



Leeds City Council

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# LOCAL FLOOD RISK MANAGEMENT STRATEGY

2018 Update







Leeds City Council

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2018 Update

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# FOREWORD

As the Executive member holding the portfolio for Flood Risk Management within Leeds, I am delighted to be able to introduce this update to the Leeds Flood Risk Strategy.



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Since the first local Flood Risk Management Strategy was adopted in 2014, Leeds has received its wake-up call to the consequences of flooding on its residents and businesses. The extraordinary winter of 2015/16 saw storms Desmond, Eva and Frank demonstrate the devastation flooding can cause. Whilst the existing strategy supported our response, the impact exceeded all Leeds' previous flooding experiences. Since then, investigations have allowed us to understand what happened and update our records of places at risk. Our update to the Preliminary Flood Risk Assessment in 2017 has allowed baseline flood data to be refreshed and further areas of flood risk to be identified.

This update allows a newly identified Leeds Flood Risk Area, alongside new preventative measures, to be incorporated into our strategy. It also shows how previously identified works have been implemented and how priorities to remaining flooding problems have been updated. This has enabled a new programme of works as the strategy moves into its next phase.

Since 2012 flood alleviation measures have reduced flood risk to 3700 properties, the most significant of which is Leeds Flood Alleviation Scheme Phase 1. Work continues to assess feasibility and develop designs for such schemes, including Leeds Flood Alleviation Scheme Phase 2. Construction has started on works around Killingbeck that will reduce the risk of flooding around the area and will open the area up to the potential of building new houses. We have been successful, through working with partners, in securing funding from a range of sources including the EA, local growth deal, central government, developers and our own budgets. Updating our strategy allows us to build on previous achievements and to keep our momentum to continue to deliver reductions in flood risk. By doing this we support ongoing sustainable growth and regeneration for the city region, as well as sustaining safe, healthy communities.

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# EXECUTIVE SUMMARY

The scope of this updated Local Flood Risk Management Strategy covers all sources of flooding. It focuses on 'local flooding' that originates from ordinary watercourses, surface water, sewers (rainfall only) and groundwater. It also includes Main River flooding and although this is primarily the Environment Agency's responsibility; however, its inclusion here allows the impact on the local situation to be recognised.



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The purpose of this strategy is to guide the activities undertaken by Risk Management Authorities operating in the metropolitan district of Leeds. These are Leeds City Council, the Environment Agency, Yorkshire Water Services, Ainsty Internal Drainage Board and Highways England.

Lead Local Flood Authorities have duties under the Flood and Water Management Act to develop, maintain, apply and monitor a strategy for local flood risk management. The initial strategy was originally developed in 2012, adopted in 2014 and now is being updated in 2018 in accordance with the proposed six-year review cycle.

The strategy needs to take account of current legislation, guidance and other plans. Hence updating at regular intervals allows changes that have occurred since its initial development to be taken into account. This update has now incorporated the following:

- Changes in legislative context including Brexit, the government's 25-year Environmental Plan and the National Infrastructure plan.
- Local plans including Leeds Best Council Plan and the Inclusive Growth Strategy for Leeds.
- Newly defined Leeds Flood Risk Area, which was identified through the updated Preliminary Flood Risk Assessment in July 2017.
- Section 19 reports following the significant flooding events, particularly winter 2015.
- Measures implemented since 2012, in particular the Leeds Flood Alleviation Scheme Phase 1.
- Ongoing development of schemes to address local and city wide flooding problems.
- Changes in funding sources and mechanisms.

List of Measures is a key part of the strategy. This has been monitored and amended annually through the Council's scrutiny processes since the strategy was adopted in 2014. This has now been fully updated to take account of revised priorities, works completed and newly identified problems.

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# 1 LEGISLATIVE CONTEXT

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## 1.1 INTRODUCTION

This Strategy has been developed with regard to all current legislation and guidance relating to flood risk management in the district of Leeds.

There is appreciation that the legislation and guidance, set out in the following sub-section, may change in the years following the departure of the United Kingdom (UK) from the European Union (EU).

Section 9 contains a list of reference material related to flood risk for Leeds district. It contains relevant legislation, guidance, reports, strategies and studies, which have been used to develop this strategy.

## 1.2 EUROPEAN UNION WITHDRAWAL ACT

Exactly what leaving the EU will mean for the environment of the UK is hard to predict, but it will be significant. The protection of the UK's natural environment has been profoundly shaped by EU legislation and policy for four decades.

The European Union Withdrawal Bill had its first reading in the House of Commons on 13 July 2017. The bill proposed to do three main things:

- Repeal the European Communities Act 1972. This legislation provides legal authority for EU law to have effect as national law in the UK. This will no longer be the case after the UK leaves the EU.
- Bring all EU laws onto the UK books. Laws and regulations made over the past 40 years while the UK was a member of the EU will continue to apply after the UK leaves the EU.
- Give ministers power to make secondary legislation.

The European Union (Withdrawal) Act became law on 26<sup>th</sup> June 2018. At the time of writing, it is anticipated that the laws and regulations transposed from European Directives will be committed to UK law following the UK's departure from the EU.

## 1.3 THE FLOOD RISK REGULATIONS

The European Union Flood Directive (2007/60/EC) is consolidated into UK law in the Flood Risk Regulations 2009 (FRR), which came into force on 10th December 2009. Under these regulations Leeds City Council (as a unitary authority) is designated a 'Lead Local Flood Authority' (LLFA) for the area.

FRR states that an LLFA must prepare a preliminary assessment report in relation to flooding in its area, described as a Preliminary Flood Risk Assessment (PFRA). The PFRA aims to locate areas in which the risk of surface water and groundwater flooding is significant and warrants further examination through the production of flood risk maps and management plans. It must be updated every six years in line with Environment Agency (EA) guidance. Leeds City Council completed their first PFRA for Leeds district in September 2011 and produced an updated PFRA in June 2017.

The Local Flood Risk Management Strategy (LFRMS) must consider the outcomes of the PFRA, and its updates, when developing the specific measures set out in the 'List of Measures' (Appendix

C). The updated PFRA revealed a change in understanding of flood risk across Leeds district resulting in the identification of a new Flood Risk Area (FRA) for Leeds district. The PFRA Update was accepted by the EA in December 2017 and subsequently submitted to the European Commission.

## 1.4 THE WATER ENVIRONMENT REGULATIONS

The European Union Water Framework Directive (2000/60/EC) is consolidated into UK law in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

The aims of the Water Framework Directive (WFD) are to:

- Prevent deterioration and enhance status of aquatic ecosystems, including groundwater;
- Promote sustainable water use;
- Reduce pollution, and
- Contribute to the mitigation of floods and droughts.

Regulation 33 of the Water Environment Regulations states that local authorities, as well as other public bodies, must 'have regard to the RBMP for a river basin district' 'when exercising functions affecting the district'. RBMP refers to the relevant River Basin Management Plan.

Regulation 35 requires local authorities to provide 'such information in its possession' and 'such assistance as the Environment Agency may reasonably seek' in connection with its WFD functions. Incorporation of WFD objectives into all aspects of local authority function are necessary to meet this requirement.

Local authorities can help to address the causes of poor water body status and make a major contribution to meeting WFD objectives, both in their own activities and in their work with others. Key local authority functions which can contribute to WFD objectives include:

- Local planning policies.
- Development management and building control.
- Drainage, flood risk management and Sustainable Drainage Systems (SuDS).
- Environmental health and pollution control.
- Managing a local authority's own buildings, assets and green-space.
- Local authority highway functions.
- Community leadership, advocacy and partnership roles.

## 1.5 ENVIRONMENTAL ASSESSMENT OF PLANS AND PROGRAMMES REGULATIONS

The Strategic Environmental Assessment Directive (2001/42/EC) is consolidated into UK law in the Environmental Assessment of Plans and Programmes Regulations 2004.

A Strategic Environmental Assessment (SEA) was been undertaken in parallel to the production of the initial LFRMS in accordance with these regulations. This used the Leeds Sustainability Appraisal Framework to appraise the LFRMS, with focus on the 'Objectives for managing flood risk' that are defined in Section 6 of the strategy and the associated 'List of Measures' in Appendix C. This framework promotes sustainable development: development that 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland Commission, 1987).

For the purpose of this update the LFRMS objectives and the objectives of the sustainability appraisal framework are unchanged. Hence it is considered that the earlier SEA remains current. The appraisal undertaken confirmed that the LFRMS provides greater clarity and focus on the environment, education, cooperation, the economy, health and equality and climate change.

The SEA process established eight monitoring indicators to assess the implementation of the LFRMS; these are presented in Section 8. The SEA Report is included in Appendix B.

## 1.6 EQUALITY IMPACT ASSESSMENT

Section 149 of the Equality Act 2010 imposes a legal duty, known as the Public-Sector Duty (Equality Duty), on all public bodies.

The Equality Duty requires a public authority, in the exercise of its functions, to:

- Consider the need to eliminate unlawful (direct or indirect) discrimination, harassment and victimisation and other conduct prohibited by the Equality Act 2010;
- Advance equality of opportunity between people who share a protected characteristic and those who do not share it; and
- Foster good relations between people with a protected characteristic and those who do not share it.

A screening exercise was carried out into the impact of the LFRMS on Equality, Diversity, Cohesion and Integration. The finding of this was that a full Assessment was not required at this time – however further assessment will be carried out as each measure is considered.

## 1.7 FLOOD AND WATER MANAGEMENT ACT

As a LLFA, the Council is required under Section 9 of the Flood and Water Management Act (FWMA), which came into effect on the 12th April 2010, to develop, maintain, apply and monitor a strategy for local flood risk management – a ‘Local Flood Risk Management Strategy’.

Section 9 of the FWMA states that the LFRMS must specify:

- (a) The Risk Management Authorities in the Leeds LLFA area;
- (b) The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area;
- (c) 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);
- (d) The measures proposed to achieve those objectives;
- (e) How and when the measures are expected to be implemented;
- (f) The costs and benefits of those measures, and how they are to be paid for;
- (g) The assessment of local flood risk for the purpose of the strategy;
- (h) How and when the strategy is to be reviewed, and
- (i) How the strategy contributes to the achievement of wider environmental objectives.

## 1.8 NATIONAL FLOOD AND COASTAL EROSION RISK MANAGEMENT STRATEGY

The EA and the Department for Environment Food and Rural Affairs (Defra) jointly developed and published their National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England on the 19th July 2011 pursuant to Section 7 of the FWMA. The National FCERM Strategy for England sets out six high-level principles ('The Guiding Principles') to guide LLFAs in their risk management activities.

1. Community focus and partnership working.
2. A catchment and coastal 'cell' based approach.
3. Sustainability.
4. Proportionate, risk-based approach.
5. Multiple benefits.
6. Beneficiaries should be encouraged to invest in risk management.

## 1.9 LOCAL DEVELOPMENT FRAMEWORK

To ensure consistency with local planning guidance the LFRMS has been produced with reference to the Leeds Local Development Framework (LDF).

The key Development Plan Documents reviewed, were the Leeds Core Strategy (adopted November 2014) and Natural Resources and Waste Local Plan (adopted January 2013).

Leeds Core Strategy Policy EN5 is presented below. It sets out the six 'objectives for managing local flood risk', which are listed in Section 5 of this document.

### POLICY EN5: MANAGING FLOOD RISK

The Council will manage and mitigate flood risk by:

- i. Avoiding development in flood risk areas, where possible, by applying the sequential approach and where this is not possible by mitigating measures, in line with the NPPF, both in the allocation of sites for development and in the determination of planning applications;
- ii. Protecting areas of functional floodplain as shown on the Leeds Strategic Flood Risk Assessment (SFRA) from development (except for water compatible uses and essential infrastructure);
- iii. Requiring flood risk to be considered for all development commensurate with the scale and impact of the proposed development and mitigated where appropriate;
- iv. Reducing the speed and volume of surface water run-off as part of new build development;
- v. Making space for flood water in high flood risk area;
- vi. Reducing the residual risks within Areas of Rapid Inundation;
- vii. Encouraging the removal of existing culverting where practicable and appropriate, and
- viii. The development of the Leeds Flood Alleviation Scheme (FAS).



The Natural Resources and Waste Local Plan provides LCC's policy requirement for sustainable drainage. It is provided below.

#### POLICY WATER 7: SURFACE WATER RUN-OFF

All developments are required to ensure no increase in the rate of surface water run-off to the existing formal drainage system. Development will be expected to incorporate sustainable drainage techniques wherever possible, both:

- On previously developed sites peak flow rates must be reduced by at least 30%, and
- On sites which have not previously been connected to the drainage infrastructure, or watercourse, surface water run off rates will not exceed the 'greenfield' run-off rate (i.e. the rate at which water flows over land which has not previously been developed).

Water 7 policy will be reviewed in 2019, in which LCC will seek to further reductions in runoff from brownfield sites that are undergoing major development.

The LFRMS must be consistent with the National FCERM Strategy for England, and these six high-level principles. Therefore, the objectives for managing local flood risk in Section 6 of this LFRMS and the specific measures in the 'List of Measures' in Appendix C have been aligned with these high-level guiding principles to ensure consistency with National FCERM Strategy for England.

### 1.10 BEST COUNCIL PLAN 2018/19 – 2020/21

This plan maintains Leeds City Council's long-term 'Best City' strategy. It focuses on tackling poverty and inequalities through a combination of: strengthening the economy, acting in a way that is compassionate and caring, and supporting vulnerable children and adults.

Building on the range of council and partnership strategies in place and in development, this Best Council Plan update sets out seven interconnected priority areas of work that flow from the council's two main cross-cutting strategies: Inclusive Growth and Health and Wellbeing.

- Inclusive growth.
- Health and wellbeing.
- Child-friendly city.
- Safe, strong communities.
- Housing.
- 21st-century infrastructure.
- Culture.

Each strategy has a number of Key Performance Indicators (KPIs) that outline how the council will measure progress and achievements. Of these KPIs, the following relate to the management of flood risk:

- Growth in new homes in Leeds.
- Number of residential and commercial properties moved to a lower level of flood risk.

## 1.11 LEEDS INCLUSIVE GROWTH STRATEGY 2018 – 2023

This inclusive strategy sets out the ambition for Leeds to have a strong economy within a compassionate city. It set out how partners will work together to grow the economy ensuring everyone can contribute to, benefit from, and grow to their full potential.

It recognises that Leeds is the main economic centre for Leeds City Region, and a driver of growth for the Northern Powerhouse, Yorkshire and the national economy. This strategy also provides a framework for how the city will work on inclusive economic growth with the Leeds City Region Local Enterprise Partnership and West Yorkshire Combined Authority, partners across Yorkshire, the Northern Powerhouse and, in the context of the national Industrial Strategy, with central Government. It also sets out how the city intends to promote a positive, outward looking image on the global stage seeking to increase inward investment, exports and tourism.

It states that Leeds will only fulfil this potential for future growth if it sustains the progress it is making, and by taking action on areas where it could perform better. This includes tackling poverty, addressing skills gaps, housing growth and regeneration, exports, investment in research and development, developing, attracting and retaining a skilled workforce, and transport and infrastructure.

It defines twelve big ideas to shape the city by boosting long term productivity, competitiveness and social inclusion. Integral to this are the principles of sustainable development which embrace the social, economic and environmental impacts of their implementation. There is a lot of good work already taking place in Leeds but there remains an opportunity for this to have renewed focus, a clearer strategic context and stronger commitment from businesses and others in the city.

It acknowledges that flood protection and green infrastructure will form part of its vision for 21<sup>st</sup> century infrastructure.

## 1.12 NATIONAL INFRASTRUCTURE ASSESSMENT JULY 2018

This sets out the plan of action for the country's infrastructure for over the next 10 – 30 years. The national infrastructure commission was set up to address problems with long term infrastructure planning in the UK. One of its core proposals includes national standard of flood resilience by 2015. The Commission's recommendations represent a major long-term programme of investment in the UK's infrastructure. The programme includes substantial funding for major schemes such as Crossrail 2 and Northern Powerhouse Rail, as well as to support the delivery of enhanced digital networks and flood protection.

It states that a long-term strategy for flood protection would allow a nationwide standard of resilience to flooding, with catchment based plans. These plans should evaluate the full range of options including traditional flood defences, 'green infrastructure' (whether Natural Flood Management or SuDS), individual property measures and spatial planning. In the Commission's social research, 59 per cent of people agreed that everyone should have the same standard of flood resilience, even though some properties cost more to protect. The Commission believe that a national standard should be set for resilience to flooding with an annual likelihood of 0.5 per cent by 2050, where feasible. Over longer time periods, higher standards might be achievable. Densely populated areas, where the consequences of flooding are potentially much more serious, should be resilient to flooding with a likelihood of only 0.1 per cent a year by 2050. The Environment Agency should update plans for all catchments and coastal cells in England before the end of 2023.



This provides a new vision for the development of public infrastructure which will bring new challenges in promoting and securing investment in flood risk infrastructure.

## 2 LEEDS CITY COUNCIL ADMINISTRATIVE AREA

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### 2.1 PHYSICAL CHARACTERISTICS

The administrative area of Leeds City Council covers an area of approximately 560 square kilometres. This includes approximately 360 square kilometres of countryside designated as Green Belt. The district encompasses the major city of Leeds as well as number of smaller settlements including: Wetherby, Otley, Guiseley, Yeadon, Horsforth, Garforth, Rothwell, Pudsey and Morley. The population of Leeds is approximately 750,000 - in around 320,000 households (figures from 2011 Census).

The general topography of the district is undulating and varies in level from 10m Above Ordnance Datum (AOD) at Fairburn on the River Aire and Thorp Arch on the River Wharfe to more than 340m AOD at Hawksworth Moor. The rocks underlying the district date from the Upper Carboniferous period: with sandstones of the older Millstone Grit Series in the north of the district and alternating shales, mudstones, coal seams and sandstones of the Lower Coal Measures in the south of the district. The overlying soils in the district mainly comprise of clays and loams, and are relatively impermeable. However, sands and gravels are commonly found adjacent to the River Aire.

### 2.2 DRAINAGE FEATURES

Most of the district is drained naturally via a series of watercourses, some of which are culverted in urban areas; these typically run in steep sided valleys towards the major/ strategic watercourses (designated Main Rivers) which generally travel in an easterly direction eventually discharging to the River Ouse and Humber.

The major watercourses in the district are:

- The River Aire, which traverses the district from the north-west to south-east and drains approximately two thirds of the district;
- The River Wharfe, which drains an area to the north and east of the district. This drains to the River Ouse, with small areas draining to the River Nidd and direct to the River Ouse, and
- The River Calder, which forms part of the southern boundary of the district and flows from the west to east to join the River Aire at Castleford.

In urban areas, the drainage of the district is facilitated by a sewer system. Urban areas of Leeds were originally served by 'Combined Sewers' (carrying both foul and surface water); however, it has been the policy since the 1950s to ensure that new developments and redevelopments incorporate separate foul and surface water systems. Consequently, a significant part of the city now has separate or partially-separate sewers, with the surface water sewers connected in many cases directly to watercourses.

Many of the combined sewers in the district drain to the Knostrop Waste Water Treatment Works which is located to the south-east of Leeds, adjacent to the River Aire.

### 2.3 SOURCES OF FLOOD RISK

The scope of the LFRMS covers all sources of flooding, but it focuses specifically on 'local flooding'. Flooding that originates from Main Rivers, such as the River Aire, is not categorised as 'local flooding' and risk management responsibility for these watercourses sits principally with the EA.

