P_21

A Local Plan for

Lancaster District

2020 – 2031

Plan period 2011 - 2031

Water Management Background Paper

[December 2021]

Shaping a better future

LANCASTER CITY COUNCIL
Promoting City, Coast & Countryside

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1 INTRODUCTION

1.1 One of the most apparent manifestations of climate change is the increased amount of precipitation and severity of events. Lancaster District has experienced several episodes of flooding in recent years, the most severe relating to Storm Desmond in 2015, which was referred to as unprecedented, but was followed by further severe flooding in 2017. There have been flooding incidents since, which while less widespread still have had a significant impact on those affected.

1.2 During the 2015 Storm Desmond event, over 250 homes and 200 businesses were flooded in Lancaster District with nearly 68,000 properties affected by loss of services such as electricity or sanitation, restricted access, or the gardens/grounds were flooded. A fifth of the properties flooded in Lancashire were in Lancaster District. In November 2017, around 658 properties were affected in the Lancaster district out of approximately 982 across Lancashire.

1.3 Given the projected changes to precipitation and sea level, the severity of recent climate change related events, and the continuation of other instances of flooding, this topic has been included within the scope of the Climate Emergency Local Plan Review (CELPR).

1.4 As part of the review, the Council commissioned an update to the Strategic Flood Risk Assessment (2018) (SFRA). The SFRA (2021) takes account of the changes within the National Planning Policy Framework (2019), updated Environment Agency guidance (2020), and the Environment Agency indicative updated climate change allowances. The associated flood maps show an increase in the areas at risk and a cumulative impact assessment of flood risk identifies High Risk Catchments in the District. The SFRA makes policy recommendations with regard to water management. The Council has taken these recommendations into account and worked with the Environment Agency and the Local Lead Flood Authority (Lancashire County Council) to revise policies in relation to flooding and water management.

1.5 This background paper explains how the proposed water management policies in the draft plan have been amended to address the recommendations in the SFRA and enhance how the policies address the impact of climate change.

2 THE IMPACT OF CLIMATE CHANGE ON FLOODING

2.1 The Climate Change Committee has listed flooding and coastal change as one of the greatest climate change risks for the UK.

2.2 The UK Climate Projections (UKCP) provide the most up-to-date assessment of how the UK climate may change in the future.

2.3 UK Climate Projections - Headline Findings (September 2019):

> *'The most recent decade (2009-2018) has been on average 1% wetter than 1981- 2010 and 5% wetter than 1961-1990 for the UK overall.*
>
> *Winters in the UK, for the most recent decade (2009-2018), have been on average 5% wetter than 1981-2010 and 12% wetter than 1961-1990. Summers in the UK have also been wetter, by 11% and 13% respectively. However, very long-period natural variations are also seen in the longer observational record. These show periods in earlier parts of the historical record with similar levels of UK summer rainfall to 2009-2018, illustrating the importance of considering long period natural variations.*

Total rainfall from extremely wet days (days exceeding the 99th percentile of the 1961-1990 rainfall) increased by around 17% in the decade (2008-2017), for the UK overall. However, changes are largest for Scotland and not significant for most of southern and eastern England.

Hourly precipitation extremes increase in future. The CPM shows increases of 25% [1990 to 2070] in the precipitation associated with an event that occurs typically once every 2 years.

Mean sea level around the UK has risen by about 17 cm since the start of the 20th century (when corrected for land movement).'[1]

2.4 The following headline projections have been made for precipitation by the 2070's relative to the 1981-2000[2]:

- Winter precipitation increases of around 35%.
- Extreme hourly intensity associated with an event that typically occurs once every 2 years increased by 25%.
- Events will be of higher intensity.

2.5 Climate change will have a wide range of impacts upon the water environment, including risk to water supplies, flooding, damage to marine environments and fisheries, loss of biodiversity, changes in the hydrological cycle, rising sea levels and changes in ocean currents.

2.6 Flooding caused by climate change will create risks for property and the economy. Such risks include subsidence, wear of building fabric, increased maintenance costs, structural damage, reduced building lifetime, increased insurance and impacts on project finance. There are also likely to be adverse impacts to the productivity of agriculture, particularly the yield from fields. Flooding can also have a significant impact upon the health and wellbeing of our communities, causing increased mental health concerns such as anxiety and physical issues arising from pollution.

2.7 As rainfall becomes more intense over shorter durations, the capacity for water to be absorbed reduces. Rainfall reaches rivers quicker and those which are within rapid response catchments such as Burrow Beck at Bowerham and Hala, Whitley Beck at Galgate and the River Roeburn, are likely to result in an increase in river levels and surface water flooding. The cumulative assessment in the SFRA identifies 7 catchments in the District at high risk of flooding and where properties are more sensitive to increases in flood risk.

3 WHY IS SURFACE WATER FLOODING GETTING WORSE?

3.1 The effect of climate change upon rainfall is just one reason why flooding incidents are increasing. The way in which we develop land has a significant effect upon how the environment responds to rainfall. In the natural environment, rainfall is dealt with in a variety of ways, it evaporates from the leaves of trees and plants, is breathed back into the air by evapotranspiration and is absorbed by soils and leaf litter. Once the soils are saturated, water either infiltrates into the underlying geology or runs off across the surface through watercourses

[1] UK Climate Projections: Headline Findings (September 2019) (Met Office) https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp-headline-findings-v2.pdf

[2] https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/ukcp-infographic-headline-findings.pdf

which can be permeant features or ephemeral (where a watercourse appears only at times when water cannot infiltrate).

3.2 When we develop land, these natural processes are changed. Historically, development surfaced over land with impermeable materials and channelled rainwater and sewage into pipes underground. This can be seen in the older parts of the district, particularly the centres and terraced urban areas. Such development resulted in the loss of soils to absorb water, infiltration opportunities, and plants to hold rainfall prior to evaporation. Where properties do have gardens, they are often surfaced over as patios/decking, for car parking or extensions. These incremental small changes add significant levels of additional non-permeable hard surfacing (this can be referred to as Urban Creep) and exacerbate surface water flooding.

3.3 The way in which sites are developed is changing. Surface water is disposed of by infiltration where possible and attenuated prior to discharge into surface water sewers where it is not. However, much of the infiltration and attenuation is provided by underground crates and pipes. While these may address surface water discharge, they are not accessible for easy maintenance, pipes can become blocked, pollution from roads can contaminate natural watercourses and at times they can be slow to react to intense flood events. Such systems also do not provide multifunctional benefits to support climate change mitigation.

4 POLICY CONTEXT

Introduction

4.1 Planning policy has evolved with a greater emphasis on addressing climate change, flooding and water management. This section highlights some of the policy background used to develop the policies on flood risk and water management. This is not an exhaustive list and there are many other legislation and policy documents in respect of flood risk and water management. Appendix D of the SFRA (2021) outlines a range of other documents.

National Planning Policy Framework 2021

4.2 The 'National Planning Policy Framework (NPPF)'[3] sets out the policy approach to focus development away from areas at risk of flooding, mitigating and adapting to climate change. The paragraphs below relate to the aspects which are within the scope of the Climate Emergency Local Plan Review.

4.3 Paragraphs 153 and 154 state that policies in local plans should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts. New development should be planned to avoid increased vulnerability and where new development is brought forward in areas which are vulnerable, risks should be managed through adaption measures, including through the planning of green infrastructure.

