Cheshire West and Chester Level 1 SFRA - Appendix G

Final Catchment-level assessment of Cumulative Impacts of Development on Flood Risk

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Prepared for:

Cheshire West and Chester Council

Cheshire West and Chester

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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 the Cheshire West and Chester Council (the Council) authority area. 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 Local Plan making stage and the planning application and development design stages. Paragraph 171 of the National Planning Policy Framework (NPPF, 2025) states:

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

To understand the impact of future development on flood risk in the Council area, flood risk data has been compared with potential changes in the 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 Method

2.1 Cumulative impact assessment

2.1.1 Cumulative impact of development: assessing existing and future development scenarios

To ensure that the strategic policies of the new Local Plan consider the impact of any future development on areas susceptible to flooding, the potential development pressures during the new 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 new Local Plan, as well as the potential future development pressures during the active Local Plan period.

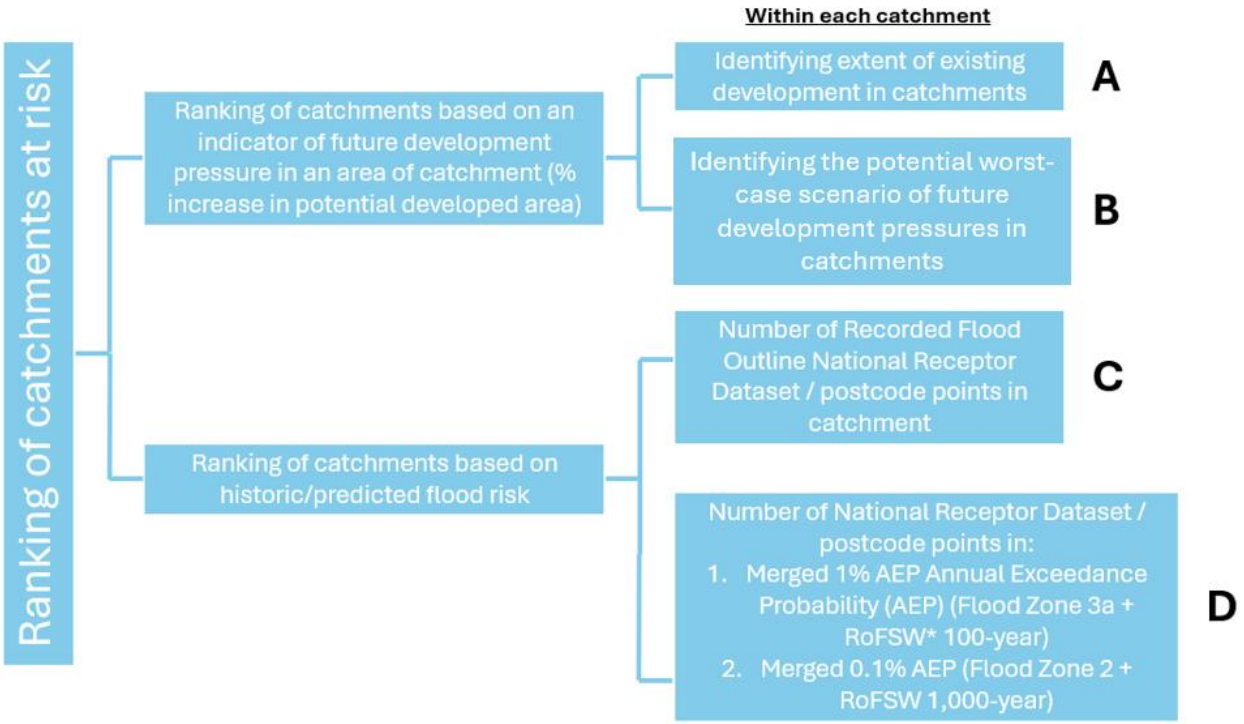
It should be noted that the inclusion of potential future development pressures in neighbouring authorities makes the scoring method sensitive to future change, should any larger sites be removed, or additional sites come forward. However, it provides the best possible indication of development pressure across the Council area and neighbouring authority areas at the time of assessment.