All flooding in Leeds is of concern to the residents and business of Leeds, as well as Leeds City Council. As such, this strategy promotes a collaborative approach to flood risk management in Leeds between all RMAs, and incorporates specific measures to alleviate Main River flooding, such as Leeds FAS Phase 1 and 2.

For further information on how flood risk from Main Rivers is managed by the EA, please refer to the Leeds SFRA, the Aire and Ouse Catchment Flood Management Plans (CFMP), the Humber RBMP and the EA's National FCERM Strategy for England.

The 5 main sources of flooding in Leeds are outlined below.

- **Main Rivers.** This type of flooding typically occurs when a watercourse cannot cope with the water draining into it from surrounding land. Main Rivers are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance, which are not categorised as 'ordinary watercourses'.
- **Ordinary watercourses.** This type of flooding includes lakes, ponds or other areas of water which flow into an ordinary watercourse (not Main River). It typically occurs when a watercourse cannot cope with the water draining into it from surrounding land.
- **Surface water.** This type of flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground, but lies on or flows over the ground surface instead.
- **Sewers.** This strategy only covers sewer flooding where it is wholly or partially caused by rainwater. This type of flooding occurs when sewers are overwhelmed by heavy rainfall or they become blocked. The chance of flooding depends on the capacity of the local sewer system and amount of rain that falls.
- **Groundwater.** This type of flooding occurs when levels of water in the ground rise above the surface. It is most likely to happen in areas where the ground contains permeable rocks that water can soak into or pass through easily.

## **2.4 FLOODING ISSUES**

### **2.4.1 PREVIOUSLY REPORTED**

Leeds district is susceptible to flooding from a variety of sources and every year this area experiences flooding incidents that affect residential and business properties and city-wide infrastructure. These result from severe weather and from issues with the design and maintenance of the built environment.

A list of significant flood events in the Leeds district are shown below.

- River Aire. Major floods in 1775, 1866 and 1946; minor floods in 2000, 2002 and 2007.
- River Wharfe at Otley in 1935, 1965, 1975, 1982, and a near miss in 2000.
- River Calder at Methley in 1960 (homes up to 13 feet underwater).
- Wyke Beck in 2004, 2005 and 2007 (70 residential properties flooded).
- Wortley Beck in 1946, 2002, 2005 and 2007.
- Highway drainage at Amley Gyratory.
- 14-15 June 2007. 100mm rainfall in 48 hours caused flooding in City, Wortley, Beeston, Pudsey, Swillington, Methley and Guiseley.
- 19-20 June 2007. Intense rainfall caused flooding in city centre, Halton, Pudsey and Methley.

- 25 June 2007. Over 100mm of rainfall in 24 hours flooded more than 250 properties city-wide (Halton, Collingham, Wortley, Rothwell, Mabgates, Meanwood, Kippax et al.)

## 2.4.2 IDENTIFIED SINCE 2011

- 10-11 June 2012. Short duration, high intensity rainfall caused surface water flooding to south east Leeds. Kippax, Austhorpe, Garforth, Swillington, Woodlesford and Whitkirk were impacted most. 11mm of rainfall was recorded on the first day of the flood event.
- 21-23 June 2012. Steady rainfall across this period caused flooding in Allerton Bywater, Seacroft and Gipton, Bardsey, Collingham, Garforth, Wetherby and Woodlesford. 14mm of rainfall was recorded on the first day of the flood event.
- 25-27 October 2013. Several high intensity rainfall events produced surface water flooding at Otley, Yeadon and Guisley. 22mm of rain was recorded on the first day of the flood event.
- 8-10 August 2014. Short duration, high intensity rainfall caused surface water flooding in Allerton Bywater, Garforth and Kippax. An estimated 80mm of rain fell within a 5 hour period on the first day of the event. 102 properties were recorded as internally flooded. It was assessed as a 1 in 200 year return period event.
- 13-16 November 2015. Many high intensity, long duration rainfall resulted in fluvial flooding that was focused at Otley, but also affected areas such as Leeds city centre. An estimated 78mm of rain fell during this period. 73 residential properties were flooded, of which 62 were in Otley.
- 25-29 December 2015. One of the wettest winters on record; rainfall throughout this period was assessed as a 1 in 200 year return period event. The highest recorded levels were experienced on the River Aire, Calder and Wharfe. Flooding from these rivers, as well as other sources, affected homes and businesses, as well as critical and local infrastructure. Property flooding in Leeds district totalled 3368.

It is a responsibility of Risk Management Authorities to collect, record and share flood risk data for Leeds district. In 2017 an assessment of this risk data was carried out in the LCC PFRA Update. It resulted in the identification of a new Flood Risk Area (FRA), which covers much of the Leeds metropolitan district.

## 2.5 FLOOD MITIGATION

The List of Measures, which is provided in Appendix C, comprises the Schemes and Policies implemented by the Council to mitigate flood risk across Leeds. It is a live document that is regularly updated and reviewed ahead of the annual scrutiny board review. It contains more detail than is presented below; such as: project phase, cost and priority for previous, ongoing and future schemes.

### 2.5.1 MEASURES COMPLETED SINCE 2011

An accompanying map for the following table is provided as Appendix E of this report. It shows the location of the schemes completed since 2011.

**Table 1 – LCC schemes completed since 2011**

<b>Scheme</b>	<b>Location</b>	<b>Properties / infrastructure protected</b>	<b>Date completed</b>
Leeds Road (Allerton Bywater) pumping station FAS	Allerton Bywater	Leeds Road	2011
Newton Road property protection and resilience scheme	Newton Road and Potternewton	10	2011
Lower Wortley - property protection and resilience scheme	Lower Wortley	21	2011
Church Lane, Bardsey - property protection and resilience scheme	Bardsey	3	2011
Dean Park Drive, Drighlington - property protection and resilience scheme	Drighlington	8	2011
Barley Hill Recreation Ground	West Garforth	9	2012
Oakdene, Watercourse Improvements	Swillington	1	2013
Lowther Road, Garforth - Culvert Improvements	Garforth	9	2014
Wellhouse Drive FAS	Gledhow	1	2014
Culvert Headwall Repair Scheme	Otley	-	2014
Hawthorn Terrace FAS Phase 1	West Garforth	10	2016
Leeds FAS Phase 1, River Aire	River Aire (City Centre to Upper Catchment)	3000	2017
Glebelands Recreation Ground	Garforth	10	2017
Barley Hill Recreation Ground Phase 2	West Garforth	24	2017
Ramsden Street, Kippax, FAS	Kippax	32	2017

Westfields, Allerton Bywater	Allerton Bywater	40	2018
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**Table 2 – LCC policies completed since 2011**

<b>Policy</b>	<b>Completion date</b>
Undertake SEA for the LFRMS	2012
Publish LFRMS	2014
Publish LFRMS List of Measures	2014
Publish PFRA Update	2017
Publish LFRMS Update	2018
Publish updated LFRMS List of Measures	2018

## 2.5.2 CURRENT MEASURES

**Table 3 – Current LCC schemes**

<b>Scheme</b>	<b>Location</b>	<b>Current phase</b>	<b>Date expected</b>
Leeds FAS Phase 2, River Aire City Centre to Upper Catchment*	River Aire - City Centre to Upper Catchment	Feasibility	2018
Queen Street Culvert*	Allerton Bywater	Design / Construction (on hold)	2018
Hawthorn Terrace FAS Phase 2*	West Garforth	Design / Construction	2019
Killingbeck Meadows FAS*	Halton Moor	Construction	2019
Farnley Wood Beck FAS*	Cottingley	Feasibility	2019
Lin Dyke Catchment Assessment - Upper and Middle catchments*	Garforth and Kippax	Feasibility	2020
Wyke Beck Catchment Assessment*	Communities along Wyke Beck	Feasibility	2020
Wortley Beck FAS*	Wortley Beck	Feasibility	2020



Wharfedale Flooded Communities Study*	Collingham, Linton, Wetherby and Thorp Arch	Feasibility	2020
Lower Mickletown Road Flood Embankment*	Mickletown	Design/ Construction	2021
Otley FAS*	Otley	Feasibility	2021
Barnsdale Road Property Level Protection Scheme*	Allerton Bywater	Design (on hold)	TBC
Potternewton Surface Water FAS†	Potternewton	Pre Outline Business Case	2021
Thorner Beck FAS†	Thorner	Pre Outline Business Case	2022
Victoria Road Surface Water FAS†	Guiseley	Pre Outline Business Case	2022
Sheepscar: evaluate the condition of formal and informal flood defences along the Sheepscar Beck which were recently breached to identify potential remedial works required.†	Sheepscar	TBC	2020
Develop and implement feasibility studies for fluvial flood mitigation to improve the standard of protection along Meanwood Beck, Bagley Beck and Farnley Wood Beck.†	Meanwood Beck, Bagley Beck and Farnley Wood Beck	TBC	2020
Improvements to surface water drainage outfalls†	City wide	Ongoing	NA
LCC Significant Maintenance†	Across the District	Ongoing	NA

\* Features on the EA 6-year programme

† Featured on the LCC pipeline programme

**Table 4 – Current LCC policies**

Policy	Frequency
Provide regular feedback to senior officers and elected members on FRM progress, working groups, and strategies such as: <ul style="list-style-type: none"> <li>- Director of City Development (quarterly);</li> <li>- City Development (annually);</li> <li>- City Development Scrutiny Board (annually), and</li> <li>- All Area Committees (two-yearly).</li> </ul>	6 Monthly
Review Council Policy on FRM e.g. 'Maintaining Water Resources and Responding to Flood Incidents' approved by Exec Board on 17 May 2006 to ensure that it conforms to the requirements of the FWMA that Local authorities should lead on the management of local flood risk, with the support of the relevant organisations.	6 Monthly
Review and update Emergency Handbook, Generic Flooding Plan, Community Flood Action Plans, West Yorkshire Major Flood Incident Plan, Reservoir Emergency Plan.	Annually
Review LFRMS List of Measures	Annually
Maintain internet and intranet web pages to provide comprehensive information to all stakeholders on: <ul style="list-style-type: none"> <li>- The sources of flooding and who is responsible for what;</li> <li>- How to prepare for flooding emergencies;</li> <li>- What to do when flooding occurs and who to report this to, and</li> <li>- How flood risk is treated within the planning process.</li> </ul>	Annually
Develop register of structures and features which are likely to have a significant effect on flood risk.	Continual
Identify locations where culverts can be removed or improved through redevelopment.	Continual
Watercourse and beck condition surveys.	Continual
Improve communications, engagement and coordination of activities with internal and external partners (including RMAs).	Continual
Investigate opportunities to reduce carbon from pump operations.	Continual
Implement SuDS through Planning.	Continual
Engagement and communication with public on FRM issues; such as: <ul style="list-style-type: none"> <li>- Targeted 'flood fairs' held in at-risk locations highlighting flood protection products;</li> <li>- Wider public information campaigns for at-risk households drawing attention to useful resources, and</li> <li>- Engagement with local flood action groups (EA and RET).</li> </ul>	Continual
Leeds City Council to increase their flood risk management capacity, knowledge and skills (as LLFA) in order to deliver their new responsibilities as conferred under the FWMA 2010.	Continual
Significantly increase the percentage take-up of properties registered for flood warnings in flood warning areas across city. City wide campaign as current take-up is low.	Continual
Promote the use of sustainable design principles in all future developments to ensure that the risk of flooding and climate change are fully taken into account e.g.	Continual

<ul style="list-style-type: none"><li>- Promoting use of SuDS;</li><li>- Incorporating policies and recommendations within Leeds LDF;</li><li>- Developer contributions in Core Strategy;</li><li>- Biodiversity and local amenity, and</li><li>- Climate Change Adaptation.</li></ul>	
Review of SFRA produced by Jacobs in October 2007; assess the need for a Level 2 SFRA to be undertaken.	Continual

## 3 DUTIES OF RISK MANAGEMENT AUTHORITIES

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### 3.1 INTRODUCTION

Flood risk in the district is managed the Risk Management Authorities (RMAs), which are defined in the FWMA. For Leeds district, these are identified as:

- Leeds City Council, as the LLFA;
- Leeds City Council, as Highway Authority;
- Yorkshire Water Services Limited (YWS), as the Water and Sewerage Company (WaSC);
- Environment Agency, who have responsibility for managing flood risk for Main Rivers;
- Highways England (previously Highways Agency), who have responsibility for motorways and major trunk roads, and
- Ainsty IDB, the Internal Drainage Board (IDB).

As RMAs each of the above authorities has specific responsibilities in relation to FCERM and must also coordinate their activities with each other. In preparation of the LFRMS, a limited consultation of RMAs was undertaken. The key responsibilities of each of the above authorities are outlined in the following sub-section.

### 3.2 LEEDS CITY COUNCIL

Leeds City Council's principal responsibilities as LLFA under the FWMA and FRR are summarised below. The following responsibilities supplement any existing duties under the Land Drainage Act 1991.

- Local Flood Risk Management Strategy. Develop, maintain, apply and monitor a strategy for managing local flood risk in the Leeds Metropolitan District.
- Preliminary Flood Risk Assessment. Report on historic, current and future understanding of flood risk for the Leeds district; review and consider changes to FRAs. An update is required every six years, with the last update submitted to the EA on 22nd June 2017.
- Co-operation & Arrangements. Co-operate with other RMAs in exercising their flood risk management functions under both the FWMA and the FRR.
- Power to Request Information. Request a person to provide information in connection with the authority's risk management functions.
- Duty to Maintain a Register. Establish and maintain a register of structures and features, including ownership, which are believed to have a significant effect on a local flood risk.
- Flood Risk Management Works under general powers. Undertake works to manage flood risk from surface runoff, groundwater and ordinary watercourses (all works must be consistent with the LFRMS).
- Flooding Investigations. Investigate flooding incidents in the district, to the extent that it is considered necessary or appropriate, and in cooperation with other RMAs where appropriate.
- Sustainable Development. Contribute towards sustainable development through flood risk management activities.
- Incidental Flooding. Plan, erect, maintain, alter or remove buildings or other structures (including those used for flood defence purposes) in a way that will or may cause: flooding, an increase in the amount of water below ground, or coastal erosion.

- Designation of Features. Powers to designate a structure or a natural or manmade feature that is considered to influence flood risk in order to prevent the alteration or removal of the structure or feature without consent.
- Sustainable Drainage. Approve drainage schemes (in line with non-statutory standards) and ensure they are appropriately maintained. Ensure decisions on planning applications relating to major developments (10 dwellings, or equivalent non-residential developments) have SuDS in place, unless demonstrated to be inappropriate.

### 3.3 ENVIRONMENT AGENCY

The EA is an executive, non-departmental public body responsible to the Secretary of State for Environment, Food and Rural Affairs. Its principal aims are to protect and improve the environment, and to promote sustainable development. The EA take lead responsibility for risk-based management of flooding from Main Rivers and the sea and regulation of the safety of reservoirs with a storage capacity greater than 25,000m<sup>3</sup>. The FWMA proposed an amendment to the Reservoirs Act to target a reduction in the capacity at which reservoirs should be regulated from 25,000m<sup>3</sup> to 10,000m<sup>3</sup>; however, this reduction is yet to be confirmed at the time of writing.

The following roles and responsibilities are set out for the body within the FWMA:

- Development of a National Strategy for FCERM to cover all forms of flooding.
- The conversion of Regional Flood Defence Committees into Regional Flood and Coastal Committees with a new remit to include coastal erosion issues.
- Powers to request information from any person in connection with the Environment Agency's Flood and Coastal Erosion Risk Management functions.
- Power to designate structures and features that affect flooding or coastal erosion.
- Powers to cause flooding and erosion for nature conservation and cultural heritage reasons, and people's enjoyment of these assets.
- A duty to consider FCERM in carrying out other work that may affect FCERM.
- A duty to consider the LFRMS.
- A duty to report to Ministers about FCERM, including application of the national strategies for England and Wales.
- Act as a statutory consultee to the SuDS approving body on sustainable drainage that impacts water quality or strategic flood risk.

The EA published National Strategy for FCERM in 2011. It sets out a national framework for managing the risk of flooding and coastal erosion and describes the roles and responsibilities of management authorities and communities. It has a significant impact upon LLFAs, as it communicates their duties under the FWMA.

Due to government commitments in its 25 year Environment Plan, the EA will revise the 2011 strategy in 2019. At the time of writing, workgroup consultation is taking place to consider the ambition for flood and coastal erosion risk management in 2050. The strategy will include:

- An overview of flood and coastal erosion risk in England.
- A long-term, strategic ambition for managing flood and coastal erosion risk in England.
- The high-level measures proposed to achieve that ambition.
- The contribution these will make towards the government's wider environmental objectives.
- How and when the strategy will be reviewed.

Formal consultation on National FCERM Strategy 2050 will take place in 2019. At this time LLFAs will have the opportunity to comment upon FCERM, as well as any changes in their roles and responsibilities.

### 3.4 YORKSHIRE WATER SERVICES LIMITED

YWS is the sole WaSC operating in the Leeds district. As a provider of water infrastructure services, the company have existing responsibilities in relation to FCERM in the Leeds district, which were supplemented by the FWMA. The following responsibilities were provided by YWS in the previous iteration of the LFRMS:

- Where appropriate assist the LLFAs in meeting their duties in line with the National FCERM Strategy for England and guidance.
- Where appropriate assist the LLFAs in meeting their duties in line with local strategies in its area.
- Where appropriate share information and data with RMAs, relevant to their flood risk management functions.
- A duty to effectually drain their area, in accordance with Section 94 of the Water Industry Act 1991.
- A duty to register all reservoirs with a capacity greater than 10,000m<sup>3</sup> with the Environment Agency.
- Agreement with Ofwat to maintain a register of properties at risk from hydraulic overloading in the public sewerage system (DG5 register).
- Appropriate management of surface water in combined systems.
- Encourage the use of SuDS.
- Create a detailed understanding of flood risk from the public sewer system.
- Explore and implement multi benefit/agency schemes.

The following priorities were provided for West Yorkshire:

- Appropriate management of surface water from the combined sewer system.
- Encourage the use of SuDS.
- Where appropriate share information and data with RMAs.
- Create a detailed understanding of flood risk from the public sewer system.
- Explore and implement multi-agency and multi-benefit schemes to resolve issues within the company's appointed business.

### 3.5 AINSTY INTERNAL DRAINAGE BOARD

Ainsty IDB are the sole IDB operating in the Leeds district and cover only a very small percentage of Leeds district (in the Wetherby area) and, as such, its role is limited. Under the FWMA, Ainsty IDB have new duties and responsibilities supplementing their existing powers. Their key powers and responsibilities are:

- Power to designate structures and features that affect flooding or coastal erosion.
- Power to cause flooding and erosion for nature conservation and cultural heritage reasons, and people's enjoyment of these assets.
- A duty to exercise their functions in a manner consistent with local and national strategies.

- A duty to be subject to scrutiny from the LLFA's democratic processes.
- The ability to work in consortia with other IDBs.
- Statutory consultee to the SuDS approving body on sustainable drainage that impacts land drainage.
- Power to do works on ordinary watercourses flooding within their boundary.

### **3.6 HIGHWAYS ENGLAND**

As a highway authority, Highways England manage major trunk roads and motorways in the Leeds district including the M621, M62, M1 & A1. Their responsibilities in relation to flood risk management are listed below.

- Provide and manage highway drainage and roadside ditches under the Highways Act 1980.
- A duty to exercise their functions in a manner consistent with local and national strategies.

