
- [Flood risk assessment: Flood Zones 1, 2, 3 and 3b](#)

1.3.5 Sites passing the sequential and exception tests

Development sites can be allocated or granted planning permission with a suitable site-specific FRA, approved and signed off by the LPA, where the sequential test and the exception test (if required) are passed and agreement is reached between the LPA, LLFA, the EA, the water companies and any ancillary stakeholders.

In addition, a site is likely to be allocated without the need to assess flood risk where the indicative use is for open space. Assuming the site is not to include any development or land raising / regrading works and is to be left open in its original state then the allocation is likely to be acceptable from a flood risk point of view. However, for sites where there is potential for flood storage, options should be explored as part of an FRA.

In terms of opportunities for reducing flood risk overall as a requirement of the exception test, the FRCC-PPG states:

“Developers should refer to the Strategic Flood Risk Assessments and site-specific Flood Risk Assessments to identify opportunities to reduce flood risk overall and to demonstrate that the measures go beyond just managing the flood risk resulting from the development. Reductions could be achieved, for example by:

- *Incorporating green infrastructure within the layout and form of development to make additional space for the flow and storage of flood water;*
- *Providing Sustainable Drainage Systems, that manage flood risk beyond the proposed site and above the usual standard, such as by removing surface water from existing combined sewers;*
- *Providing or making contributions to flood risk management infrastructure that will provide additional benefits to existing communities and/or by safeguarding the land that would be needed to deliver it.” (Paragraph 037).*

1.3.6 Surface water flood risk to assessed sites

For sites at surface water flood risk, the following should be considered, proportionate to the risk shown by the FMfP - Surface Water Spatial Planning datasets:

- More detailed surface water assessment or modelling may reveal increased risk or less risk to a site compared to what is shown by the national FMfP - Surface Water Spatial Planning datasets;
- Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied (Policy F5 para 2, NPPF);
- The FMfP - Surface Water Spatial Planning datasets do not map flooding less than 0.075m (7.5cm) in depth. Therefore, where the dataset may show no flooding, there may be shallow flooding up to a depth of 0.075m;
- Outline drainage strategy to ascertain natural flow paths and topographic depressions, particularly for the larger sites which may influence development at sites elsewhere;
- Full drainage strategy encompassing detailed surface water modelling of proposed site layouts, attenuation areas, diversion of flow routes, SuDS;

- Ensuring future maintenance of surface water and SuDS assets through s106 agreements;
- The size of development and the possibility of increased surface water flood risk caused by development on current greenfield land (where applicable) and cumulative impacts of this within specific areas;
- Management and re-use of surface water onsite, assuming the site is large enough to facilitate this and achieve effective mitigation. Effective surface water management should ensure risks on and off site are controlled;
- Larger sites could leave surface water flood-prone areas as open greenspace, incorporating social and environmental benefits;
- SuDS must be used where possible for all development proposals which could affect drainage on or around the development site to control flow rates and reduce volumes of runoff, in ways which are proportionate to the nature and scale of the proposal (Policy F8 para 1, NPPF).
- Appropriate SuDS may offer opportunities to control runoff to greenfield rates or betterment on existing. Restrictions on surface water runoff from new development should be incorporated into the development planning stage. For brownfield sites, where current infrastructure may be staying in place, then runoff should attempt to mimic that of greenfield rates, unless it can be demonstrated that this is unachievable or hydraulically impractical. Developers should design SuDS in accordance with the 'National standards for sustainable drainage systems (SuDS)', updated July 2025, as required by the NPPF. They should also refer to relevant Local Plan policies and other guidance documents cited in the Level 1 SFRA. Note that SuDS should not be sited in locations of fluvial flood risk unless they are designed to mitigate for both sources of risk;
- Runoff up to and including the 1% Annual Exceedance Probability (AEP) event, including for climate change, should be managed onsite where possible;
- Measures of source control should be required for all development sites;
- Developers should be required to set part of their site aside for surface water management, to contribute to flood risk management in the wider area and supplement blue green infrastructure networks;
- Developers should be required to maximise permeable surfaces;
- Flow routes on new development where the sewerage system surcharges as a consequence of exceedance of the 3.3% AEP design event should be retained;
- It may be beneficial to carry out a local Surface Water Management Plan (SWMP) or wider drainage strategies for targeted locations with any known critical drainage problems. Investigation into the capacity of existing sewer systems would be required in order to identify critical parts of the system i.e. pinch points.
- Drainage model outputs could be obtained from the water company to confirm the critical parts of the drainage network and subsequent recommendations could then be made for future development i.e. strategic SuDS sites, parts of the drainage system where any new connections should be avoided, and parts of the

system that may have any additional capacity and recommended runoff rates. A Water Cycle Study would help to inform this.

