Local Flood Risk Management Strategy

Strategic Environmental Assessment Environmental Report

March 2014



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Non-Technical Summary

- 1.1 This Environmental Report assesses the potential environmental effects that may arise from the implementation of the Manchester Local Flood Risk Management Strategy. It is required under the Environmental Assessment of Plans and Programmes Regulations 2004.
- 1.2 Chapter 2 describes the approach that is being taken to the SEA of the LFRMS and outlines the tasks involved.
- 1.3 Chapter 3 presents the review of plans policies and programmes, baseline information and key sustainability issues for Manchester.
- 1.4 Chapter 4 presents the SEA framework that is being used for the SEA of the LFRMS.
- 1.5 Chapter 5 summarises the findings of the SEA of the draft LFRMS (November 2013).
- 1.6 Chapter 6 details the approach that will be taken to monitoring the effects of the LFRMS as it is implemented.
- 1.7 Chapter 7 presents the conclusions of the SEA and describes the next steps to be undertaken. The conclusions of the Environmental Report are that the Policies within the Local Flood Risk Management Strategy meet the range of environmental objectives identified in the SEA Framework. The LFRMS Policies are considered to offer generally positive effects on environmental, social and economic objectives. None of the measures in the final LFRMS are likely to have significant negative effects on any of the SEA objectives. This is because of the nature of the LFRMS, which has the overarching aim of effective flood risk management, meaning that the effects of the strategy are largely positive.

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Chapter 1 – Introduction

1.1 The Strategic Environmental Assessment (SEA) is concerned with assessing the potential environmental effects that may arise from the implementation of the Manchester Local Flood Risk Management Strategy (LFRMS). This report ('the Environmental Report') presents the SEA of the draft LFRMS (November 2013) and it should be read in conjunction with that document.

The Manchester Area

- 1.2 The City of Manchester is located to the south and west of the Pennines, the source of the City's principal rivers, the Mersey and the Irwell. Manchester was an important centre in Roman and Medieval times, but grew significantly during the industrial revolution in the 18th and 19th centuries, which has shaped both the built environment cotton mills, grand civic buildings, and terraced housing and the actual landscape in terms of canals and reservoirs. The City today contains a mix of housing types, including concentrations of apartments in the City Centre, together with pre-war suburbs and post-war housing estates, with employment concentrated in the City Centre and at more peripheral locations in the north and east of the City and close to Manchester Airport.
- 1.3 Over half a million people live in Manchester, including one of the largest student populations in Europe, and the City is at the heart of the Greater Manchester City Region with a population of almost 2.7 million people. Transport infrastructure converges on the City Centre, whose population increases significantly during the day with workers, shoppers and visitors. The City has a predominantly urban character, although many homes have gardens, and there are many parks and landscaped areas, often associated with the rivers and canals.
- 1.4 Flood risk is an increasingly important issue in England due to climate change, and cities, which have often developed next to rivers, can be particularly vulnerable. It is not economically possible to prevent all flooding from occurring, but there are actions that can be taken by individuals, businesses, government and the wider community, to manage the risks and reduce the impacts of flooding with the resources available. Working collaboratively with all stakeholders will help actions to be coordinated and investment aligned, to manage risk more effectively.

Manchester Local Flood Risk Management Strategy

- 1.5 The Flood and Water Management Act 2010 ('the Act') gave local authorities a new role to manage local flood risk in their area. The Act established Manchester City Council as a Lead Local Flood Authority (LLFAs) with the requirement to produce a LFRMS. This LFRMS should be consistent with the National Flood and Coastal Erosion Risk Management Strategy. The strategy sets out a vision for the management of flood risk and, although the Act specifies some of the key elements that must be included in the LFRMS, it is intended that they will be locally specific, reflecting key local issues and enabling communities to be more involved in decision-making regarding flood risk management.
- 1.6 The Act defines local flood risk as flood risk from:
 - Surface runoff.

- Groundwater.
- Ordinary watercourses (those that do not form part of a 'main river').
- 1.7 The Act requires LFRMSs to specify:
 - The risk management authorities within the authority's area (in Manchester these are the Environment Agency, the LLFA (Manchester City Council), the Water Company (United Utilities) and the Highway Authority (Manchester City Council and the Highways Agency).
 - The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area.
 - The assessment of local flood risk for the purpose of the strategy.
 - The objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009).
 - The measures proposed to achieve those objectives.
 - How and when the measures are expected to be implemented.
 - How and when the strategy is to be reviewed.
 - How the strategy contributes to the achievement of wider environmental objectives.
- 1.8 LLFAs must consult risk management authorities that may be affected by the strategy as well as the general public about its LFRMS.

Strategic Environmental Assessment

- 1.9 The EU Directive 2001/42/EC on the assessment of effects of certain plans and programmes on the environment (the "SEA Directive") came into force in the UK on 20 July 2004 through the Environmental Assessment of Plans and Programmes Regulations 2004 (the "SEA Regulations").
- 1.10 The SEA Directive and Regulations require formal strategic environmental assessment of plans and programmes which are likely to have significant effects (either positive or negative) on the environment. The Directive requires an SEA to be carried out for all plans and programmes *"which are subject to preparation and/or adoption by an authority at national, regional or local level..."*. The Local Flood Risk Management Strategy for Manchester is one such document.
- 1.11 The overarching objective of the SEA Directive is: "To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans... with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans... which are likely to have significant effects on the environment." (Article 1).
- 1.12 SEA is an iterative assessment process which plans and programmes are now required to undergo as they are being developed, to ensure that potential significant environmental effects arising from the plan/programme are identified, assessed, mitigated and communicated to plan-makers. SEA also requires the monitoring of significant effects once the plan/programme is implemented.

- 1.13 The aim of the SEA is to identify potentially significant environmental effects created as a result of the implementation of the plan or programme on issues such as *"biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors"* (Annex 1(f)).
- 1.14 SEA should be undertaken iteratively, as the Local Flood Risk Management Strategy is progressed, and involves evaluating the likely significant environmental effects of implementing the strategy. The aim is that environmental considerations can be integrated into the production of the strategy in order to improve its overall sustainability performance.

Compliance with the SEA Regulations

1.15 This report has been prepared in accordance with the SEA Regulations. The reporting requirements of Regulation 12(3) / Schedule 2 of the SEA Regulations are set out in Table 1.1 below, which also indicates where in this SEA Report the relevant requirement has been met.

Table 1.1 - Requirements of the SEA Regulations and where these have been addressed in this SEA Report

Requirements	Where covered
Preparation of an environmental report in which the likely significant effects on the environmental report in which the likely significant effects on the environmenting the plan or programme, and reasonable alternatives taking into a objectives and geographical scope of the plan or programme, are identified, devine evaluated. The information to be given is:	vironment of account the scribed and
a) An outline of the contents, main objectives of the plan or programme, and relationship with other relevant plans and programmes;	Chapter 3
b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Chapter 3
c) The environmental characteristics of areas likely to be significantly affected;	Chapter 3
d) Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Chapter 3
e) The environmental protection objectives, established at international Community or national level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	Chapter 3
f) The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors. (Footnote: These effects should include secondary, cumulative, synergistic, short, medium and long-	Chapter 5

term permanent and temporary, positive and negative effects);	
g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Chapter 5
h) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Chapter 2
i) a description of measures envisaged concerning monitoring in accordance with Article 10;	Chapter 6
j) a non-technical summary of the information provided under the above headings.	Non - Technical Summary

Structure of the SEA Report

- 1.16 This Chapter has described the background to the production of the Manchester LFRMS and the requirement to undertake an SEA. The remainder of this report is structured into the following sections:
 - **Chapter 2** describes the approach that is being taken to the SEA of the LFRMS and outlines the tasks involved.
 - **Chapter 3** presents the review of plans policies and programmes, baseline information and key sustainability issues for Manchester.
 - **Chapter 4** presents the SEA framework that is being used for the SEA of the LFRMS.
 - **Chapter 5** summarises the findings of the SEA of the draft LFRMS (November 2013).
 - **Chapter 6** details the approach that will be taken to monitoring the effects of the LFRMS as it is implemented.
 - **Chapter 7** presents the conclusions of the SEA and describes the next steps to be undertaken.
- 1.17 The information in the main body of the report is supported by a number of appendices:
 - **Appendix 1** sets out the consultation comments received in relation to the SEA Scoping Report and describes how each one has been addressed.
 - **Appendix 2** presents the review of plans, policies and programmes of relevance to the SEA. This was updated since it was originally presented in the SEA Scoping Report, in light of the consultation comments received.
 - **Appendix 3** presents the updated baseline information for Manchester, which has again been updated since the Scoping stage.
 - **Appendix 4** presents the detailed SEA matrices for the final LFRMS.

2.1 The approach for carrying out the SEA of the Manchester LFRMS is based on current best practice and the ODPM guidance document "A Practical Guide to the Strategic Environmental Assessment Directive"¹

SEA Stages and Work Undertaken

2.2 Table 2.1 sets out the main stages of the SEA based on Figure 5 of the Practical Guide to the SEA Directive.

SEA Stage	Tasks		
Stage A: setting the context and objectives, establishing the baseline and	A1: Identifying other relevant plans, programmes and environmental protection objectives		
deciding on the Scope	A2: Collecting baseline information		
	A3: Identifying environmental problems		
	A4: Developing SEA objectives		
	A5: Consulting on the Scope of the SEA		
Stage B: Develop options, taking account of assessed effects	B1: Testing the LFRMS objectives or policies against the SEA objectives		
	B2: Developing strategic alternatives		
	B3: Predicting the effects of the LFRMS		
	B4: Evaluating the effects of the LFRMS		
	B5: Mitigating adverse effects		
	B6: Proposing measures to monitor the environmental effects of implementing the LFRMS		
Stage C: Preparing the SEA Report	C1: Preparing the Environmental Report		
Stage D: Consulting on the Project and the SEA Report	D1: Consulting the public and Consultation Bodies on the LFRMS and Environmental Report		
	D2: Assessing significant changes		
	D3: Making decisions and providing information		
Stage E: Monitoring the significant	E1: Developing aims and methods for monitoring		

Table 2.1 – Stages in the SEA Process

 $^{^1}$ A Practical Guide to the Strategic Environmental Assessment Directive. Practical guidance on applying European Directive 2001/42/EC "on the assessment of the effects of certain plans and programmes on the environment. Office of the Deputy Prime Minister. September 2005.

Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope

- 2.3 An SEA Scoping Report was prepared and consulted upon with the three statutory consultees (Natural England, The Environment Agency and English Heritage) between June and July 2013. The SEA Scoping exercise involved the following main tasks:
 - Baseline assessment to understand the economic, social and environmental character of Manchester City and to identify any specific environmental problems or sustainability issues of relevance to the LFRMS;
 - Identification and review of other relevant policies, plans, programmes, strategies and initiatives which may influence the LFRMS;
 - Development of a framework of SEA objectives against which the LFRMS policies would be appraised.
- 2.4 A list of the comments received from the consultees along with a description of how each one was addressed is provided in Appendix A. The revised and updated baseline information and review of plans, policies and programmes are presented in Chapter 3 and in Appendices B and C. The updated key environmental and sustainability issues are presented in Chapter 3.

Stage B: Develop options, taking account of assessed effects

2.5 We developed an early draft of the LFRMS for internal review within the Council during September 2013. The draft SEA objectives in the Scoping Report were used to appraise the policies in this LFRMS. An initial SEA matrix was produced (similar to Appendix D) in relation to the draft LFRMS policies and the findings and recommendations were taken into account by Manchester City Council as the Draft LFRMS for public consultation was produced. The SEA was then updated to reflect that version of the LFRMS. No reasonable alternatives to the measures included in the early draft LFRMS were identified during the SEA process.

Stage C: Preparing the SEA Report

2.6 This report is the output of Stage C.

Stage D: Consulting on the LFRMS and the SEA Report

- 2.7 The consultation on the Draft LFRMS will take place between November and December 2013, with the report being made available to the statutory environmental bodies as well as a range of other consultees and the wider public. The SEA Report is being published alongside the Draft LFRMS during the consultation.
- 2.8 Comments received during consultation will be taken into account as the LFRMS is finalised. The comments relating specifically to the SEA will also be taken into account and addressed where relevant as part of an updated version of the SEA to reflect the final version of the LFRMS.

Stage E: Monitoring the significant effects of implementing the LFRMS

2.9 Proposals for monitoring the significant effects of implementing the LFRMS are set out in Chapter 6 of this report.

Difficulties encountered and data limitations

- 2.10 During the SEA it was at times difficult to reach a judgement regarding the likely effect of a particular measure in the LFRMS on one or more of the SEA objectives, because of a lack of information regarding exactly how and where particular actions would be carried out. As such, there is uncertainty attached to a number of the potential effects (as described in Chapter 5).
- 2.11 It should be noted that while the baseline will be continually updated throughout the SEA process, the information outlined within this report represents a snapshot of the information available at the time of undertaking this round of assessments.

Chapter 3 – Reviews of plans policies and programmes and baseline information

Review of Plans, Policies and Programmes

- 3.1 The SEA Directive states that the Environmental Report should provide information on: "The plan's relationship with other relevant plans and programmes and "the environmental protection objectives, established at international, [European] Community or national level, which are relevant to the plan... and the way those objectives and any environmental considerations have been taken into account during its preparation" (Annex 1 (a), (e)).
- 3.2 A review of all relevant plans and programmes was undertaken. This review identified the relationships between the SEA and plans and programmes which, in turn, enabled potential synergies to be exploited and, conversely, conflicting initiatives to be identified. The international, national, regional and local policies, plans and programmes considered in the review are listed in Table 3.1 below.

Table 3.1 – Flatis, Folices and Flogrammes of relevance to the LERING	Table 3.1 – Plans,	Polices and	Programmes of	of relevance	to the LFRMS
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International Level
The Ramsar Convention on Wetlands of International Importance (1971)
European Commission (1979 (Amended in 1997)) - EC Council Directive 79/409/EEC, on the Conservation of Wild Birds
European Commission (1985 (Amended in 1997)) - EC Council Directive 85/337/EEC & 97/11/EC, on the Assessment of the Effects of certain Public and Private Projects on the Environment
United Nations (1992) - The Kyoto Protocol and UN Framework Convention on Climate Change
European Commission (1992) - EC Council Directive 92/43/EEC, on the Conservation of Natural Habitats and of Wild Fauna and Flora
European Commission (1998) - EU Biodiversity Strategy
European Commission (1998) - EC Council Directive 98/83/EC on the quality of water intended for human consumption
European Commission (1999) - EC Council Directive 1999/31/EC, on the landfill of waste
European Commission (2000) - EC Council Directive 2000/60/EC, establishing a framework for Community action in the field of water policy
European Commission (2006) - EC Council Directive 2006/118/EC on the protection of groundwater against pollution and deterioration
European Commission (2007) - EC Council Directive 2007/60/EC on the assessment and

management of flood risks

National Level

English Nature (2003) - Accessible Natural Greenspace Standards in Towns and Cities: a Review

and Toolkit for their Implementation

DCLG (2004) - The Environmental Assessment of Plans and Programmes Regulations (S.I. 2004 No. 1633)

Defra (2005) - Securing the Future - UK Government Sustainable Development Strategy

ODPM/Scottish Executive/Welsh Assembly Government/DoENI (2005) - A Practical Guide to the Strategic Environmental Assessment Directive

UK Parliament (2006 - Contaminated Land (England) Regulations

Defra (2007) - A Strategy for England's Trees, Woods and Forests

Department for Culture, Media and Sport/Welsh Assembly Government (2007) - Heritage protection for the 21st Century – White Paper

DTI (2007) - Meeting the Energy Challenge: A White Paper on Energy

Defra (2007) - Guidance for Local Authorities on Implementing the Biodiversity Duty

Pitt Review (2008) - Learning lessons from the 2007 floods

UK Parliament (2008) - Climate Change Act 2008

UK Parliament (2009) - The Flood Risk Regulations 2009

Defra (2009) - Safeguarding our Soils – A Strategy for England

Environment Agency (2009) - Water for People and the Environment; Water Resources Strategy for England and Wales

DCLG (2009) - Development and Flood Risk PPS25 Practice Guide

UK Parliament (2010) - The Flood and Water Management Act 2010

HM Government (2010) - Healthy Lives, Healthy People: Our strategy for public health in England (White Paper)

HM Government (2010) - Local growth: realising every place's potential (Local Growth White Paper)

Defra (2010) - The Conservation of Habitats and Species Regulations 2010

DCLG (2011) - PPS10: Planning for Sustainable Waste Management

Environment (2011) - The National Flood and Coastal Erosion Risk Management Strategy for England

Defra (2011) - Biodiversity 2020 - A strategy for England s wildlife and ecosystem services

HM Government (2011) - The Natural Choice (Natural Environment White Paper)

HM Treasury (2011) - National Infrastructure Plan 2011

Defra (2011) - Guidance for risk management authorities on sustainable development in relation to their flood and coastal erosion risk management functions

Defra (2011) - Government Review of Waste Policy in England 2011

Environment Agency (2011) - SEA and Climate Change: Guide for Practitioners.

DCLG (2012) - National Planning Policy Framework

DCLG (2012) - Technical Guidance to the National Planning Policy Framework

Regional and Sub-regional

Red Rose Forest (1994) - Red Rose Forest Plan

Association of Greater Manchester Authorities (AGMA) (2002) - Greater Manchester Derelict Land Strategy

AGMA (2006) - Manchester City Region Spatial Strategy

GONW (2008) - North West of England Plan - Regional Spatial Strategy to 2021

AGMA (2008) - Towards a Green Infrastructure Framework for GM

Manchester City Council / Salford City Council / Trafford Council (2008) - Irwell City Park Planning Guidance

AGMA (2008) - Strategic Flood Risk Assessment (SFRA) for Greater Manchester

AGMA (2009) - Prosperity for all: The Greater Manchester Strategy

United Utilities (2009) - Business Plan 2010-2015: Planning for the Future

Environment Agency (2009) - Irwell Catchment Flood Management Plan (Summary Report)

Environment Agency (2009) - Mersey Estuary Catchment Flood Management Plan (Summary Report)

Environment Agency (2009) - Upper Mersey Catchment Flood Management Plan (Summary Report)

Environment Agency (2009) - Water for life and livelihoods: River Basin Management Plan - North West River Basin District

Greater Manchester Biodiversity Project (2009) - Greater Manchester Biodiversity Action Plan

NWRA (2010) - Atlantic Gateway – Accelerating Growth Across the Manchester and Liverpool City Regions – Framework for a Global Growth Opportunity

Transport for Greater Manchester and Greater Manchester Combined Authority (2011) - Greater Manchester's third Local Transport Plan 2011/12 – 2015/16

Manchester City Council / Salford City Council / Trafford Council (2011) - Manchester, Salford, Trafford Hybrid Strategic Flood Risk Assessment (SFRA)

AGMA (2012) - Greater Manchester Joint Waste DPD

AGMA (2013) - Greater Manchester Joint Minerals DPD

Local Level

Manchester City Council (1995) - Unitary Development Plan (UDP) - Extant Policies July 2012

Manchester City Council (2005 (Action Plan refreshed 2012)) - Wildabout Manchester - the

Manchester Biodiversity Strategy + Action Plan

Manchester City Council (2006) - The Manchester Way: Sustainable Community Strategy 2006-2015

Manchester City Council (2009) - Manchester: A Certain Future (MACF)

Manchester City Council (2009) - Open Space, Sport and Recreation Study

Manchester City Council (2011) - Preliminary Flood Risk Assessment

Manchester City Council (2012) - Core Strategy DPD

Manchester City Council (In Draft, January 2013) - Manchester Green and Blue Strategy

Summary of Review of Plans, Policies and Programmes

- 3.3 Many of the policies, programmes, plans and strategies and initiatives that have been reviewed are indirectly relevant to the LFRMS, for example those that relate to the protection of natural assets including biodiversity and soils. Those that are most directly relevant are summarised below (the full review can be found in Appendix 2):
 - Flood and Water Management Act (2010) This Act sets out the statutory requirement for Lead Local Flood Authorities (LLFAs) to produce a strategy for managing local flood risk. It therefore provides the legal basis for the production of the Manchester LFRMS.
 - National Flood and Coastal Erosion Risk Management Strategy (2011) The Flood and Water Management Act requires all LFRMSs to be in conformity with this Strategy, which encourages more effective risk management by enabling people, communities, business, infrastructure operators and the public sector to work together to achieve better understanding of the risks of flooding both nationally and locally, so that investment in risk management can be prioritised more effectively. As such, the Manchester LFRMS must have regard to the contents of the Strategy.
 - **Flood Risk Regulations** (2009) The Flood Risk Regulations transpose the European Flood Directive into domestic law, and have distinct requirements for those areas that are identified as being at 'significant' flood risk, including much of the City of Manchester.
 - The National Planning Policy Framework and Technical Guidance (2012) The NPPF has replaced the suite of planning policy statements and planning policy guidance, including PPS25 which previously presented national policy in relation to Development and Flood Risk. The NPPF, and its associated Technical Guidance sets out the considerations that local planning authorities need to take account of in order to avoid new development increasing flood risk.
 - Manchester Salford Trafford Hybrid Strategic Flood Risk Assessment (2011) – This document established the extent of flood risk in Manchester from a number of sources, including main rivers, canal breach and overtopping, groundwater, surface water and ordinary water courses, using the best information available at the time; it defines the geographical extent of the

various flood risk zones. It is therefore an important part of the evidence base for the production of the LFRMS.