### **3.7 OTHER RISK MANAGEMENT AUTHORITIES**

Other authorities and stakeholders, with no designated role under the FWMA, also have a key responsibility for flood risk management in their own areas of discipline; as listed below.

- Network Rail.
- Canal and River Trust.
- Met Office.
- Natural England.
- English Heritage.
- Association of British Insurers.
- Local flood partnerships, forums and community groups.

It is expected that these authorities will undertake their activities in a manner that is consistent with this strategy.

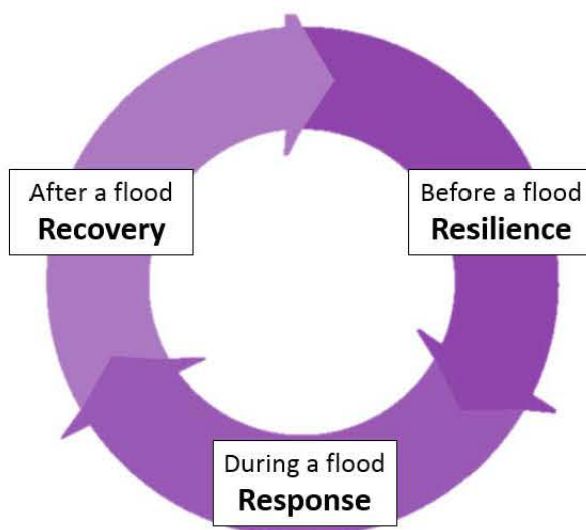
## 4 LOCAL FLOOD RISK MANAGEMENT

### 4.1 INTRODUCTION

The management of flooding in Leeds district is the responsibility of the principal RMAs listed in Section 3 of this strategy. A list of the key local flood risk management contacts at each of the RMAs are included in Appendix D of this strategy.

Management of flooding is a collaborative effort between RMAs, but the key activities and responsibilities involved can be separated into 3 stages: before, during and after a flood, as shown in Figure 1. These 3 stages (Resilience, Response, Recovery), align with the three 'P's (Prevention, Protection and Preparedness); as defined in the EA's flood resilience guidance.

**Figure 1 – Management activities before, during and after a flood event**



Resilience	The phase before a flood involves activities to reduce but not necessarily eliminate the likelihood of flooding. For example, this can include capital schemes, asset maintenance, flood warning, preparedness, planning and strategies.
Response	The phase during a flood, which involves activities and responsibilities in coordinating an emergency. For example, this includes the mobilisation of emergency services, rapid response, evacuation and sand bagging.
Recovery	The phase after a flood involves activities and responsibilities to reinstate conditions prior to a flood emergency. For example, this includes the reconstruction of physical infrastructure and restoration of social, economic, physical and emotional well-being.

The flood risk management activities detailed above are implemented through a programme of measures developed by the Council. This list of measures comprises policies and schemes that aim to address flooding across Leeds district.



## 4.2 PRIORITISATION OF MEASURES

Measures have been prioritised following the approach set out in the previous iteration of this strategy. Prioritisation is based upon local knowledge of flood risk in Leeds held by the Council and its partner organisations. A priority has been assigned to each measure, which relates to the timescale in which the measures are delivered, reviewed, or where necessary, both.

- High (1-2 years),
- Medium (2-5 years), i.e. within the lifetime of the strategy, and
- Low priority (>5 years, to be carried forward for review in the next strategy).

Prioritisation for the previous strategy took place for the 2012 to 2018 LFRMS review cycle, whilst the LFRMS report was published in 2014. All measures prioritised for delivery during this period have been updated for the current 2018 to 2024 cycle.

Additional measures have been identified during the lifetime of the previous strategy, which reflects a change in the understanding of flooding in Leeds district. The Council's PFRA Update, published in June 2017, describes the evidence of flooding that led to this change, which is largely associated with the winter floods of 2015-16.

As part of the annual LCC Medium Term Plan (MTP) refresh process and the annual LCC Scrutiny update, LCC FRM undertake a prioritisation exercise using the latest understanding of flooding according to modelling and incident data available.

A completed list of measures is provided in Appendix C.

## 4.3 FUNDING

A limited amount of funding is available to progress items on the 'List of Measures' provided in Appendix C. Funding comes from a number of different sources, with the largest proportion being received from central government.

A summary of the funding sources available is provided in Table 6.

**Table 6 – Potential funding sources for flood risk management activities**

<b>Source of funding</b>	<b>Description</b>	<b>Administered by</b>	<b>Appropriate for</b>
FCERM Grant-in-Aid (FCERM GiA)	Central government funding for flood (and coastal) defence projects with a budget of £2.6 billion over 6 years). It encourages a partnership approach to maximise match-funding and work towards achieving specified outcomes with a requirement to evidence a reduction in flood risk to properties.	Environment Agency	Medium to large capital FRM projects.
Local Levy	Annual contributions from councils to a regional 'pot'. It is smaller than the FCERM GiA budget but offers more flexibility on the type and size of project it can fund.	Environment Agency	Smaller FRM projects, or as a contribution to FCERM GiA projects.
Private contributions	Voluntary, but funding from beneficiaries of projects could make contributions from national funding viable.	Leeds City Council	All projects.
Water company investment	Investment is heavily regulated by Ofwat, but there are opportunities for contributions to area-wide projects which help to address sewer under-capacity problems.	Yorkshire Water Services Limited	Projects that help to remove surface water from combined sewers.
Section 106 contributions (Town and Country Planning Act)	Contributions from developers linked to specific development sites, where off-site improvements to drainage infrastructure are required to make the developers proposals acceptable	Leeds City Council	Larger development sites.
Community Infrastructure Levy (CIL)	A local levy applied by the Planning Authority on developers to contribute to a general infrastructure fund. A bid for CIL must be made for flood management or drainage improvements against other competing council priorities.	Leeds City Council	All measures outlined in this strategy.
Committed Sum	Where a developer, as part of their proposals, construct works for flood alleviation. These can be separate schemes, part of a larger scheme or contributions in kind i.e. land	Leeds City Council	Development.

Council tax	A ring-fenced provision within the annual council tax for the specific purpose of contributing to FRM.	Leeds City Council	Not current, but there is potential to deliver key measures in this strategy.
Business rates supplements	Agreement from local businesses to raise rates for specified purposes.	Leeds City Council	Measures that address flood risk to businesses.
Council capital funding	The council's infrastructure programme, which prioritises capital improvement projects. The programme has included funding for drainage capacity improvements for many years, which is targeted at the highway drainage systems.	Leeds City Council	Measures which are small to medium capital projects.
Council revenue funding	The Council has a number of revenue streams to support technical and admin processes and to maintain council infrastructure.  Existing revenue budgets include highway drainage maintenance, watercourse maintenance and funding for the Flood Management Team discharging the LLFA duty for the council.	Leeds City Council	Measures requiring officer time and/or maintenance activity.
Leeds City Region Enterprise Partnership (LEP)	A business-lead partnership between local authorities, businesses and, in some cases, representatives from academic institutions.  The LEP works closely with the West Yorkshire Combined Authority to deliver a shared Strategic Economic Plan for Leeds City Region in West Yorkshire.	LEP	Seeks partnership to strategically drive economic growth; jobs and skills; inward investment; infrastructure; and business growth.
West Yorkshire Combined Authority (WYCA)	Established in April 2014 as an authority with powers over transport, economic development and regeneration for five local authorities.  Is the body responsible for delivering large-scale infrastructure projects in Leeds City Region.  Works closely with the Leeds City Region Enterprise Partnership (LEP) to deliver a shared Strategic Economic Plan for Leeds City Region in West Yorkshire.	WYCA	Works with the LEP and other local partners to ensure our region has the right transport, housing and environment to meet the needs of businesses and our economy.

Local Growth Deal	WYCA and the LEP secured £1 billion Local Growth Deal for Leeds City Region to deliver their shared Strategic Economic Plan.	WYCA / LEP	-
LEP Growing Places Fund	£35.5m was provided to the LEP by Government in 2012. Provides loan funding to kick-start stalled development or infrastructure projects that will create homes, jobs and other economic benefits in Leeds City Region.	LEP	Support for projects including site access and clearance, broadband and transport infrastructure, utilities, refurbishment of buildings and flood defence barriers.
European Structural and Investment Funds (ESIF)	The ESIF programme is funded through European Regional Development Fund (ERDF), European Social Fund (ESF) and European Agricultural Fund for Rural Development (EAFRD).  Match funding of 50% of project costs is required.  Activity is delivered locally through the Leeds City Region Local Enterprise Partnership (LEP). £308 million programme launched by the LEP in 2014.	LEP	A focus on smart, sustainable and inclusive growth.
Heritage Lottery Fund (HLF)	£19.7m of National Lottery funding since 2017 to improve understanding and management of water landscapes. £2-3 million per scheme.  Landscape Partnership schemes work with local, regional and national partners to promote a catchment approach to water management by engaging people, communities and landowners to improve water management in the long term.	HLF	Schemes awarded funding focus on using nature and heritage to provide opportunities for communities within post-industrial landscapes, from new skills training and educational opportunities, to boosting tourism and local business promoting heritage-led regeneration.
HS2	Has changed the face of development in the area; facilitates flood scheme development that will be managed by the LLFA after HS2 development.	-	-

## 4.4 CLIMATE CHANGE ADAPTATION

### 4.4.1 INTRODUCTION

A key factor impacting on the ability of RMAs to manage local flood risk is climate change. There is clear scientific evidence that global climate change is happening now. The effects of climate change

can be seen in the UK and around the world. UK temperatures and sea levels, including those of British coastal waters, have risen over the past three decades. There has also been a documented global increase in the frequency of extreme weather events such as floods, droughts and tropical storms. It is predicted that these extreme weather events will become more severe during coming decades.

In light of this, it is imperative that the effects of more extreme flooding in the Leeds district are mitigated against and that plans and schemes are developed to better manage and adapt to any increased risk of local flooding. This affects the functions of all RMAs and all council departments.

#### 4.4.2 LEEDS CLIMATE COMMISSION

The Leeds Climate Commission was established in 2017 to influence positive choices on issues relating to energy, carbon, weather and climate. It is a collaborative effort between organisations and actors from across the city and from the public, private and third sectors.

A strategy group leads the commission, which is chaired by Professor Andy Gouldson (University of Leeds), with the vice chair from Leeds City Council (Councillor James Lewis).

The purpose of the Leeds Climate Commission is to:

- Promote leadership in the city on climate change, encouraging stakeholders to take effective action now, while maintaining a long-term perspective;
- Provide authoritative independent advice on the most effective steps required to meet the city's carbon reduction target so as to inform policies and actions of local stakeholders and decision makers;
- Monitor progress towards meeting the city's carbon targets and recommend actions to keep on track;
- Advise on the assessment of the climate-related risks and adaptation opportunities in the city and on progress towards climate resilience;
- Bring together major organisations and key groups in Leeds to collaborate on projects that result in measurable contributions towards meeting the city's climate reduction target and also to deliver enhanced climate resilience, particularly in the area of flood risk;
- Promote best practice in public engagement on climate change and its impacts in order to support robust decision-making;
- Act as a forum where organisations can exchange ideas, research findings, information and best practice on carbon reduction and climate resilience.

The Leeds Climate Commission's Implementation Plan provides an ongoing update on progress with these areas of activity which are summarised in monthly bulletins and newsletters. Additional information on the commission, including the implementation of their plans can be found on the Can-do Cities website ([www.leeds.candocities.org](http://www.leeds.candocities.org)).

#### 4.4.3 YORKSHIRE INTEGRATED CATCHMENT SOLUTIONS PROGRAMME

Yorkshire Integrated Catchment Solutions Programme (iCASP) is an ambitious and exciting programme to generate benefits for Yorkshire by applying environmental science to catchment challenges.

The iCASP programme looks to support and undertake projects that translate existing environmental science so that it can be used to further integrated catchment management. These projects focus on:

- Promoting the resilience of the region's cities;
- Mitigating drought and flood risk in the context of climate change;
- Improving the delivery of flood forecasts;
- Developing approaches to improve ecological and chemical status of surface and groundwaters, and water quality entering treatment works;
- Enhancing carbon sequestration in soils and woodlands, and
- Supporting sustainable agriculture.

iCASP's first project helped organisations in Yorkshire to prepare in advance for the publication of new UK climate change projections due for release in November 2018 (known as UKCP18).

In collaboration with the UK Met Office, which is responsible for producing the projections, the iCASP project has been giving organisations including Leeds City Council an opportunity to rehearse ways of using the updated information in their operations and strategies; including for surface water flood risk management<sup>1</sup>.

The project was selected as a demonstrator by the Met Office, to be made available nationally as part of the release guidance material<sup>2</sup>. iCASP will continue this support following the release of UKCP18 by organising a regional forum in 2019. This will be a one day event in designed for organisations who need to use UK climate projections for resilience planning, including flood risk management.

## 4.5 SUSTAINABLE DEVELOPMENT

Defined by the United Nations (Brundtland Commission, 1987), sustainable development is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. The promotion of sustainable development is a key part of climate change adaptation and will help mitigate against any increase in flood risk arising as a result of climate change.

A number of principle ways in which local flood risk management can contribute to sustainable development are identified below.

- Working with natural processes to reduce flood risk e.g. by restoring the natural capacities of soil and vegetation to intercept rainfall.
- Promoting greater use of SuDS.
- Developing flood resilient infrastructure and buildings which perform satisfactorily without suffering permanent loss of functionality during extreme flood events.
- Developing flood defences that are adaptable and flexible and take account of the projected longer-term impacts of climate change.
- Sustainable procurement of energy supplies and materials to reduce the impact on the wider environment.

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<sup>1</sup> <https://icasp.org.uk/resources/uk-climate-projections/>

<sup>2</sup> <https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/uoecicasp.v2.pdf>

- Carbon counting and offsetting with the aim of decreasing greenhouse gas emissions.
- Improving engagement with local communities to ensure that people affected by flooding are empowered to take appropriate actions to reduce flood risk.
- Improving health and wellbeing of communities through environmental improvement and a reduction in flood risk.
- Developing the knowledge, skills and awareness to improve our understanding of flood risk and the effects of climate change.
- Supporting flood response and recovery through better management of the risk of flooding to people, property, the economy and the environment.
- Benchmarking good environmental performance using environmental performance tools such as the Building Research Establishment Environmental Assessment Method (BREEAM) and the Civil Engineering Environmental Quality Assessment and Awards Scheme (CEEQUAL).

The methods and approaches identified above have been embodied in the local flood risk management objectives listed in Section 5 of this strategy and are drawn out more specifically via the measures included in the 'List of Measures' in Appendix C.

## 4.6 SUSTAINABLE DRAINAGE SYSTEMS

LCC's policy for SuDS has been adopted through Core Strategy Policy EN5 and Natural Resources and Waste Local Plan Water Policy 7. In addition to this LCC have developed and adopted 'SuDS Supplementary Guidance Note 22' for new developments. In summary, this guidance:

- Explains how drainage concepts are considered when new developments are being planned, and states that LCC 'will seek to incorporate sustainable drainage systems for significant developments and will encourage sustainable drainage systems for all other developments', and
- Outlines the requirements for an Indicative Drainage Strategy that should accompany outline planning applications; for significant developments a Drainage Impact Statement will also be required.

An update to Water 7 Policy in 2019 may provide an opportunity to update this guidance note to include:

- Specific guidance on where sustainable development would work in Leeds, and
- Increase in runoff reduction requirements for the development major brownfield sites.

It should be noted that this guidance note is limited by the National Planning Policy Framework, which indicates that the planning authority can only require sustainable drainage where practicable.

In 2017 an update of the 'Leeds City Council Minimum Drainage Considerations for Development Control' was carried out to reflect the most recent climate change allowances provided by the Environment Agency.

LCC's Flood Risk Management team is preparing a SuDS Adoption Guide in collaboration with Wakefield Metropolitan District Council, which will be used to provide clarity over ownership and maintenance of SuDS.

## 4.7 ENGAGEMENT WITH PARTNERS

### 4.7.1 COMMUNICATION

A stakeholder communication and engagement plan was devised as part of the 2011 LFRMS. It is a key aspect of the strategy for flood risk management. It is important that there is effective communication between all stakeholders particularly between the LLFA and other RMAs in responding to flood events, and the public, to raise awareness and involve local communities in decision making. It has been successful in the previous review cycle; therefore, the following activities of this plan will be continued in the next review cycle:

1. Develop.  
Develop the LFRMS and provide ongoing opportunity for input from stakeholders.
2. Review.  
Review draft LFRMS (particularly objectives for managing local flood risk and 'List of Measures') with all interested/affected parties.
3. Scrutiny.  
Review of LFRMS by Scrutiny Committee.
4. Publish.  
Publish LFRMS and a summary with guidance on the availability of further information.
5. Future.  
Plan and agree future activities and schedule next review of 'List of Measures'.

In producing the LFRMS the council have consulted internally, with other RMAs that may be affected by the strategy, the public and also other LLFAs to ensure that the LFRMS is consistent with the catchment 'cell' approach set out in the National FCERM Strategy for England.

A review of the LFRMS and the List of Measures takes place annually. Remarks from the committee are included in the LCC governance comments provided in ~~Appendix G~~.

### 4.7.2 RESPONSE AND RECOVERY

LCC takes a lead role in planning for severe weather through the Resilience and Emergencies Team (RET), both across the Council and as part of the West Yorkshire Resilience Forum with partners including the emergency services and the NHS.

In the event of flooding, RET deploys the Leeds City Council Flood Plan, which outlines the roles and responsibilities of multi-disciplinary teams based on the level of severity. The plan was published in December 2017 and tested in March 2018 as Exercise Titan.

The plan takes the user through initial triggers, leading into a series of service specific checklists that cover the stages of flooding expected (standby), flooding occurring (response) and flooding subsides (recovery). It describes the mechanism by which the RMAs work together to manage flooding during an incident.



## 5 OBJECTIVES FOR MANAGING LOCAL FLOOD RISK

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To manage flood risk effectively, six high-level objectives have been created to provide a strategic context and steer the flood risk management activities undertaken by all RMAs. These objectives embody the six high-level guiding principles in the EA's National FCERM Strategy for England listed in Section 2. All RMAs should have regard to these objectives when undertaking their flood risk management activities. Measures for local flood risk management, based on these objectives, are outlined in the 'List of Measures' in Section 6 and presented in Appendix C of this strategy.

1. Improve procedural cooperation between LLFA and other RMAs to meet the requirements of new legislation and achieve catchment-wide solutions to identified risks and problems, such as emergency planning.
2. Promote sustainable flood risk management through WFD compliance, climate change adaptation, land management, habitat protection and creation.
3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management; such as land allocation and SuDS.
4. Increase internal skills and the capacity for flood risk management.
5. Increase community awareness of flood risk, and the work of the LLFA in managing this risk. Engage with local communities and involve them in decision making.
6. Improve the understanding of local flood risk and seek to decrease this risk through the implementation of affordable, high quality measures to alleviate flooding, where it is practicable.

## 6 LIST OF MEASURES

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A List of Measures has been developed for the LFRMS which is based upon the six objectives for managing local flood risk listed in Section 5. The List of Measures sets out a broad range of schemes, actions, initiatives, plans and strategies for managing local flood risk in the Leeds district. Some of the measures are localised and relate to a very specific part of the district, whereas other measures are higher level district wide proposals. Where appropriate each measure has been assigned a priority ranking (high, medium, low) based on the expected timescale to implement the measure, the associated costs and benefits of the measure have also been assigned where available.

The Action Plans for the Leeds Policy Units contained in the River Aire and Ouse CFMPs have been reviewed and the relevant actions incorporated within the LFRMS 'List of Measures'.