The assessment is undertaken on a river catchment scale, using catchments defined by the WFD. Several of the WFD catchments assessed within the cumulative impact assessment cross administrative boundaries into neighbouring districts. To account for this in the study, all neighbouring councils were contacted to provide information of future development within their administrative area. The councils are:

- Cheshire East
- Halton
- Liverpool
- Shropshire
- Flintshire
- Warrington
- Wirral
- Wrexham

The site data received from these councils was combined with that of Cheshire West and Chester to understand the risk to each WFD catchment, based upon potential future growth.

The approach to understanding the catchments most influenced by the cumulative impact of development is conceptualised in Figure 2-1.



**Risk of Flooding from Surface Water (RoFSW)*

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

A. Existing development scenario

To understand the level of existing development within the study area, the Environment Agency's (EA) National Receptor Dataset (NRD) covering the Council area and neighbouring authority areas was used. For the neighbouring authorities in Wales, the OS Code Point Open postcode points were used due to the NRD for Wales not being available. This dataset contains points plotted at the average coordinates representative of all individual addresses within a particular postcode, rather than representing specific property points. Therefore, the assessment may be skewed towards those areas where the NRD has been used.

B. Indicator of development pressure

To understand which catchments within the Council area are likely to experience the greatest pressure for future growth, the following sites were analysed: all sites which were either allocated in the current CWaC Local Plan, sites listed as future potential sites taken from the CWaC Land Availability Assessment (Stage 1) for the new Local Plan, and the sites provided by the neighbouring authorities. This represents the 'worst-case' development scenario within the Council area and therefore does not account for any sites that do not come forward for development.

This analysis has been used as an indicator of areas likely to be subject to the greatest development pressure in future. This is the only spatial data indicator available at the time of preparing the assessment because definitive development areas have not yet been allocated within all the Local Plans of the neighbouring authorities.

The data allows calculation of the overall area of sites within each catchment which are either proposed or submitted to the relevant LPA to consider for allocation within their Local Plans, illustrating the relative pressures on the catchments. This data is used to identify catchments likely to be under the greatest pressure for development. The percentage total proposed area of development is calculated and ranked with the catchment with the highest proportion of growth ranked as '1'.

Sites information for Shropshire and Flintshire councils is not included in this assessment, as suitable information was not made available at the time of the assessment. Allocation information was shared by Liverpool City Council for consideration within the assessment, however none of the allocations were within a WFD catchment shared with Cheshire West and Chester.

Table 2-1: Summary of datasets used to define river catchments

Dataset	Coverage	Source of data	Use of data
Catchment boundaries	Cheshire West and Chester Council authority area	Water Framework Directive (WFD) catchments	Existing development / flood risk

Table 2-2: Summary of datasets used to estimate future development pressure

Dataset	Coverage	Source of data	Use of data
Local Plan allocations, committed developments, LAA sites and SHLAA sites within CWaC and neighbouring authorities	Catchments covering the Cheshire West and Chester Council authority area	Cheshire West and Chester Council Cheshire East Council Halton Council Warrington Council Wirral Council Wrexham Council	Indicator of relative development pressure

Table 2-3: Summary of datasets used to rank catchments by flood risk

Dataset	Coverage	Source of data	Use of data
Merged 1 in 100-year flood extent (Flood Zone 3 and 1 in 100-year RoFSW extent)	Catchments covering the Cheshire West and Chester Council authority area	Environment Agency (EA) / Natural Resources Wales (NRW)	Potential fluvial, tidal and surface water flood risk
Merged 1 in 1000-year flood extent (Flood Zone 2 and 3, and 1 in 1000-year RoFSW extent)	Catchments covering the Cheshire West and Chester Council authority area	Environment Agency (EA) / Natural Resources Wales (NRW)	Potential future fluvial, tidal and surface water flood risk
Recorded Flood Outline	Catchments covering the Cheshire West and	Environment Agency (EA) / Natural Resources	Historic flooding