4.4 Paragraph 161 requires local plans to take a sequential approach to the location of new development, taking into account all sources of flood risk and the current and future impacts of climate change to avoid flood risk to people and property. Local plans should manage this risk by:

'a) applying the sequential test and then, if necessary, the exception test as set out below;

[3] National Planning Policy Framework (MHCLG 2019) National Planning Policy Framework - GOV.UK (www.gov.uk)

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.'

4.5 The CELPR is not reviewing the sites allocated in the Local Plan (2020). References in the NPPF to the sequential approach to site allocation are therefore not relevant to this review. However, they are important when considering windfall sites which are not allocated within the Local Plan. The CELPR considers and aims to enhance how policies address climate change and its impacts. Bullet point c) of paragraph 161 is particularly pertinent to the CELPR.

4.6 Paragraph 166 states that a sequential test is not required for an allocated site, but an exception test may need to be applied where aspects of the proposal have not been considered or where recent information about existing or potential flood risk should be taken in to account. The Environment Agency updates and the SFRA (2021) provide new information about flood risk and Appendix B of the SFRA (2021) highlights the flood zones included within each of the allocated sites.

4.7 Paragraph 169 states major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should include appropriate proposed minimum operational standards, have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development and where possible, provide multifunctional benefits.

4.8 Paragraph 174 states that planning policies and decisions should contribute to and enhance the natural and local environment (amongst other things) by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil or water pollution. Development should, wherever possible, help to improve local environmental conditions such as water quality, taking into account relevant information such as river basin management plans.

Planning Practice Guidance

4.9 The Planning Practice Guidance (PPG) provides guidance on managing flood risk and climate change. The following paragraphs are particularly pertinent to the CELPR.

The Flood Risk and Coastal Change Guidance

4.10 The Flood Risk and Coastal Change Guidance was updated in August 2021, although most of the guidance remains dated 2014. The CELPR presents an opportunity for policies to be updated to better reflect the guidance, particularly the emphasis of reducing flood risk, sustainable drainage, and the need to consider flood risk early in the design stage.

> *'Local planning authorities and developers should seek flood risk management opportunities (eg safeguarding land), and to reduce the causes and impacts of flooding (eg through the use of sustainable drainage systems in developments).' [Paragraph: 001 Reference ID: 7-001-20140306]*
>
> *'Developers and applicants need to consider flood risk to and from the development site, and it is likely to be in their own best interests to do this as early as possible, in*

particular, to reduce the risk of subsequent, significant additional costs being incurred. The broad approach of assessing, avoiding, managing and mitigating flood risk should be followed.' [Paragraph: 029 Reference ID: 7-029-20140306]

'Local authorities and developers should seek opportunities to reduce the overall level of flood risk in the area and beyond. This can be achieved, for instance, through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems, through safeguarding land for flood risk management, or where appropriate, through designing off-site works required to protect and support development in ways that benefit the area more generally.'[Paragraph: 050 Reference ID: 7-050-20140306]

4.11 Flood risk on and off development sites can be reduced by the integration of flood risk management techniques including sustainable drainage and natural flood risk management. By designing these in from the outset, developers can achieve a variety of other goals such as biodiversity net gain, improved site design and amenity for occupiers.

'Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. *into the ground (infiltration);*
2. *to a surface water body;*
3. *to a surface water sewer, highway drain, or another drainage system;*
4. *to a combined sewer.'*

[Paragraph: 080 Reference ID: 7-080-20150323]

4.12 The higher up the hierarchy, the more sustainable SuDS will be and the greater the range of benefits they will deliver.

'In considering a development that includes a sustainable drainage system the local planning authority will want to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing maintenance.' [Paragraph: 081 Reference ID: 7-081-20150323]

'After applying a sequential approach so that, as far as possible, development is located to where there is the lowest risk of flooding, new development can be made safe by:

- *designing buildings to avoid flooding by, for example, raising floor levels;*
- *providing adequate flood risk management infrastructure which will be maintained for the lifetime of the development, for example, using Community Infrastructure Levy or planning obligations, or Partnership Funding where appropriate*
- *leaving space in developments for flood risk management infrastructure to be maintained and enhanced, and;*
- *mitigating the potential impacts of flooding through design and flood resilient and resistant construction'.*

[Paragraph: 054 Reference ID: 7-054-20150415]

Climate Change Guidance

4.13 The PPG gives examples of adapting to climate change. These include:

- *'Considering the impact of and promoting design responses to flood risk and coastal change for the lifetime of the development.*
- *Considering availability of water and water infrastructure for the lifetime of the development and design responses to promote water efficiency and protect water quality*

- *Promoting adaptation approaches in design policies for developments and the public realm.'*
  [Paragraph: 003 Reference ID: 6-003-20140612]

4.14 It also provides examples on how adaption and mitigation approaches should be integrated, including

> *'through the provision of multi-functional green infrastructure, which can reduce urban heat islands, manage flooding and help species adapt to climate change – as well as contributing to a pleasant environment which encourages people to walk and cycle.' [Paragraph: 004 Reference ID: 6-004-20140612]*

5 AMENDMENTS TO WATER MANAGEMENT POLICIES

Introduction

5.1 Policies DM33 to DM36 of the Development Management Development Plan Document (adopted 2020) address water management. Consideration has been given to how the policies can be amended to adequately take climate change into account, ensure the protection of new and existing properties from flooding, take opportunities to reduce flooding and provide for the future resilience of new and existing communities. The review also considers how policies can be improved to ensure surface water drainage schemes are appropriately designed to make the best use of above ground techniques to reduce and mitigate flooding, support biodiversity enhancements, and provide urban cooling and pollution control. Policies have also been revised to ensure that such systems are maintained in the long term.

5.2 The SFRA (2021) makes policy recommendations on pages 66 to 67 and pages 91 to 95. The policies have been revised to improve how they address these recommendations and to enhance how they deal with the causes and impacts on climate change. The revised policies place an emphasis on the use of above ground sustainable drainage that provides multifunctional benefits, including biodiversity enhancement, easier monitoring and maintenance, pollution control, better design and place making, urban cooling and health benefits associated with green and blue spaces.

5.3 Appendix A of this background paper identifies each of the SFRA (2021) recommendations and explains they have been addressed in the CEPLR draft policies.

Policy DM33: Development and Flood Risk

5.4 Adopted Policy DM33 sets out the Councils approach to addressing flood risk when determining planning applications. The policy provides a clear direction that new development should be located in the areas at lowest flood risk and provides criteria to minimise the risk of flooding. The main changes to the proposed draft policy relate to what should be considered when determining flood risk, when a flood risk assessment and exception test are required, an emphasis on reducing the causes and impacts of flooding, naturalisation of watercourses and the use of natural flood risk management.

Exception Test

5.5 The SFRA (2017) which informed the allocation of sites in the Local Plan was drafted in 2017. Since then, the Environment Agency Flood Zones and surface water risk areas have been updated. These updated flood zones, affect sites allocated in the Local Plan, increasing the level of flood risk on sites and within the catchments they are located. Applications for development on allocated sites do not require a sequential test, however, paragraph 166 of the Framework states an exception test may be required where,

'more recent information about the existing or potential flood risk should be taken in account'.