The 'List of Measures' is designed to be a 'living document' which will be monitored and updated on a regular basis when measures are completed or new ones added and is found in Appendix C of this strategy. The 'List of Measures' form the basis of the Council's MTP.

The List of Measures has been split into the four categories outlined below.

- **Flood awareness, response and recovery** – this includes initiatives to improve engagement with internal and external partners, raise awareness of the LFRMS, involve local communities in decision making, improve cooperation between RMAs and plans for emergency response and recovery.
- **Spatial planning and development control** – this includes implementation of SuDS and promoting sustainability and climate change adaptation in future developments.
- **Studies, schemes, assessments and plans** – this includes investigating flooding incidents, assessing flood risk and developing and promoting schemes to alleviate flood risk.
- **Asset management and maintenance** – this includes developing a register for recording flood risk assets, planning routine inspection and maintenance of assets and undertaking asset maintenance works.

## 7 REVIEWING AND MONITORING THE STRATEGY

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It is expected that this strategy will be reviewed once every six years, which will link the LFRMS review with the cycle for reviewing the PFRA, as outlined in the FRR. As such, the third review of the LFRMS is expected to be completed by December 2024.

In order to monitor the implementation of the LFRMS in the last review cycle, eight monitoring indicators were used. These indicators were identified as part of the SEA process, and are listed below:

1. The number of measures in the 'List of Measures' which have been completed?
2. Are there active measures in the 'List of Measures' which cover each of the six 'Objectives for managing flood risk'?
3. Improving engagement on flood risk - How many public engagement events have taken place? School events, flood fairs, flood action group meetings.
4. The number of new developments where SuDS have been installed? Include SuDS, green corridors, rainwater harvesting, green roofs, land management (tree planting).
5. Are property level flood protection (PLP) schemes reducing flood risk – Number of properties where PLP schemes have been installed and operated successfully in a flood event?
6. Number of Leeds City Council staff engaged in flood risk management activities?
7. Reliability of public transport – Number of Metro bus and train routes disrupted by flooding/drainage problems?
8. Is the LFRMS consistent with the plans and actions of partner organisations? Review and incorporate relevant actions from the Aire and Ouse CFMPs in the 'List of Measures'?

These indicators are still relevant to the Council, and are considered during the planning and development processes for managing flood risk; however, due to the difficulty in obtaining reliable and representative data, there has been limited reporting of this information so far. The questions remain appended to the List of Measures found in Appendix C, for use in the 2018 to 2024 LFRMS cycle.

Leeds City Council monitor their performance of meeting the objectives of managing flood risk through a number of forums and planning process, which include:

- Monthly Flood Risk Management Performance Monitoring report that tracks progress against annually set performance indicators. It also tracks an assessment of corporate risks;
- Annual and monthly progress reviews against the EA's MTP;
- Annual and monthly reporting of Corporate Performance using numbers of commercial and residential receptors better protected from flooding, and
- Annual review of progress undertaken by the Council's Scrutiny Board (Sustainable Economy and Culture). As set out in the previous strategy, performance is indicated by assessing the progress of Schemes and Policies that comprise the List of Measures provided in Appendix C.

Additionally, the Council's progress toward flood risk management objectives is monitored quarterly through a number of board meetings with partners; such as the Leeds Flood Resilience (LFR) Programme Board.

The LFR Programme Board is responsible for providing a strategic overview of flood resilience in Leeds, and where necessary, approvals and decision making that may affect Programme process and delivery. In addition, they will link to and create opportunities for catchment wide collaboration

and working, and develop ambitious integrated schemes. The board includes the Environment Agency, Yorkshire Water as well as LCC team representatives covering: Flood Risk, Development, Highways and Transport, Planning, Asset Management and Regeneration, Communities, Strategy and Policy, Resources and Housing, Regeneration, Civil Engineering, Communications, Parks and Countryside.

LCC has expanded the capital programme to increase delivery capacity within LCC FRM and the Civil Engineering Major Project Flood Programme team. This includes a new governance structure including the Infrastructure & Investment Group which has supported evidence and mapping based prioritisation of future schemes.

## 8 RELEVANT GUIDANCE AND INFORMATION

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- Framework to assist the development of the Local Strategy for Flood Risk Management, 'A Living Document', 2nd Edition, Local Government Association, November 2011.
- National Flood and Coastal Erosion Risk Management Strategy for England, EA and Defra, July 2011.
- Flood and Water Management Act (FWMA), Her Majesty's Stationery Office, 2010.
- Flood Risk Regulations (FRR), Her Majesty's Stationery Office, 2009.
- Water Framework Directive (WFD), European Parliament, 2010.
- Preliminary Flood Risk Assessment (PFRA), Leeds City Council, September 2011.
- Strategic Flood Risk Assessment (SFRA), Leeds City Council, October 2007.
- Environmental Assessment of Plans and Programmes Regulations, Her Majesty's Stationery Office, 2004.
- National Planning Policy Framework (NPPF), Ministry of Housing, Communities & Local Government, March 2012.
- Planning Practice Guidance: Flood risk and coastal change, Ministry of Housing, Communities & Local Government, March 2014.
- Aire Catchment Flood Management Plan (CFMP), Environment Agency, July 2010.
- Ouse Catchment Flood Management Plan (CFMP), Environment Agency, July 2010.
- Guidance for Risk Management Authorities on sustainable development in relation to their flood and coastal erosion risk management functions, Defra, October 2011.
- Natural Resources and Waste Local Plan, Leeds Local Development Framework, Leeds City Council, January 2013.
- Core Strategy, Leeds Local Development Framework, Leeds City Council, November 2014.
- Water Environment (Water Framework) Regulations, Her Majesty's Stationery Office, 2017.
- European Union Withdrawal Act, Her Majesty's Stationery Office, 2018.
- Preliminary Flood Risk Assessment (PFRA) Update, Leeds City Council, June 2017.
- The National Planning Policy Framework and relevant planning practice guidance, Ministry of Housing, Communities & Local Government, Nov 2016.
- Humber River Basin District Management Plan (RBMP), Environment Agency, February 2016 (Updated June 2018).
- Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities, Environment Agency, September 2011 (Updated April 2016).
- Supplementary Guidance No. 22 'Sustainable Drainage In Leeds', Leeds City Council, 2004.
- Multi-agency Flood Plan Review, Defra, June 2018.

## 9 GLOSSARY

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Groundwater flooding	This occurs when levels of water in the ground rise above the surface. It is most likely to happen in areas where the ground contains aquifers. These are permeable rocks that water can soak into or pass through easily.
Local flood risk	Refers to flood risk from surface runoff, groundwater, sewer flooding (attributable to rainwater) and ordinary watercourses - this includes lakes, ponds or other areas of water which flow into an ordinary watercourse.
Main river	These are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance. The EA have primary responsibility for managing flood risk from these watercourses.
Ordinary watercourse flooding	This occurs when a watercourse cannot cope with the water draining into it from surrounding land. This includes lakes, ponds or other areas of water which flow into an ordinary watercourse.
Sewer flooding	This occurs when sewers are overwhelmed by heavy rainfall or when they become blocked. The chance of flooding depends on the capacity of the local sewer system and amount of rain that falls.
Surface water flooding	This occurs when rainwater does not drain away through the normal drainage system or soak into the ground, but lies on or flows over the ground surface instead.

## 10 ABBREVIATIONS

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AOD	Above Ordnance Datum
BREEAM	Building Research Establishment Environmental Assessment Method
CEEQUAL	Civil Engineering Environmental Quality Assessment and Awards Scheme
CFMP	Catchment Flood Management Plan
CIL	Community Infrastructure Levy
Defra	Department for Environment, Food and Rural Affairs
DG5	Director General 5 (Register)
EA	Environment Agency
ESIF	European Structural and Investment Funds
EU	European Union
FAS	Flood Alleviation Scheme
FCERM	Flood and Coastal Erosion Risk Management
FCERM GiA	Flood and Coastal Risk Management Grant in Aid
FRA	Flood Risk Area
FRMP	Flood Risk Management Plan
FRR	Flood Risk Regulations (2009)
FWMA	Flood and Water Management Act (2010)
HMSO	Her Majesty's Stationery Office
iCASP	Yorkshire Integrated Catchment Solutions Programme
IDB	Internal Drainage Board
LFRMS	Local Flood Risk Management Strategy
LGA	Local Government Association
LLFA	Lead Local Flood Authority
MAFP	Multi-Agency Flood Plan
MHCLG	Ministry of Housing, Communities and Local Government
MTP	Medium Term Plan
Ofwat	Office of Water Regulation
PFRA	Preliminary Flood Risk Assessment
PLP	Property Level Flood Protection
RBMP	River Basin Management Plan
RET	Resilience and Emergencies Team

RMA	Risk Management Authority
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
UK	United Kingdom
UKCP09	UK Climate Projections 2009
UKCP18	UK Climate Projections 2018
WaSC	Water and Sewerage Company
WFD	Water Framework Directive
WYCA	West Yorkshire Combined Authority
YWS	Yorkshire Water Services Limited



# Appendix A

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**UKCP09 CLIMATE PROJECTIONS  
FOR LEEDS**

**wsp**

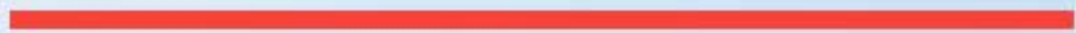
## APPENDIX A - UKCP09 United Kingdom Climate Change Projections for Leeds

The figures in the table below are the UKCP09 (2009) outputs for the Humber River Basin District.

The values shown are for the 25km grid square centred on Leeds.

Change Variable	Uncertainty Range	Change Factors		
		Up to 2025	2025 - 2055	Beyond 2055
Precipitation % Winter	Upper enhanced estimate	-	-	-
	Upper end estimate	8.1%	16.4%	46.5%
	Central estimate	4.7%	11.9%	16.0%
	Lower end estimate	1.6%	7.8%	1.7%
Precipitation % Summer	Upper enhanced estimate	-	-	-
	Upper end estimate	-2.4%	-13.2%	-1.4%
	Central estimate	-8.8%	-20.2%	-24.8%
	Lower end estimate	-14.9%	-26.9%	-38.8%
Precipitation % on Wettest Day - Winter	Upper enhanced estimate	-	-	-
	Upper end estimate	8.2%	16.3%	43.9%
	Central estimate	4.6%	11.9%	16.8%
	Lower end estimate	1.2%	7.7%	0.5%
Precipitation % on Wettest Day - Summer	Upper enhanced estimate	-	-	-
	Upper end estimate	6.4%	2.9%	16.0%
	Central estimate	-0.3%	-4.0%	-5.1%
	Lower end estimate	-6.6%	-10.5%	-17.6%
Peak River Flow %	Upper enhanced estimate	35.0%	45.0%	75.0%
	Upper end estimate	25.0%	30.0%	50.0%
	Central estimate	10.0%	15.0%	20.0%
	Lower end estimate	-5.0%	0.0%	5.0%

# Appendix B



**STRATEGIC ENVIRONMENTAL  
ASSESSMENT REPORT**

**Leeds City Council  
Local Flood Risk Management Strategy - 2013**

**Strategic Environmental Assessment Report**

**Final Report**  
July 2013



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## Revision Schedule

### Local Flood Risk Management Strategy - 2013 Strategic Environmental Assessment Report July 2013

Rev	Date	Details	Prepared by	Reviewed by	Approved by
1.0	04 July 2013	Final Report (for Internal Distribution)	Simon Gilliland Engineer	Ian Hope Group Engineer	

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## **1. Executive Summary**

This report has been produced to document the Strategic Environmental Assessment (SEA) undertaken on the Council's Local Flood Risk Management Strategy (LFRMS). An SEA is required in order to comply with the Environmental Assessment of Plans and Programmes Regulations 2004. Leeds City Council is required under Section 9 of the Flood and Water Management Act (FWMA), to develop, maintain, apply and monitor a LFRMS for the metropolitan district of Leeds to guide all flood risk management activities undertaken.

The Leeds Sustainability Appraisal Framework, developed by the Council's Sustainable Development Unit has been used to structure the SEA process and ensure compliance with legislation. This framework promotes sustainable development: development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987).

The appraisal of the LFRMS principally comprised a workshop session on 5<sup>th</sup> July 2012 where internal departments and external partner organisations reviewed the LFRMS to appraise its performance against various sustainability objectives. The feedback provided at this workshop session has been incorporated in the final version of the LFRMS. The appraisal process focused on the 'Objectives for managing local flood risk', which steer the overall direction of the LFRMS. Consequently, the LFRMS 'Objectives' have been strengthened to provide greater clarity, improve consideration of a wider range of factors and promote sustainable flood risk management; which includes the addition of a sixth objective.

In order to effectively monitor the implementation of the LFRMS and its success in managing flood risk in Leeds eight monitoring indicators have been established; these are presented in Chapter 6 of this SEA report. Reviews of these monitoring indicators will be undertaken concurrently with reviews of the 'List of Measures'.

## **2. Introduction**

### **2.1. Local Flood Risk Management Strategy**

As Lead Local Flood Authority (LLFA), Leeds City Council is required under Section 9 of the Flood and Water Management Act (FWMA), to develop, maintain, apply and monitor a strategy for local flood risk management – a “Local Flood Risk Management Strategy” (LFRMS).

The scope of the LFRMS covers all sources of flooding including Main River flooding, although this is primarily the Environment Agency’s responsibility, but it focuses more specifically on ‘local flooding’ which originates from ordinary watercourses, surface water, sewers (rainfall only) and groundwater.

The purpose of the LFRMS is to guide the flood risk management activities undertaken by Risk Management Authorities operating in the metropolitan district of Leeds; namely, Leeds City Council, the Environment Agency, Yorkshire Water Services, Ainsty Internal Drainage Board and the Highways Agency.

The five principal ‘Objectives for managing flood risk’ in Leeds, as specified in the LFRMS, are listed below. These are the first draft of the objectives which were issued prior to the appraisal of the LFRMS undertaken on the 5<sup>th</sup> July 2012. The updated version of the ‘Objectives for managing flood risk’ are presented in Chapter 5.

1. Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic solutions to identified risks/problems;
2. Develop a consistent approach to planning and investment in flood risk management between RMAs (land allocation, sustainable development, climate change adaptation and emergency planning) and avoid duplication of effort or inefficient investment;
3. Increase internal skills and ultimately capacity for flood risk management;
4. Increase community awareness of the work of the LLFA and local flood risk and involve local communities in decision making – localism agenda;
5. Improve understanding of local flood risk and seek to decrease local flood risk through implementation of measures to alleviate flooding where practicable.

### **2.2. Strategic Environmental Assessment**

The Strategic Environmental Assessment (SEA) Directive (2001) (EC Directive 2001/42/EC) is transposed into UK law as The Environmental Assessment of Plans and Programmes Regulations 2004. This legislation aims to increase the consideration of environmental issues during the decision making and preparation of

strategic level documents such as plans, programmes or strategies. The LFRMS is a statutory plan and is therefore subject to the requirements of The Environmental Assessment of Plans and Programmes Regulations 2004.

### **2.3. Leeds Sustainability Appraisal Framework**

The Council's Sustainable Development Unit (SDU) developed its Sustainability Appraisal (SA) Framework in 2004 in anticipation of the introduction of the Planning Compulsory Purchase Act (2004) which requires SEA's to be undertaken for all Development Plan Documents (DPD's); and also the requirement for compliance with the SEA Directive.

The scope of the SA Framework is to appraise the economic, environmental and social impacts of emerging DPD's, policies and proposals against a set of identified objectives/criteria. The underlying purpose of this being to seek to improve the effectiveness of planning (and other strategic documents) in delivering sustainable development: development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987); and to ensure compliance with the SEA Directive.

Whilst the 2004 framework has enabled the systematic appraisal of documents against the requirements, it was felt by practitioners that there was considerable scope for improvement in terms of a more targeted and efficient process, to lead to clearer outcomes. Within this context, the Council has undertaken a number of reviews and revisions to the SA process, with the overall ambition to meet these important requirements.

To date several documents, including Supplementary Planning Documents (SPD), which previously required SEA's have been appraised using this framework. The current revision of the framework, used in this SEA, was finalised in November 2011.

For more information on the development of the Leeds SA Framework refer to the document prepared by the Council's SDU entitled 'Leeds Sustainability Appraisal Revised Methodology, Version 5, November 2011.

### 3. Appraisal Process

In order to facilitate the appraisal of the LFRMS using the Leeds SA Framework a full day workshop session was held on Thursday 5<sup>th</sup> July 2012 at Leeds Civic Hall. This was attended by representatives from Leeds City Council: Flood Risk Management, Emergency Planning, Sustainable Development and Transport Policy and also by the Environment Agency. The Workshop was facilitated by Dr Tom Knowland from SDU. A full list of workshop participants is included in Appendix A.

The following appraisal process was followed:

- Baseline data, prepared in advance of the workshop by staff from the Council's Flood Risk Management section, was presented and discussed. This included specific information on the risk of flooding in the Leeds district and the extent of drainage infrastructure; this data is included in Appendix B. In addition to this baseline data, other information was also provided on the day including copies of the 'The State of the City Report – Leeds 2011' which sets out key facts about the city, and the challenges that it faces and the Council's Environmental Statement (EMAS) which documents the Council's environmental performance over the past year.
- The revised SA Framework was explained and discussed. In the revised methodology eight of the twenty four sustainability appraisal objectives have been identified as 'upstream' objectives that could in turn lead to 'midstream' and 'downstream effects. A complete list of the SA objectives is included in Appendix C. The LFRMS was tested in terms of its 'upstream' effects first, and was then tested for related 'midstream' and 'downstream' effects associated with the upstream objective. More attention was paid in the SA process to the appraisal of upstream objectives as this should result in more positive outcomes for the associated downstream effects.
- Each of the five flood risk management objectives in the LFRMS was appraised along with the draft 'List of Measures' (Action Plan) included in Appendix D, although this is subject to revision. The focus of the appraisal was firmly on making the LFRMS as sustainable as possible: the appraisal process was used as a checklist and trigger for discussion about whether the LFRMS says the right things in the right way, rather than an end in itself. The SA process also included a Health and Equality Impact Assessment and a Climate Proofing Assessment.
- Comments made during the discussions, and suggestions for changing the LFRMS to make it more sustainable, were documented and written up. A summary of the discussions are included in Appendix E for the SA and Appendix F for the Climate Proofing Assessment.

## **4. Appraisal Findings**

### **4.1. Summary**

The sustainability appraisal undertaken confirmed that the LFRMS should have very positive impacts in terms of reducing and managing the risk of flooding, encouraging sustainable development and drainage design, contributing to economic success, increasing the quality and number of green spaces, raising public awareness of flood risk, promoting social inclusion and ensuring the operation of key transport infrastructure during flood events. In doing so, it should also increase support for regeneration and promote the remediation and development of Brownfield sites. A more detailed summary of the SA discussions is included in Appendix E.

### **4.2. Environment**

There is potential that measures in the 'List of measures' involving construction related activities will have a detrimental impact on the wider environment both visual and environmental. Therefore, rewording objectives in the LFRMS to put a greater focus on high quality sustainable design of Sustainable Drainage Systems (SuDS) and flood alleviation schemes will ensure that the public realm is enhanced and will also promote greater pride in place and provide environmental improvements. Sustainable construction techniques will also keep resource consumption low and promote the use of recycled materials and low carbon alternatives.