Dataset	Coverage	Source of data	Use of data
	Chester Council authority area	Wales (NRW)	
National Receptor Dataset (NRD)	Catchments covering the Cheshire West and Chester Council authority area within England	Environment Agency (EA)	Number of properties at risk within the English authority areas
OS Code Point Open postcode points - plotted at the average coordinates representative of all individual addresses within a particular postcode	Catchments covering the Cheshire West and Chester Council authority area within Wales	Ordnance Survey (Open source)	Proxy for number of properties at risk within the Welsh authority areas

2.1.2 Cumulative impact of flood risk: assessment of flood risk

A composite flood risk score is derived for each catchment, by taking an average ranking of both recorded risk (historic incidents) and modelled (predicted) fluvial, tidal and surface water flood risk.

To understand the relative flood risk within the catchments, a ranking system is adopted, with the worst-case flood risk numbered '1'.

C. Historic flood risk

Data used in assessment:

- EA Recorded Flood Outline (number of NRD points affected) - flood extents mapped following flood events (largely relates to fluvial flooding). This is intersected with the NRD points to count the number of properties affected.
- NRW Recorded Flood Extents (number of property postcode points affected) - flood extents mapped following flood events (largely relates to fluvial flooding). This is intersected with postcode points to approximate the number of properties affected.

D. Sensitivity to increases in flood flows

Data used in assessment:

- Present day risk: Merged fluvial, tidal and surface water 1 in 100-year (1% AEP) flood extent - Flood Zone 3 and RoFSW 100-year (number of NRD / postcode points at risk within catchment).
- Future risk: Merged fluvial, tidal and surface water 1 in 1,000-year (0.1% AEP) flood extent - Flood Zone 2 (and 3) and RoFSW 1000-year (number of NRD / postcode points at risk within catchment).

- The NRD / postcode data was separately intersected with the Present day (1 in 1,000-year) and Future (1 in 100-year) risk merged fluvial, tidal and surface water flood extents, to approximate the increase in the number of properties at risk of flooding. The flood extents are merged to prevent double counting of properties at risk where fluvial, tidal and surface water flood risks overlap.
- The difference between the Present and Future risk is then calculated and given as a percentage of the total number of NRD / postcode points in the catchment. This gives an indication of which catchments are most sensitive to increases in surface water runoff from upstream. For example, if there were 100 NRD points in a catchment, 15 within the 1 in 1,000-year merged flood extent and 5 within the 1 in 100-year merged flood extent, 10% of properties in that catchment are considered sensitive to increased flood risk.
- The assessment is an indicator 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.
- It should be noted that the Flood Zones represent flood risk from watercourses, with a catchment area greater than 3km^2. Where the EA have suitable data for smaller catchments, this is also included in the Flood Zones.

2.1.3 Assessment assumptions and limitations

Table 2-4 sets out the assumptions and limitations of the cumulative impact assessment.

Table 2-4: 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 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.

Assessment aspect	Assumption made	Details of limitation in method	Justification
Development pressure	Potential development site area not provided for all neighbouring authorities	Potential development sites were not made available for Shropshire or Flintshire authority areas.	Potential development pressure was not taken into account for the WFD catchments shared between Cheshire West and Chester and Shropshire/Flintshire. Cumulative impacts were assessed through flood risk only. It is recommended that this assessment is updated should this information be made available.
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.
Flood risk	Overlap between fluvial, tidal and surface water flood extents	The Risk of Flooding from Surface Water mapping identifies the lowest points in the landscape, and therefore low-lying river and tidal 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 Risk of Flooding from Surface Water datasets are merged, to create a composite flood risk layer, with any overlapping areas dissolved.

Assessment aspect	Assumption made	Details of limitation in method	Justification
Flood risk	Use of OS Code Point Open postcode point data to represent properties affected by historic/predicted flood risk in Wales	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.

2.1.4 Ranking the results

The results are ranked for each of the above assessments from 1 to 44. For example, the catchment with the highest percentage of property points within the recorded flood outline dataset would be ranked at number 1. The individual flood risk, historic flooding and development ranks are added to give an overall ranking for each catchment, as indicated in Table 2-5. The catchment with the lowest combined rank is the most sensitive to the cumulative impact of development.