- Greater Manchester Surface Water Management Plan (2012) This document provides important evidence relating to flood risk from surface water in Manchester, identifying the areas at highest risk. It is therefore an important part of the evidence base for the production of the LFRMS and the management of flood risk in the City.
- **EU Water Framework Directive** (2000) The Directive came into UK law in 2003 and aims to protect and enhance water quality. It requires River Basin Management Plans to be drawn up in order to improve the water environment.
- North West River Basin District Management Plan (2009) This document sets out the challenges facing the Irwell and Mersey River Basins and sets out actions to address them. It has been prepared under the Water Framework Directive and provides important evidence for the LFRMS.
- Upper Mersey Catchment Flood Management Plan (2009) This document give an overview of the flood risk across the Upper River Mersey catchment and recommends ways of managing those risks now and over the next 50-100 years.
- **River Irwell Catchment Flood Management Plan** (2009) This document give an overview of the flood risk across the River Irwell catchment and recommends ways of managing those risks now and over the next 50-100 years.

Baseline Information

- 3.4 Manchester City Council maintains a significant database of information about the principal physical, economic, social and environmental characteristics of the City. The Council places a high priority on the continued collection and management of data which allows the accurate description of environmental, social and economic issues in the city.
- 3.5 The baseline data for the SEA includes information from a range of sources which is both quantitative and qualitative. The information provides the basis for assessing the potential impact of the LFRMS policies and will aid development of appropriate mitigation measures, together with future monitoring data.

Human Health

- 3.6 Life expectancy in Manchester is below the national average. One factor in improving this may be adult participation in regular exercise by ensuring public access to land used for physical recreation and to other goods and services that make a difference to quality of life
- 3.7 Flooding, particularly involving sewers, can have profound impacts on physical health, and in severe cases may cause a risk to lives.
- 3.8 These issues, together with the adverse implications for properties, and particularly if they are common, can contribute to the perceived flood risk and can impact on stress levels and mental health.

Biodiversity (including Flora and Fauna)

Manchester has 38 Green Flag parks covering 596 ha, almost half (47.7%) of publicly available green leisure space (not including river valleys) in the City

- 3.9 There are currently eight Local Nature Reserves covering 392 hectares, and 36 Sites of Biological Importance (SBIs) covering 304 hectares, including areas of ancient woodland, two Sites of Special Scientific Interest (SSSIs), and the Rochdale Canal SSSI is also a Special Area of Conservation (SAC) close to the Manchester border.
- 3.10 Manchester has a diversity of habitats that can support a wide range of flora and fauna. Many semi-natural habitats still remain throughout Manchester, such as semi-natural ancient broadleaved woodland in areas such as Boggart Hole Clough and Cotterill Clough. The main priority habitats in Manchester are:
 - Acid grassland e.g. Bailey's Wood, Blackley Forest;
 - Ancient and/or species-rich hedgerows e.g. Stenner Lane near Fletcher Moss, Sunbank Lane;
 - Wet woodlands e.g. Nan Nook Wood, Stenner Woods, Blackley Forest;
 - Lowland broadleaved woodland e.g. Baileys Wood, Rosehill Wood, Heaton Park, Cotterill Clough;
 - Lowland heathland e.g. Moston Fairway, Boggart Hole Clough, Blackley Forest;
 - Lowland meadows e.g. Chorlton Ees;
 - Unimproved neutral grassland e.g. Chorlton Water Park, Castle Hill Farm nr Manchester Airport;
 - Marshy grassland e.g. Broadhurst Clough, Moston Fairway;
 - Managed greenspace all Manchester parks;
 - Reedbed e.g. Chorlton Ees, Harpurhey Reservoirs, Clayton Vale;
 - Rivers e.g. River Mersey, River Medlock, River Irk;
 - Canals e.g. Rochdale Canal, Ashton Canal, Bridgewater Canal; and
 - Ponds & lodges e.g. near to the Manchester Airport runway and adjacent to Cotterill Clough.
- 3.11 Priority (legally protected) species which occur in Manchester and the level of protection conferred against them are as follows:
 - Great crested newt European protected species;
 - Water vole UK Protected species;
 - Brown hare Hares Protection Act (1911);
 - Pipistrelle bat –European protected species;
 - Skylark, linnet, reed bunting, spotted fly-catcher, tree sparrow, grey partridge, bullfinch, song thrush general protection under Wildlife and Countryside Act 1981 (as amended);
 - Floating water plantain European protected species;
 - Grass-wrack pondweed currently not protected by any legislation; and Manchester Poplar.

- 3.12 Manchester contains several hundred hectares of Grade 3 agricultural land, some of which is likely to be Grade 3a, which is also classified as best and most versatile agricultural land. However, most of Manchester's best Grade 3 agricultural land is contained within the Manchester Airport site and is not therefore available for agricultural purposes.
- 3.13 Construction, land use change, changes to flood risk and more general changes to the water environment could negatively impact on some aspects of biodiversity, but there could also be opportunities for habitat creation or improvement.

Water & Soils

- 3.14 There have been major improvements in water quality in Greater Manchester in recent decades, with fish returning to rivers which were previously too polluted. However, much more progress needs to be made in order to meet the Water Framework Directive (WFD) target that all watercourses must meet good ecological status or potential by 2027 (if not possible by 2015). Latest figures indicate that Manchester has 21% of watercourses in the Good category. The Bridgewater Canal, the Ashton Canal and the Rochdale Canal do all meet the relevant standards.
- 3.15 The City Region has had a long history of intense industrial activity, and faces a considerable challenge in dealing with its legacy of contaminated land. Manchester has had an industrial use on some 26.5% (3,066 hectares) of its land at some time in the past, with these uses being concentrated in the East Manchester wards of Bradford, Ancoats & Clayton and Miles Platting & Newton Heath. So far, over 6500 potentially contaminated sites have been identified in the City, based on an informed estimate of the potential for contamination to be present at a site and the possibility that it may pose a risk to health or the environment. The next stage has begun, to carry out detailed inspections of the 6500 sites, in order of priority, to identify whether contamination is actually present.
- 3.16 Development could lead to cumulative effects on water quality (e.g. through an increased area of impermeable surfaces, accelerated rates of polluted run-off including sewer surcharges, and disturbance of contaminated land / groundwater) if not managed properly. Care needs to be taken either to avoid the disturbance of contaminated land and soils which may lead to increased pollution of runoff or the contamination of groundwater, or to secure the remediation of contaminated land, thus improving soil and water quality through the reduction in polluted run-off.
- 3.17 Flood mitigation measures will in many cases also have an impact on water quality, particularly as the morphology of watercourses is one of the features assessed when determining the ecological status or potential of a watercourse.
- 3.18 The Environment Agency has classed the North West as an area of relatively low water stress. Although infrastructure improvements may be necessary to continue to meet water supply needs, this is much less of an issue than in other, drier parts of the country.

Flood Risk

- 3.19 Flood risk in Manchester arises from a number of different sources and is catalogued in a number of different documents. Details of properties at predicted risk of flooding, including those within the 10% most deprived areas according to the IMD, are contained in Appendix 1.
- 3.20 The Manchester Salford Trafford Hybrid Strategic Flood Risk Assessment (SFRA) identified that in the Regional Centre and Inner Areas, the primary risk is from the Irwell, Irk, Medlock and Corn Brook; with the Bridgewater, Rochdale and Ashton

Canals, surface water and culverted watercourses also posing a risk. There is a significant residual risk of flooding from defences overtopping or breaching on the Lower Irwell at Lower Broughton (originating in Salford) and in extreme flood events from the Grey Irwell. The interaction between different sources of risk is complex, especially between the River Medlock and the Bridgewater Canal. In the vicinity of the Airport, the risk of flooding is not as high as in the Regional Centre and Inner Areas, but there is some risk posed by the River Bollin, Timperley Brook and Fairywell Brook.

- 3.21 The SFRA also identified that some areas of Manchester are also potentially vulnerable to groundwater flooding (although there are few recorded instances of this), or to flooding from canals. Evidence on these types of flooding is less well developed than for fluvial and surface water flooding. The strategic surface water flood map contained in the Greater Manchester Surface Water Management Plan (GM SWMP) includes an allowance for drainage via the sewer system. This was produced in close collaboration with United Utilities and whilst this is not a sophisticated assessment of sewer capacity, and is not based on any empirical data, it does represent an improvement on previous modelling.
- 3.22 Multi-authority or sub-regional documents like the Manchester, Salford, Trafford (MST) Hybrid SFRA and the GM SWMP are useful but they are point-in-time documents. The Environment Agency produces and updates various national data sets which provide nationally comparable information. These include the (soon to be) updated Flood Map for Surface Water (which uses information from the GM SWMP), the main river (and some non-main river) fluvial maps, and ground water maps. Third parties, such as United Utilities, Peel Holdings and the Canal and River Trust also have their own strategies and datasets.
- 3.23 It is important to emphasise at this stage that modelling will not provide certainty that floods will occur or what their extent / depth / velocity would be. Modelled outputs are only as good as the datasets / methodology that are used in the process, and models which include significant assumptions (such as drainage rates for surface water runoff) should be treated with some caution. However, even with this qualification, modelling remains a very useful tool for assessing flood risk.

Air Quality

3.24 The SEA of the National Flood and Coastal Erosion Risk Management Strategy concluded that significant impacts on air quality as a result of the strategy were unlikely to occur and therefore it was scoped out of the assessment. Similarly, it is concluded that significant impacts on air quality as a result of the LFRMS are also unlikely to occur and therefore Air Quality is scoped out of this SEA.