In addition, the LFRMS has significant potential to improve the public realm and provide new recreational opportunities. The promotion of SuDS and green corridors will enhance local environments and provide new amenities there may also be opportunities with the implementation of the 'List of Measures' to provide regeneration opportunities on contaminated sites through land remediation.

Fine-tuning of the flood risk management objectives in the LFRMS to put greater emphasis on ensuring that the Water Framework Directive is complied with in the implementation of measures will also ensure that water quality and biodiversity are enhanced.

### **4.3. Education and Training**

The LFRMS objectives will provide a minimal increase in external education and training opportunities; although there may be some indirect increases through job opportunities on the River Aire Flood Alleviation Scheme for example. However, the LFRMS objectives do provide opportunities for the development of internal Council staff to meet the requirements of new legislation and improve the Council's understanding of flood risk and its capacity for flood risk management.

### **4.4. Cooperation**

New legislation, such as the Flood and Water Management Act (2010) have been the drivers for closer cooperation and planning between risk management authorities. There is a need to improve engagement with local communities on the current and projected impacts of climate change; in particular, overcoming the

apathy of residents, which is considered to be a key problem. Work is ongoing by the EA and the Council to improve understanding of flood risk and promote cost effective solutions to flooding problems; for example: partnership funding and property level protection and resilience schemes.

Rewording the LFRMS objectives to promote greater community inclusion and engagement rather than just increasing community awareness of flood risk as at present will also more proactive engagement with local communities.

#### **4.5. Economy**

The LFRMS objectives encourage efficient investment in flood risk management, this is investment which provides benefits to the local economy in terms of reduced flood damage and disruption and an increase in economic opportunities. There are measures in the 'List of Measures' which will undoubtedly bring significant benefits to the economy of Leeds. This is particularly the case with the River Aire Flood Alleviation Scheme, the first item in the 'List of Measures', which will help secure the long-term economic success of businesses in Leeds city centre.

#### **4.6. Health and Equality**

It is noted that the LFRMS objectives say nothing specifically about health and equality issues. In relation to health, the impacts of the LFRMS are clearly positive as the objectives will benefit health through reduction in flood risk and better management of flood risk in general. In relation to equality the impacts are less clear, however, the measures in the 'List of Measures' are generally targeted at communities where there has been historic flooding or where the risk of flooding is greatest, which are often areas of higher social deprivation, in this way the LFRMS will actually reduce social inequalities.

#### **4.7. Climate Proofing**

The Climate Proofing Assessment which was undertaken as part of the SA process demonstrated that LFRMS performs well in relation to mitigating existing and projected climate risks. Allowances for climate change are currently being used, however, greater use of the latest data provided by the United Kingdom Climate Impacts Programme (UKCIP) should be promoted. In addition, new tools are being developed by the EA to improve the mapping of flood risk such as the Mapping All Sources Tool (MAST) which will bring together all sources of flooding on one map. A more detailed summary of the Climate Proofing discussions is included in Appendix F.

## **5. Changes to LFRMS**

Following the SEA workshop the LFRMS objectives have been strengthened to provide greater clarity, improve consideration of a wider range of factors and promote sustainable flood risk management. This includes splitting objective 2 to create an additional objective. The revised LFRMS objectives are listed below; these are also presented in the LFRMS.

1. Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic (catchment wide) solutions to identified risks and problems – emergency planning;
2. Promote sustainable flood risk management through: WFD compliance, climate change adaptation (UKCIP), land management, habitat protection and creation;
3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs;
4. Increase internal skills and ultimately capacity for flood risk management;
5. Increase community awareness of flood risk and the work of the LLFA in managing this risk; engage with local communities and involve them in decision making – localism agenda;
6. Improve understanding of local flood risk and seek to decrease local flood risk through implementation of affordable, high quality measures to alleviate flooding where practicable.

## 6. Monitoring of LFRMS

In order to monitor the implementation of the LFRMS and its success in managing flood risk in Leeds eight monitoring indicators were identified at the SEA workshop. These will ensure that the 'Objectives for managing flood risk' are providing the intended steer to the flood risk management activities undertaken in Leeds and that the 'List of Measures' are being progressed. Reviews of the monitoring indicators will be undertaken concurrently with reviews of the 'List of Measures'.

The eight key monitoring indicators for the LFRMS are listed below. Additional monitoring indicators will be added as appropriate:

1. The number of measures in the 'List of Measures' which have been completed?
2. Are there active measures in the 'List of Measures' which cover each of the six 'Objectives for managing flood risk'?
3. Improving engagement on flood risk - How many public engagement events have taken place? School events, flood fairs, flood action group meetings.
4. The number of new developments where SuDS have been installed? Include SuDS, green corridors, rainwater harvesting, green roofs, land management (tree planting).
5. Are property level flood protection (PLP) schemes reducing flood risk – Number of properties where PLP schemes have been installed and operated successfully in a flood event?
6. Number of Leeds City Council staff engaged in flood risk management activities?
7. Reliability of public transport – Number of Metro bus and train routes disrupted by flooding/drainage problems?
8. Is the LFRMS consistent with the plans and actions of partner organisations? Review and incorporate relevant actions from the Aire and Ouse CFMP's in the 'List of Measures'?



## 7. References

- Framework to assist the development of the Local Strategy for Flood Risk Management, 'A Living Document', 2<sup>nd</sup> Edition, LGA, November 2011.
- National Flood and Coastal Erosion Risk Management Strategy for England, EA and Defra, July 2011.
- Flood and Water Management Act (FWMA), HMSO, 2010.
- Flood Risk Regulations (FRR), HMSO, 2009.
- Water Framework Directive (WFD), European Parliament, 2010.
- Preliminary Flood Risk Assessment (PFRA), Leeds City Council, September 2011.
- Leeds Local Flood Risk Management Strategy (LFRMS) – Draft, Leeds City Council, August 2012.
- Environmental Assessment of Plans and Programmes Regulations, HMSO, 2004.
- Building Trust with Others – a guide for staff, Environment Agency.
- National Planning Policy Framework (NPPF), DCLG, March 2012
- Aire Catchment Flood Management Plan (CFMP), Environment Agency, July 2010.
- Ouse Catchment Flood Management Plan (CFMP), Environment Agency, July 2010.
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- Leeds Sustainability Appraisal Revised Methodology, Version 5, Leeds City Council Sustainable Development Unit, November 2011.
- A Practical Guide to the Strategic Environmental Assessment Directive, Office of the Deputy Prime Minister, September 2005.
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- State of the City – Our vision to be the best city in the UK, Leeds City Council, 2011

## 8. Acronyms

BREEAM	Building Research Establishment Environmental Assessment Method
CFMP	Catchment Flood Management Plan
CLR	Contaminated Land Report
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DPD	Development Plan Document
EA	Environment Agency
EC	European Community
EMAS	Environmental Management Statement
FRM	Flood Risk Management
FRR	Flood Risk Regulations (2009)
FWMA	Flood and Water Management Act (2010)
HMSO	Her Majesty's Stationery Office
LCC	Leeds City Council
LFRMS	Local Flood Risk Management Strategy
LGA	Local Government Association
LLFA	Lead Local Flood Authority
MAST	Mapping All Sources Tool
PEPU	Peacetime Emergency Planning Unit
PFRA	Preliminary Flood Risk Assessment
PLP	Property Level Flood Protection
PPS25	Planning Policy Statement 25: Development and Flood Risk
RMA	Risk Management Authority
SA	Sustainability Appraisal
SDU	Sustainable Development Unit
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SPD	Supplementary Planning Document
SuDS	Sustainable Drainage Systems
UK	United Kingdom
UKCIP	UK Climate Impacts Programme
UKCP09	UK Climate Projections (latest)
WFD	Water Framework Directive
YWS	Yorkshire Water Services

## **9. Appendices**

**APPENDIX A – SEA Workshop Participants**

**APPENDIX B – Baseline Data**

**APPENDIX C – Leeds Sustainability Appraisal Framework**

**APPENDIX D – List of Measures**

**APPENDIX E – Summary of SEA Workshop Discussions**

**APPENDIX F – Climate Proofing Assessment**

## **Appendix A – SEA Workshop Participants**

Dr Tom Knowland	Sustainable Development Unit
Jon Andrews	Sustainable Development Unit
Ian Hope	Flood Risk Management
Simon Gilliland	Mouchel
Paul Seddon	Peacetime Emergency Planning Unit
Dave Cherry	Transport Policy
Claire Brown	Environment Agency
Karen Robson	Environment Agency
Libby Turpin	Leeds University

## Appendix B – Baseline Data

Data provided to participants in advance of SEA Workshop on 5<sup>th</sup> July 2012.

- The metropolitan district of Leeds covers an area of approximately 560 square kilometres;
- The population of the metropolitan district of Leeds is approximately 750,000;
- The employment rate in Leeds is 69%, which is broadly in line with regional and national averages;
- Leeds has over 150 designated nature conservation sites across the city;
- The road network in Leeds totals 2,965 kilometres;
- In 2010 38% of travel into Leeds was via public transport;
- The average annual CO<sub>2</sub> emissions per capita is 6.3 tonnes (2009 survey); this is similar to other large metropolitan districts in the UK;
- The Environment Agency estimates that there are 1500 homes and 500 businesses at 'significant' risk of river flooding within the district (at risk of annual flooding with a probability of 1 in 75 years);
- Parts of Leeds city centre are estimated to have a 1 in 20 year risk of flooding from the River Aire;
- There are approximately 500km of ordinary watercourses 'non-main river' in the Leeds district, which are managed by Leeds City Council.
- Approximately 80% of the population is in the catchment that is drained by sewers to Knostrop Waste Water Treatment Works;
- The general topography Of Leeds is undulating and varies in level from 10m above Ordnance Datum at Fairburn on the River Aire and Thorp Arch on the River Wharfe to more than 340m at Hawksworth Moor;

## Appendix C – Leeds Sustainability Appraisal Framework

SA objective	Upstream, midstream and downstream effects
Maintain or improve the conditions which have enabled business success, economic growth and investment through increased entrepreneurship and innovation and investment in infrastructure and physical assets	Upstream: Does it contribute to economic success by: <ul style="list-style-type: none"> <li>a) increasing entrepreneurship</li> <li>b) increasing innovation</li> <li>c) increasing investment in infrastructure and physical assets</li> </ul>
	Midstream: How does the contribution to economic success affect: <ul style="list-style-type: none"> <li>a) improved community regeneration</li> <li>b) retention of investment in the local economy</li> <li>c) air quality, especially industrial and transportation related emissions</li> </ul>
	Downstream: How does its contribution to economic success affect: <ul style="list-style-type: none"> <li>a) Waste arisings and management of waste</li> <li>b) Development in flood plain</li> <li>c) Rates of surface water run off</li> <li>d) Remediation of contaminated land</li> <li>e) Poverty levels</li> <li>f) Crime levels</li> <li>g) Biodiversity</li> </ul>
Increase participation in education and life-long learning and reduce the disparity in participation and qualifications achieved across Leeds	Upstream: Will it result in increased educational attainment by <ul style="list-style-type: none"> <li>a) Providing educational opportunities</li> <li>b) Providing lifelong learning opportunities</li> <li>c) Increasing participation rates in education and training</li> </ul>
	Midstream: Does it contribute to the positive development of community by: <ul style="list-style-type: none"> <li>a) Increasing community participation</li> <li>b) Providing opportunities to increase educational attainment</li> <li>c) Providing multiple use of facilities</li> </ul>
	Downstream: How does it, via improved and/or increased educational attainment, affect: <ul style="list-style-type: none"> <li>a) Waste generation and management</li> <li>b) Carbon dioxide and greenhouse gas emissions, as it relates to behavioural changes</li> <li>c) Public health</li> <li>d) Obtaining employment</li> </ul>
Provide, maintain and improve culture, leisure and recreational activities that are available to all	Upstream: How does it provide, maintain and improve access (non car based) to: <ul style="list-style-type: none"> <li>a) Culture to all</li> <li>b) Leisure to all</li> <li>c) Recreational activities to all</li> </ul>
	Midstream: Does it contribute to the positive development of community by: <ul style="list-style-type: none"> <li>a) Promoting a shared community focus</li> <li>b) Providing free or subsidized CLR activities</li> </ul>
	Downstream: Will it, through provision of CLR, promote: <ul style="list-style-type: none"> <li>a) Recreational opportunities, such as exercise, social contact, cultural experiences or activities</li> <li>b) The reduction of crime</li> </ul>
Make the best use of land as a resource	Upstream: Does it make best use of land as a resource by: <ul style="list-style-type: none"> <li>a) Promoting the use of Previously Developed Land</li> <li>b) Developing at an appropriate density for the area to promote sustainable development</li> <li>c) Providing for multiple functions of land use (i.e. green infrastructure, mixed use, etc.), where appropriate</li> <li>d) Make appropriate use of land, given constraints and opportunities (i.e. flood risk, etc.)</li> </ul>
	Midstream: Does it contribute to the positive development of the community by: <ul style="list-style-type: none"> <li>a) Concentrating services</li> <li>b) Creating a walkable and accessible community</li> </ul>
	Downstream: Does it address the best use of land in relation to: <ul style="list-style-type: none"> <li>a) Remediating contaminated land</li> <li>b) Maintaining, protecting and enhancing biodiversity of the areas it affects, both directly and indirectly</li> <li>c) Its impact on the rate of surface water run off</li> <li>d) Its impact on development in the flood plain</li> <li>d) Minimising the generation of transport related greenhouse gases</li> </ul>
Increase accessibility and connectivity through investment in a	Upstream: How does it promote: <ul style="list-style-type: none"> <li>a) Increased accessibility via public transportation</li> <li>b) Increased investment into sustainable transportation network</li> <li>c) The uptake of sustainable transportation methods</li> </ul>
	Midstream: How does it contribute positively to the promotion of:

<b>SA objective</b>	<b>Upstream, midstream and downstream effects</b>
high quality transport system and through influencing others and changing behaviours	<ul style="list-style-type: none"> <li>a) Accessibility community services</li> <li>b) Improved air quality</li> <li>c) Improved water quality</li> </ul>
	Downstream: How does it: <ul style="list-style-type: none"> <li>a) Reduce greenhouse gas emissions</li> <li>b) Improve the health of residents</li> <li>c) Mitigate against biodiversity impacts arising from air and water pollution</li> <li>d) Increase access to employment opportunities</li> <li>e) Promote and enhance a cleaner and greener city</li> </ul>
Maintain and enhance the quality and distinctiveness of the landscape and the historic and built environment	Upstream: Does it contribute to quality of place by: <ul style="list-style-type: none"> <li>a) Promoting character in townscape and landscape</li> <li>b) Encouraging sense of pride of place</li> <li>c) Potential to walk or cycle to or through a place</li> <li>d) Promoting the use of heritage assets (building/land) to conserve special interest</li> </ul>
	Midstream: How does it positively contribute to the development of community by: <ul style="list-style-type: none"> <li>a) Providing well designed affordable housing</li> <li>b) Providing amenities for the community</li> </ul>
	Downstream: How does it, through addressing quality of place: <ul style="list-style-type: none"> <li>a) Remediate contaminated land</li> <li>b) Reduce generation of carbon emissions</li> <li>c) Successfully integrate waste facilities</li> <li>d) Contribute to and support the physical and mental wellbeing of residents</li> <li>e) Design out crime</li> </ul>
Increase energy efficiency, low and zero carbon forms of energy generation and local distribution	Upstream: How does it: <ul style="list-style-type: none"> <li>a) Increase energy efficiency</li> <li>b) Provide for low and zero carbon generation</li> <li>c) Provide for local distribution</li> </ul>
	Downstream: How does it reduce the production of greenhouse gases
Reduce consumption (increase efficient use) of natural resources (e.g. minerals, water)	Upstream: How does it reduce the use of resources by: <ul style="list-style-type: none"> <li>a) Reusing resources</li> <li>b) Diverting resources</li> <li>c) Minimising resources</li> <li>d) Design and method reduce impact</li> </ul>
	Midstream: Does it by decreasing the consumption of natural resources: <ul style="list-style-type: none"> <li>a) improve water quality</li> </ul>
	Downstream: Does it, by decreasing consumption of natural resources: <ul style="list-style-type: none"> <li>a) Provide opportunities for biodiversity (e.g. restoration)</li> <li>b) Impact on levels of flood risk</li> <li>c) Impact on waste arisings and management</li> <li>d) Design and methods reduce impact</li> </ul>

**Leeds Sustainability Appraisal Revised Methodology, November 2011, Version 5**

## Appendix D – List of Measures

This is the 'List of Measures' provided to participants at the SEA Workshop on 5<sup>th</sup> July 2012. The updated version of the 'List of Measures' is in Appendix C of the Leeds Local Flood Risk Management Strategy.

### **Objective 1**

**Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic solutions to identified risks/problems.**

22. Improve communications, engagement and coordination of activities with internal and external partners (including RMAs): Leeds City Council Flood Risk Management Group; Technical Standards and Guidance; Planning and Flood Risk; Yorkshire and Humber Learning Alliance.

24. Review and update Emergency Handbook, Generic Flooding Plan, Community Flood Action Plans, West Yorkshire Major Flood Incident Plan, Reservoir Emergency Plan.

34. Review Council Policy on FRM - e.g. 'Maintaining Water Resources and Responding to Flood Incidents' approved by Exec Board on 17 May 2006 to ensure that it conforms to the requirements of the FWMA that Local authorities should lead on the management of local flood risk, with the support of the relevant organisations.

### **Objective 2**

**Develop a consistent approach to planning and investment in flood risk management between RMAs and avoid duplication of effort or inefficient investment.**

18. Pump operation - carbon reduction

19. Implement SuDS Approval Body (SAB) function

20. Publish Local Flood Risk Management Strategy

21. Undertake Strategic Environmental Assessment (SEA)

25. Review Local Flood Risk Management Strategy (LFRMS)

26. Review LFRMS 'List of Measures'

30. Review and update as appropriate the Strategic Flood Risk Assessment (SFRA) produced by Jacobs in October 2007

33. Climate change adaptation

35. Provide regular feedback to senior officers and elected members on FRM progress: working groups, strategies, list of measures...etc



- Director of City Development (quarterly)
- City Development SLT (annually)
- Other key officers as needs arise
- City Development Scrutiny Board (annually)
- All Area Committees (two-yearly)

### **Objective 3**

**Increase internal skills and ultimately capacity for flood risk management.**

37. Leeds City Council to increase their flood risk management capacity and skills (as Lead Local Flood Authority) in order to deliver their new responsibilities as conferred under the Flood and Water Management Act 2010.

### **Objective 4**

**Increase community awareness of the work of the LLFA and local flood risk and involve local communities in decision making – localism agenda.**

23. Engagement and communication with public on FRM issues

- Targeted ‘flood fairs’ held in at-risk locations highlighting flood protection products;
- Wider public information campaigns for at-risk households drawing attention to useful resources;
- Engage with local flood action groups (EA and PEPU).

36. Maintain internet and intranet webpages to provide comprehensive information to all stakeholders on:

- The sources of flooding and who is responsible for what;
- How to prepare for flooding emergencies;
- What to do when flooding occurs and who to report this to;
- How flood risk is treated within the planning process.