5.6 The Environment Agency has updated the allowances for peak river flow following research completed in 2020. This research sought to better understand how different river catchments respond to changes in rainfall due to climate change within river basin districts. It uses the latest rainfall projections from the Met Office UK Climate Projections (UKCP18). The Environment Agency provided early indicative allowances, and these have been used to model a revised flood zone for the SFRA (2021). While the peak flow allowance when published differ slightly from the indicative figures provided, the Environment Agency has advised that the use of those provided is acceptable.

5.7 The revisions to the flood maps and the flood zones modelled using the revised indicative peak river flow allowances, show that additional property and land is now included within areas at risk of flooding or at higher risk than previously determined. Appendix B of the SFRA (2021) provides an assessment of sites. The assessment identifies the flood zones and surface water risk within each site and the percentage of land within each risk level. Examples include H4 and H5, both sites were previously within flood zone 1 only but now include flood zones 2, 3a and 3b. Site DOS2, various employment sites and the strategic housing sites also include increased risk. However, the percentage of land in the higher flood zones, in most of these sites, is relatively low. Development can still be accommodated, subject to a sequential approach to site layout which avoids the higher flood zones, and the provision of flood risk mitigation measures. Reference to the need for an exception test has been added to proposed draft Policy DM34 to highlight that where circumstances have changed development fall within the following categories, an exception test will be required:

- highly vulnerable and in flood zone 2
- essential infrastructure in flood zone 3a or 3b
- more vulnerable in flood zone 3a

An exception test aims to ensure that development is safe, the sustainability benefits outweigh the flood risk and opportunities to reduce flood risk are taken. The revised flood maps and information available in the SFRA (2021) should be referred to by developers to inform the proposals.

Flood Risk Assessment

5.8 The Government guidance for 'Flood risk assessment if you're applying for planning permission', provides a limited number of occasions when a flood risk assessment is required, focusing on fluvial flood zones. However, footnote 55 of the NPPF states,

> *'A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.'*

5.9 The SFRA (2021) identifies land as being at increased risk in accordance with footnote 55 of the NPPF. The Cumulative Impact Assessment carried out as part of the SFRA (2021) identifies catchments as high, medium and low risk. The Catchment Rating Map from the SFRA (2021) is attached at Appendix B of this background paper.

5.10 The SFRA (2021) makes recommendations for when flood risk assessments are required (Policy Recommendation 1: High Risk Urban Catchments and Recommendation 4 in the table on page 93). The recommendations reflect the identification of high risk catchments, the risks associated with surface water and ground water flooding and where sites may be at increased risk in the future. The new SFRA (2021) flood mapping identifies risks from all sources and should be consulted when determining whether a flood risk assessment is required. Proposed draft Policy DM33 has been amended to ensure that all sources of flood risk and locally identified areas at increased risk are appropriately taken into account when determining whether a flood risk assessment is required.

Reduce Flood Risk

5.11 The current policy seeks to ensure that new development does not increase flooding beyond the site. This approach aims to retain the status quo and fails to take the opportunity new development can create to reduce flooding both on and off a site. This approach could sterilise opportunities to reduce the causes and impacts of flooding on the occupiers of new development and existing communities. The Local Plan allocates sites within catchments where flooding incidents occur. For example, the sites at Grab Lane (Policy H4) and Land at Leisure Park/Auction Mart, Wyresdale Road (Policy H5) are located to the north of Burrow Beck. Burrow Beck floods through Hala and contributes to flooding in south Lancaster. The East Lancaster Strategic site is located to the east of the Caton Road which has previously flooded. Canal Quarter is located to the west of the city centre, there are areas at risk of surface water flooding within the allocation and the site contributes to surface water run-off, which affects flooding in the city centre. The Agricultural Business Centre Site (Policy EC3), while only having a small area of surface water flooding identified within it, is in close proximity to areas within flood zone 2 and 3 and areas at risk of surface water flooding.

5.12 The NPPF refers to Local Plans using opportunities provided by new development to reduce the causes and impacts of flooding. Proposed draft Policy DM33 has therefore been amended to address this and emphasise that new development should incorporate measures to reduce flood risk by reducing surface water run-off and increasing storage capacity. The aim is for new development to support a reduction in flood risk rather than simply reflect green field run-off rates.

Natural Flood Risk Management

5.13 The SFRA (2021) makes recommendations to ensure the maintenance and enhancement of natural drainage features, natural flood risk management and culvert removal. It also recommends that green and blue infrastructure is incorporated into proposals. Paragraph 161c of the NPPF seeks improvements to green, other infrastructure and natural flood risk management techniques to reduce the causes and impacts of flooding.

5.14 As part of the CELPR, proposed draft Policy DM33 has been amended to encourage natural flood risk management techniques, the removal of culverts and naturalisation of modified channels. Whilst contributing to reducing the risk of flooding, such techniques also contribute to enhancing biodiversity, pollution control, and urban cooling. They will not however, be included in the calculations used when determining the run-off rates for development, as the impacts can be difficult to quantify. Natural flood risk management and enhancement to culverts will contribute additional flood risk reduction measures.

Policy DM34: Surface Water Run-Off and Sustainable Drainage

5.15 Adopted Policy DM34 sets out the Council's approach to surface water and sustainable drainage. The main changes to the proposed draft policy relate to a priority for the use of naturalistic sustainable drainage solutions, the provision of criteria for the design of Sustainable

Drainage Systems (SuDS), the provision of minimum run-off rates and information required to support proposals. The proposed draft policy aims to provide criteria and guidance to ensure that sustainable drainage schemes are designed to reduce flood risk and provide multi-functional benefits. The criteria and guidance are intended to support developers and ensure that submissions include the evidence and information required for a scheme to be assessed.

5.16 A House of Commons Report states,

> *'While the uptake of sustainable drainage systems has improved in recent years, the installation of high-quality SuDS features delivering multiple environmental benefits may still be insufficiently incentivised'.*[4]

5.17 Sustainable flood risk management can contribute positively to a range of policy aims. SuDS can provide enhanced placemaking, green and blue infrastructure networks, biodiversity enhancement, climate change mitigation and adaptation, access and recreation provision, active travel networks, and community health and well-being. Ciria describes SuDS as,

> *'SuDS aim to manage rainfall close to where it falls (at source); slow and attenuate runoff before it enters receiving waterbodies; allow water to soak into the ground and replenish soil moisture and groundwater levels; promote evapotranspiration; and filter and cleanse runoff of contaminants washed from the land surface. In many cases implementing drainage components that are on the surface (i.e. above ground), and will often incorporate vegetation and surrounding planting, as well as proprietary products will facilitate the delivery of SuDS'.*[5]

5.18 Ciria guidance on delivering better water management states,

> *'IWM*[6] *directly supports the Secretary of State for Environment, Food and Rural Affairs' ambitions for greening urban environments and ensuring development should result in net environmental gain and crucially, to 'work with nature to protect communities from flooding, slowing rivers and creating and sustaining more wetlands to reduce flood risk and offer valuable habitats' (HM Government 2018). IWM can help contribute to the urban aspect of nature recovery network through the creation of multi-beneficial connected blue and green spaces. IWM contributes to all of the 25-year goals set out in the plan'.*[7]

5.19 The Ciria guidance also states,

> *'Incorporating SuDS reduces costs for draining the site and providing water for consumptive use, whilst also increasing the value (and return to the developer) of the units on the site by increased open space quality.'*
>
> *'several viability assessments place the cost of delivering SuDS and increased water efficiency to optional Building Regulations and the Building Research Establishment Environmental Assessment Method (BREEAM) standards at £0 (e.g. Less, 2018 and Adams Integra, 2016)'.*

5.20 The Ciria guidance highlights a barrier to integrated water management implementation as the lack of up-to date plans which do not include integrated water management policies.