Table 2-5: Breakdown in rankings for each assessment

Catchment Name	Growth rank	Historic Flood Risk rank	Predicted Flood Risk rank	Total Combined rank	Overall rank
Aldford Brook	27	8	25	58	21
Arley Brook (Source to Gale Brook)	39	19	20	78	29
Ash Brook (Darley Brook to Weaver)	10	19	7	36	10
Ash Brook (Source to Darley Brook)	8	19	9	39	10
Ashton Brook	34	19	44	101	42
Balderton drain	7	10	1	18	2
Bogart Brook	20	19	42	84	33
Bradley Brook	17	19	21	58	19
Cogshall Brook	25	18	17	57	21
Croco	12	19	15	46	14
Crowton Brook	23	14	41	83	29

Catchment Name	Growth rank	Historic Flood Risk rank	Predicted Flood Risk rank	Total Combined rank	Overall rank
Cuddington Brook (Source to Crowton Brook)	4	19	40	64	24
Dane (Cow Brook to Wheelock)	14	7	10	30	7
Dane (Wheelock to Weaver)	1	2	2	5	1
Darley Brook	33	19	36	87	40
Dee - Chester Weird to Ceiriog	28	5	16	50	16
Dibbinsdale Brook and Clatter Brook	22	15	14	49	18
Finchetts Gutter	5	11	8	23	3
Forge (Kidd) Brook	21	19	29	67	25
Gale Brook	43	19	24	86	36
Garden City Drain	35	19	38	90	41
Gowy (Milton Brook to Mersey)	16	3	23	42	13
Gowy and tribs (Source to Milton Brook)	26	19	34	79	31
Henlake Brook	40	19	13	72	27
Keckwick Brook	11	19	4	32	8
Marbury Brook	32	16	39	90	38
Milton Brook	29	17	33	81	31
Peckmill Brook, Holpool Gutter at Ince Marshes	2	19	27	48	15
Peover Eye	18	19	12	48	16
Puddinglake Brook	37	19	28	83	35
Pulford Brook	38	1	19	57	20
Rivacre Brook	9	13	5	26	5
Salters Brook	19	12	30	66	23
Smoker Brook (Gale Brook to Wincham Brook)	30	19	32	78	33
Stanney Mill Brook	3	19	3	25	4
Wade Brook	13	19	6	39	12

Catchment Name	Growth rank	Historic Flood Risk rank	Predicted Flood Risk rank	Total Combined rank	Overall rank
Weaver (Dane to Frodsham)	6	4	18	28	6
Weaver (Marbury Brook to Dane)	15	9	11	35	9
Weaver (Source to Marbury Brook)	43	19	35	97	42
Wettenhall Brook	31	19	37	86	38
Wheelock (Fowle Brook to Dane)	24	19	31	71	28
Worthenbury Brook (Worthenbury Lower)	41	19	26	86	36
Wych Lower (Worthenbury Middle)	36	19	43	96	44
Wych Upper (Worthenbury Upper)	42	6	22	70	26

A Red Amber Green (RAG) rating is then 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 to increases in flood risk and development between catchments within the study area.

Specific policies are provided for each resulting risk category. Catchment-specific planning policy considerations are identified for the catchments where cumulative development is likely to have the greatest impact on flood risk to communities. The overall analysis provides context for further appropriate consideration of catchment-scale flood risk issues.

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.

A map of the RAG rating for each catchment is shown in Figure 2-2 and a summary of the final results is shown in Table 2-6, Table 2-7 and Table 2-8. Specific policies are provided for each resulting risk category.