**5. Improve understanding of local flood risk and seek to decrease local flood risk through implementation of measures to alleviate flooding where practicable.**

1. River Aire Flood Alleviation Scheme
2. Flood Alleviation Scheme - West Garforth recreation ground (local levy)
3. Flood Alleviation Scheme - Leeds Road (Allerton Bywater) pumping station (local levy)
4. Flood Alleviation Scheme - Ramsden Street, Kippax (local levy)
5. Flood Alleviation Scheme - Station Road (Morley) culvert renewal scheme
6. Flood Alleviation Scheme - Wyke Beck
7. Flood Alleviation Scheme - Collingham Beck
8. Flood Alleviation Scheme - Farnley Wood Beck

9. Newton Road property protection and resilience scheme
10. Lowther Road, Garforth - Culvert Improvements
11. Lower Wortley - property protection and resilience scheme
12. Church Lane, Bardsey - property protection and resilience scheme
13. Dean Park Drive, Drighlington - property protection and resilience scheme
14. Environment Agency schemes
15. YWS DG5 schemes
16. Develop register of assets affecting local flood risk
17. Watercourse and beck condition surveys
27. Carry out flood warning feasibility studies for the Wortley Beck and Meanwood Beck.
28. Investigate the interaction between the Leeds and Liverpool Canal and the River Aire.
29. Produce a register of culverts and outfalls, to identify capacity and other issues.
31. Sheepscar: evaluate the condition of formal and informal flood defences along the Sheepscar Beck which were recently breached to identify potential remedial works required.
32. Meanwood: work with EA to support the development of an holistic flood defence and resilience strategy for the Meanwood Beck catchment which takes account of the watercourse, sewers and highway drains in problem locations.

## Appendix E – Summary of SEA Workshop Discussions

This is a summary of the discussions undertaken on 5<sup>th</sup> July 2012 to appraise the Leeds Local Flood Risk Management Strategy. Notes from the SEA workshop session are in the **blue** coloured font.

### KEY

	Upstream sustainability objectives
	Midstream sustainability objectives
	Downstream sustainability objectives
	Health decision making criteria
	Equality decision making criteria
	Health & Equality decision making criteria

Questions relating to the criteria in the SEA Directive are clearly marked \*

### UPSTREAM SUSTAINABILITY OBJECTIVES

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
UPSTREAM SA1: ECONOMIC SUCCESS MAINTAIN OR IMPROVE THE CONDITIONS WHICH HAVE ENABLED BUSINESS SUCCESS, ECONOMIC GROWTH AND INVESTMENT THROUGH INCREASED ENTREPRENEURSHIP AND		SA1: ECONOMIC SUCCESS DOES IT CONTRIBUTE TO ECONOMIC SUCCESS BY:-					
		A) INCREASING ENTREPRENEURSHIP?	0	Neutral impact			
		B) INCREASING INNOVATION?	0	Neutral impact			

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
INNOVATION AND INVESTMENT IN INFRASTRUCTURE AND PHYSICAL ASSETS.		C) INCREASING INVESTMENT IN INFRASTRUCTURE AND PHYSICAL ASSETS?	+	Partnership funding encourages ongoing investment in flood risk infrastructure			
Midstream	SA9: Mixed Neighbourhoods  SA10: Social inclusion and community empowerment <i>Generation of money from economic success often funds/stimulates regeneration projects providing better quality environments, housing and access to amenities.</i>	SA9: Mixed Neighbourhoods SA10: Social inclusion and community empowerment <i>How does the contribution to economic success affect:</i> a) improved community regeneration?  b) retention of investment in the local economy?		Marginal impact – brings land back into use and promotes new development  Increase in confidence to local firms from reduced flood risk e.g. River			

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics				Aire Scheme			
Midstream	SA11: Air quality <i>There may be direct impacts on air quality from industrial processes.</i>  <i>The increased levels of road traffic associated with economic success will bring an associated increase in emissions of air pollutants.</i>	SA11: Air quality* <i>How does the contribution to economic success affect air quality especially industrial and transportation related emissions?</i>	+	Reduced risk of flooding – flooding can cause grid lock and traffic congestion effecting air quality			
Midstream	SA12: Improve water quality <i>Clean water is essential for a healthy workforce, and as a raw material for many manufacturing processes. There is also direct regulation of water quality in the UK making polluting businesses liable to fines for pollution.</i>	SA12: Improve water quality* <i>How does the contribution to economic success affect water quality especially industrial and transportation related water pollution?</i>	+	Strategy complies with Water Framework Directive (WFD) – this promotes improved water quality through FRM activities			Amend objective 2 to specifically reference WFD
Downstream	SA13: Employment	SA13: Employment					

\* SEA Directive: Air

\* SEA Directive: Water

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	opportunities <i>There is a direct link between economic success and employment as all businesses need employees.</i>	opportunities <i>How does the contribution to economic success affect employment opportunities?</i>	+	Protecting and creating jobs through implementing measures e.g. River Aire Scheme			
Downstream	SA14: Health <i>There are recognised links between wealth and health, with the poorest communities often suffering higher morbidity rates.</i>  <i>Poor air quality has known health effects (respiratory illness).</i>	SA14: Health* <i>How does the contribution to economic success affect health and health inequalities?</i>	+	Flooding causes stress – measures to reduce flooding through FRM activities have a positive impact on health			
Downstream	SA15: Crime <i>Levels of crime (particularly property crime) tend to increase during periods of economic recession.</i>	SA15: Crime <i>How does the contribution to economic success affect crime levels?</i>	+	Minimal impact – slightly positive as looting can occur in evacuated areas during floods			
Downstream	SA17: Biodiversity / geological conservation <i>Investment in economic developments can provide opportunities for</i>	SA17: Biodiversity* / geological conservation <i>How does the contribution to economic success affect opportunities for biodiversity?</i>	+	Strategy will comply with WFD – positive environmental impacts e.g. SuDS,			Amend objective 5 to specifically reference WFD/

\* SEA Directive: Health

\* SEA Directive: Biodiversity, fauna, flora

Sustainability Objective and definition Linked to Up / Mid / Downstream topics	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	<i>new wildlife habitat creation (e.g. clean-up of waterfront areas, management of invasive weeds).</i>			green corridors			environmental enhancement
Downstream	SA19: Flood risk <i>Flooding can be very costly to businesses if their premises flood.</i>  <i>Flooding of transport infrastructure (roads, rail lines, etc) may also hinder business.</i>	SA19: Flood risk* <i>How does the contribution to economic success affect local flood risk?</i>	++	<b>Very positive</b> – protects economic success through reduced flood risk and improved insurance chances			Ensure downstream flooding issues are considered – ‘Catchment Cell Approach’
Downstream	SA20: Waste <i>Economic activity is likely to stimulate production of waste (industrial waste, office waste etc)</i>	SA20: Waste* <i>How does the contribution to economic success affect waste generation and management?</i>	+	Flooding generates waste which needs to be cleared up			
Downstream	SA21: Contaminated land <i>Economic activity can drive remediation to free up land for development.</i>	SA21: Contaminated land* <i>How does the contribution to economic success affect remediation of contaminated land?</i>	+	Marginal positive impact – brings land back into use and allows new development			

\* SEA Directive: Material assets

\* SEA Directive: Material assets

\* SEA Directive: Soil

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
<b>UPSTREAM SA2 EDUCATION</b> INCREASE PARTICIPATION IN EDUCATION AND LIFE-LONG LEARNING AND REDUCE THE DISPARITY IN PARTICIPATION AND QUALIFICATIONS ACHIEVED ACROSS LEEDS		<b>SA2: EDUCATION</b> WILL IT RESULT IN INCREASED EDUCATIONAL ATTAINMENT BY:-					
		A) PROVIDING EDUCATIONAL OPPORTUNITIES?	+	Objectives 3 and 4 relate to increasing awareness of flood risk			
		B) PROVIDING LIFELONG LEARNING OPPORTUNITIES?	0	Neutral Impact			
		C) INCREASING PARTICIPATION RATES IN EDUCATION AND TRAINING?	0	Neutral Impact			
Midstream	SA9: Mixed neighbourhoods Education can increase understanding between communities.  Education can sometimes divide communities were there is a disparity in opportunities available to different sectors of the community.	SA9: Mixed neighbourhoods How does the contribution to education affect neighbourhood relations?	+	Encourages community to work together e.g. flood action groups & Property level protection schemes			
Midstream	SA10: Social inclusion and community	SA10: Social inclusion and community empowerment					Strengthen



Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	empowerment <i>Education can increase community participation and integration among different sections of society</i>	<i>How does the contribution to education affect social inclusion and community empowerment?</i>	+	Flood Action Groups promote social inclusion			objective 4 to promote social inclusion as well as awareness raising
Downstream	SA13: Employment opportunities <i>Education or training are pre-requisites for the majority of employment opportunities</i>	SA13: Employment opportunities <i>How does the contribution to education affect employment opportunities?</i>	+	Leeds Flood Alleviation Scheme may possibly provide training opportunities			
Downstream	SA14: Health <i>Better education and understanding of personal health</i>  <i>Training of health professionals</i>  <i>Better access to education leads to higher levels of employment and greater personal wealth, which is known to be associated with better health</i>	SA14: Health* <i>How does the contribution to education affect health and health inequalities?</i>	+	Ensures people know what to do in a flood. Community are aware – less stress			
Downstream	SA18: Climate change mitigation	SA18: Climate change mitigation*		Marginal positive			

\* SEA Directive: Human health

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	Higher levels of knowledge and awareness of climate impacts may change public attitudes and behaviours.  Better education may lead to development of better mitigation strategies	How does the contribution to education affect climate change mitigation?	+	impact through increased community awareness and knowledge			
Downstream	SA20: Waste Education could play an important role in changing peoples' attitudes and behaviour towards reducing waste.	SA20: Waste* How does the contribution to education affect waste generation and waste management?	0	Marginal/neutral impact			
UPSTREAM SA3: CULTURE, LEISURE AND RECREATION PROVIDE, MAINTAIN AND IMPROVE CULTURE, LEISURE AND RECREATIONAL ACTIVITIES THAT ARE AVAILABLE TO ALL		SA3: CULTURE, LEISURE AND RECREATION HOW DOES IT PROVIDE, MAINTAIN AND IMPROVE ACCESS (NON CAR BASED) TO:-					
		A) CULTURE FOR ALL?	0	Neutral impact			Recreation areas may used for flood storage on
		B) LEISURE FOR ALL?	+	Increases amenity value e.g. SuDS schemes, fish			

\* SEA Directive: Climatic factors

\* SEA Directive: Material assets

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
		C) RECREATIONAL ACTIVITIES FOR ALL?	+	passes and upstream storage			some occasions – last resort
Midstream	SA9: Mixed neighbourhoods A range of cultural opportunities provide more opportunities for mixing between different sectors of the community.	SA9: Mixed neighbourhoods How does the contribution to culture, leisure and recreation affect neighbourhood relations?	0	Neutral impact			
Midstream	SA10: Social inclusion and community empowerment Provision of free or subsidised CLR facilities would improve access for more people in the community.  Culture, leisure and recreational amenities will aid cohesive communities by provided a shared community focus.	SA10: Social inclusion and community empowerment How does the contribution to culture, leisure and recreation affect social inclusion and community empowerment?	0	Marginal/neutral impact			
Downstream	SA14: Health Access to more/better cultural, recreational and particularly leisure	SA14: Health* How does the contribution to culture, leisure and recreation affect health and health	+	Some schemes may provide improved amenity value and			

\* SEA Directive: Human health

Sustainability Objective and definition Linked to Up / Mid / Downstream topics	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	<i>facilities may improve physical fitness and mental wellbeing.</i>	<i>inequalities?</i>		health benefits			
Downstream	SA15: Crime Participation in sports and other recreational activities may reduce levels of certain crimes by providing alternative activities, particularly for young people?	SA15: Crime How does the contribution to culture, leisure and recreation affect crime?	-	Marginal negative impact if recreational services e.g parks used for flood storage			Maintain services e.g. Youth Service
UPSTREAM SA4: BEST USE OF LAND MAKE THE BEST USE OF LAND AS A RESOURCE		SA4: BEST USE OF LAND* DOES IT MAKE BEST USE OF LAND AS A RESOURCE BY:-	+	Sustainable development, use of SuDS, making most of open spaces/ green spaces.			Strengthen objective 2 in the strategy to cover this
		A) PROMOTING THE USE OF PREVIOUSLY DEVELOPED LAND?					
		SEA (MATERIAL ASSET) B) DEVELOPING AT AN APPROPRIATE DENSITY FOR THE AREA TO PROMOTE SUSTAINABLE DEVELOPMENT?					

\* SEA Directive: Material asset

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
		C) PROVIDING FOR MULTIPLE FUNCTIONS OF LAND USE (I.E. GREEN INFRASTRUCTURE, MIXED USE ETC), WHERE APPROPRIATE?	+	Flood storage in park areas and open space, energy generation e.g. hydro electric			
		D) MAKE APPROPRIATE USE OF LAND, GIVEN CONSTRAINTS AND OPPORTUNITIES (I.E. FLOOD RISK ETC)	+				
Midstream	SA9: Mixed neighbourhoods  SA10: Social inclusion and community empowerment <i>Making best use of existing land for the benefit of mixed neighbourhoods and communities.</i>	SA9: Mixed neighbourhoods <i>How does the use of land affect neighbourhood relations?</i>	0	Neutral impact			
Midstream	SA10: Social inclusion and community empowerment <i>Making best use of existing land for the benefit of mixed neighbourhoods and communities</i>	SA10: Social inclusion and community empowerment <i>How does the use of land affect social inclusion and community empowerment?</i>	0	Neutral impact			

Sustainability Objective and definition Linked to Up / Mid / Downstream topics	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Downstream	SA17: Biodiversity / geological conservation <i>Greenfield land is likely to support higher levels of biodiversity High quality green infrastructure can provide valuable habitats and aid movement/migration of wildlife.</i>	SA17: Biodiversity* / geological conservation <i>How does the use of land affect biodiversity?</i>	+	Potential for habitat creation and development of green corridors			Strengthen objective 5 to cover this – Water Framework Directive (WFD)
Downstream	SA18: Climate change mitigation <i>Reusing existing buildings reduces the need to construct new ones, and avoids the energy and resource use associated with wholly new developments?</i>	SA18: Climate change mitigation* <i>How does the use of land affect climate change mitigation?</i>	+	Use of land for flood mitigation schemes and storage reduces flood risk			
Downstream	SA19: Flood risk <i>Developments on previously undeveloped, vegetated ground will increase runoff and decrease the lag time</i>	SA19: Flood risk* <i>How does the use of land affect flood risk?</i>	+	Use of land for flood mitigation schemes and storage reduces flood risk			

\* SEA Directive: Biodiversity, fauna, flora

\* SEA Directive: Climatic factors

\* SEA Directive: Material assets

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	<p>for this extra water to find it's way to the rivers. This enhances the risk of flooding.</p> <p>Developments in greenfield floodplains are at risk from flooding events.</p>						
Downstream	SA21: Contaminated land Contaminated land usually only exists in previously developed land. Restricting development to brownfield sites will necessitate the remediation of this land as site as prepared for construction	SA21: Contaminated land* How does the use of land affect remediation of contaminated land?	+	Flood alleviation schemes may make areas of contaminated land developable			
UPSTREAM SA5: ACCESSIBILITY AND CONNECTIVITY INCREASE ACCESSIBILITY AND CONNECTIVITY THROUGH INVESTMENT IN A HIGH QUALITY TRANSPORT SYSTEM AND		SA5: ACCESSIBILITY AND CONNECTIVITY*? HOW DOES IT PROMOTE:-					
		A) INCREASED ACCESSIBILITY VIA PUBLIC TRANSPORTATION?	+	Protects transport infrastructure – Leeds is a key transport hub, impact			

\* SEA Directive: Soil

\* SEA Directive: Material assets

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
THROUGH INFLUENCING OTHERS AND CHANGING BEHAVIOUR.		B) INCREASED INVESTMENT INTO SUSTAINABLE TRANSPORTATION NETWORK?  C) THE UPTAKE OF SUSTAINABLE TRANSPORTATION METHODS?	+	on economy big  Wyke Beck Sustainable Transport link – public access via cycle-ways and pedestrian bridges along green corridor			
Midstream	SA9: Mixed neighbourhoods Communities can be segregated if appropriate transport links do not exist	SA9: Mixed neighbourhoods How does the contribution to accessibility and connectivity affect neighbourhood relations?	+	Communities not isolated by flooding		Flooding can improve community cohesion	
Midstream	SA10: Social inclusion and community empowerment Improving connectivity and access, particularly through public transport, walking and cycling would enable higher levels of social inclusion.  Improving connectivity and reducing severance may increase people's feelings of belonging in their community	SA10: Social inclusion and community empowerment How does the contribution to accessibility and connectivity affect social inclusion and community empowerment?	0	Neutral impact			



Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
Midstream	SA11: Air quality <i>Road traffic emissions are the major source of poor air quality in Leeds.</i>	SA11: Air quality* <i>How does the contribution to accessibility and connectivity affect air quality?</i>	+	Flooding disrupts transport and causes traffic congestion			
Midstream	SA12: Water quality <i>Runoff from roads can contain oil, heavy metals and other toxic substances which can affect water quality.</i>	SA12: Water quality* <i>How does the contribution to accessibility and connectivity affect water quality?</i>	+	SuDS mitigate and improve water quality; reduced flood risk to transport network > reduced pollutants in water			
Downstream	SA13: Employment opportunities No justification	SA13: Employment opportunities <i>How does the contribution to accessibility and connectivity affect employment opportunities?</i>	+	Slight positive impact – improved connectivity results in improved economy/business			
Downstream	SA14: Health <i>Poor air quality resulting from road transport emissions can have serious health impacts, particularly those with existing cardio-vascular disease and the elderly.</i>  <i>Road traffic accidents can kill or seriously</i>	SA14: Health* <i>How does the contribution to accessibility and connectivity affect health and health inequalities?</i>	+	Access to surgeries and NHS services improved			

\* SEA Directive: Air

\* SEA Directive: Water

\* SEA Directive: Human health

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics	<i>injured people.</i>  <i>High levels of private car use encourage lower levels of physical activity and fitness. Opportunities should be taken where possible to encourage and facilitate more walking and cycling.</i>						
Downstream	SA16: Cleaner, greener and more attractive city <i>Road transport is the most extensive source of environmental noise pollution, and can have lead to high levels of annoyance and health impacts in exposed locations.</i>	SA16: Cleaner, greener and more attractive city* <i>How does the contribution to accessibility and connectivity affect creating a cleaner, greener and more attractive city?</i>	+	No silt, sewage, sludge from floods on streets – improves connectivity. Improved public realm and access through provision of SuDS and green spaces			
Downstream	SA17: Biodiversity / geological conservation <i>Poor air quality and water quality resulting from transport can</i>	SA17: Biodiversity* / geological conservation <i>How does the contribution to accessibility and connectivity affect biodiversity?</i>	+	Provision of improved public realm and access through SuDS and			

\* SEA Directive: Interrelationship between factors

\* SEA Directive: Biodiversity, fauna, flora

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	<p>reduce levels of biodiversity, particularly for very pollution-sensitive organisms such as lichen.</p> <p>Wildlife fatalities from traffic collisions.</p>			green spaces			
Downstream	<p>SA18: Climate change mitigation There is the potential to reduce CO2 emissions from road transport through encouraging less private car use and promoting cleaner vehicles technologies/fuels.</p>	<p>SA18: Climate change mitigation* How does the contribution to accessibility and connectivity affect climate change mitigation?</p>	+	<p>Flooding disrupts transport and causes traffic congestion – protecting transport infrastructure is good for climate change adaptation; more electronic information signs on the road</p>			
Downstream	<p>SA19: Flood risk No justification</p>	<p>SA19: Flood risk* How does the contribution to accessibility and connectivity affect flood risk?</p>	+	<p>Highway improvements such as drainage reduce flood risk; improved cooperation on FRM</p>			
<b>UPSTREAM SA6: QUALITY OF PLACE MAINTAIN AND ENHANCE THE QUALITY AND</b>		<p><b>SA6 QUALITY OF PLACE*</b> <b>DOES IT CONTRIBUTE TO QUALITY OF PLACE BY:-</b></p>					