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[4] House of Commons Environment, Food and Rural Affairs Committee, Flooding, Fourth Report Session 2019-21 (2021) https://committees.parliament.uk/publications/4601/documents/46603/default/

[5] Ciria - W047b B£ST Guidance – Guidance to assess the benefits of blue and green infrastructure using B£ST Release version 5 June 2019 03 - MWH UK Report.dot (susdrain.org)

[6] Integrated Water Management

[7] Ciria Delivering better water management through the planning system A Main Guidance.pdf

5.21 The proposed amendments to draft Policy DM34 aim to ensure that the Council has a sound policy basis on which to require an improvement in the uptake and quality of SuDS features which will deliver multi-functional benefits and contribute to national and local aims to combat climate change and aid biodiversity.

Sustainable Drainage Hierarchy

5.22 Ciria provides the following guidance on sustainable drainage management or treatment train:

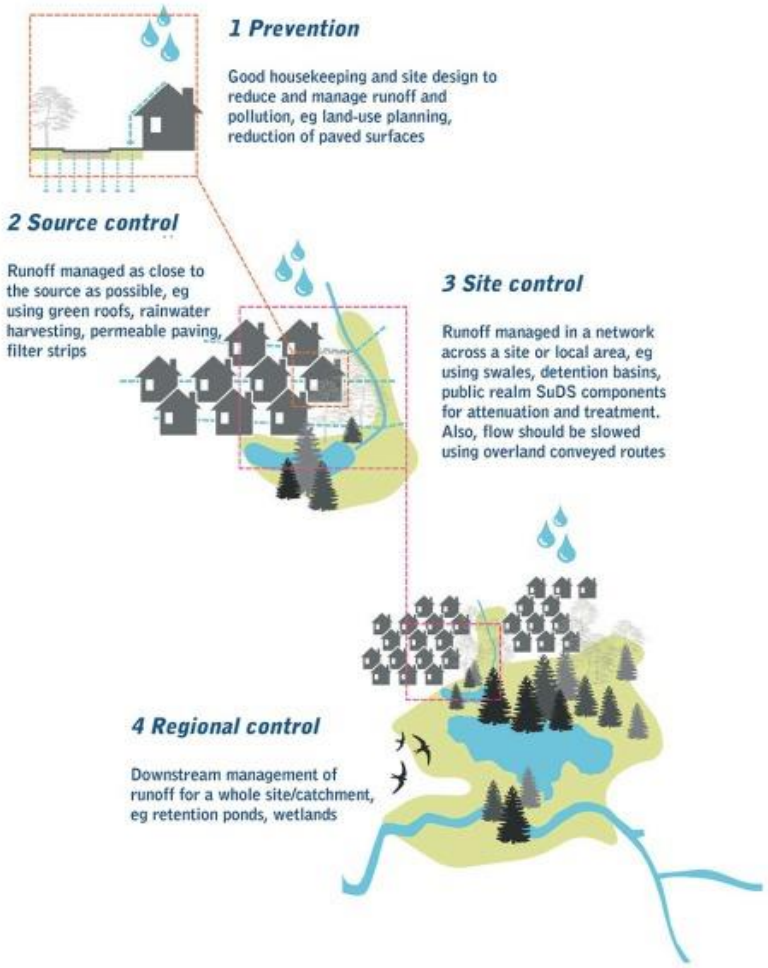

Figure 1: Sustainable Drainage Treatment Train[8]

1. Prevention – Good site design to reduce and manage run-off and pollution – reduce paved surfaces, reuse water such as rainwater harvesting/reuse

2. Source Control – Manage run-off as close to the source as possible using green roofs, rainwater harvesting, permeable paving, infiltration

3 Site Control – manage run-off in a network across the site using swales, detention basins, drainage within the green infrastructure. Slow flow and store water using overland conveyance.

5.23 The SFRA (2021) recommends incorporating green and blue infrastructure into development to promote recreation, water management, biodiversity and climate change mitigation. One way to do this is to ensure that above ground multi-functional SuDS are prioritised. The drainage hierarchy has been amended to prioritise naturalistic above ground solutions which provide for

[8] Dickie, S, McKay, G, Ions, L, Shaffer, P (*2010)* Planning for SuDS – making it happen*, C687, CIRIA, London (ISBN: 978-0-86017-687-9)*

a range of sustainability benefits. The table below shows the priority order for discharge methods and the associated sustainability priority.

DISCHARGE METHOD		SUSTAINABILITY				
Sustainable Drainage Hierarchy	**Control**	**Sustainability Hierarchy**	**SuDS Technique**	Flood Reduction	Pollution Reduction	Wildlife & Landscape Benefit
Highest Priority	**Re-use of water**	Highest Sustainability Priority	**Rainwater Harvesting and Reuse**	✓	✓	
	Infiltration		**Green/Living Roofs & Walls**	✓	✓	✓
			Infiltration: Soakaways Swales Unlined ponds and wetlands Bioretention Trees within systems	✓	✓	✓
			• Permeable surfaces • Filter trenches / Infiltration trenches	✓	✓	
	Above Ground Attenuation and Gradual Release to Infiltration (see above) or Water Course		**Basins and ponds:** Wetlands Balancing Ponds Detention Basins Retention Basins Conveyance swales	✓	✓	✓
Lowest Priority (Only if other options are not achievable)	**Below Ground Attenuation Prior to Gradual Release to Infiltration (see above) or Water Course**		**Tanks & Piped Systems:** • Crated Attenuation Tanks • Oversize pipes	✓		
	Controlled Discharge • **To Surface Water Sewer** • **To Combined Sewer**	Least Sustainable		✓		

Table 1: Surface Water Discharge and Sustainability Priorities

5.24 The hierarchy aims to ensure that wherever possible, surface water is managed in a sustainable way which reduces flooding and provides a wide range of other benefits in accordance with the NPPF and other guidance such as that from Ciria.[9] Development should deliver SuDS as high up the hierarchy as possible, combination or hybrid solutions can be delivered where necessary. A

[9] Ciria Delivering better water management through the planning system A Main Guidance.pdf

similar example is included at policy SI 13 of the London Plan 2021 and the Warwick District Local Plan (2017) includes a policy presumption against underground tanks.

5.25 The first priority is to reduce and reuse surface water run-off. This can be as simple as a green roof on a shed or garage, or a water butt in a garden to larger scale green roofs across a development and tanks for storing rainwater which is then reused in the home or business. These techniques can be used at home level or as sitewide treatment. The reuse of water reduces costs arising from the use of treated water and the costs associated with discharge. The Council is also seeking to adopt the Building Regulation Requirement G2: Water Efficiency and continue the use of BREEAM for water use in non-residential buildings in proposed draft Policy DM30b. These measures will reduce wastewater entering the drainage systems thereby reducing the risk of surcharge, flooding and pollution.