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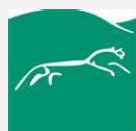
South Oxfordshire and Vale of White Horse Level 1 SFRA Addendum

**Appendix D - Catchment-level assessment of
the Cumulative impacts of Development on
Flood Risk**

Final

Prepared for
South Oxfordshire District Council
Vale of White Horse District Council

Date
October 2026



**Vale
of White Horse**

Document Status

Issued	October 2026
Issued to	Rebekah Goodwill
BIM reference	TFZ-JBA-XX-XX-RP-EN-0003
Revision	P02
Prepared by	Freya Nation BSc Analyst
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Abbreviations

ACDP	Areas with Critical Drainage Problems
AEP	Annual Exceedance Probability
EA	Environment Agency
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
LPA	Joint Local Planning Authority
NFM	Natural Flood Management
NPPF	National Planning Policy Framework
OS	Ordnance Survey
RAG	Red-Amber-Green
RFO	Recorded Flood Outline
RMA	Risk Management Authority
SuDS	Sustainable drainage systems
WFD	Water Framework Directive

1 Introduction

Cumulative impacts are defined as the effects of past, current and future activities on the environment. The below assessment is a catchment based approach, which indicates potential cumulative impacts on flood risk in the South Oxfordshire and Vale of White Horse authority areas. These cumulative impacts may be negative, such as development leading to an increase in the existing level of flood risk within a catchment. They may also be positive, such as effective surface water management within a development site helping to alleviate existing flooding issues within a catchment.

The cumulative impact of development should be considered at both the Joint Local Plan making stage and the planning application and development design stages. Section 18 Policy F1 of the National Planning Policy Framework (NPPF, 2026) states:

'...development plans should be informed by an up-to-date strategic flood risk assessment which considers current and future flood risk from all sources, including cumulative impacts in, or affecting, areas susceptible to flooding'

To understand the impact of future development on flood risk in the South Oxfordshire and Vale of White Horse, flood risk data has been compared with potential changes in developed area within each river catchment defined within the Water Framework Directive (WFD). This identifies the catchments where development may have the greatest impact on flood risk, and therefore where further assessment would be required within a site-specific Flood Risk Assessment (FRA).

Where catchments have been identified as sensitive to the cumulative impact of development, the assessment concludes with potential strategic planning policy suggestions to manage the risk.

2 Cumulative Impact Assessment Methodology

2.1 Cumulative impact of development and flood risk

2.1.1 Introduction

The cumulative impact of development is assessed in two parts. These comprise an evaluation of future development pressures within each WFD river waterbody catchment and an assessment of historical and predicted future flood risk. The approach to understanding the catchments most influenced by the cumulative impact of development is conceptualised in Figure 2-1.