\* SEA Directive: Climatic factors

\* SEA Directive: Material assets

\* SEA Directive: Cultural heritage including architectural and archaeological heritage

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
DISTINCTIVENESS OF THE LANDSCAPE AND THE HISTORIC AND BUILT ENVIRONMENT		A) PROMOTING CHARACTER IN TOWNSCAPE AND LANDSCAPE?	-	Potential negative impact if public realm works are not high quality			Flood alleviation schemes should be good quality and reduce flood risk e.g. flood walls with glass panels and hydraulic barriers  Revise objectives in LFRMS to promote good design
		B) ENCOURAGING SENSE OF PRIDE OF PLACE?					
		C) POTENTIAL TO WALK OR CYCLE TO OR THROUGH A PLACE?	+	Provision of improved access to water environment e.g. SuDS and green corridors			
		D) PROMOTING THE USE OF HERITAGE ASSETS (BUILDING / LAND) TO CONSERVE SPECIAL INTEREST?	+	Potential negative impact on listed structures e.g. weirs on River Aire may need to be removed			
Midstream	SA9: Mixed neighbourhoods <i>Good quality social housing should be of a good design and compliment existing land use in the area.</i>	SA9: Mixed neighbourhoods <i>How does the contribution to quality of place affect neighbourhood relations?</i>	+	Positive impact if good quality scheme design			
Midstream	SA10: Social inclusion and community empowerment <i>Good quality and well designed affordable or</i>	SA10: Social inclusion and community empowerment <i>How does the contribution to quality of place affect social inclusion and community</i>	+	Community groups are supportive of schemes which			

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	<p><i>social housing should reduce disparities in the housing markets.</i></p> <p><i>Modern developments should provide better amenities for communities (open space provision, etc).</i></p>	<p><i>empowerment?</i></p>		<p>improve public realm and amenity</p>			
Midstream	<p>SA12: Water quality <i>Particularly in former industrial areas, there may be a risk of mobilising contamination from land into watercourses.</i></p>	<p>SA12: Water quality* <i>How does the contribution to quality of place affect water quality?</i></p>	+	<p>Good quality schemes with SuDS and appropriate contaminant removal will enhance water quality</p>			
Downstream	<p>SA14: Health <i>Modern housing may offer accommodation that provides a healthier indoor environment (as regards indoor air quality, damp, etc).</i></p> <p><i>A high quality landscape can contribute to wellbeing.</i></p>	<p>SA14: Health* <i>How does the contribution to quality of place affect health and health inequalities?</i></p>	+	<p>Good quality schemes will enhance public realm and improve amenity value</p>			
Downstream	<p>SA15: Crime <i>Building design can</i></p>	<p>SA15: Crime <i>How does the contribution to</i></p>		<p>Good quality schemes will</p>			

\* SEA Directive: Water

\* SEA Directive: Human health

Sustainability Objective and definition Linked to Up / Mid / Downstream topics	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	<i>affect whether people decide to commit a crime or not, by enhancing the risk of being watched/caught</i>	<i>quality of place affect crime?</i>	+	promote pride in the place – reduced graffiti and low level crime			
Downstream	SA16: Cleaner, greener and more attractive city <i>High quality developments may improve neighbourhood cleanliness.</i>	SA16: Cleaner, greener and more attractive city* <i>How does the contribution to quality of place affect the creation of a cleaner, greener and more attractive city?</i>	+	Good quality schemes will promote pride in place and create a more attractive city			
Downstream	SA18: Climate change mitigation <i>Modern housing must be built to higher energy efficiency standards than in the past (building regulations, BREAM).</i>	SA18: Climate change mitigation* <i>How does the contribution to quality of place affect climate change mitigation?</i>	0	Neutral impact			
Downstream	SA19: Flood risk <i>Wherever possible new developments should not be built in areas at risk of flooding (identified in the SFRA/PPS25)?</i>  <i>Flood protection</i>	SA19: Flood risk* <i>How does the contribution to quality of place affect flood risk?</i>	+	Good quality schemes will provide both improvements to public realm and flood risk benefits			

\* SEA Directive: Interrelationship between factors

\* SEA Directive: Climatic factors

\* SEA Directive: Material assets

Sustainability Objective and definition Linked to Up / Mid / Downstream topics	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	<p><i>measures should be designed into any new development sited in a flood risk area?</i></p> <p><i>A lot of the flood risk area in Leeds city centre constitutes historical buildings (waterfront/wharf areas).</i></p>						
Downstream	<p>SA21: Contaminated land <i>A lot of historical industrial areas known to be heavily contaminated.</i></p>	<p>SA21: Contaminated land* <i>How does the contribution to quality of place affect remediation of contaminated land?</i></p>	+	Opportunity for remediation through schemes which provide opportunity for new development			
<p><b>UPSTREAM SA7: ENERGY AND LOW CARBON GENERATION</b> <i>INCREASE ENERGY EFFICIENCY, LOW AND ZERO CARBON FORMS OF ENERGY GENERATION AND LOCAL DISTRIBUTION</i></p>		<p><b>SA7: ENERGY AND LOW CARBON GENERATION*?</b> <i>HOW DOES IT:-</i></p>					
		A) <i>INCREASE ENERGY EFFICIENCY?</i>	+	Measure 18 – pump operation carbon reduction			Strengthen objectives to include reference to low carbon
		B) <i>PROVIDE FOR LOW AND ZERO CARBON GENERATION?</i>	+	Potential incorporation of hydro electric, solar panels, wind turbines			

\* SEA Directive: Soil

\* SEA Directive: Material assets

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
		C) PROVIDE FOR LOCAL ENERGY (INCLUDING HEAT) DISTRIBUTION?	+	in schemes			
Downstream	SA14: Health Community CHP projects could reduce fuel poverty by providing cheap or free sources of heat to homes, and would therefore alleviate ill health resulting from living on cold or damp conditions (particularly for the elderly).	SA14: Health* How does the contribution to energy and low carbon generation affect health and health inequalities?	0	Neutral impact – could possibly sell on electricity			
Downstream	SA18: Climate change mitigation Increasing energy efficiency and introducing alternative local energy generation are likely to produce fewer carbon emissions.	SA18: Climate change mitigation* How does the contribution to energy and low carbon generation affect climate change mitigation?	-	More pumping would be bad for the environment but potentially offset by green energy			Strengthen objectives to include reference to low carbon
Downstream	SA20: Waste New energy production processes are likely to involve energy-from-waste	SA20: Waste* How does the contribution to energy and low carbon generation affect waste and waste management?	+	Management of (waste) water is improved			

\* SEA Directive: Human health  
\* SEA Directive: Climatic factors



Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
<b>UPSTREAM SA8: RESOURCE CONSUMPTION</b> REDUCE RESOURCE CONSUMPTION AND ENCOURAGE EFFICIENT USE OF NATURAL RESOURCES		<b>SA8: RESOURCE CONSUMPTION*</b> HOW DOES IT REDUCE THE USE OF RESOURCES BY:- A) REUSING RESOURCES? B) DIVERTING RESOURCES FROM THE WASTE STREAM? C) MINIMISING RESOURCE USE? D) REDUCING THE IMPACT OF RESOURCE USE THROUGH DESIGN AND METHOD?	+	Re-use of materials, sustainable materials, SuDS			
Midstream	SA11: Air quality No justification	SA11: Air quality* How does the contribution to resource consumption affect air quality?	-	Consumption of more resources would affect air quality			Keep resource consumption low
Midstream	SA12: Water quality <i>Reduced water</i>	SA12: Water quality* <i>How does the contribution to</i>					

\* SEA Directive: Material assets

\* SEA Directive: Material assets

\* SEA Directive: Air

\* SEA Directive: Water

Sustainability Objective and definition Linked to Up / Mid / Downstream topics	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	<i>consumption means that less water will be exposed to contaminants, requiring less treatment.</i>	<i>resource consumption affect water quality?</i>	+	SuDS have positive impact on water quality			
Downstream	SA17: Biodiversity / geological conservation <i>Encouraging efficient use of natural resources means more biological and geological resources will be left intact.</i>	SA17: Biodiversity */ geological conservation <i>How does the contribution to resource consumption affect biodiversity?</i>	+	SuDS amd green corridors have a positive impact on biodiversity			
Downstream	SA18: Climate change adaptation <i>Reduced resource consumption mean less extraction and processing of materials and will therefore result in fewer greenhouse gas emissions.</i>	SA18: Climate change mitigation* <i>How does the contribution to resource consumption affect climate change mitigation</i>	+	Marginal improvement through efficient use of resources			
Downstream	SA19: Flood risk <i>Green design (grass roofs, porous surfaces, etc) can reduce flood risk.</i>	SA19: Flood risk* <i>How does the contribution to resource consumption affect flood risk</i>	+	Efficient use of resources will reduce flood risk			
Downstream	SA20: Waste	SA20: Waste*					Use of 'site

\* SEA Directive: Biodiversity, fauna, flora

\* SEA Directive: Climatic factors

\* SEA Directive: Material assets

Sustainability Objective and definition	Justification	Linked objective and Decision making criteria:  Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Linked to Up / Mid / Downstream topics							
	<i>Efficient use of resources will result in less waste arisings.</i>	<i>How does the contribution to resource consumption affect waste and waste management?</i>	-	Construction creates waste – materials should be reused and recycled			waste management plans' to reduce waste consumption

\* SEA Directive: Material assets

## Appendix F – Climate Proofing Assessment

This is a summary of the discussions undertaken on 5<sup>th</sup> July 2012 to appraise the Leeds Local Flood Risk Management Strategy. The discussions from the SEA workshop are in the **blue** coloured font.

STRATEGY OBJECTIVE		EXISTING CLIMATE RISKS (vulnerability mapping / LCLIP / PEPU Plans)	PROJECTED CLIMATE RISKS (use of EA models or UKCIP models)
<p><b>Objective 1:</b> Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic solutions to identified risks/problems.</p>	<ul style="list-style-type: none"> <li>- Improve communications;</li> <li>- Review and update relevant guidance / plans;</li> <li>- Review Council policy on flood risk management.</li> </ul>	<ul style="list-style-type: none"> <li>- OK - but can improve;</li> <li>- Currently flood mapping produced with 1 in 100yr, 1000yr + 20% CC allowance;</li> <li>- Mapping improvements for surface water - looking to develop these maps;</li> <li>- Hydraulic modelling - combined risk &gt; river and surface water;</li> <li>- UK climate database available.</li> </ul>	<ul style="list-style-type: none"> <li>- Use best available data - could develop local models utilising local knowledge to improve SW mapping. Use UKCP's to account for climate change;</li> <li>- MAST (Mapping All Sources) Tool: Will bring together all flood sources on one map (Groundwater/ surface water/ fluvial) - currently being developed by EA.</li> </ul>
<p><b>Objective 2:</b> Develop a consistent approach to planning and investment in flood risk management between RMAs (land allocation, sustainable development, climate change adaptation and emergency planning) and avoid duplication of effort or inefficient investment.</p>	<ul style="list-style-type: none"> <li>- Pump operation - carbon reduction;</li> <li>- Implement SuDS Approval Body function;</li> <li>- Publish local flood risk management strategy and List of Measures;</li> <li>- Review and update Strategic Flood Risk Assessment;</li> <li>- Climate change adaptation;</li> <li>- Regular feedback to senior officer and elected members.</li> </ul>	<ul style="list-style-type: none"> <li>- Appropriate flood legislation - FWMA 2010 key driver;</li> <li>- YWS have their own investment strategy - cooperation with YWS could be strengthened - closer working on SuDS adoption;</li> <li>- Need to engage with communities to think more about SuDS - closer engagement with Planning Authority on where development is taking place.</li> </ul>	<ul style="list-style-type: none"> <li>- As for existing but with pressures e.g. Large developments - Kirkstall Forge;</li> <li>- Legislation on the development of impermeable areas;</li> <li>- SuDS investment strategy could be strengthened.</li> </ul>

STRATEGY OBJECTIVE		EXISTING CLIMATE RISKS (vulnerability mapping / LCLIP / PEPU Plans)	PROJECTED CLIMATE RISKS (use of EA models or UKCIP models)
<p><b>Objective 3:</b> Increase internal skills and ultimately capacity for flood risk management.</p>	<ul style="list-style-type: none"> <li>- Increase LCC flood risk management capacity and skills (as LLFA).</li> </ul>	<ul style="list-style-type: none"> <li>- Improved training for all staff – engineers...etc. Try to improve proactive measures for whole river catchment;</li> <li>- Use of UKCP data in all designs - not just 20% or 30% allowances;</li> <li>- Strengthen cooperation with neighbouring authorities;</li> <li>- Improved catchment management activities - refer to CFMP e.g. tree planting - assess benefits of this.</li> </ul>	<ul style="list-style-type: none"> <li>- As for existing.</li> </ul>
<p><b>Objective 4:</b> 4. Increase community awareness of the work of the LLFA and local flood risk and involve local communities in decision making – localism agenda.</p>	<ul style="list-style-type: none"> <li>- Engagement and communication with public (flood fairs, wider public info campaigns, engage with local flood action groups);</li> <li>- Maintain internet and intranet pages to provide comprehensive info to all stakeholder.</li> </ul>	<ul style="list-style-type: none"> <li>- Resident Apathy - need to improve involvement once a contact has been established;</li> <li>- Attend existing community events rather than create own;</li> <li>- Investigate alternative events e.g. around school pickup time.</li> </ul>	<ul style="list-style-type: none"> <li>- Deliver best value for money.</li> </ul>

STRATEGY OBJECTIVE		EXISTING CLIMATE RISKS (vulnerability mapping / LCLIP / PEPU Plans)	PROJECTED CLIMATE RISKS (use of EA models or UKCIP models)
<p><b>Objective 5:</b> Improve understanding of local flood risk and seek to decrease local flood risk through implementation of measures to alleviate flooding where practicable.</p>	<ul style="list-style-type: none"> <li>- Flood alleviation schemes;</li> <li>- Property protection and resilience schemes;</li> <li>- Culvert improvements;</li> <li>- Environment Agency and YWS dG5 schemes;</li> <li>- Develop register of assets affecting local flood risk;</li> <li>- Watercourse and beck condition surveys;</li> <li>- Flood warning feasibility studies (Wortley Beck and Meanwood Beck);</li> <li>- Investigate interaction between Leeds &amp; Liverpool Canal and the River Aire;</li> <li>- Produce register of culverts and outfalls;</li> <li>- Evaluate condition of flood defences along Sheepscar Beck;</li> <li>- Work with EA to support development of flood defence and resilience strategy for the Meanwood Beck catchment.</li> </ul>	<ul style="list-style-type: none"> <li>- Identify existing flooding hot spots;</li> <li>- What is right for a specific community - not just Standard of Protection - check hydraulic modelling methodology;</li> <li>- Understand flood risk now and what risk will be in 50 years time - use UKCP and relevant guidance;</li> <li>- Assumptions for UKCP's - emissions - should use upper end estimates;</li> <li>- Indirect effects of major schemes - e.g. River Aire/Leeds - effects downstream on Castleford;</li> <li>- Cost/benefit analysis for each applicable area – affordability;</li> <li>- Improve capability to deal with a flood when it happens - property protection and resilience e.g. Todmorden.</li> </ul>	<ul style="list-style-type: none"> <li>- Understanding of flood risk in the future;</li> <li>- Improve understanding of downstream catchment effects - unforeseen impacts, indirect effects, effect of bridges, reduced risk, increased capacity;</li> <li>- Potential Partnership Funding - include paragraph for this in strategy and strengthen objectives 4 and 5.</li> </ul>