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

- Dane (Wheelock to Weaver)
- Balderton drain
- Finchetts Gutter

- Stanney Mill Brook
- Rivacre Brook
- Weaver (Dane to Frodsham)
- Dane (Cow Brook to Wheelock)
- Keckwick Brook
- Weaver (Marbury Brook to Dane)

The catchments rated as medium sensitivity to the cumulative impacts of development are:

- Ash Brook (Darley Brook to Weaver)
- Ash Brook (Source to Darley Brook)
- Wade Brook
- Gowy (Milton Brook to Mersey)
- Croco
- Peckmill Brook, Hoolpool Gutter at Ince Marshes
- Dee - Chester Weird to Ceiriog
- Peover Eye
- Dibbinsdale Brook and Clatter Brook
- Bradley Brook
- Pulford Brook
- Aldford Brook
- Cogshall Brook

The catchments rated as low sensitivity to the cumulative impacts of development are:

- Cuddington Brook (Source to Crowton Brook)
- Salters Brook
- Forge (Kidd) Brook
- Wych Upper (Worthenbury Upper)
- Wheelock (Fowle Brook to Dane)
- Henlake Brook
- Arley Brook (Source to Gale Brook)
- Smoker Brook (Gale Brook to Wincham Brook)
- Gowy and tribs (Source to Milton Brook)
- Milton Brook
- Crowton Brook
- Puddinglake Brook
- Bogart Brook
- Gale Brook
- Wettenhall Brook
- Worthenbury Brook (Worthenbury Lower)
- Darley Brook
- Garden City Drain
- Marbury Brook
- Wych Lower (Worthenbury Middle)