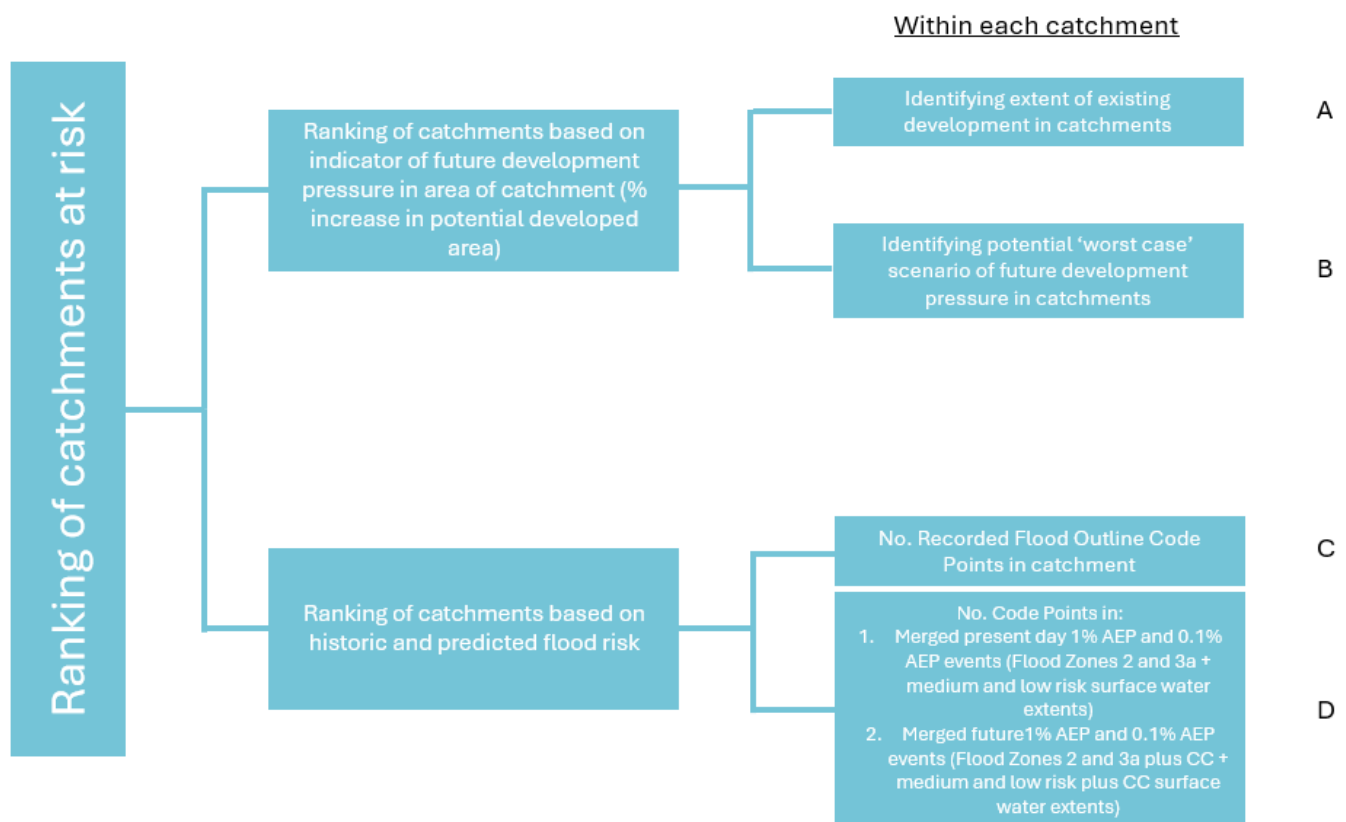


Figure 2-1: Overview of the method used in the cumulative impact assessment

2.1.2 Assessing existing and future development scenarios

To ensure that the strategic policies of the new Joint Local Plan consider the impact of any future development on areas susceptible to flooding, the potential development pressures during the new Joint Local Plan period need to be considered. The impact of development is assessed by establishing a growth scenario of development already committed to prior to the preparation of the Joint Local Plan, as well as the potential future development pressures during the active Joint Local Plan period.

The assessment is undertaken on a river catchment scale, using catchments defined by the WFD. Several of the WFD river waterbody catchments assessed within the cumulative

impact assessment cross administrative boundaries into neighbouring authorities. To account for this in the study, all councils that share a WFD river waterbody catchment with South Oxfordshire and Vale of White Horse were contacted to provide information of future development within their administrative area. These councils are:

- Oxford City Council
- Cherwell District Council
- Buckinghamshire Council
- Wokingham Borough Council
- Reading Borough Council
- West Berkshire Council
- Wiltshire Council
- Swindon Borough Council
- Cotswold District Council
- West Oxfordshire District Council

The site allocation information provided by these neighbouring authorities was combined with that of the South Oxfordshire and Vale of White Horse to understand the risk to each WFD river waterbody catchment, based upon potential future growth.

It should be noted that the inclusion of potential future development pressures in neighbouring authorities makes the scoring method sensitive to future change, should any larger sites be removed, or additional sites come forward. However, it provides the best possible indication of development pressure across the South Oxfordshire and Vale of White Horse area and catchments that feed into it. Potential future development information for Buckinghamshire, Wokingham, Reading, Swindon, Cotswold and West Oxfordshire was not included within this assessment, as no allocation data was made available for consideration. Cumulative impacts in areas with no future development information available have been identified solely through flood risk.

2.1.2.1 Existing development scenario (Part A - Figure 2-1)

To understand the level of existing development within the study area, the Ordnance Survey (OS) Open Code Point dataset covering the South Oxfordshire and Vale of White Horse area and neighbouring authority areas was used to establish the baseline growth scenario.

2.1.2.2 Indicator of development pressure (Part B - Figure 2-1)

To understand which catchments within the South Oxfordshire and Vale of White Horse area are likely to experience the greatest pressure from future growth, all potential development sites within South Oxfordshire district and Vale of White Horse district, as well as the sites provided by Oxford City Council, Cherwell District Council, West Berkshire Council and Wiltshire Council, were analysed. This analysis serves as an indicator of areas likely to be subject to the greatest development pressure in the future.

This data allows calculation of the overall area of site allocations within each catchment, illustrating the relative pressures on the catchments. The percentage total proposed area of development is calculated and ranked, with the catchment with the highest proportion of growth ranked as '1'.

2.1.3 Datasets used to assess future development pressures

Table 2-1 provides an overview of the datasets considered within the future development section of the cumulative impact assessment.

Table 2-1: Data considered within the development assessment and their purpose

Dataset	Coverage	Source of data	Purpose
Catchment boundaries	South Oxfordshire and Vale of White Horse authority areas	WFD river waterbody catchments (Environment Agency)	To identify and map catchments that will determine the study area extent
Existing development data (accessed September 2026)	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Open Code Point dataset (Ordnance Survey)	To provide the existing development scenario
Development commitments in South and Vale (provided for consideration in 2024)	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	South Oxfordshire District Council and Vale of White Horse District Council	To provide the existing development scenario
Joint Local Plan potential future development sites (provided for consideration in 2026)	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	South Oxfordshire District Council and Vale of White Horse District Council	To provide an indicator of relative future development pressures within the study area
Neighbouring authority local plan site allocations (provided for consideration in 2024)	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Oxford City Council, Cherwell District Council, West Berkshire Council and Wiltshire Council	To provide an indicator of relative future development pressures within the study area

2.1.4 Assessing the sensitivity to flood risk

In addition to the assessment of future development pressures, a composite flood risk score is derived for each catchment. This is calculated by taking an average ranking of both recorded flood risk (historic incidents) and modelled (predicted) fluvial and surface water risk. To understand the relative flood risk within each catchment, a ranking system is adopted, with the worst-case flood risk numbered as '1'.