5.26 The second priority is the use of infiltration which mimics natural processes by allowing rainfall to percolate through hard surfaces or running off then into landscaped areas such as a swale, trench, pond or wetland. The features should incorporate materials and plants to filter out pollution and absorb water. Swales can be designed to hold water and transfer it slowly from higher to lower areas. High quality infiltration slows water discharge, removes pollution and provides the range of other benefits mentioned above.

5.27 There may be locations on a site where, infiltration is not possible or sites where infiltration is too slow or too fast. In such cases, the third priority is the use of attenuation, water should then be transported above ground, through swales or trenches to infiltration features or to a watercourse. Above ground attenuation slows water discharge, removes pollution and provides the range of other benefits mentioned above.

5.28 The use of underground tanks/pipe is discouraged as these do not provide the multi-functional benefits referred to by the NPPF and various other guidance. However, there may be cases such as on small brownfield sites where above ground infiltration and attenuation cannot be accommodated. In these cases, hybrid solutions can be used to deliver some multi-functional benefits.

SuDS Design

5.29 The proposed draft policy includes criteria for the design of SuDS. The criteria seek to ensure that multi-functional benefits are provided as referred to in the NPPF and Ciria guidance. Each item does not need to be dealt with discretely, a well integral SuDS can incorporate all the criteria within few design features which can be accommodated within a scheme.

Flood Risk Reduction

5.30 Flood risk reduction measures are the obvious requirement for inclusion in SuDS schemes. SuDs increase water retention by slowing down the runoff rates and increasing the amount of time that rainwater takes to enter the river or sewer systems, holding water during storm events to prevent runoff flooding sites and off-site. Development must address the water coming off the site, combining this requirement with others such as pollution control, biodiversity net gain and landscape, amenity enhancement and minimising the cost and the land take required.

Management of Surface Water in Stages

5.31 When designed as an integral part of high-quality green and blue infrastructure, water is slowed by increased vegetation to soak up water and areas where water is captured, water is then slowly released through infiltration, plant absorption, evaporation and controlled discharge.

5.32 By treating surface water in stages and as close to the source as possible, SuDS improve water quality by capturing it before it reaches waterways, reducing the impact on the environment and the amount of treatment required. Source control is a requirement of the Ciria SuDS

Manual.[10] To be at its most effective, SuDS should include multi-level source control and is described by Ciria as delivering one or more of the following:

- *'Capture, store and remove (e.g. rainwater harvesting systems, green roofs)*
- *Capture, store and treat (e.g. pervious pavements, detention basins, bioretention systems)*
- *Capture, convey and treat (e.g. swales)*
- *Capture, store and infiltrate (e.g. soakaways, infiltration trenches)'*

Environmental and Biodiversity

5.33 By providing appropriate vegetation rich in native species, linking areas with existing green and blue networkS to support wildlife movement, and supporting the function of existing ecological networks, development can achieve requirements for environmental enhancement and biodiversity net gain.

5.34 The RSPB and NHBC[11] have produced guidance which sets out approaches to design to provide for biodiversity in development. It emphasises multifunctional benefits, including at section 5, combining biodiversity and sustainable drainage. The use of swales, bioretention beds, filter strips and removing kerbs or sections of kerbs can make it easier for wildlife to move around sites. Wetlands, detention basins and ponds can provide new and enhanced wildlife habitats.

Pollution Control

5.35 Providing a single SuDS feature such as a pond, will have a negative impact due to the built up of sediment if this is not filtered out before it reaches an infiltration pond. A single feature infiltration feature would also not provide runoff reduction features. Water should be captured as close to the source as possible by using pervious pavements, swales and infiltration trenches. Filtration systems can use plants, sands, gravel, permeable paving, as natural filters to clean water. SuDS, if designed to meet the required standards, can be used for polluted sites. Semi-permeable membranes can form a barrier which allows water to percolate but traps heavy metals. Water is then clean when it goes into watercourses. Treating surface water in this way also provides biodiversity benefits. A combination of such features will provide multi-level pollution control along with the other benefits previously mentioned.

Landscape and Amenity

5.36 Well-designed attractive SuDS features which are integral to the green and blue infrastructure of a site, integrated in the urban environment and connected with other networks, such as green corridors, recreation areas, foot and cycle paths will benefit the amenity of a site. SuDS can improve visual aesthetics, enhance green space and high-quality public realm.

5.37 Safe design does not require SuDS to be fenced off and inaccessible. SuDS can be made safe by ensuring there is natural surveillance, a level area around features, the use of gentle slopes and muddy margins to discourage access, clear identification of the water edge, boardwalks and paths around features. Ciria provides guidance on health and safety principles.[12] Not all SuDS features are wet, while the Council would not wish to see essential play and recreational space within areas which may become flooded, they may be used for ancillary recreational space, especially areas around them.

[10] The SuDS Manual (C753) 2015 Ciria
https://www.susdrain.org/files/resources/SuDS_manual_output/suds_manual_faqs.pdf

[11] Biodiversity in new housing developments: creating wildlife-friendly communities RSPB NHBC (NF89) 2021
S067-NF89-Biodiversity-in-new-housing-developments_FINAL.pdf (nhbcfoundation.org)

[12] Health and safety principles for SuDS: framework and checklists Ciria
paper_rp992_17_health_and_safety_principles.pdf (susdrain.org)

Watercourse Restoration and Natural Flood Management

5.38 The NPPF aims to ensure new development reduces the causes and impacts of flooding, and where appropriate provides natural flood management techniques. Culverts and concrete channels have limited ecological value and were generally constructed to contain and transfer water without slowing movement or storage capacity. De-culverting and naturalisation of concrete channels can increase capacity, slow flows, provide easier access for maintenance, enhance biodiversity, introduce vegetation to improve water quality and improve amenity value. De-culverting and naturalisation of channels does require separate consent from either the Environment Agency or Local Lead Flood Authority, depending on the type of watercourse. The Environment Agency and Local Lead Flood Authority support de-culverting and naturalisation due to the wide range of benefits mentioned. Design work will need to meet their requirements.

Design Standard

5.39 The Councils preference is, where possible for SuDS to be adopted to remove the burden for maintenance from homeowners. While property level SuDS usually remain the responsibility of a homeowner, if designed to meet their requirements, United Utilities will adopt schemes or parts of schemes. While there is currently no method to require the adoption of SuDS, by ensuring they are designed to an adoptable standard, there will be an additional layer of quality control and the opportunity for adoption.

5.40 The SFRA (2021) lists a number of documents, which SuDS design should adhere to. The proposed draft policy refers to the Ciria SuDS Manual[13] and the Council's Flood Risk and Sustainable Drainage Supplementary Planning Document (SPD) and the accompanying text at 9.39 to the remainder. The Council has previously published Planning Advisory Notes covering these issues, but these will be replaced with a single SPD which provides advice and guidance on how a developer can meet the requirements of the proposed draft policy.

Climate Change and Discharge Rates

5.41 In 2021, the Environment, Food and Rural Affairs Committee stated,

> *'The Climate Change Committee said in 2019 that "inadequate progress has been made" on managing increasing surface water flood risk, noting that "the plans that do exist do not consider different climate change scenarios", and that there are no plans which ensure that new development does not increase overall vulnerability to surface water flooding'.*[14]

5.42 The NPPF requires policies to support measures to ensure the future resilience of communities and infrastructure to the impacts of climate change and the PPG advises that plans should promote design responses to flood risk and coastal change for the lifetime of the development.