- Weaver (Source to Marbury Brook)
- Ashton Brook

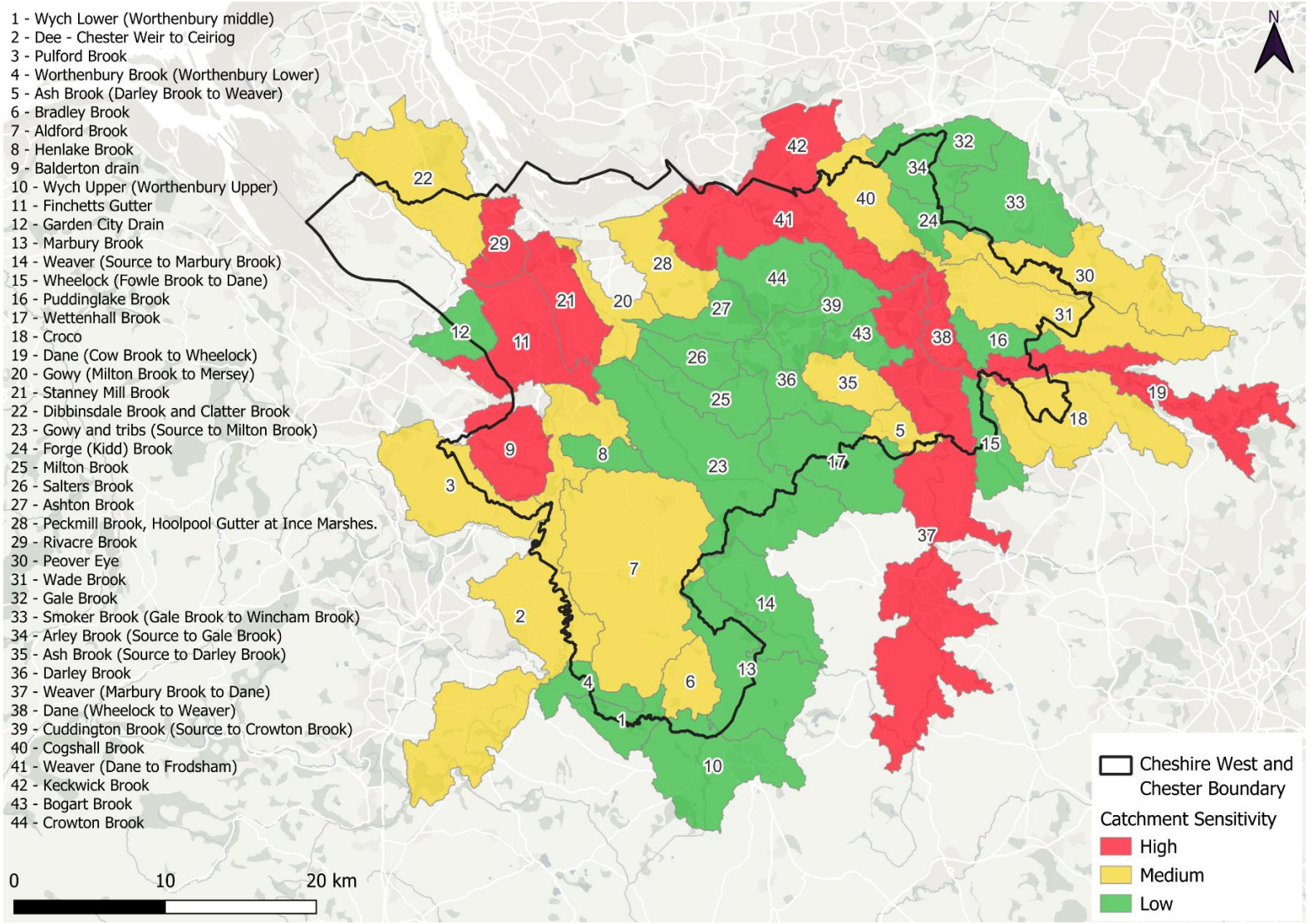


Figure 2-2: Sensitivity of catchments within and around the Cheshire West and Chester study area to cumulative impacts

Table 2-6: Results of cumulative impact assessment (High Overall Rank)

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
38	Dane (Wheelock to Weaver)	Remains within CWaC	23%	High	202	11%	High	High	1
9	Balderton drain	Flows out of CWaC into Flintshire	10%	High	26	15%	High	High	2
11	Finchetts Gutter	Flows out of CWaC into Flintshire	13%	High	122	10%	Medium	High	3
21	Stanney Mill Brook	Remains within CWaC	17%	High	0	11%	Medium	High	4
29	Rivacre Brook	Remains within CWaC	9%	High	31	11%	Medium	High	5
41	Weaver Dane to Frodsham)	Flows out of CWaC into Halton	12%	High	218	7%	Medium	High	6
19	Dane (Cow Brook to Wheelock)	Flows into CWaC from Cheshire East	5%	Medium	114	9%	High	High	7

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
42	Keckwick Brook	Flows out of CWaC into Halton and Warrington	7%	Medium	0	11%	Medium	High	8
37	Weaver (Marbury Brook to Dane)	Flows into CWaC from Cheshire East	4%	Medium	219	8%	Medium	High	9

Table 2-7: Results of cumulative impact assessment (Medium Overall Rank)

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
5	Ash Brook (Darley Brook to Weaver)	Flows into CWaC from Cheshire East	7%	High	0	10%	Medium	Medium	10
35	Ash Brook (Source to Darley Brook)	Remains within CWaC	10%	High	0	10%	Medium	Medium	10
31	Wade Brook	Flows into CWaC from Cheshire East	5%	Medium	0	6%	Medium	Medium	12
20	Gowy (Milton Brook to Mersey)	Remains within CWaC	4%	Medium	0	11%	Medium	Medium	13
18	Croco	Flows into CWaC from Cheshire East	5%	Medium	21	6%	Medium	Medium	14
28	Peckmill Brook, Hoolpool Gutter at Ince Marshes	Remains within CWaC	20%	High	0	7%	Low	Medium	15
2	Dee - Chester Weird to Ceiriog	Flows into CWaC from Wrexham	2%	Medium	0	8%	Medium	Medium	16

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
30	Peover Eye	Flows into CWaC from Cheshire East	4%	Medium	71	7%	Medium	Medium	16
22	Dibbinsdale Brook and Clatter Brook	Flows out of CWaC into Wirral	2%	Medium	0	5%	Medium	Medium	18
6	Bradley Brook	Remains within CWaC	4%	Medium	1	7%	Low	Medium	19
3	Pulford Brook	Flows into CWaC from Flintshire and Wrexham	0%	Low	28	5%	Medium	Medium	20
7	Aldford Brook	Remains within CWaC	2%	Medium	107	7%	Medium	Medium	21
40	Cogshall Brook	Flows into CWaC from Warrington	2%	Medium	16	7%	Medium	Medium	21