Climatic Factors

- 3.25 Manchester has overall per capita greenhouse gas emissions below the national average.
- 3.26 Research funded by the Joseph Rowntree Foundation has shown that large parts of Manchester are more vulnerable than the national average to both flood risk and risk associated with heat waves, both of which are predicted to get worse as a result of climate change. This assessment is based on the communities' vulnerability (for example age and income profiles), the hazard (likelihood of a flood or heat wave occurring) and the exposure (e.g. type of dwelling).
- 3.27 Flood risk management will make a significant contribution to how well adapted communities are to the increased risk of flooding as a result of climate change, and

different approaches may make a positive or negative impact on vulnerability to heat stress, depending on the materials and approaches used.

Population, Housing and Employment

- 3.28 Manchester has experienced significant population growth between 2001 and 2011. Manchester grew particularly rapidly, with a 19% population increase, and is planning for a further population increase to contribute to the economic growth of the City. There are high rates of migration both into and out of Manchester, with international migration playing a significant role. In the 2011 census, Manchester was the most densely populated local authority in the North West, with 4350 people per square kilometre.
- 3.29 Manchester has seen significant housing growth over the last 8 years. Manchester has a lower proportion of detached 'household spaces' and a greater proportion of terraced housing and flats than the national average. In 2001, the main housing type in Manchester was terraces, however between 2001 and 2011, Manchester saw a significant increase in the proportion of apartments in the dwelling stock, with flats now the most common housing type. All 3 Authorities are seeking an appropriate increase in dwellings to support the sustainable growth of the City Region. All housing, existing and new, needs to have a suitable level of resilience in order to reduce the risk of flooding both the probability and the consequences.
- 3.30 Deprivation is a serious issue in Manchester which was ranked 4th in the national Index of Multiple Deprivation in 2010. This is a reflection, in part at least, of the City's industrial past and the consequences of the subsequent decline of that industry.
- 3.31 An adequate supply of good-quality, safe housing, which needs to be free from or resilient to flood risk, is needed to support sustainable growth and to reduce social and economic exclusion and stress.
- 3.32 Failure to protect employment and service concentrations, transport routes, and other infrastructure and assets from flooding could reduce the attractiveness of the area to existing and new businesses and residents.

Infrastructure and Material Assets

- 3.33 Manchester has very effective transport links both nationally and internationally with Manchester Airport being the primary international gateway for the North of England. The airport is the largest in England outside the south east. Manchester is the centre of an extensive heavy rail network as well as Metrolink, a very successful light rail system. It is located within the M60 motorway ring linking to the M602, M61, M62, M56, M56 (airport spur) and onto the M6. The strategic highway network links to the Trans Europe Network and European markets. There are also a number of important canals, including the Manchester Ship Canal which links to the Mersey Estuary and broad canals such as the Bridgewater Canal, Ashton Canal and Rochdale Canal which link to the wider canal network.
- 3.34 Links into the City Centre from surrounding areas are good with Metrolink serving communities to the North, North East, East, South and West, a comprehensive train and bus network and a free Metroshuttle service operates in the City Centre. The proportion of trips made to the City Centre by means other than the private car has increased over recent years, overcrowding on public transport at peak times has become an issue.
- 3.35 Transport is an essential part of the infrastructure underpinning population and economic stability and growth across Manchester. Transport links are a key issue to address worklessness, by providing greater connectivity to further and higher

education and training, therefore enabling residents to access the new jobs being created.

- 3.36 Manchester contains a complex network of utility infrastructure gas distribution and storage facilities, electricity generation and distribution networks and water supply and wastewater treatment / removal infrastructure. Sewer pipes and highway drains have often become combined with culverted non-main rivers over time and the precise role and function of such watercourses may not always be readily understood.
- 3.37 Manchester contains areas related to actual or potential mineral extraction and associated transport facilities, which need to be safeguarded from built development. Sand and gravel deposits are found across Manchester, although the existing built development and other constraints mean that the opportunities for mineral extraction are limited. Any flood defence works within these areas may need to consider prior extraction of minerals.
- 3.38 Manchester contains waste management facilities which need to be safeguarded, and protected from potential flood risk and the resulting potential for polluted runoff. Any future facilities would need to be developed within this context too.

Cultural Heritage

- 3.39 There are approximately 900 listed buildings and there are 34 Conservation Areas in Manchester. Grade I and II* listed buildings represent only 3.5% of the total listed building stock. The number of Grade I and Grade II* listed "Buildings at Risk" in Manchester has fallen slightly over the last few years and there are currently 7 "at risk of decay". There has been a steady reduction since 2001 in the number of Grade I and Grade II* listed buildings at Risk" register. There are currently no registered historic parks and gardens at risk of decay.
- 3.40 Manchester also has non-designated heritage assets such as buildings of local interest, archaeological sites and monuments, and historic landscapes, all of which are identified in the Historic Environment Record held by the Greater Manchester Archaeological Advisory Service. It is worth noting that in the context of Greater Manchester, industrial heritage forms an important part of cultural heritage. These heritage assets, whether designated or not, require protection from (further) harm, including from flooding. Certain types of heritage (for example weirs, wharves, canalside warehouses, etc) are located in and adjacent to watercourses due to their historical purpose and are therefore particularly likely to be at risk of flooding.

Landscape

- 3.41 Manchester covers a number of National Character Areas, including Manchester Conurbation, Mersey Valley and Shropshire, Cheshire & Staffordshire Plain. There are no designated landscapes within the authority.
- 3.42 Manchester has significant areas of green infrastructure, consisting of networks of multi-functional open spaces, linear corridors, and the links between them. Among the functions performed by green infrastructure are climate change mitigation and flood risk reduction, by for example reducing the urban heat island effect and providing areas of natural drainage.

Key Environmental and Sustainability Issues

3.43 Reviewing the relevant plans, policies and programmes and considering the baseline character of the area highlights a number of environmental and

sustainability issues facing Manchester. These are relevant to producing the LFRMS and have been considered throughout the SEA process, in particular helping to inform the SEA objectives developed at the Scoping stage

- 3.44 Annex 1 of the SEA Directive requires that information is provided in "the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan."
- 3.45 In order to meet this requirement, Table 3.2 summarises the key issues and sets out how they are likely to develop over time in the absence of the LFRMS.

Key Environmental and Sustainability Issues	Likely Evolution without the LFRMS
Human Health - Life expectancy is increasing, but still lags well behind the rest of the country. Overall, the health of residents in Manchester is significantly lower than the national average for England based on a number of health profile indicators.	In the absence of the flood risk management achieved through implementation of the LFRMS, other flood management plans and policies such as the Catchment Flood Management Plans and policies to manage flood risk in the Manchester Core Strategy would still apply and should have some benefit in terms of protecting local people's health and wellbeing from the potential adverse impacts of flooding. However, these are likely to have less direct and significant effects on the protection of human health through the management of local flood risk than implementation of the LFRMS would.
<i>Biodiversity (including Flora and Fauna)</i> - High value of the City's natural environment, with various conservation designations which must be protected and enhanced where possible.	In the absence of the flood risk management achieved through implementation of the LFRMS, other flood management plans and policies such as the Catchment Flood Management Plans and policies to manage flood risk in the Manchester Core Strategy would still apply and should have some benefit in terms of protecting the natural environment from the potential adverse impacts of flooding. However, these are likely to have less direct and significant effects on the protection of the natural environment through the management of local flood risk than implementation of the LFRMS would.
<i>Water</i> - The need to adhere to the Water Framework Directive (WFD) in terms of protecting the quality and quantity of all water bodies.	The requirement to adhere to the WFD would apply even without implementation of the LFRMS, and would be met through other plans and strategies, but the LFRMS has an important role to play in terms of ensuring that measures proposed to manage flood risk in Manchester do not adversely affect water quality. Therefore, impacts on water quality due to flood events may be increased without implementation of the LFRMS.
<i>Soil</i> - Manchester has had a long history of intense industrial activity and this has had an enormous impact on the condition of much of the land. In common with all other major cities in the UK, Manchester has a large proportion of land which has been redeveloped at least once, and on which some contamination may therefore be present.	This issue is likely to continue as at present, as the LFRMS does not intend to address contaminated land issues. Rather the LFRMS should consider the issue of contaminated land in relation to sites where currently flooding could lead to the release of pollutants into watercourses or groundwater, and sites where development or actions identified by the LFRMS could cause or exacerbate such a situation. The LFRMS would also consider how development and flood risk management interact, helping to shape future plans and strategies and their application. Therefore, impacts of

	interaction of contaminated soils with flood water may be increased without implementation of the LFRMS.
<i>Flood Risk</i> - Flood risk in Manchester arises from a range of sources: rivers (including culverted rivers and streams); canals; surface water, (including interactions with sewers and highway drains); groundwater and ponds, lakes and reservoirs. The cumulative effects of different sources of flooding and their interactions makes flood risk a complex issue in the City.	In the absence of the flood risk management achieved through implementation of the LFRMS, other flood management plans and policies such as the Catchment Flood Management Plans and policies to manage flood risk in the Manchester Core Strategy would still apply and should have some benefit in terms of protecting local people's health and wellbeing from the potential adverse impacts of flooding. However, these are likely to have less direct and significant effects on the protection of human health through the management of local flood risk than implementation of the LFRMS would.
<i>Climatic Factors</i> - Likely future increase in flood risk as a result of ongoing climate change.	This issue is likely to continue as at present, as the LFRMS does not intend to address the causes of climate change. Rather the LFRMS should help to ensure that the City is well-equipped to adapt to the increasing flood risk. Therefore without implementation of the LFRMS, the implications of climate change in terms of increased flood risk may be more negative.
Population, Housing and Employment - Population growth and the resulting pressure for new housing and associated development.	This issue is likely to continue as at present, as the LFRMS does not intend to address population growth and demand for development. Rather the LFRMS should help to ensure an adequate supply of good-quality, safe housing, which is free from or resilient to flood risk in order to support sustainable growth and to reduce social and economic exclusion and stress. Also the LFRMS should help to ensure that the City is well-equipped to accommodate any new development without increasing local flood risk. Therefore without implementation of the LFRMS, the implications of development pressure in terms of increased flood risk may be more negative.
Infrastructure and Material Assets - Flooding can have a serious impact on infrastructure and material assets. Failure to protect employment and service concentrations, transport routes, and other infrastructure and assets from flooding could reduce the attractiveness of the area to existing and new businesses and residents.	In the absence of the flood risk management achieved through implementation of the LFRMS, other flood management plans and policies such as the Catchment Flood Management Plans and policies to manage flood risk in the Manchester Core Strategy would still apply and should have some benefit in terms of protecting infrastructure and material assets from the potential adverse impacts of flooding. However, these are likely to have less direct and significant effects on the protection of infrastructure and material assets through the management of local flood risk than implementation of the LFRMS would.
<i>Cultural Heritage</i> - There are approximately 900 listed buildings and 34 Conservation Areas in Manchester. The number of Grade I and Grade II* listed buildings at risk in Manchester has fallen slightly over the last few years and there are currently no registered historic parks and gardens at risk of decay. Built heritage in Manchester is generally	In the absence of the flood risk management achieved through implementation of the LFRMS, other flood management plans and policies such as the Catchment Flood Management Plans and policies to manage flood risk in the Manchester Core Strategy would still apply and should have some benefit in terms of protecting heritage assets from the potential adverse impacts of flooding. However, these are likely to have less direct and significant effects on the protection of heritage assets through the management of local flood risk than