5.43 The SFRA (2021) recommends the effects of climate change should be considered, the latest EA allowances are taken into account, SuDS adhere to industry standards and to the applicable runoff discharge rate and storage volume allowances stated by the LLFA and that development on brownfield land should discharge to greenfield rates.

5.44 The proposed draft policy sets out the peak runoff rate, runoff volume, the climate change allowance and an allowance for urban creep to be used in SuDS calculations. The runoff rates and climate change allowance have been determined in collaboration with the LLFA and the runoff rates reflect the industry standard. The use of the upper end climate change allowance

[13] The SuDS Manual (C753) 2015 Ciria
https://www.susdrain.org/files/resources/SuDS_manual_output/suds_manual_faqs.pdf

[14] House of Commons Environment, Food and Rural Affairs Committee, Flooding, Fourth Report Session 2019-21 (2021) https://committees.parliament.uk/publications/4601/documents/46603/default/

reflects the Environment Agency guidance[15] and the risks within the district identified in the SFRA (2021). An urban creep allowance has been included to account for additional hard surfacing arising from permitted development such as extensions and patios. In combination, the figures referred to aim to ensure that flood risk is managed for the lifetime of the development.

Information Requirements

5.45 Adopted Policy DM34 includes a list of information required to support applications. The proposed draft amendments seek to update the scale of development that such information is required for and provide additional advice to support developers.

5.46 The scale of development that information is required for has been updated to reflect the current Lancaster Planning Application Validation Guide[16] and the recommendations within the SFRA (2021). The information required does not differ significant in practice to what is currently asked for either at application submission stage or by conditions attached to planning permissions. The proposed draft policy seeks to provide clearer requirements to point developers in the right direction and avoid delays when determining an application.

5.47 The NW SuDS Proforma and associated guidance sets out the information that the Environment Agency, Local Lead Flood Authority and United Utilities wish to see when being consulted on applications. It has been,

> *'Created for the North West, sponsored and endorsed by the Nort West Regional Flood and Coastal Committee, and has been development by a task group of representatives from United Utilities, North West Local Authorities and the Environment Agency.'*[17]

5.48 The NPPF states that SuDS should have minimum operational standards and maintenance arrangements for the lifetime of the development. Adopted Policy DM34 already includes a requirement for ongoing maintenance, the proposed draft policy adds a requirement for management details, this will ensure that management arrangements are also in place for lifetime of the scheme. A Surface Water Management and Maintenance Plan is expected to demonstrate that clear arrangements have been established for the operation and maintenance of the SuDS for the lifetime of the development, identify ownership and maintenance responsibilities for all the surface water drainage system (arrangements for adoption by any public authority or statutory undertaker or any other arrangements to secure the operation of the drainage scheme throughout its lifetime) and a maintenance plan. These details are usually required by condition, the proposed draft policy change will therefore not significantly alter practices but will make the requirements clearer for developers.

Post Construction Validations

5.49 Visual inspections for monitoring, enforcement and maintenance are simpler to carry out where above ground SuDS are delivered. This is another benefit arising from such schemes. Where SuDS are provided underground, ensuring a developer has accorded with the approved scheme can be problematic. To overcome this issue, a requirement for validation has been added into the proposed draft policy. This will ensure that developers deliver the approved scheme and where they fail to do so, arrangements can be made to rectify this.

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[15] Flood Risk assessment: climate change allowances Environment Agency (July 2020) Flood risk assessments: climate change allowances - GOV.UK (www.gov.uk)

[16] Lancaster Planning Application Validation Guide (2020) Submit a planning application - Lancaster City Council

[17] SuDS Proforma The Flood Hub Planning & Development | The Flood Hub

Policies DM35: Water Supply and Waste Water and DM36: Protecting Water Resources, Water Quality and Infrastructure

5.50 The proposed amendments to draft policies DM35 and DM36 are minor and reflect comments made by the Environment Agency and United Utilities. The amendments add clarification and seek to prevent pollution arising from the surface or wastewater schemes within development. The overall thrust of the policies does not however significantly change.

6 CONCLUSION

6.1 The NPPF, PPG, and various other guidance documents, particularly the Ciria guidance and the evidence and recommendations in the SFRA (2021), along with collaboration with the Environment Agency, Local Lead Flood Authority and United Utilities have influenced the draft proposed policies on water management. The combination of the proposed amendments seeks to enhance how development addresses climate change, in particular flooding and water management. The draft policies will improve how flood risk is assessed, how sites are laid out and designed to address a sequential approach to flood risk and how they manage and dispose of water which fall on them and runs through them and ensure multi-functional benefits are provided.

APPENDIX A – SFRA (2021) RECOMMENDATIONS AND POLICY RESPONSE

Policy Recommendation 1: High risk urban catchments (Cumulative Impact Assessment)	
SFRA (2021) Recommendation	**CELPR Policy Response**
All new development (other than minor extensions) in these catchments should:	
• Consider site specific Flood Risk Assessments to demonstrate what measures can be put in place to contribute to flood risk reduction downstream. This could be through SuDS, natural flood management techniques, green infrastructure, and green-blue corridors.	• Policy DM33 requires Flood Risk Assessments (III & IV) and measures to reduce flooding VI & VIII).
• Maintain existing blue and green spaces, particularly where there is an environmental or climate change mitigation value, and consider creating additional blue and green infrastructure, combing these with the existing network.	• Policy DM33 seeks opportunities for the enhancement of watercourses (VII). • Policy DM34 prioritises the provision of above ground SuDS to create multi-functional green and blue infrastructure. • Policy DM43 protects green and blue infrastructure and opportunities to extend networks.
• Produce a Green and Blue Infrastructure Management and Maintenance Plan to set out the effective management of green and blue infrastructure assets so they can continue to deliver the long-term benefits they were designed to provide.	• Policy DM43 required a Green and Blue Management Infrastructure Management and Maintenance Plan and Policy DM43 requires a Surface Water Lifetime Management and Maintenance Plan. The Plans should be crossed referenced.
• Surface Water Drainage Strategies consistent with local planning requirements will be required for all developments in this catchment, regardless of development size.	• Policy DM43 sets out the requirements for Surface Water Drainage Strategies, including a requirement for all development within the High Risk Urban Catchments to provide one.