Table 2-8: Results of cumulative impact assessment (Low Overall Rank)

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
26	Salters Brook	Remains within CWaC	3%	Medium	10	5%	Low	Low	23
39	Cuddington Brook (Source to Crowton Brook)	Remains within CWaC	13%	High	0	4%	Low	Low	24
24	Forge (Kidd) Brook	Flows into CWaC from Cheshire East	2%	Medium	0	5%	Low	Low	25
10	Wych Upper (Worthenbury Upper)	Flows into CWaC from Wrexham and Shropshire	0%	Low	58	6%	Medium	Low	26
8	Henlake Brook	Remains within CWaC	0%	Low	0	8%	Medium	Low	27
15	Wheelock (Fowle Brook to Dane)	Flows into CWaC from Cheshire East	2%	Medium	0	5%	Low	Low	28
34	Arley Brook (Source to Gale Brook)	Flows out of CWaC into Cheshire East	0%	Low	0	7%	Medium	Low	29

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
44	Crowton Brook	Remains within CWaC	2%	Medium	4	3%	Low	Low	29
23	Gowy and tribs (Source to Milton Brook)	Flows into CWaC from Cheshire East	2%	Medium	0	5%	Low	Low	31
25	Milton Brook	Remains within CWaC	1%	Medium	1	5%	Low	Low	31
43	Bogart Brook	Remains within CWaC	3%	Medium	0	2%	Low	Low	33
33	Smoker Brook (Gale Brook to Wincham Brook)	Flows into CWaC from Cheshire East	1%	Medium	0	5%	Low	Low	33
16	Puddinglake Brook	Flows into CWaC from Cheshire East	0%	Low	0	5%	Low	Low	35
32	Gale Brook	Flows out of CWaC into Cheshire East	0%	Low	0	6%	Low	Low	36
4	Worthenbury Brook (Worthenbury	Flows into CWaC from Wrexham	0%	Low	0	5%	Low	Low	36

Map label	Catchment Name	Drainage direction	% area of growth	Growth RAG score	Property points in historic flood outlines	% increase in properties at risk: 1 in 100 to 1 in 1,000-year flood extent	Flood Risk RAG score	Overall RAG score	Overall rank
	Lower)								
13	Marbury Brook	Flows out of CWaC into Cheshire East	1%	Medium	1	4%	Low	Low	38
17	Wettenhall Brook	Flows out of CWaC into Cheshire East	1%	Medium	0	4%	Low	Low	38
36	Darley Brook	Remains within CWaC	1%	Low	0	4%	Low	Low	40
12	Garden City Drain	Flows out of CWaC into Wrexham	0%	Low	0	4%	Low	Low	41
27	Ashton Brook	Remains within CWaC	1%	Low	0	2%	Low	Low	42
14	Weaver (Source to Marbury Brook)	Flows out of CWaC into Cheshire East	0%	Low	0	4%	Low	Low	42
1	Wych Lower (Worthenbury Middle)	Flows out of CWaC into Wrexham	0%	Low	0	2%	Low	Low	44

2.1.5 Planning policy considerations

Catchment-specific planning policy 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 a 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.

1. Considerations for all new development in Cheshire West and Chester

- Developments must 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 developments[1] must 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 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

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 1,000m^2 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.

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.
    - The Council (as LPA and LLFA) and the EA should be consulted during the development of the surface water drainage strategy.
- In upland and 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 must 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 must support existing LPA guidance on the reduction of existing runoff rates, through the use of SuDS.
- Any development within the fluvial (i.e. Flood Zones 3b, 3a and 2) must 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.

2. Planning considerations for medium sensitivity catchments

All new developments (other than minor extensions) in these catchments must:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Cheshire West and Chester SuDS Guidance[2]. 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

2 Cheshire West and Chester SuDS Guidance

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.