2.1.4.1 Historic flood risk (Part C - Figure 2-1)

To understand the impact to property from historic flood incidents, the EA Recorded Flood Outline (RFO) dataset was considered. This was intersected with the OS Open Code Points within each catchment to provide an indication of the number of historically impacted properties per catchment.

2.1.4.2 Sensitivity to increases in flood flows (Part D - Figure 2-1)

To understand the sensitivity of each catchment to increases in flood flows, an assessment of fluvial and surface water flood risk was undertaken. This assessment provides an indication of where local topography makes an area more sensitive to increases in flood risk. This may be due to any number of reasons, including climate change, new development etc. It is not an absolute figure or prediction of the impact that new development will have on flood risk.

The present day flood risk scenario is based on the EA Flood Map for Planning Flood Zones 3 and 2 (1% Annual Exceedance Probability (AEP) and 0.1% AEP events) combined with the EA Flood Map for Planning Surface Water Spatial Planning present day medium (1% AEP event) and low (0.1% AEP event) risk extents. The future flood risk scenario is based on the EA Flood Map for Planning Flood Zones plus Climate Change and the EA Flood Map for Planning Surface Water Spatial Planning climate change datasets.

The fluvial climate change allowance used in the EA Flood Map for Planning - Flood Zones plus Climate Change dataset is the 'Central' allowance for the 2080s epoch (2070-2125) for risk of flooding from rivers

For surface water, the 'Upper end' (based on the 95th percentile) for the 2070s epoch (2061-2125) has been used in the EA Flood Map for Planning Surface Water Spatial Planning for the climate change scenarios.

The fluvial and surface water flood extents are merged to prevent double counting of properties at risk where fluvial and surface water flood risks overlap.

The present and future flood risk scenarios have been separately intersected with the OS Open Code Points to approximate the number of properties at risk within each scenario. The difference between the number of properties within the present and future flood risk scenarios has been calculated and given as a percentage of the total number of OS Open Code Points within the catchment. This gives an indication of which catchments are most sensitive to increases in surface water runoff upstream.

2.1.5 Datasets used to assess the sensitivity to flood risk

Table 2-2 provides an overview of the datasets considered within the flood risk section of the cumulative impact assessment.

Table 2-2: Data considered within the flood risk assessment and their purpose

Dataset	Coverage	Source of data	Purpose
Catchment boundaries	South Oxfordshire and Vale of White Horse authority areas	WFD river waterbody catchments (Environment Agency)	To identify and map catchments that will determine the study area extent
Property point data	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Open Code Point dataset (Ordnance Survey)	To provide an indication of the number of properties at risk
Historic flood incidents	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Recorded Flood Outlines (Environment Agency)	To understand which areas have been impacted by historic flooding
Fluvial present day flood zones	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Flood Map for Planning Flood Zones 2 and 3 (Environment Agency)	To understand the present day risk of fluvial flooding
Fluvial future flood zones	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Flood Map for Planning Flood Zones plus Climate Change (Environment Agency)	To understand the potential future risk of fluvial flooding
Surface water present day flood zones	Catchments covering the South Oxfordshire and Vale of White Horse authority areas	Flood Map for Planning - Surface Water Spatial Planning present day medium and low risk extents (Environment Agency)	To understand the present day risk of surface water flooding
Surface water	Catchments	Flood Map for Planning	To understand the

Dataset	Coverage	Source of data	Purpose
future flood zones	covering the South Oxfordshire and Vale of White Horse authority areas	- Surface Water Spatial Planning climate change medium and low risk extents (Environment Agency)	potential future risk of surface water flooding

3 Results

3.1 Introduction

The results are ranked for each of the above assessments from 1 to 50. For example, the catchment with the highest percentage of property points within the recorded flood outline dataset would be ranked as '1'. The individual historic flooding, flood risk sensitivity and future development pressure ranks are summed to give an overall ranking for each catchment. The catchment with the lowest combined rank is the most sensitive to the cumulative impact of development.

3.2 Cumulative impact assessment results

A Red Amber Green (RAG) rating is applied to the catchments, with red being high sensitivity, amber being medium sensitivity and green being low sensitivity. It should be noted that this assessment provides a relative assessment of sensitivity increases in flood risk and development between catchments within the study area.

A map of the RAG rating for each catchment is shown in Figure 3-1 and a summary of the results is shown in Table 3-1.