Policy Recommendation 2: High risk large rural catchments with localised flood risk issues (Cumulative Impact Assessment)	
SFRA (2021) Recommendation	**CELPR Policy Response**
Opportunities within rural catchments should be explored to:	
• Promote environmental land management practices to attenuate surface water runoff, through methods such as cover crops, riparian borders, and infiltration techniques, to alleviate potential issues downstream.	• Policy DM33 promotes natural flood risk management (VIII) and opportunities to improve the function of watercourses (VII).
• Promote community resilience in rural areas where immediate assistance following serious flood events might not be possible.	• This is a wider issue for the Council rather than a planning policy matter.
• The LPA should work closely with the Environment Agency and Lancaster County Council as LLFA to identify areas of land that should be safeguarded for the future use of natural flood management features.	• This is a wider issue for the Council. The CELPR does not revisit allocations therefore safeguarding land is out of scope.
Policy Recommendation 3: Applicable across the borough to minimise cumulative impact (Cumulative Impact Assessment)	
SFRA (2021) Recommendation	**CELPR Policy Response**
All new development in these catchments should:	
• Incorporate green and blue infrastructure into development plans, through both maintaining current green and blue spaces and also creating additional infrastructure to promote recreation, water management, biodiversity and climate change mitigation. Proposals involving the loss of designated green or blue spaces will be resisted by Lancaster City Council unless appropriate mitigations measures have been considered.	• Policy DM43 requires that new development integrates green and blue infrastructure and takes opportunities to extend networks. • Policy DM34 priorities above ground SuDs to enhance green and blue infrastructure and the associated multifunctional benefits. • Policy DM43 states that the Council will resist the loss of green and blue infrastructure other than in exceptional cases, where appropriate mitigation is provided.
• Integrate Surface Water Drainage Strategies in accordance with local	• Policy DM34 sets out the local requirement for Surface Water Drainage Strategies.

requirements for all major and non-major developments. These should take into account all sources of flooding to ensure that future development is resilient to flood risk and does not increase flood risk elsewhere.	• Policy DM33 (V) requires development to be resilient and to reduce flood risk.
Recommendation 1: No development within the functional floodplain…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…as per the National Planning Policy Framework and Flood Risk and Coastal Change Planning Practice Guidance, unless in exceptional circumstances such as for essential infrastructure, which must still pass the Exception Test, or where development is water compatible. Development must not impede the flow of water within the functional floodplain nor should it reduce the volume available for the storage of floodwater. Sites within the functional floodplain may still be developable if the site boundary can be removed from the functional floodplain or the site can accommodate the risk on site and keep the area of functional floodplain free from development or obstruction and allowed to flow freely.	• Policy DM33 protects the functional flood plain and sets out the requirements for Exception Tests.
Recommendation 2a: Consider surface water flood risk…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…with equal importance alongside fluvial and tidal risk including possible withdrawal, redesign or relocation for sites identified to be at significant surface water risk through this SFRA.	• The CELPR does not reassess allocated sites. Amendment to boundaries or withdrawal of sites is therefore out of scope. The Exception Test and FRA will ensure that sites are designed sequentially to avoid development in high risk flood zones.
SuDS on all new development must adhere to industry standards and to the applicable runoff discharge rate and storage volume allowances stated by the LLFA.	• Policy DM34 sets out the run off rates and refers to the Sustainable Drainage Systems: Non -statutory technical standards.
Site-specific FRAs should always consider surface water flood risk management and options for onsite flood storage through appropriate SuDS. The LPA / LLFA must always be consulted during this process, as should UU and the EA, if required.	• Policy DM33 requires that FRAs consider all sources of flood risk. • Policy DM34 sets out runoff rates, climate change and urban creep allowances which will dictate the onsite storage required.

Recommendation 2b: Use of appropriately sourced SuDS…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…required for all developments of 5 or more residential units or major commercial development.	• Policy DM34 sets seeks SuDS for all development and sets out the requirements for Sustainable Drainage Strategies for all developments of 5 or more residential units or major commercial development.
As per the NPPF, in terms of SuDS, development in areas at flood risk should only be permitted where SuDS are incorporated into the design, unless clear evidence demonstrates this would be inappropriate.	• Policy DM34 requires that SuDS are incorporated into the design.
SuDS scoping and design, as part of a site-specific FRA, must be included within the early stages of the site design in order to incorporate appropriate SuDS within the development.	• Policy DM34 requires that SuDS are incorporated into the design. The accompanying text at 9.39 states that SuDS should be an integral part of the design process.
The LPA, LLFA, UU (if appropriate) must be consulted during the site design stage and the FRA must be submitted to and approved by the LPA, considering all consultation with key stakeholders.	• Developers are encouraged to engage during the design process. The Council cannot however, require them to do so. • Consultation with all key stakeholders will take place at planning application stage.
All SuDS must be designed to meet industry standards, as specified below, including any replacement standards/documents which update or are in addition to those listed: • Local SuDS Guidance • Interim national standards published in March 2015 • Technical Standards for Sustainable Drainage Systems (Defra) • C753 The SuDS Manual • Sewers for Adoption 8	• Policy DM34 refers to SuDS design and industry standards.

Recommendation 3: Sequential approach to site layout…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…must be followed by the LPA to ensure sustainable development when either allocating land in Local Plans or determining planning applications for development. The overall aim of the Sequential Approach should be to steer new development to low risk Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, the flood risk vulnerability of land uses and reasonably available sites in Flood Zone 2 should be considered, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in higher risk Flood Zone 3a, be considered. This should take into account the flood risk vulnerability of land uses, residual surface water and/or groundwater flood risk and the likelihood of meeting the requirements of the Exception Test, if required. This SFRA, the NPPF and FRCC-PPG must be consulted throughout this process along with the LPA, LLFA, EA, and UU if appropriate.	• Policy DM33 (I) refers to the requirement for Sequential Tests. The CELPR does not reassess allocated sites, carrying out a Sequential Test is therefore out of scope. The Sequential Test will be followed at application stage where required.
Recommendation 4: Requirement for a site-specific Flood Risk Assessment…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…from a developer when a site is: • Located in Flood Zone 2 or 3 • Greater than 1 hectare in size • Within Flood Zone 1 where any part of the site is identified by the RofSW flooding maps as being at risk of surface water flooding • Identified by the EA as having critical drainage problems (within an Area with Critical Drainage Problems) • Situated over or within 8 metres of a culverted watercourse or where development will be required to control or influence the flow of any watercourse • Identified as being at increased flood risk in	• Policy DM33 sets out when a Flood Risk Assessment is required to reflect the bullet points in the SFRA.

future • At risk of flooding from other sources of flooding or at residual risk • Subject to a change of use to a higher vulnerability classification which may be subject to other sources of flooding • Situated in an area currently benefitting from defences • Any site identified in the Cumulative Impact Assessment Before deciding on the scope of the FRA, this SFRA should be consulted along with the LPA, LLFA, and UU. The FRA should be submitted to and be approved by the LPA including suitable consultation with the LLFA and the EA and any other applicable parties.	
Recommendation 5: Natural Flood Management techniques…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…must be considered, where possible, to aid with flood alleviation and implementation of suitable SuDS, depending on the location.	• Policy DM33 encourages the use of natural flood management.
The Council's GBI Strategy and the national Working with Natural Processes mapping (included in this SFRA) should be consulted in the first instance, followed by local investigation into whether such techniques are appropriate and whether the benefits are proportionate to the work required to carry out the identified Working with Natural Processes approaches.	• The GBI Strategy identifies green and blue infrastructure and opportunities for enhancement.
Natural drainage features should be maintained and enhanced and there should be a presumption against culverting of open watercourses. Where possible, culvert removal should be explored.	• Policy DM34 require measures to maintain natural flood management. • Policies DM33 and DM34 seek removal and naturalisation of culverts.