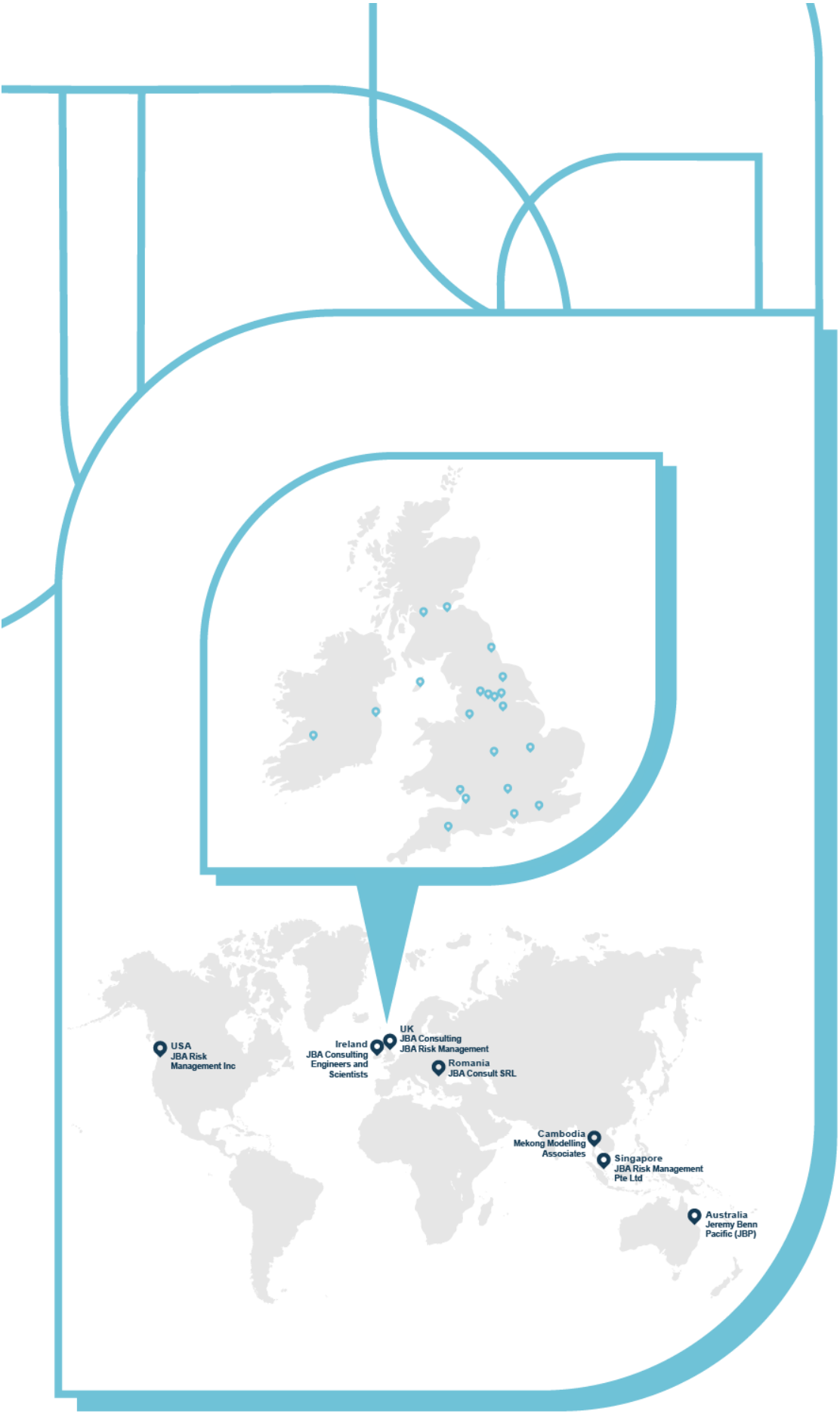
3. Planning considerations for higher sensitivity catchments

For all new development (other than minor extensions) in these catchments, consider for following:

- 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 flows[3] and volumes[4] in their post-development state, to counter cumulative impacts of development within the catchment.
- A surface water drainage strategy must 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 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 must be consulted at pre-application stage.
    - The FRA must 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 should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
    - A surface water drainage strategy must 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

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

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 must 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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