The catchments ranked as at high sensitivity to the cumulative impacts of development are:

- Childrey Brook and Norbrook at Common Barn
- Thames (Evenlode to Thame)
- Cherwell (Ray to Thames) and Woodeaton Brook
- Northfield Brook (Source to Thames) at Sandford
- Ock and tributaries (Land Brook confluence to Thames)
- Ginge Brook and Mill Brook
- Chalgrove Brook (Watlington to Thame)
- Oxon Ray (upstream A41 to Cherwell) including Otmoor
- Frilford and Marcham Brook
- Thame (Aylesbury to Scotsgrove Brook)
- Childrey Brook and tributaries
- Cole (Bower Bridge to Thames) including Coleshill
- Thame (Scotsgrove Brook to Thames)
- Thames (Reading to Cookham)
- Tuckmill Brook and tributaries

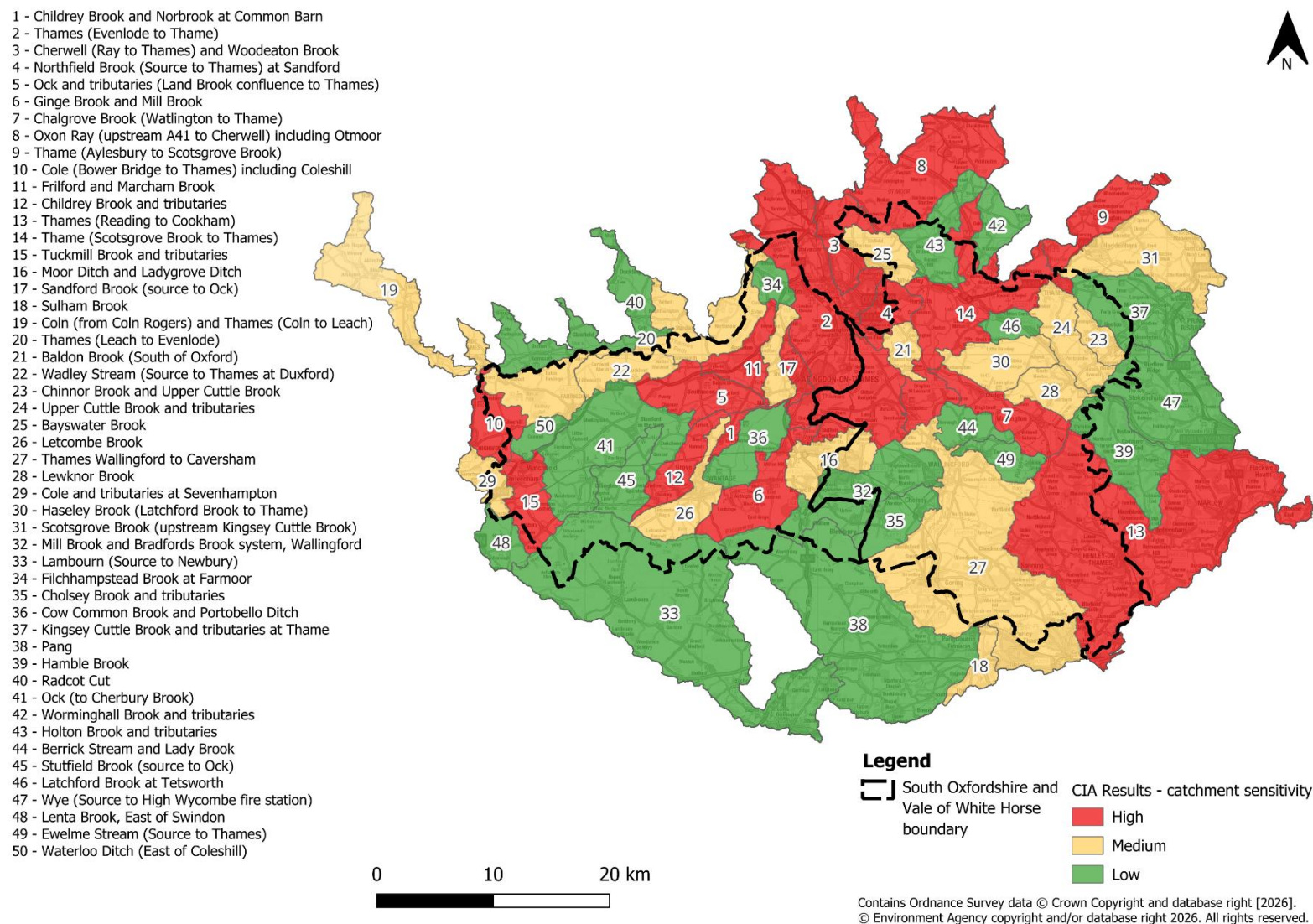


Figure 3-1: Sensitivity of catchments within and around the Council study area to cumulative impacts