Recommendation 6: Phasing of development…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…must be carried out by the LPA on a site by site basis and also within larger sites by the developer to avoid any cumulative impacts of flood risk (reinforced by the NPPF).	• The CELPR does not reassess allocated sites, the phasing of sites is therefore out of scope.
Using a phased approach to development, should ensure that any sites at risk of causing flooding to other sites are developed first to ensure that flood storage measures are in place and operational before other sites are developed, thus contributing to a sustainable approach to site development during all phases of construction. It may be possible that flood mitigation measures put in place at sites upstream could alleviate flooding at downstream or nearby sites. Development phasing within large strategic sites of multiple developments should also be considered where parts of such sites are at flood risk.	• Policy DM34 requires that for large-phased sites, the drainage strategy is coordinated and holistic.
Recommendation 7: Planning permission for at risk sites…	
SFRA (2021) Recommendation	**CELPR Policy Response**
…can only be granted by the LPA where a site-specific FRA shows that:	
• The requirements of the NPPF and FRCC-PPG have been followed and referenced together with appropriate consultation with the LLFA, the EA, and UU, where applicable.	• Policy DM33 sets out criteria for assessing the development of sites at risk, including reference to the national policy.
• The effects of climate change have been considered using the latest EA allowances.	• Policy DM33 (IV) requires consideration of climate change. • Policy DM34 sets out climate change allowances.
• There is no loss in floodplain storage resulting from the development i.e. where development takes place in a fluvial flood zone or is at risk from surface water flooding, compensatory storage must be found to avoid loss of floodplain and subsequent displacement of water which may cause flooding elsewhere.	• Policy DM33 protects the functional flood plain.

• The development will not increase flood risk elsewhere.	• Policies DM33 (VI) and DM34 require reduction in flood risk.
• For previously developed sites, the development should look to meet greenfield runoff rates where practicable (in line with the Non-Statutory Technical Standards for Sustainable Drainage (March 2013)), achieved through providing Sustainable Drainage Systems as appropriate or through the use of appropriate flow and volume control devices.	• Policy DM34 requires brownfield development to meet greenfield rates and where this is not achievable sets a rate for reduction.
• There is no adverse effect on the operational functions of any existing flood defence infrastructure.	
• Proposed resistance / resilience measures designed to deal with current and future risks are appropriate.	• Policy DM33 (V) requires the incorporation of resilience, adaption and mitigation measures.
• Whether the development will be safe for its lifetime and has passed the Exception Test, if applicable.	• Policy DM33 sets out when and Exception Test will be required. • FRAs will demonstrate that development is safe for the lifetime taking into account climate change.
• Appropriate SuDS techniques have been considered and are to be incorporated into the design of the site, where applicable.	• Policy DM34 sets would the requirement for SuDS.
• An appropriate Emergency Plan is included that accounts for the possibility of a flood event and shows the availability of safe access and egress points accessible during times of flood.	• Policy DM33 (V) requires an Emergency Plan.

APPENDIX B – CUMULATIVE IMPACT ASSESSMENT - CATCHMENT RISK DESIGNATIONS

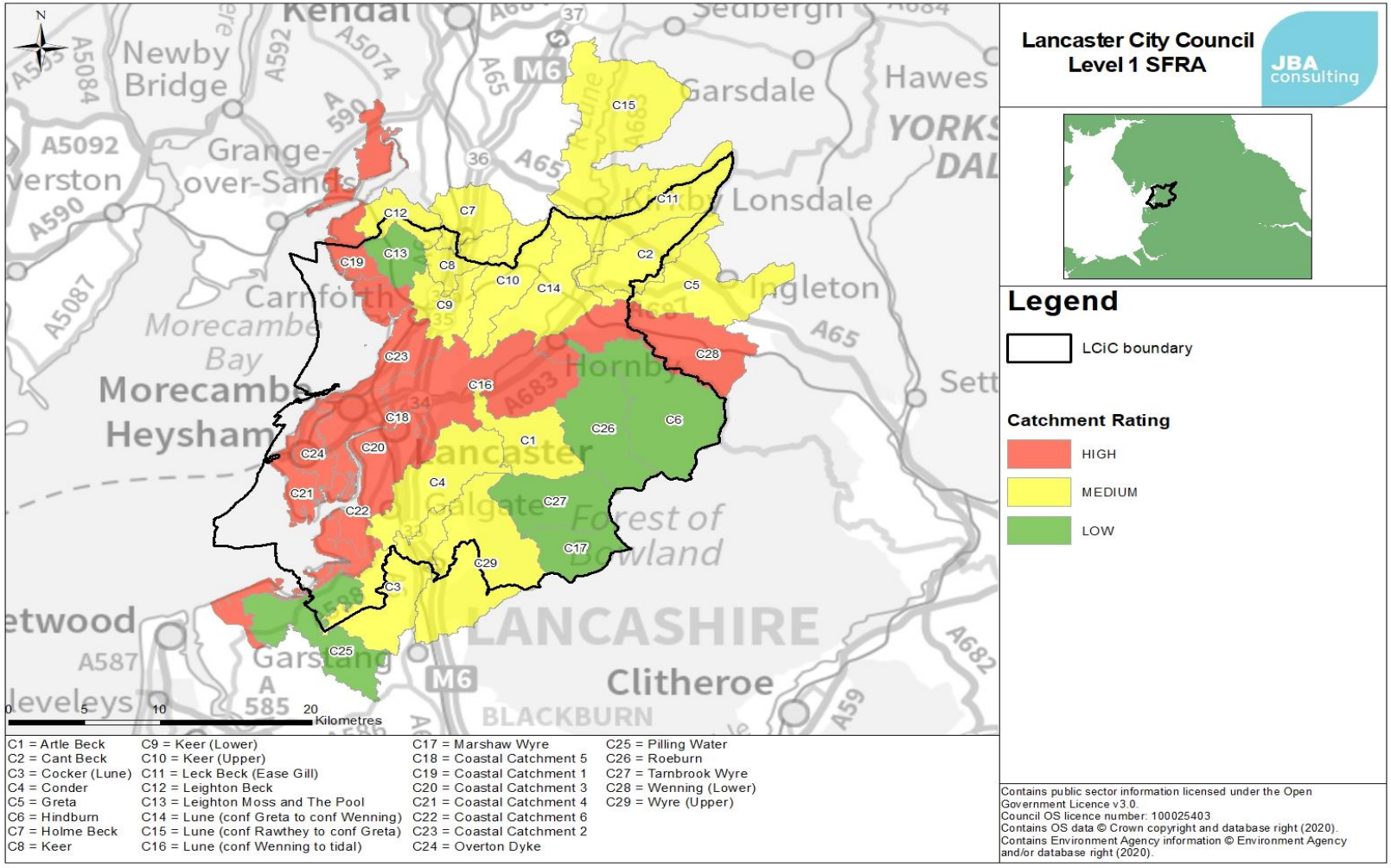

Figure 0-1: Map of the results of the cumulative impact assessment for each of the catchments SFRA (2021)

High Risk Urban Catchments

- Coastal catchment 2 (C23)
- Coastal catchment 3 (C20)
- Coastal catchment 4 (C21)
- Overton Dyke (C24)
- Lune – conf Wenning to tidal (C16)
- Wenning – Lower (C28)

Lancaster City Centre falls within Coastal catchment 3, which received a high-risk rating in the cumulative impact analysis. In addition to this, Heysham falls within both the Overton Dyke catchment and Coastal catchment 4. Morecambe lies within Coastal catchment 2.

High Risk Large Rural Catchments With Localised Flood Risk Issues

- Coastal catchment 1 (C19)