conferred a high level of protection and Manchester City Council has recently designated a number of new Conservation Areas. It is important that this high level of protection remains or is further enhanced.	implementation of the LFRMS would.
<i>Landscape</i> - Actions from the LFRMS may affect the use of land and changes in flood risk and water levels, thus having an impact on landscape. Such changes may of course present opportunities to create new landscape features and enhance the landscape.	In the absence of the LFRMS, any measures which may affect the local landscape, for example by leading to the construction of flood defences or changing land use, would not apply.

Chapter 4 SEA Framework

- 4.1 The SEA Framework is a key component in completing the SEA through synthesising the baseline information and sustainability issues into a systematic and easily understood tool that allows the assessment of effects arising from the implementation of the LFRMS. Although the SEA Directive does not specifically require the use of objectives or indicators in the SEA process, they are a recognised and useful way in which social, environmental and economic effects can be evaluated and compared at key stages of the Strategy's development, and are recommended in the Government's SEA Guidance.
- 4.2 The SEA Framework comprises a list of objectives. Progress toward achieving these objectives will be measured using the corresponding indicators. The purpose of the SEA Framework is to provide a set of criteria against which the performance of the LFRMS can be predicted and evaluated.
- 4.3 The SEA Framework has been developed using an iterative process, based on the review of relevant plans and programmes, the evolving baseline, analysis of key sustainability issues and consideration of which of these issues can potentially be addressed by the LFRMS.
- 4.4 Twelve SEA objectives have been defined as set out in Table 4.1.

Table 4.1 – The Draft SEA Objectives for the Manchester/Salford/Trafford Local Flood Risk Management Strategies

1. Minimise the probability and consequences of flooding

2. Minimise the probability and consequences of climate change

3. Maintain and where possible enhance the quality of water resources, water bodies and their environment

4. Maintain and where possible enhance biodiversity, geodiversity and soils

5. Protect and where possible enhance the landscape and green infrastructure

- 6. Protect and where possible enhance townscapes and cultural heritage
- 7. Ensure the efficient use of land
- 8. Protect and enhance the health and well-being of the population
- 9. Support the sustainable growth of the City Region
- 10. Minimise economic and social exclusion for all

11. Protect existing and future economic and social infrastructure and assets, services and amenities and encourage economic investment and growth

12. Maintain and where possible enhance the transport network for all users

- 4.5 Schedule 2 of the SEA Regulations provides a list of specific environmental topics to be addressed. In drawing up the SEA objectives, care was taken to ensure that the SEA Directive's environmental objectives were also covered.
- 4.6 Table 4.2 sets out these SEA environmental topics and the relevant SEA objectives from the Manchester LFRMS SEA Framework that address them. This helps to demonstrate that each SEA environmental issue has been addressed in the assessment of the LFRMS. Note that one of the SEA topics, 'air', was scoped out of the assessment due to the fact that the type of measures to be included in the LFRMS are not considered likely to have an impact on air quality, as they relate to flood risk management and will not result in emissions to air that could affect air quality.

SEA Topic	SEA Objective
Biodiversity, fauna and flora	3, 4, 5, 7
Population and Human Health	1, 8, 9, 10
Water and Soils	1, 3, 4
Air	Scoped out of the SEA
Climatic Factors	2
Cultural Heritage and Landscape	6
Infrastructure and Material Assets	9, 11, 12

Table 4.2 – SEA Environmental Topics and coverage by the SEA Objectives

Compatibility Assessment of LFRMS Policy against SEA objectives

4.7 A compatibility matrix was developed to identify to what extent the objectives of the LFRMS are compatible with the SEA objectives as set out in the SEA Scoping Report. When testing compatibility the following scale was used:

\checkmark	Broadly Compatible	?	Requires Further Clarification
Х	Potential Conflict		Not Relevant

Assessment of LFRMS Policy

- 4.8 An assessment of the policies of the LFRMS has been conducted using a broadbrush and qualitative approach, which is generally accepted as good practice by the SEA guidance for a strategic level plan and policy setting.
- 4.9 Potential sustainability effects for each of the LFRMS policies were assessed in terms of progress towards achieving the relevant SEA objective.
- 4.10 A detailed assessment of each of LFRMS policy components was conducted using a separate assessment sheet. The results of the policy assessments were then brought together in a single sheet summarising the assessment across all policies.

4.11 The Magnitude of effects was defined in terms of progress towards achieving the relevant SEA objective and used the following scoring system:

++	Significant Positive Impact	+	Positive Impact	0	Neutral (No) Impact
	Significant Negative Impact	-	Negative Impact	?	Unknown Impact

- 4.12 A Significant Positive impact suggests that the LFRMS Policy is likely to result in substantial progress towards the SEA objective, whilst a Significant Negative impact suggests that the LFRMS policy is likely to be detrimental to achieving the SEA objective. A Positive or Negative impact that is not deemed significant is where the impact is likely to be indirect rather than a direct result of the policy. A neutral impact is one where the LFRMS policy is likely to result in no change or any contribution to achieving or not achieving the SEA objective. An unknown impact is where it is uncertain how the policy relates to the SEA objective.
- 4.13 Effects of the LFRMS policies were also characterised in terms of their duration (short, medium or long term) and whether they are likely to be temporary or permanent. Predictions were made using the evidence of the baseline data wherever possible. Short term, medium and long term effects were defined as those predicted to commence within the first five, five to ten and ten or more years of implementation of the LFRMS, respectively The scoring scales used to characterise the various features of the predicted effects are as follows:

I	Duration	Permanence				
ST	Short Term	Т	Temporary			
MT	Medium Term	Ρ	Permanent			
LT	Long Term					

Secondary and Cumulative Effects Assessments

- 4.14 Annex I of the SEA Directive requires that the assessment of effects include secondary, cumulative and synergistic effects.
 - Secondary or indirect effects are effects that are not a direct result of the plan, but occur away from the original effect or as a result of the complex pathway e.g. flood defence works changes a water table and thus affects the ecology of a nearby wetland. These effects are not cumulative and have been identified and assessed primarily through the examination of the relationship between various objectives during the assessment of environmental effects.
 - Cumulative effects arise where several proposals individually may or may not have a significant effect, but in-combination have a significant effect. Cumulative effects can be:
 - Additive- the simple sum of all the effects;
 - Neutralising- where effects counteract each other to reduce the overall effect;
 - Synergistic- is the effect of two or more effects acting together which is greater than the simple sum of the effects when acting alone. For instance, a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

- 4.15 Many environmental problems result from cumulative effects. Cumulative effects assessment is a systematic procedure for identifying and evaluating the significance of effects from multiple activities. The analysis of the causes, pathways and consequences of these effects is an essential part of the process.
- 4.16 Cumulative (including additive, neutralising and synergistic) effects have been considered throughout the entire SEA process, as described below:
 - As part of the review of relevant strategies, plans and programmes and the derivation of draft SEA objectives, key receptors have been identified which may be subject to cumulative effects.
 - In the process of collecting baseline information cumulative effects have been considered by identifying key receptors (e.g. specific wildlife habitats) and information on how these have changed with time, and how they are likely to change without the implementation of the LFRMS.
 - Testing the consistency between the LFRMS Policies and SEA objectives has highlighted the potential for cumulative effects against specific LFRMS objectives.

Chapter 5 – SEA Findings

- 5.1 In order to ascertain the overall sustainability of the approach proposed for the Local Flood Risk Management Strategy, the draft Policies, initially identified were tested against the SEA Objectives to gauge their compatibility. Table 5.1 shows the results of the broad compatibility assessment of the LFRMS policies with the SEA Objectives. The table shows that all of the LFRMS policies are directly compatible with the SEA objectives with no conflicts identified.
- 5.2 SEA matrices have been prepared, which present the detailed assessment of each of the objectives (and associated measures) in the final LFRMS (February 2013) against each of the twelve SEA objectives. The SEA matrices can be found in Appendix 4. Table 5.2 below presents a summary of the potential environmental effects of the LFRMS objectives for each of the SEA objectives.
- 5.3 In general, the LFRMS objectives have been found to have mostly positive effects on the environment, due to the LFRMS being a proactive strategy to reduce and manage flooding within Manchester. While potentially significant positive effects have been identified in relation to SEA objectives 1, 2, 8, 11 and 12, no significant negative or negative effects from the measures in the LFRMS have been identified in relation to any of the SEA objectives. Some LFRMS objectives are unlikely to have any effects on the environment as they relate more to improving knowledge and understanding of flood risk rather than actual works or actions that could have an effect on the ground.
- 5.4 Therefore, when taken as a whole, the synergistic and cumulative effects of all the LFRMS objectives and measures combined are considered to be overall positive for the environment, due to the likely outcomes of implementing the LFRMS being a reduction in flooding and associated risk to the natural and built environment within Manchester.