Table 3-1: Results of cumulative impact assessment

Map label	Catchment name	Area of growth (%)	Growth RAG score	Code points in historic flood outlines	Increase in properties at flood risk (%)	Flood risk RAG score	Overall RAG score	Overall rank
1	Childrey Brook and Norbrook at Common Barn	17.82%	High	7	7.1%	High	High	1
2	Thames (Evenlode to Thame)	4.61%	High	222	8.9%	High	High	2
3	Cherwell (Ray to Thames) and Woodeaton Brook	4.56%	High	6	13.8%	High	High	3
4	Northfield Brook (Source to Thames) at Sandford	14.29%	High	0	10.8%	High	High	3
5	Ock and tributaries (Land Brook confluence to Thames)	3.06%	High	41	6.8%	High	High	5
6	Ginge Brook and Mill Brook	6.18%	High	18	5.1%	Medium	High	6
7	Chalgrove Brook (Watlington to Thame)	1.49%	High	2	9.0%	High	High	7
8	Oxon Ray (upstream A41 to Cherwell) including Otmoor	0.59%	Medium	3	9.9%	High	High	8
9	Thame (Aylesbury to Scotsgrave Brook)	0.00%	Low	4	10.4%	High	High	8

Map label	Catchment name	Area of growth (%)	Growth RAG score	Code points in historic flood outlines	Increase in properties at flood risk (%)	Flood risk RAG score	Overall RAG score	Overall rank
10	Cole (Bower Bridge to Thames) including Coleshill	0.00%	Low	2	9.0%	High	High	10
11	Frilford and Marcham Brook	0.61%	Medium	3	7.5%	High	High	10
12	Childrey Brook and tributaries	15.26%	High	0	7.0%	Medium	High	12
13	Thames (Reading to Cookham)	0.00%	Low	169	8.2%	High	High	13
14	Thame (Scotsgrove Brook to Thames)	1.05%	High	7	8.4%	High	High	14
15	Tuckmill Brook and tributaries	4.00%	High	1	7.4%	Medium	High	14
16	Moor Ditch and Ladygrove Ditch	2.63%	High	1	8.4%	Medium	Medium	16
17	Sandford Brook (source to Ock)	2.58%	High	1	7.0%	Medium	Medium	17
18	Sulham Brook	0.46%	Medium	11	5.5%	Medium	Medium	18
19	Coln (from Coln Rogers) and Thames (Coln to Leach)	0.00%	Low	21	6.6%	High	Medium	19
20	Thames (Leach to Evenlode)	0.00%	Low	29	6.6%	High	Medium	19

Map label	Catchment name	Area of growth (%)	Growth RAG score	Code points in historic flood outlines	Increase in properties at flood risk (%)	Flood risk RAG score	Overall RAG score	Overall rank
21	Baldon Brook (South of Oxford)	1.28%	High	0	8.2%	Medium	Medium	21
22	Wadley Stream (Source to Thames at Duxford)	0.00%	Low	0	16.7%	High	Medium	21
23	Chinnor Brook and Upper Cuttle Brook	3.38%	High	0	7.0%	Medium	Medium	23
24	Upper Cuttle Brook and tributaries	1.22%	High	0	7.6%	Medium	Medium	24
25	Bayswater Brook	4.56%	High	1	5.6%	Low	Medium	25
26	Letcombe Brook	2.27%	High	7	5.5%	Medium	Medium	25
27	Thames Wallingford to Caversham	0.19%	Low	221	5.5%	Medium	Medium	25
28	Lewknor Brook	0.00%	Low	0	9.3%	Medium	Medium	28
29	Cole and tributaries at Sevenhampton	10.42%	High	0	5.3%	Low	Medium	29
30	Haseley Brook (Latchford Brook to Thame)	8.79%	High	0	5.4%	Low	Medium	29
31	Scotsgrove Brook (upstream Kingsey Cuttle Brook)	0.10%	Low	0	8.9%	Medium	Medium	29
32	Mill Brook and Bradfords Brook system, Wallingford	2.74%	High	2	5.8%	Low	Low	32

Map label	Catchment name	Area of growth (%)	Growth RAG score	Code points in historic flood outlines	Increase in properties at flood risk (%)	Flood risk RAG score	Overall RAG score	Overall rank
33	Lambourn (Source to Newbury)	0.09%	Low	17	6.4%	Medium	Low	33
34	Filchhampstead Brook at Farmoor	0.00%	Low	0	7.9%	Medium	Low	34
35	Cholsey Brook and tributaries	0.58%	Medium	3	4.1%	Medium	Low	35
36	Cow Common Brook and Portobello Ditch	7.04%	High	0	3.8%	Low	Low	35
37	Kingsey Cuttle Brook and tributaries at Thame	0.44%	Medium	0	6.6%	Low	Low	37
38	Pang	0.09%	Low	13	4.1%	Low	Low	38
39	Hamble Brook	0.00%	Low	3	4.3%	Low	Low	39
40	Radcot Cut	0.00%	Low	9	0.9%	Low	Low	39
41	Ock (to Cherbury Brook)	0.12%	Low	4	3.1%	Low	Low	41
42	Worminghall Brook and tributaries	0.00%	Low	0	6.3%	Low	Low	41
43	Holton Brook and tributaries	0.00%	Low	1	3.4%	Low	Low	43
44	Berrick Stream and Lady Brook	0.00%	Low	0	4.9%	Low	Low	44
45	Stutfield Brook (source to Ock)	0.00%	Low	0	4.4%	Low	Low	45

Map label	Catchment name	Area of growth (%)	Growth RAG score	Code points in historic flood outlines	Increase in properties at flood risk (%)	Flood risk RAG score	Overall RAG score	Overall rank
46	Latchford Brook at Tetworth	0.00%	Low	0	2.8%	Low	Low	46
47	Wye (Source to High Wycombe fire station)	0.00%	Low	0	2.3%	Low	Low	47
48	Lenta Brook, East of Swindon	0.00%	Low	0	1.9%	Low	Low	48
49	Ewelme Stream (Source to Thames)	0.00%	Low	0	1.4%	Low	Low	49
50	Waterloo Ditch (East of Coleshill)	0.00%	Low	0	0.0%	Low	Low	50

4 Assumptions and limitations

Table 4-1 sets out the assumptions and limitations of the cumulative impact assessment.

Table 4-1: Assumptions and limitations of the assessment

Assessment aspect	Assumption made	Details of limitation in method	Justification
Development pressure	Assumption of housing density and impermeable areas	Where potential development densities were not known for the sites, it is assumed that 70% of the site area would contribute surface water runoff to the wider catchment. This takes into account a 30% allowance for landscaping and requirements for sustainable drainage systems (SuDS) within sites, which lessens the impacts of new development	With housing densities and proportions of undeveloped areas not known, the approach aims to provide a more realistic indication of site development in the growth scenario
Development pressure	Current site use assumed to be greenfield (undeveloped)	The current use of the sites (e.g. greenfield/brownfield) is often undefined. Brownfield sites are likely to have a less significant impact on flood risk as they have previously been developed. Therefore, in absence of this information, a 'worst case' assessment is produced, which assumes that all sites are greenfield (undeveloped) and may overestimate the risk within each catchment	The assessment considers the 'worst case' development scenario, that all sites were greenfield (undeveloped) prior to growth. With the former land uses for each site not known, the approach overestimates the potential impact, but this is a precautionary approach
Development pressure	Potential development site area not provided for all neighbouring authorities	Potential development sites were available for consideration for the Buckinghamshire, Wokingham, Reading, Swindon, Cotswold and	Potential development pressure was not taken into account for the WFD catchments shared between South Oxfordshire and Vale of

Assessment aspect	Assumption made	Details of limitation in method	Justification
		West Oxfordshire authority areas	White Horse and Buckinghamshire, Wokingham, Reading, Swindon, Cotswold and West Oxfordshire. Cumulative impacts were assessed through flood risk only. It is recommended that this assessment is updated should this information be made available.
Flood risk	Overlap between fluvial and surface water extents	The Flood Map for Planning – Surface Water Spatial Planning Extents mapping identifies the lowest points in the landscape, and therefore low-lying river floodplains are also classified as being at surface water risk. This can lead to ‘double counting’ of flood risk.	To prevent double counting, the Flood Zone and Flood Map for Planning – Surface Water Spatial Planning Extents datasets are merged, to create a composite flood risk layer, with any overlapping areas dissolved.
Flood risk	Use of OS Code Point Open postcode point data to represent properties affected by historic/predicted flood risk	As postcode points represent the average location of all properties within a postcode area, there may be properties at the edges of a catchment or the study area which are counted within the neighbouring area or not picked up at all. The dataset is based on full postcodes.	The postcode points are an available open source dataset. Postcode area sizes are also relative to the density of properties in a location, providing better data coverage in areas where a greater number of properties were likely to be affected.

5 Planning considerations

5.1 Introduction

Catchment-specific planning considerations have been identified for the catchments where cumulative development is likely to have the greatest impact on flood risk to communities.

In addition to assessment at this Level 1 SFRA level, it is recommended that site-specific FRAs are required to include consideration of the cumulative effects of the proposed development. It should be demonstrated that flood risk downstream will not be made worse by the combination of effects from more than one development allocation.

Specific planning considerations are provided for each sensitivity category and are set out in Sections 5.2 to 5.4 below.

5.2 Considerations for all new development in South Oxfordshire and Vale of White Horse districts

The following planning considerations apply to development within all catchments:

- Developments should seek betterment of existing flood risks both within the site and in surrounding areas. As a minimum, developments must meet national and local standards for FRAs and surface water drainage strategies. By looking at flood risks beyond the site boundary, developers should be encouraged to implement sustainable solutions which manage flood risk.
- Major developments¹ should be accompanied by an overall surface water drainage strategy. This should cover:
 - How the cumulative impacts of potential peak rates and volumes of surface water runoff from development sites would impact on the peak flows, duration of flooding and timing of flood peaks on receiving watercourses. This should be used to develop and implement appropriate drainage sub-catchments for the management of surface water, as well as specific runoff rate and volume requirements for each phase of the development.
 - The risk of flooding from all sources, including for rainfall events greater than the design standard of the surface water drainage system should be taken into account. This is to ensure there is no flood risk to new properties, and that exceedance flows in extreme events are safely routed around those properties.
 - The consideration of how SuDS, natural flood management techniques, green infrastructure and green-blue corridors can be designed into the development