LFRMS Policy		SEA Objectives										
	1	2	3	4	5	6	7	8	9	10	11	12
1. Improve and maintain flood risk evidence base		\checkmark	$\overline{\checkmark}$	$\overline{\checkmark}$		$\overline{\checkmark}$	$\overline{\checkmark}$			$\overline{\checkmark}$	$\overline{\checkmark}$	$\overline{\checkmark}$
2. Local Flood Risk Management interventions seeking to reduce the likelihood, severity and consequences of flooding from ordinary watercourses, ground water and surface water runoff.	\checkmark	✓	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
3. Local Flood Risk Management Authorities and other key stakeholders working together to progress priority interventions that support the aim and objectives of the LFRMS		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
4. Monitor and maintain drainage infrastructure within Manchester.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
5. Promote awareness of local flood risk and ways that the risk can be managed by people and communities.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
6. Ensure that local flood risk is properly considered for new development proposals.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
7. Ensure that the LLFA responds to appropriate consultation exercises on matters affecting Local Flood Risk Management.		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
8. Ensure that the LLFA investigates and reports on flood incidents appropriately.		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
9. Aim to contribute towards the achievement of sustainable development in undertaking flood risk management functions.		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

Table 5.1 - Compatibility of LFRMS Policy with SEA Objectives

Where SEA Objectives are:

1. Minimise the probability and consequences of flooding	7. Ensure the efficient use of land
2. Minimise the probability and consequences of climate change	8. Protect and enhance the health and well-being of the population
3. Maintain and where possible enhance the quality of water resources, water bodies and their environment	9. Support the sustainable growth of the City Region
4. Maintain and where possible enhance biodiversity, geodiversity and soils	10. Minimise economic and social exclusion for all
5. Protect and where possible enhance the landscape and green infrastructure	11. Protect existing and future economic and social infrastructure and assets, services and amenities and encourage economic investment and growth
6. Protect and where possible enhance townscapes and cultural heritage	12. Maintain and where possible enhance the transport network for all users

LFRMS Policy		SEA Objectives										
	1	2	3	4	5	6	7	8	9	10	11	12
1. Improve and maintain flood risk evidence base	_+	_+	+	+	+	_+	_+	_+	+	_+	_+	_+
2. Local Flood Risk Management interventions seeking to reduce the likelihood, severity and consequences of flooding from ordinary watercourses, ground water and surface water runoff.	++	++	+	+	+	+	+	++	+	+	++	++
3. Local Flood Risk Management Authorities and other key stakeholders working together to progress priority interventions that support the aim and objectives of the LFRMS		++	+	+	+	+	+	+	+	+	+	+
4. Monitor and maintain drainage infrastructure within Manchester.	++	++	+	+	+	+	+	++	+	+	++	++
5. Promote awareness of local flood risk and ways that the risk can be managed by people and communities.	++	++	+	+	+	+	+	++	+	+	+	+
6. Ensure that local flood risk is properly considered for new development proposals.	++	++	+	+	+	+	+	+	+	+	+	+
7. Ensure that the LLFA responds to appropriate consultation exercises on matters affecting Local Flood Risk Management.	+	+	0	0	0	0	+	+	+	+	+	+
8. Ensure that the LLFA investigates and reports on flood incidents appropriately.	+	+	0	0	0	0	+	+	+	+	+	+
9. Aim to contribute towards the achievement of sustainable development in undertaking flood risk management functions.		+	+	+	+	+	+	+	+	+	+	+

Table 5.2 – Summary of SEA scores for the LFRMS Policies

Where SEA Objectives are:

1. Minimise the probability and consequences of flooding	7. Ensure the efficient use of land
2. Minimise the probability and consequences of climate change	8. Protect and enhance the health and well-being of the population
3. Maintain and where possible enhance the quality of water resources, water bodies and their environment	9. Support the sustainable growth of the City Region
4. Maintain and where possible enhance biodiversity, geodiversity and soils	10. Minimise economic and social exclusion for all
5. Protect and where possible enhance the landscape and green infrastructure	11. Protect existing and future economic and social infrastructure and assets, services and amenities and encourage economic investment and growth
6. Protect and where possible enhance townscapes and cultural heritage	12. Maintain and where possible enhance the transport network for all users

SEA Objective 1: Minimise the probability and consequences of flooding SEA Objective 2: Minimise the probability and consequences of climate change

- 5.5 The potential effects of the LFRMS policies on SEA objectives 1 and 2 have been summarised together because due to the SEA objectives relating to minimising the probability and consequences of flooding either or currently or due to climate change, the effects of the LFRMS policies are similar.
- 5.6 All of the LFRMS policies and associated measures are likely to have either positive or significant positive effects on these two objectives, as the measures have all been designed with the aim of reducing overall flood risk, both the probability and consequences.
- 5.7 Significant positive effects are predicted for five of the LFRMS policies (LFRMS Policies 2, 3, 4, 5 and 6). This is because the measures associated with those LFRMS policies are considered likely to have a particularly strong and direct impact on minimising the probability and consequences of flooding.
- 5.8 The measures set out in LFRMS Policy 1 and 8 to improve and maintain a flood risk evidence base and undertake flood risk investigations will not directly minimise the probability and consequences of flooding but the evidence and improved skills will help to support other LFRMS Policies, e.g. identify areas requiring intervention (Policy 2) so this measure is considered to a have a positive indirect impact on SEA objectives 1 and 2.
- 5.9 The measures set out in LFRMS Policy 7 to ensure that the LLFA responds to appropriate consultation exercises on matters affecting Local Flood Risk Management will not directly minimise the probability and consequences of flooding. However, undertaking appropriate responses to consultation exercises could increase the likelihood of an improved level of understanding of flood risk and can help shape relevant policies, strategies and work programmes which could minimise the probability and consequences of flooding and help the City adapt to the localised effects of climate change. Therefore, this measure is considered to a have a positive indirect impact on SEA objectives 1 and 2.
- 5.10 The measures set out in LFRMS Policy 9 to aim to contribute towards the achievement of sustainable development in undertaking flood risk management functions will not directly minimise the probability and consequences of flooding. However, striving towards sustainable development will seek to minimise the probability and consequences of flooding through the provision of robust flood risk management measures that will incorporate the potential consequences of climate change. Setting targets for permitted discharges from new and redeveloped sites will contribute to the reduction in overall flood risk throughout the City in the future. The policy will also ensure that new development is directed to areas of lower flood risk, and that new development does not increase the risk facing other areas. Therefore, this measure is considered to a have a positive indirect impact on SEA objectives 1 and 2.
- 5.11 No negative effects from the LFRMS policies, minor or significant, have been identified in relation to these two SEA objectives.

SEA Objective 3: Maintain and where possible enhance the quality of water resources, water bodies and their environment

SEA Objective 4: Maintain and where possible enhance biodiversity, geodiversity and soils

SEA Objective 5: Protect and where possible enhance the landscape and green infrastructure

SEA Objective 6: Protect and where possible enhance townscapes and cultural heritage

- 5.12 The potential effects of the LFRMS policies on SEA objectives 3, 4, 5 and 6 have been summarised together because they have a number of common themes and the effects on the LFRMS policies are broadly similar.
- 5.13 All of the LFRMS policies and associated measures are likely to have either positive or neutral effects on these objectives. They are likely to have only indirect effects on the quality of water resources, water bodies and their environment; biodiversity, geodiversity and soils; landscape and green infrastructure; and townscapes and cultural heritage as a resulting benefit from the primary aim of the LFRMS of effectively managing local flood risk.
- 5.14 LFRMS Policies 1-6 and Policy 8 have a positive indirect effect on these SEA objectives.
- 5.15 The measures set out in LFRMS Policy 7 to ensure that the LLFA responds to appropriate consultation exercises on matters affecting Local Flood Risk Management are, on balance, not thought to have any impact (neutral effect) on these four SEA objectives.
- 5.16 The measures set out in LFRMS Policy 8 to ensure that the LLFA investigates and reports on flood incidents are, on balance, not thought to have any impact (neutral effect) on these four SEA objectives.
- 5.17 No negative effects from the LFRMS policies have been identified in relation to these four SEA objectives.

SEA Objective 7: Ensure the efficient use of land

- 5.18 All of the LFRMS policies and associated measures are likely to have positive effects on this objective, as the measures are likely to have only indirect effects on the efficient use of land as a resulting benefit from the primary aim of the LFRMS of effectively managing local flood risk.
- 5.19 An improved evidence base (LFRMS Policy 1), maintaining drainage infrastructure (LFRMS Policy 4), ensuring flood risk considered for new developments (LFRMS Policy 6), investigating flooding incidents (LFRMS Policy 8) will provide a better basis to ensure efficient use of land through improved drainage and the use of SUDS in order to steer development towards brownfield sites and away from flood risk areas.
- 5.20 Improving the level of understanding of local flood risk (LFRMS Policy 5) could heighten awareness of localised problems and therefore increase the likelihood of providing suitable mitigation. This should help to protect land and reduce the likelihood of adverse effects from flooding events (e.g. high levels of surface water run-off from development of greenfield land).
- 5.21 Undertaking appropriate responses to consultation exercises (LFRMS Policy 7) could increase the likelihood of an improved level of understanding of flood risk

and can help shape relevant policies, strategies and work programmes which could ensure the efficient use of land (e.g. brownfield or areas of no flood risk) to minimise the probability and consequences of flooding from development.

- 5.22 Promoting multi-functional space, space for wildlife and local green space as part of the appraisal of flood intervention measures (LFRMS Policy 2), through partnership working (LFRMS Policy 3) and striving towards sustainable development (LFRMS Policy 9) will ensure land is used in the most efficient and sustainable manner.
- 5.23 No negative effects from the LFRMS policies have been identified in relation to this SEA objective.

SEA Objective 8: Protect and enhance the health and well-being of the population

- 5.24 All of the LFRMS policies and associated measures are likely to have either positive or significant positive effects on this objective, as the measures have all been designed with the aim effectively managing local flood risk which will directly or indirectly protect and enhance the health and well-being of the population.
- 5.25 Local flood risk management interventions (LFRMS Policy 2) and monitoring and maintaining drainage infrastructure in Manchester (LFRMS Policy 4) should help to reduce the risk of health impacts of sewer flooding and reduce the risk of flooding, including to recreation and amenity features, thereby having a direct significant positive effect on the health and wellbeing of the population. Removal of rubbish from channels improving recreational and amenity benefit of riverside walks. Promoting multi-functional space, space for wildlife and local green space as part of the appraisal of flood intervention measures could enhance the health and well-being of the population.
- 5.26 Promoting awareness of local flood risk and ways that the risk can be managed by people and communities (LFRMS Policy 5) could have a direct significant positive impact upon human health and well-being through reduced stress levels from being better prepared to deal with flooding. Improved awareness of localised problems could increase the likelihood of providing suitable mitigation.
- 5.27 LFRMS Policy 1, Policy 3 and Policies 6 to 9 have an indirect positive effect on these SEA objectives. Improving the evidence base available to the Council in relation to flood risk (LFRMS Policy 1), partnering with other Risk Management Authorities (LFRMS Policy 3), ensuring that local flood risk is properly considered for new development proposals (LFRMS Policy 6), undertaking appropriate responses to consultation exercises (LFRMS Policy 7), investigating and reporting on flooding incidents (LFRMS Policy 8) and striving towards the achievement of sustainable development in undertaking flood risk management functions will provide a better basis to manage flood risk and consequences of flood risk, including to leisure and recreation facilities, and will help identify opportunities to promote multifunctional use of land to provide a positive effect on the health and wellbeing of the population.
- 5.28 No negative effects from the LFRMS policies, minor or significant, have been identified in relation to this SEA objective.