¹ As defined in the NPPF as residential developments comprising 10 or more homes, or greater than 0.5 hectares in area, and for non-residential developments, additional floorspace of 1,000m² or more, or a site of 1 hectare or more, or as otherwise provided in the Town and Country Planning (Development Management Procedure) (England) Order 2015.

master plan to facilitate drainage flood risk management. As well as managing the quantity of water, they should also ensure the wider benefits of biodiversity, amenity, water quality and recreation are realised.

- Based on the above, a drainage phasing plan aligned with the SuDS management train method should be developed. Firstly, it should consider how water can be infiltrated / stored at a plot level, then conveyed through the site. It should also identify any wider storage needs at a settlement level.
 - The provision of drainage shall be based on the drainage phasing plan, to ensure adequate drainage is provided and implemented throughout the lifetime of the development. This includes provision of adequate drainage during the construction phase, to manage the risk of flooding, erosion and pollution during construction.
 - South Oxfordshire District Council and Vale of White Horse District Council (as LPAs); Oxfordshire County Council (as LLFA) and the EA should be consulted during the development of the surface water drainage strategy, subject to EA resource availability.
- In rural areas of the catchments, Natural Flood Management (NFM) techniques, such as woodland planting and earth bunds, can be used to slow down and store flood waters upstream of settlements.
 - In urban and suburban locations, SuDS should be integrated into the site design, to manage the existing surface water flow paths on the site and to help mitigate the flood risks to downstream communities.
 - Successive minor developments have the potential to significantly impact on existing surface water and flood risk issues, particularly as the LLFA is not currently consulted on such applications. Therefore, planning policy for minor developments should support existing LPA guidance on the reduction of existing runoff rates, through the use of SuDS.
 - Any development within the fluvial floodplain (i.e. Flood Zones 3b, 3a and 2) should provide suitable flood compensation storage, in consultation with the EA, to avoid a net loss in floodplain storage.
 - The LLFA and other Risk Management Authorities (RMAs) should use the information in the SFRA to inform a long term pipeline of flood alleviation studies and schemes to determine where further developer contributions on / off site would be beneficial.

5.3 Considerations for medium sensitivity catchments

The following planning considerations apply to development within those catchments identified as being at medium sensitivity. All new developments (other than minor extensions) in these catchments should:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with [Oxfordshire Local SuDS Standards & Guidance](#) and the [National Standards for SuDS](#). Preference will be given to above ground,

vegetated SuDS, which contribute to the conservation and enhancement of biodiversity and green infrastructure in the study area.

- Be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and surface water drainage strategies what measures can be put in place to contribute to a reduction in flood risk downstream. This may either be through provision of additional storage on site e.g. through oversized SuDS, natural flood management techniques, green infrastructure and green-blue corridors and/or by providing a Partnership Funding contribution towards a wider community scheme.
- Ensure both greenfield and brownfield developments are to aim to achieve greenfield runoff rates and volumes in their post-development state.
- Ensure Surface Water Management Plans are developed as required.

5.4 Considerations for higher sensitivity catchments

The following planning considerations apply to development within those catchments identified as being at higher sensitivity. For all new developments (other than minor extensions) in these catchments, consider:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the sequential and exception tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows² and volumes³ in their post-development state, to counter cumulative impacts of development within the catchment.
- A surface water drainage strategy should be required for all developments in these catchments, regardless of development size. This would mean that a site-specific FRA would be required for all developments, regardless of their size.
- The EA may designate higher sensitivity catchments as Areas with Critical Drainage Problems (ACDPs) as required. If an area with critical drainage is identified, the LPA (supported by the LLFA) should draft a policy within their Joint Local Plan to manage flood risk from local sources in these catchments with critical drainage problems.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, EA and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This

² For the 1 in 1 year rainfall event and the 1 in 100 year rainfall event

³ For the 1 in 100 year, 6 hour rainfall event

- should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
- A surface water drainage strategy should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.
 - Particular attention should be given to limiting runoff volumes to greenfield volume, with long-term storage to be provided where required. The timing of runoff released from the development site will need to be assessed against peak flow timings on the receiving watercourse, to ensure that discharges do not have a detrimental impact on downstream flood risk.
 - The timing of flows released from the development site will need to be assessed in the context of peak flows on the receiving watercourse.
 - Every opportunity should be taken to infiltrate and/or store water at a plot level.
 - Longer-term measures for managing flood risk should be considered, including river restoration and contributions to pipeline flood alleviation schemes.
 - Where development sites receive runoff from, or drain towards, neighbouring authorities, the LPA should work closely with neighbouring LPAs and the LLFA to develop complementary local plan policies on cumulative flood risk and sustainable drainage.

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