SEA Objective 9: Support the sustainable growth of the City Region

5.29 All of the LFRMS policies and associated measures are likely to have positive effects on this objective. The measures are likely to have only indirect effects on

supporting the sustainable growth of the City Region as a resulting benefit from the primary aim of the LFRMS of effectively managing local flood risk, however, these are likely to be positive.

- Improving the evidence base available to the Council in relation to flood risk 5.30 (LFRMS Policy 1), partnering with other Risk Management Authorities (LFRMS Policy 3), improving the level of understanding of local flood risk (LFRMS Policy 5), undertaking appropriate responses to consultation exercises (LFRMS Policy 7) and investigating and reporting on flooding incidents (LFRMS Policy 8) will help to inform appropriate decision-making regarding the siting of new development to support the sustainable growth of the City Region. In particular mapping the location of flooding incidents will improve the evidence base regarding historical incidences of flooding, which can be used to inform future decision making. In addition, designating flood/drainage assets is likely to enhance their status and may mean that the need to avoid new development having an adverse impact on such assets is given greater consideration. By identifying the location of drainage assets, further geographical information relevant to flood risk management will be available, which can be taken into consideration when assessing potential new development sites.
- 5.31 Flood Risk Management measures (LFRMS Policy 2) will give confidence to investors and thereby help support sustainable development within the City.
- 5.32 Monitoring and maintaining drainage infrastructure in Manchester (LFRMS Policy 4) will help to ensure drainage infrastructure has the capacity to support the sustainable growth of the City Region by reducing the risk of flooding. This policy will also support the identification of works for improvements to the existing drainage infrastructure, opportunities for retrofitting SUDS and opportunities for new strategic SUDS to potentially help facilitate future development.
- 5.33 LFRMS Policy 6 will help to ensure that new development including that of community and economic assets incorporates robust flood risk management measures. This may include ambitious targets for permitted discharges from new and redeveloped sites and measures that aim to better integrate flood risk management considerations into planning. As well as reducing levels of flood risk at new development sites, the measures will contribute to reducing the overall flood risk throughout the City. Given the scale of new employment development proposed in the City, the effects of these measures are likely to be positive.
- 5.34 Promoting the concept of multifunctional spaces that will hold flood water, provide space for wildlife and local green space as part of the planning process could lessen the threat of flooding that can have a negative impact upon the City's economy and ensure development as part of the growth of the City is undertaken in a sustainable manner (LFRMS Policy 9).
- 5.35 No negative effects from the LFRMS policies, minor or significant, have been identified in relation to this SEA objective.

SEA Objective 10: Minimise economic and social exclusion for all

- 5.36 All of the LFRMS policies and associated measures are likely to have positive effects on this objective. The measures are likely to have only indirect effects on minimising economic and social exclusion for all, but any effects are likely to be positive as a resulting benefit from the primary aim of the LFRMS of effectively managing local flood risk.
- 5.37 An improved evidence base and knowledge available to the Council (LFRMS Policy 1), improving the level of understanding of local flood risk (LFRMS Policy

5), undertaking appropriate responses to consultation exercises (LFRMS Policy 7) and investigating and reporting on flooding incidents (LFRMS Policy 8) will provide a better basis to manage flood risk in the most socially deprived areas. In particular mapping the location of flooding incidents will improve the evidence base regarding historical incidences of flooding, which can be used to inform future decision making and prioritise mitigation measures for those areas which may be considered more vulnerable. Promoting awareness of local flood risk issues across the whole of Manchester will minimise economic and social exclusion.

- 5.38 Local Flood Risk Management interventions (LFRMS Policy 2) and monitoring and maintaining drainage infrastructure (LFRMS Policy 4) will involve physical works to protect areas at risk of flooding. The Grant in Aid funding methodology prioritises areas of multiple deprivation to see that they are not disadvantaged in the bidding process and to support the aim that social and economic exclusion is minimised.
- 5.39 The development of partnership working with other Risk Management Authorities (LFRMS Policy 3) will provide a better basis to manage flood risk and consequences of flood risk and should have positive effects in relation to information sharing and stakeholder engagement. The Grant in Aid funding prioritises areas of social deprivation and will form part of the Risk Management Authorities' prioritisation of schemes to be put forward for funding with the aim that social and economic exclusion is minimised.
- 5.40 Ensuring that local flood risk is properly considered for new development proposals (LFRMS Policy 6) and striving towards sustainable development (LFRMS Policy 9) will seek to ensure social, economic and environmental aspirations are considered at all stages of development. This will help to minimise economic and social exclusion for all by ensuring flood risk measures will be applied across the entire city.
- 5.41 No negative effects from the LFRMS policies, minor or significant, have been identified in relation to this SEA objective.

SEA Objective 11: Protect existing and future economic and social infrastructure and assets, services and amenities and encourage economic investment and growth

- 5.42 All of the LFRMS policies and associated measures are likely to have either positive or significant positive effects on this objective, as the measures have all been designed with the aim of effectively managing local flood risk, which will directly or indirectly help protect existing and future economic and social infrastructure and assets, services and amenities and encourage economic investment and growth.
- 5.43 Local Flood Risk Management interventions (LFRMS Policy 2) and monitoring and maintaining drainage infrastructure (LFRMS Policy 4) will involve physical works to protect economic and social infrastructure assets, services and amenities that are currently at risk of flooding and those predicted to be at risk from climate change. Therefore, these policies are considered to a have a significant positive direct impact on SEA objective 11.
- 5.44 LFRMS Policy 1, Policy 3 and Policies 5 to 9 have an indirect positive effect on this SEA objective. An improved evidence base and knowledge available to the Council (LFRMS Policy 1), partnering with other Risk Management Authorities (LFRMS Policy 3), improving the level of understanding of local flood risk (LFRMS

Policy 5), undertaking appropriate responses to consultation exercises (LFRMS Policy 7) and investigating and reporting on flooding incidents (LFRMS Policy 8) will provide a better basis to manage flood risk and consequences of flood risk of economic and social infrastructure assets, services and amenities encouraging economic investment and growth in the City. Ensuring that local flood risk is properly considered for new development proposals (LFRMS Policy 6) and striving towards sustainable development (LFRMS Policy 9) will seek to minimise the probability and consequences of flooding through the provision of robust flood risk management measures that will have regard to the potential consequences of flood risk and the effects of climate change on the economic and social infrastructure assets, services and amenities in the City. This may include setting ambitious targets for permitted discharges from new and redeveloped sites and measures that aim to better integrate flood risk management considerations into planning.

5.45 No negative effects from the LFRMS policies, minor or significant, have been identified in relation to this SEA objective.

SEA Objective 12: Maintain and where possible enhance the transport network for all users

- 5.46 All of the LFRMS policies and associated measures are likely to have either positive or significant positive effects on this objective, as the measures have all been designed with the aim of effectively managing local flood risk, which will directly or indirectly help protect the existing and future transport network and thereby support social and economic inclusion as well as the environment.
- 5.47 Local Flood Risk Management interventions (LFRMS Policy 2) and monitoring and maintaining drainage infrastructure (LFRMS Policy 4) will involve physical works to maintain and where possible enhance the transport network for all users. Therefore, these policies are considered to have a significant positive direct impact on SEA objective 12.
- 5.48 LFRMS Policy 1, Policy 3 and Policies 5 to 9 have an indirect positive effect on this SEA objective. An improved evidence base and knowledge available to the Council (LFRMS Policy 1), partnering with other Risk Management Authorities (LFRMS Policy 3), improving the level of understanding of local flood risk (LFRMS Policy 5), undertaking appropriate responses to consultation exercises (LFRMS Policy 7) and investigating and reporting on flooding incidents (LFRMS Policy 8) will provide a better basis to manage flood risk and consequences of flood risk on the transport infrastructure in the City. In working directly with relevant partners such as the Local Highway Authority and the Highways Agency it should be possible to ensure that appropriate resilience measures are in place to minimise the potential impacts as far as possible when flood events do occur. This will help to minimise the impact on transport networks through road closures and delays to train, bus and metrolink services. Ensuring that local flood risk is properly considered for new development proposals (LFRMS Policy 6) and striving towards sustainable development (LFRMS Policy 9) will seek to minimise the probability and consequences of flooding through the provision of robust flood risk management measures that will have regard to the potential consequences of flood risk and the effects of climate change on the transport infrastructure in the City.
- 5.49 No negative effects from the LFRMS policies, minor or significant, have been identified in relation to this SEA objective.

Chapter 6 - Monitoring

- 7.2. The SEA Directive states that "member states shall monitor the significant environmental effects of the implementation of plans and programmes...in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action" (Article 10.1).
- 7.3. In addition, the Environmental Report should provide information *on "description of the measures envisaged concerning monitoring"* (Annex I (i)) (Stage E).
- 7.4. Monitoring proposals should be designed to provide information that can be used to highlight specific issues and significant effects, and which could help decision-making.
- 7.5. As discussed in Chapter 5, a number of the measures in the Draft LFRMS could have potential significant positive effects on the SEA objectives, although no likely negative effects on the environment were identified. There are also a number of SEA objectives for which no positive effects have been identified.
- 7.6. SEA monitoring will cover significant social and economic effects as well as significant environmental effects; and it involves measuring indicators which will enable the establishment of a causal link between the implementation of the Local Flood Risk Management Strategy and the likely significant environmental effects (both beneficial or adverse) being monitored. This will allow the identification of any unforeseen adverse effects and enable appropriate remedial action to be taken.
- 7.7. To achieve efficiencies, and ensure environmental effects of implementing any of the LFRMS measures are monitored, SEA monitoring of the LFRMS should be conducted as part of the overall approach to monitoring progress with the LFRMS. The LFRMS explains in Section 6 that the document will be updated as needed as new information, expertise and resources to influence the delivery of the measures outlined in the strategy become available.
- 7.8. It is recommended that monitoring of the environmental effects of the LFRMS is tied into the overall approach to monitoring the sustainability effects of other plans and strategies developed by Manchester City Council (in particular the Core Strategy), as some of the indicators proposed will be relevant to the LFRMS. Annual Monitoring Reports are already produced for the Local Development Framework (including the Core Strategy). Therefore, it is recommended that monitoring of the potential environmental effects of the LFRMS be combined with the annual monitoring process carried out for the LDF.
- 7.9. Table 6.1 sets out a number of suggested indicators for monitoring the potential environmental effects of implementing the LFRMS. Note that the indicators proposed are included as suggestions at this stage, as it is recognised that many datasets may not be available for monitoring some of the environmental effects of the LFRMS.
- 7.10. It is important to note that it will not always be necessary to collect data for all the indicators. The Council will need to consider SEA indicators to identify those that can be effectively used to monitor the environmental effects of the Local Flood Risk Management Strategy. This will need to be undertaken in dialogue with statutory environmental consultees and other bodies, including the Association of Greater Manchester Authorities (AGMA) as in many cases, the monitoring information will be provided by outside bodies (e.g. the Environment Agency).

7.11. There will be a need for careful consideration of the practicalities of monitoring to be taken into account in shaping the Final Monitoring Programme, especially in the context of limited resources at the City level. The emphasis must be on creating a balanced, effective, yet achievable set of monitoring criteria

SEA Objective	Indicator	Outline of Proposed Monitoring
1. Minimise the probability and	1. Number of properties (residential, commercial,	1. Development and maintenance of "flooding risk registry" which lists
consequences of flooding	industrial, etc.) at significant risk of flooding	number of properties at risk, with approximate standard of protection and
(significant positive effects identified	2. Number of properties granted planning	includes critical infrastructure at risk
in relation to LFRMS policies 2, 3, 4, 5,	permission in flood risk areas.	2. Number of major / minor planning permissions in the City informed by
6 and 8, as the measures are	3. Number of potentially polluting features (e.g.	Flood Risk Assessments (FRAs).
considered likely to have a	sewage treatment works, landfill sites,	3. Development and maintenance of a register of potentially polluting
particularly strong and direct impact	contaminated land at significant risk of flooding	features within the floodplain
on minimising the probability and	4. Number of flood risk management measures	4. Development and maintenance of a register of flood risk management
consequences of flooding)	implemented	measures (e.g. walls, embankments, balancing ponds, flood barriers, etc.)
	5. Number of Sustainable Drainage Systems	5. Development and maintenance of a register of sustainable drainage
	developed	systems along with their owners and maintenance regime
2. Minimise the probability and	1. Number of properties (residential, commercial,	1. Development and maintenance of "flooding risk registry" which lists
consequences of climate change	industrial, etc.) at significant risk of flooding	number of properties at risk, with approximate standard of protection and
(significant positive effects identified	2 Number of potentially polluting features (e.g.	includes critical infrastructure at risk
in relation to LFRMS policies 2, 3, 4, 5,	sewage treatment works, landfill sites,	2. Development and maintenance of a register of potentially polluting
6 and 8, as the measures are	contaminated land at significant risk of flooding	features within the floodplain
considered likely to have a	3. Per capita greenhouse gas emissions	3. No strategic monitoring required for per capita greenhouse gas emissions
particularly strong and direct impact		related to flood risk activities.
on minimising the probability and		
consequences of climate change)		
3. Maintain and where possible	1. WFD ecological status of rivers	1. Maintain a register of Source Protection Zones
enhance the quality of water	2. WFD chemical status of rivers	2. Maintain a register of significant water bodies
resources, water bodies and their		
environment (neutral effect identified		
in relation to LFRMS policies 3 and 8)		
4. Maintain and where possible	1. Area and condition of BAP habitat within the	1. Monitoring area of BAP habitats
enhance biodiversity, geodiversity	flood risk zone	2. Review of population surveys of key protected species
and soils (neutral effect identified in	2. Population of key protected species	3. Maintain a register of weirs and fish passes
relation to LFRMS policies 3 and 8)	3. Percentage of weirs which incorporate fish passes	
	4. Non-native crayfish and other invasive species	
	such as Japanese knotweed	

Table 6.1 - Proposed indicators for monitoring the potential significant and uncertain environmental effects of the LFRMS

5. Protect and where possible	1. Extent of areas of special landscape character	1. No strategic monitoring required. The impact on local landscape quality
enhance the landscape and green	(e.g. Special Landscape Areas)	and green infrastructure is to be considered on a site by site basis when
infrastructure (neutral effect	2. Extent of areas of Green Infrastructure	works are proposed.
identified in relation to LFRMS policies		
3 and 8)		
6. Protect and where possible	1. Number of designated Scheduled Ancient	1. Scheduled Ancient Monuments - a list should be updated when further
enhance townscapes and cultural	Monuments at risk of flooding	sites have been updated. No strategic monitoring is proposed.
heritage (neutral effect identified in	2. Number of listed structures at risk of flooding	2. Listed Structures - a register of listed structures at significant risk of
relation to LFRMS policies 3 and 8)	3. Size (area) of conservation areas at risk of	flooding is to be maintained with an approximate standard of protection
	flooding	indicated.
	4. Number of registered parks and gardens	3. Conservation Areas - a register of conservation areas at significant risk of
	5. Area of potential archaeological assets	flooding should be maintained and updated with new designations.
		4. Registered parks and gardens - a register of parks and gardens at
		significant risk of flooding should be maintained and updated with new
		designations.
		5. Archaeological Assets - no strategic monitoring required. Archaeological
		assessments to be undertaken on a site by site basis, as appropriate.
7. Ensure the efficient use of land	1. Amount of greenfield / brownfield land and	1. Register of greenfield and brownfield land should be maintained and
	proportion available for reuse	updated as development takes place.
	2. Area of Grade 1-3 land lost due to need for flood	
	defence (e.g. washland)	
	3. Number of flood mitigation developments to be	
	located within landscapes with a high sensitivity	
8. Protect and where possible	1. Number of sewer flooding incidents	1. Maintain register of sewer flooding incidents (United Utilities)
enhance the health and well-being of	3. Number of flood related injuries	2. Development and maintenance of "flooding risk registry" which lists
the population (significant positive	4. Number of residential properties at significant risk	number of residential properties at risk, with approximate standard of
effects identified in relation to LFRMS	of flooding	protection
policies 2, 4 and 5 as the measures		
are considered likely to have a		
particularly strong and direct impact		
on enhancing the health and well-		
being of the population)		

9. Support the sustainable growth of	1. Number of new properties resilient to flood risk	1. Development and maintenance of "flooding risk registry" which lists
the City Region	2. Extent of infrastructure and assets to support	number of properties at risk, with approximate standard of protection and
	employment and services protected from flooding	includes critical infrastructure at risk
	3. Number of Sustainable Drainage Systems	
	developed	
10. Minimise economic and social	1. Number of properties in socially deprived areas at	1. Maintain register of flooding incidents
exclusion for all	risk of flooding	2. Development and maintenance of "flooding risk registry" which lists
	2. Number and severity of flood incidents leading to	number of properties at risk, with approximate standard of protection and
	disruption or damage to transport infrastructure in	includes critical infrastructure at risk
	socially deprived areas	
	3. Number and severity of flood incidents leading to	
	disruption or damage to service provision	
11. Protect existing and future	1. Number and severity of flood incidents leading to	1. Maintain register of flooding incidents
economic and social infrastructure	disruption or damage to service provision	2. Development and maintenance of "flooding risk registry" which would
assets, services and amenities and		include key economic and social infrastructure, with approximate standard
encourage economic investment and		of protection
growth (significant positive effects		
identified in relation to LFRMS policies		
2 and 4 as the measures are		
considered likely to have a strong and		
direct impact on protecting existing		
and future economic and social		
infrastructure assets, services and		
amenities and encouraging economic		
investment and growth)		
12. Maintain and where possible	1. Number and severity of flood incidents leading to	1. Maintain register of flooding incidents
enhance the transport network for	disruption or damage to transport infrastructure	2. Development and maintenance of "flooding risk registry" which would
all users (significant positive effects		include transport infrastructure, with approximate standard of protection
identified in relation to LFRMS policies		
2 and 4 as the measures are		
considered likely to have a		
particularly strong and direct impact		
on maintaining and enhancing the		
transport network for all users		

Chapter 7 – Conclusions and Next Steps

- 7.1. The Policies within the Local Flood Risk Management Strategy meet the range of environmental objectives identified in the SEA Framework. The LFRMS Policies are considered to offer generally positive effects on environmental, social and economic objectives.
- 7.2. None of the measures in the final LFRMS are likely to have significant negative effects on any of the SEA objectives. This is because of the nature of the LFRMS, which has the overarching aim of effective flood risk management, meaning that the effects of the strategy are largely positive.
- 7.3. Likely significant positive effects have been identified in relation to the following SEA objectives:
 - 1) Minimise the probability and consequences of flooding
 - 2) Minimise the probability and consequences of climate change
 - 8) Protect and where possible enhance the health and well-being of the population
 - 11) Protect existing and future economic and social infrastructure assets, services and amenities and encourage economic investment and growth
 - 12) Maintain and where possible enhance the transport network for all users
- 7.4. All of these significant positive effects are associated with the measures designed to achieve LFRMS Policy 2 (Local Flood Risk Management interventions) and Policy 4 (monitor and maintain drainage infrastructure). The measures associated with these policies are more likely to have significant positive effects because they involve direct actions to manage flood risk. Partnering with other Risk Management Authorities (LFRMS Policy 3), promoting awareness of local flood risk issues (LFRMS Policy 5) and ensuring that local flood risk is properly considered for new development proposals (LFRMS Policy 6) are likely to have significant positive effects because they involve direct actions to manage the risk and consequences of flooding.

Next Steps

7.5. This Environmental Report will be published for comments alongside the Consultation Draft LFRMS. Following the consultation process the LFRMS will be adopted by the Council and the Environmental Report will continue to be available.