# Appendix C



## **LIST OF MEASURES**

**Appendix C - List of Measures (Policies)**

ID	Priority	Scheduled Review/Completion Date	Measure	Location (if applicable)	Category	Relevant Objective from LFRMS	Progress/Comments (reference other sources of information)	Benefits/ Outcome	Lead Organisation	Support Organisation	Last Reviewed
<b>CURRENT POLICIES</b>											
P3	HIGH	Ongoing	Develop register of structures and features which are likely to have a significant effect on flood risk.	City-wide	4. Asset management and maintenance	6. Improve understanding of local flood risk and seek to decrease local flood risk.	This is a requirement under Section 21 of the Flood and Water Management Act (2010). LCC are progressing this and have purchased new software "FloodVu" which will assist with the recording of asset information. This software links directly with the LCC's	Improve knowledge of existing infrastructure and conditions and promote a sustainable approach to asset management and maintenance.	LCC Flood Risk Management	Environment Agency & Yorkshire Water Services	17/10/2018
P4	HIGH	Ongoing	Identify locations where culverts can be removed or improved through redevelopment	City-wide	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	This measure is listed in the Aire Catchment Flood Management Plan	Improve knowledge of existing infrastructure and conditions and promote a sustainable approach to asset management and maintenance. Redevelopment plans will include consideration of the removal of problem culverts	Environment Agency	Leeds City Council	17/10/2018
P5	HIGH	Ongoing	Watercourse and beck condition surveys	City-wide	4. Asset management and maintenance	6. Improve understanding of local flood risk and seek to decrease local flood risk.	TBC	Improve knowledge of existing infrastructure and conditions and promote a sustainable approach to asset management and maintenance.	LCC Flood Risk Management	Environment Agency	17/10/2018
P8	HIGH	Ongoing	Implement SuDS through Planning	City-wide	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	This has replaced the SuDS Regulations, under Flood & Water Management Act 2010, that would have set up SABS	Development control - ensure new drainage systems incorporate SuDS measures to reduce runoff rates and therefore flood risk.	LCC Forward Planning & Implementation, Sustainable Development Unit, Flood Risk Management	Environment Agency	17/10/2018
P6	HIGH	Ongoing	Improve communications, engagement and coordination of activities with internal and external partners (including RMA's): Leeds City Council Flood Risk Management Group; Technical Standards and Guidance; Planning and Flood Risk; Yorkshire and Humber Learning Alliance, Metro (transport network).	-	1. Flood awareness, response and recovery	1. Improve co-operation between LLFA and other RMA's	Engagement and consultation is under way as part of LFRMS. Regular meetings required to share knowledge, review policy, strategy documents, list of measures...etc.	Formalise and improve cooperation between RMA's on FRM	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P15	HIGH	Annually	Review LFRMS List of Measures	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	Review scheduled to take place at least annually to assess progress with current measures and add or remove measures as appropriate. First review scheduled for 1 year after the strategy is published.	Will assess progress with List of Measures and ensure continuous improvement	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P9	MEDIUM	As required	Provide regular feedback to senior officers and elected members on FRM progress, working groups, and strategies such as: - Director of City Development (quarterly); - City Development (annually); - City Development Scrutiny Board (annually), and - All Area Committees (two-yearly).	-	1. Flood awareness, response and recovery	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	TBC	Ensures that there is ownership and awareness of on-going FRM work at appropriate levels of accountability.	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P7	MEDIUM	Ongoing	Investigate opportunities to reduce carbon from pump operations	City-wide	4. Asset management and maintenance	2. Promote sustainable flood risk management	TBC	Reduce carbon emissions and improve energy efficiency	LCC Flood Risk Management	Environment Agency	17/10/2018
P11	MEDIUM	Ongoing	Engagement and communication with public on FRM issues; such as: - Targeted 'flood fairs' held in at-risk locations highlighting flood protection products; - Wider public information campaigns for at-risk households drawing attention to useful resources, and - Engagement with local flood action groups (EA and RET).	-	1. Flood awareness, response and recovery	5. Increase community awareness of flood risk and the work of the LLFA in managing this risk	Engagement and consultation has begun as part of LFRMS - Graham Lindsey and Paul Seddon are points of contact for flood action groups	Involve communities in decisions - localism agenda	LCC Flood Risk Management & Peacetime Emergency Planning Unit	Internal LCC departments and external stakeholders	17/10/2018
P12	MEDIUM	Ongoing	Leeds City Council to increase their flood risk management capacity, knowledge and skills (as Lead Local Flood Authority) in order to deliver their new responsibilities as conferred under the Flood and Water Management Act 2010.	-	1. Flood awareness, response and recovery	4. Increase internal skills and ultimately capacity for flood risk management;	In accordance with Defra guidance on capacity building. Improve understanding of flood risk in the city and expertise to better manage consequences.	Increases local authority capacity and skills in flood risk management	LCC Flood Risk Management	Environment Agency	17/10/2018
P13	MEDIUM	Ongoing	Significantly increase the percentage take-up of properties registered for flood warnings in flood warning areas across city. City wide campaign as current take-up is low.	City wide	1. Flood awareness, response and recovery	5. Increase community awareness of flood risk and the work of the LLFA in managing this risk	This measure is listed in the Aire CFMP for the Leeds Policy Unit - to be progressed by 2030.	The consequences of flooding will be reduced through the increased potential for effective action to take place following receipt of a flood warning	Environment Agency	Leeds City Council	17/10/2018
P10	MEDIUM	Annually	Review and update Emergency Handbook, Generic Flooding Plan, Community Flood Action Plans, West Yorkshire Major Flood Incident Plan, Reservoir Emergency Plan.	-	1. Flood awareness, response and recovery	1. Improve co-operation between LLFA and other RMA's	Plans need to be updated with latest contact details, departments and processes. SG/IH have discussed with Paul Seddon in Peacetime Emergency Planning Unit and he is progressing this. This measure is listed in the Aire CFMP for the Leeds Policy Unit.	Ensures plans for coordination of FRM activities in the event of a flood are up to date and consequences and disruption of flooding are minimised.	Peacetime Emergency Planning Unit	Environment Agency & West Yorkshire Authorities	17/10/2018
P17	LOW	As required	Maintain internet and intranet web pages to provide comprehensive information to all stakeholders on: - The sources of flooding and who is responsible for what; - How to prepare for flooding emergencies; - What to do when flooding occurs and who to report this to; - How flood risk is treated within the planning process.	-	1. Flood awareness, response and recovery	5. Increase community awareness of flood risk and the work of the LLFA in managing this risk	Internet and intranet pages in place and launched. Further feedback required from services on on-going basis.	Ensures that there is a single consistent source of information on flood risk management.	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P18	LOW	On-going	Promote the use of sustainable design principles in all future developments to ensure that the risk of flooding and climate change are fully taken into account e.g. - Promoting use of SuDS; - Incorporating policies and recommendations within Leeds LDF; - Developer contributions in Core Strategy; - Biodiversity and local amenity, and - Climate Change Adaptation.	City-wide	2. Spatial planning and development control	2. Promote sustainable flood risk management	This measure is listed in the Aire Catchment Flood Management Plan	By embedding the requirements for SuDS and urban design principles within local policy we will be able to improve the management of the water environment in all new developments.	LCC Forward Planning and Implementation & Sustainable Development Unit	Environment Agency & Yorkshire Water Services	17/10/2018
P16	LOW	6 Monthly	Review Council Policy on FRM e.g. 'Maintaining Water Resources and Responding to Flood Incidents' approved by Exec Board on 17 May 2006 to ensure that it conforms to the requirements of the FWMA that Local authorities should lead on the management of local flood risk, with the support of the relevant organisations.	-	2. Spatial planning and development control	1. Improve co-operation between LLFA and other RMA's	The Policy should be reviewed in light of the publication of the FWMA.	Ensures clarity around Council's legal roles and responsibilities and that work programmes have a sound foundation.	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P19	LOW	Ongoing	Review Strategic Flood Risk Assessment (SFRA) produced by Jacobs in October 2007; assess the need for a Level 2 SFRA to be undertaken.	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	24/04/12 - SG had meeting with DF to discuss this. DF indicated that the EA have published data updates online - document as a whole is broadly up to date.	Helps ensure there is a more complete understanding of flood risk at a high-level which takes account of YWS's network and other lessons learned or gaps	LCC Flood Risk Management & Forward Planning and Implementation	Leeds City Council	17/10/2018
P14	LOW	2024	Review Local Flood Risk Management Strategy (LFRMS)	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	The LFRMS will be reviewed once every 6 years. This will link the LFRMS review with the cycles for reviewing the PFRA as outlined in the FRR. The first review is scheduled to be completed by October 2018.	Ensures LFRMS is updated with relevant information to reflect any changes in FRM	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
<b>COMPLETED POLICIES SINCE 2011</b>											
P20		Oct-12	Undertake Strategic Environmental Assessment (SEA) for LFRMS	-	2. Spatial planning and development control	2. Promote sustainable flood risk management	This is part of process of producing LFRMS. SEA Workshop planned for July 2012 to appraise the objectives and measures in the LFRMS - see 19	Will ensure LFRMS is sustainable and workable and also secure buy in from stakeholders	LCC Sustainable Development Unit & Flood Risk Management	Environment Agency	17/10/2018
P1		Mar-14	Publish Local Flood Risk Management Strategy	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	Draft strategy currently being developed in parallel with an SEA.	Will raise awareness of the LFRMS and FRM issues in the city	LCC Flood Risk Management	Environment Agency	17/10/2018
P2		Mar-14	Publish LFRMS List of Measures	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	List of measures currently being developed.	Will assess progress with List of Measures and ensure continuous improvement	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P21		Jun-17	Preliminary Flood Risk Assessment (PFRA) Update	-	1. Flood awareness, response and recovery	6. Improve understanding of local flood risk and seek to decrease local flood risk.	In accordance with EA-published self-assessment guidance.	The first review of LCC's preliminary assessment report and identification of flood risk areas (FRAs), as required by the Flood Risk Regulations (2009).	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P23		Dec-18	Publish LFRMS List of Measures	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	List of measures currently being developed.	Will assess progress with List of Measures and ensure continuous improvement	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018
P22		Dec-18	Review Local Flood Risk Management Strategy (LFRMS)	-	2. Spatial planning and development control	3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABS;	The LFRMS will be reviewed once every 6 years. This will link the LFRMS review with the cycles for reviewing the PFRA as outlined in the FRR. The first review is scheduled to be completed by October 2018.	Ensures LFRMS is updated with relevant information to reflect any changes in FRM	LCC Flood Risk Management	Internal LCC departments and external stakeholders	17/10/2018



**Appendix C - List of Measures (Schemes)**

ID	Priority	Current phase	Scheduled Phase Completion Date	Measure	PF % Score	Whole Scheme Estimated Cost	Location (if applicable)	Category	Relevant Objective from LFRMS	Progress/Comments (reference other sources of information)	Benefits/ Outcome	Lead Organisation	Support Organisation	Last Reviewed
<b>CURRENT SCHEMES AND FEASIBILITY STUDIES</b>														
S37	High	Feasibility	2018	Leeds Flood Alleviation Scheme Phase 2, River Aire City Centre to Upper Catchment	TBC	£112m	River Aire - City Centre to Upper Catchment	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Phase 2 of the Leeds FAS, looking at solutions across the whole catchment upstream of Leeds that will reduce flood risk to the city along the river Aire. Modelling and feasibility work largely complete, Outline Business Case submitted to the EA and Treasury Jan 2018. Moving in to more detailed design in 2018 with construction starting late 2018 early 2019, advanced works have taken place on some 'quick win' items and works at Stourton about to start as is a programme of advanced maintenance and stewardship.	Reduce flood risk from River Aire	LCC Flood Risk Management	Environment Agency	17/10/2018
S29	High	Design / Construction (on hold)	2018	Queen Street Culvert	NA	TBC	Allerton Bywater	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Outline design completed. Japanese knoweet treatment taking place this is a 3 year programme due to complete in 2018	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S40	High	Design / Construction	2019	Hawthorn Terrace Flood Alleviation Scheme Phase 2	TBC	TBC	West Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Initial scheme completed, but further defects with existing assets and connected infrastructure identified so further works needed and being designed	Reduced risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S15	High	Construction	2019	Killingbeck Meadows Flood Alleviation Scheme	TBC	£1.6m	Halton Moor	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Flooding to residential and commercial areas from Wyke Beck. Accelerated scheme due to combining the benefits of releasing development sites (11 housing sites and land within the Enterprise Zone and providing green infrastructure improvements to a Local Nature reserve as well as providing flood risk reduction, this scheme should receive planning permission in March 2018 and become a registered flood storage area under the Reservoirs Act. This forms part of a joint Wyke Beck Programme delivering housing growth from Brownfield land and Local Nature reserve and green space improvements.	The risk of flooding will be managed	LCC Flood Risk Management	Environment Agency	17/10/2018
S16	High	Feasibility	2019	Farnley Wood Beck Flood Alleviation Scheme	104%	£500k	Cottingley	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Flood risk to residential areas, long term issue - scheme being scoped, developer contribution secured, this scheme is now being progressed as part of the wider Wortley Beck study.	Reduce flood risk from Farnley Wood Beck	LCC Flood Risk Management	Environment Agency	17/10/2018
S31	High	Feasibility	2020	Lin Dyke Catchment Assessment - Upper and Middle catchments	TBC	£1.25m	Garforth & Kippax	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Continuation of work included in Section 19 Report, regarding flooding of the SE Leeds area in August 2014 and 2015, design works are continuing to be progressed as schemes are identified	Reduced risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S30	High	Feasibility	2020	Wyke Beck Catchment Assessment	NA	£50k	Communities along Wyke Beck	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Continuation of work carried out by both LCC & EA within the Dunhills, this has now progressed in to a catchment wide approach bringing together the EA and many departments across LCC, resulting in an initial stage bid to the LEP for ESIF funding to complete various schemes including Killingbeck meadows	Reduced risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S17	High	Feasibility	2020	Wortley Beck Flood Alleviation Scheme	111%	£1.1m	Wortley Beck	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Flooding to residential area and outer ring road. Work in partnership with the EA and YWS to develop a detailed flood alleviation scheme that integrates with all sources of flooding. This measure is listed in the Aire Catchment Flood Risk Management Plan.	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S39	High	Feasibility	2020	Wharfedale Flooded Communities Study	NA	£90k	Collingham, Linton, Wetherby, Thorp Arch	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Linked to wider catchment partnership work and Otley Flood Alleviation Study, initial modelling work currently being assessed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S9	High	Design/ Construction	2021	Lower Mickleton Road Flood Embankment	138%	£1.1m	Mickleton	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Construction of larger flood embankment along Lower Mickleton Road to protect properties from flooding. Being taken forward separately from Mickleton (Pit Lane) Flood Embankment as is substantially larger scheme. New model information only recently developed scheme proposal to be assessed in line with the	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S38	High	Feasibility	2021	Otley Flood Alleviation Scheme	TBC	£2m	Otley	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Initial £90k studied greatly extended to develop full Otley FAS to be constructed by December 2020, currently assessing shortlisted options to identify solutions to protect 58 properties from flooding, funding announced in the Autumn Statement 2016 linked to wider catchment partnership work and Wharfedale Flooded communities study	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S5	High	Design (on hold)	TBC	Barnsdale Road Property Level Protection Scheme	TBC	TBC	Allerton Bywater	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Surface water flooding to properties. Install property level protection measures - flood barriers and doors to reduce flood risk to residential properties on Barnsdale Road. Funding has now been made available from Local Levy. This is currently on hold due to changes in the ownership of the properties involved to allow time to link with their plans for the properties	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S12	Medium	Pre Outline Business Case	2021	Potternewton Surface Water Flood Alleviation Scheme	153%	£250k	Potternewton	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Surface water flooding. Install attenuation and pumping station to remove flood water to adjacent culverted watercourse. Local levy funding secured	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S10	Medium	Pre Outline Business Case	2022	Thomer Beck Flood Alleviation Scheme	101%	£150k	Thomer	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Restricted capacity of existing culverts causing overland flooding. Improve Culvert capacity. Local levy funding secured	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S11	Medium	Pre Outline Business Case	2022	Victoria Road Surface Water Flood Alleviation Scheme	100%	£250k	Guiselby	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Surface water flooding to properties. Install attenuation and pumping station to remove flood water to adjacent culverted watercourse.	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S18	Low	Pre Outline Business Case	2020	Sheepscair: evaluate the condition of formal and informal flood defences along the Sheepscair Beck which were recently breached to identify potential remedial works required.	TBC	TBC	Sheepscair	4. Asset management and maintenance	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Evaluate flood defence improvement works required.	Helps ensure that problems or new works are identified to prevent recurrence of flooding.	LCC Flood Risk Management	Environment Agency	17/10/2018
S19	Low	Pre Outline Business Case	2020	Develop and implement feasibility studies for fluvial flood alleviation schemes to improve the standard of protection along Meanwood Beck, Bagley Beck and Farnley Wood Beck - integrating with all sources of flooding.	TBC	TBC	Meanwood Beck, Bagley Beck & Farnley Wood Beck	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	This measure is listed in the Aire Catchment Flood Risk Management Plan for the Leeds Policy Unit - to be progressed by 2030.	Helps ensure that areas with proven flood risk are provided with an appropriate flood defence scheme at the earliest possible opportunity and that the Council supports the EA in developing any flood alleviation scheme in the longer-term	Environment Agency	Leeds City Council & Yorkshire Water Services	17/10/2018
S33		Ongoing	NA	Improvements to surface water drainage outfalls	NA	TBC	City wide	4. Asset management and maintenance	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Identify improvements to improve discharge of surface water from flooding hot spots, work programme ongoing	Reduce risk of flooding	LCC Flood Risk Management	Yorkshire Water Services	17/10/2018
S21		Ongoing	NA	LCC Significant Maintenance	NA	TBC	Across the District	4. Asset management and maintenance	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Continuation of regular maintenance of Watercourses and Hot-Spots	Reduced risk of flooding	LCC Flood Risk Management	Yorkshire Water Services & Environment Agency	17/10/2018

**COMPLETED SCHEMES AND FEASIBILITY STUDIES SINCE 2011**

S22	Completed	2011	Flood Alleviation Scheme - Leeds Road (Allerton Bywater) pumping station (local levy)	NA	£34k	Allerton Bywater	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S23	Completed	2011	Newton Road property protection and resilience scheme	NA	£88k (estimated)	Newton Road, Potternewton	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Improve flood resistance and resilience of properties	LCC Flood Risk Management	Environment Agency	17/10/2018
S24	Completed	2011	Lower Wortley - property protection and resilience scheme	NA	£47k (estimated)	Lower Wortley	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Improve flood resistance and resilience of properties	LCC Flood Risk Management	Environment Agency	17/10/2018
S25	Completed	2011	Church Lane, Bardsey - property protection and resilience scheme	NA	£10k (estimated)	Bardsey	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Improve flood resistance and resilience of properties	LCC Flood Risk Management	Environment Agency	17/10/2018
S26	Completed	2011	Dean Park Drive, Drighlington - property protection and resilience scheme	NA	£25k (estimated)	Drighlington	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Improve flood resistance and resilience of properties	LCC Flood Risk Management	Environment Agency	17/10/2018
S27	Completed	2012	Barley Hill Recreation Ground - (Local Levy)	NA	£113k	West Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S28	Completed	2013	Oakdene, Watercourse Improvements	NA	£8k	Swillington	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S1	Completed	2014	Lowther Road, Garforth - Culvert Improvements	NA	£84k	Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Improve flood resistance and resilience of properties	LCC Flood Risk Management	Environment Agency	17/10/2018
S4	Completed	2014	Wellhouse Drive Flood Alleviation Scheme	NA	£22k (estimated)	Gledhow	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S7	Completed	2014	Culvert Headwall Repair Scheme - (Local Levy)	NA	£36k	Otley	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S3	Completed	2017	Leeds Flood Alleviation Scheme Phase 1, River Aire City Centre	100%	£50m	River Aire - City Centre	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce flood risk from River Aire	LCC Civil Engineering Projects	Environment Agency	17/10/2018
S34	Completed	2017	Giebelands Recreation Ground	101%	£70k	Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Parks and Countryside	Environment Agency	17/10/2018
S36	Completed	2017	Barley Hill Recreation Ground Phase 2	NA	£160k	West Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Parks and Countryside	Environment Agency	17/10/2018
S2	Completed	2017	Ramsden Street, Kippax, Flood Alleviation Scheme - (Local Levy & FDGIA)	NA	£220k	Kippax	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S14	Completed	2017	Carry out flood warning feasibility studies for Wortley Beck and Meanwood Beck and implement findings.	NA	£10k	Wortley Beck and Meanwood Beck	1. Flood awareness, response and recovery	6. Improve understanding of local flood risk and seek to decrease local flood risk.	This measure is listed in the Aire Catchment Flood Risk Management Plan	Establish the potential for advanced warning of flooding. Develop more accurate flood warnings for tributaries of the River Aire which will result in reduction of economic damages and improve community safety.	Environment Agency	Leeds City Council	17/10/2018
S35	Completed	2018	Westfields, Allerton Bywater	101%	£600k	Allerton Bywater	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme Completed	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S32	Completed	2016	Hawthorn Terrace Flood Alleviation Scheme Phase 1	125%	£47k	West Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Initial scheme completed, but further defects with existing assets and connected infrastructure identified so further works needed and being designed	Reduced risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S20	Superseded	2020	Investigate the interaction between the Leeds and Liverpool Canal and the River Aire.	TBC	£10k	River Aire and Liverpool Canal	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	This study should identify the potential for managing this interaction to ensure that flood risk is managed effectively. This measure is listed in the Aire Aire Catchment Flood Risk Management Plan for the Leeds Policy Unit - to be progressed by 2030. - this has now been included in the scope of Phase 2 of the Leeds Flood Alleviation Scheme	Investigate this relationship to improve knowledge of the risk of flooding posed by the Leeds & Liverpool canal	Environment Agency	Canal & River Trust	17/10/2018
S8	Transferred	NA	Cotton Mill Beck Culvert, Valley Road	NA	£25k	Morley	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Scheme transferred to Network Rail for Review	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S13	Transferred	NA	Wakefield Road Flood Alleviation Scheme (transferred to S31)	102%	£190k	West Garforth	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Restricted culvert and surface water flow. Install new culvert and widen highway ditch, design being reviewed in line with the findings from the Lin Dyke study, as per the above link	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018
S6	Transferred	NA	Mickletown (Pit Lane) Flood Embankment (transferred to S9)	153%	£400k	Mickletown	3. Studies, schemes, assessments and plans	6. Improve understanding of local flood risk and seek to decrease local flood risk.	Assessment of a proposed setback bank is being Carried out, funding from FCRM GiA and Developer Contribution. Being taken forward separately from larger scheme - Lower Mickletown Road Flood Embankment, relies on much delayed Lower Aire Modelling work now being reviewed by LCC consultants	Reduce risk of flooding	LCC Flood Risk Management	Environment Agency	17/10/2018

# Appendix D

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**KEY LOCAL FLOOD RISK  
MANAGEMENT CONTACTS**

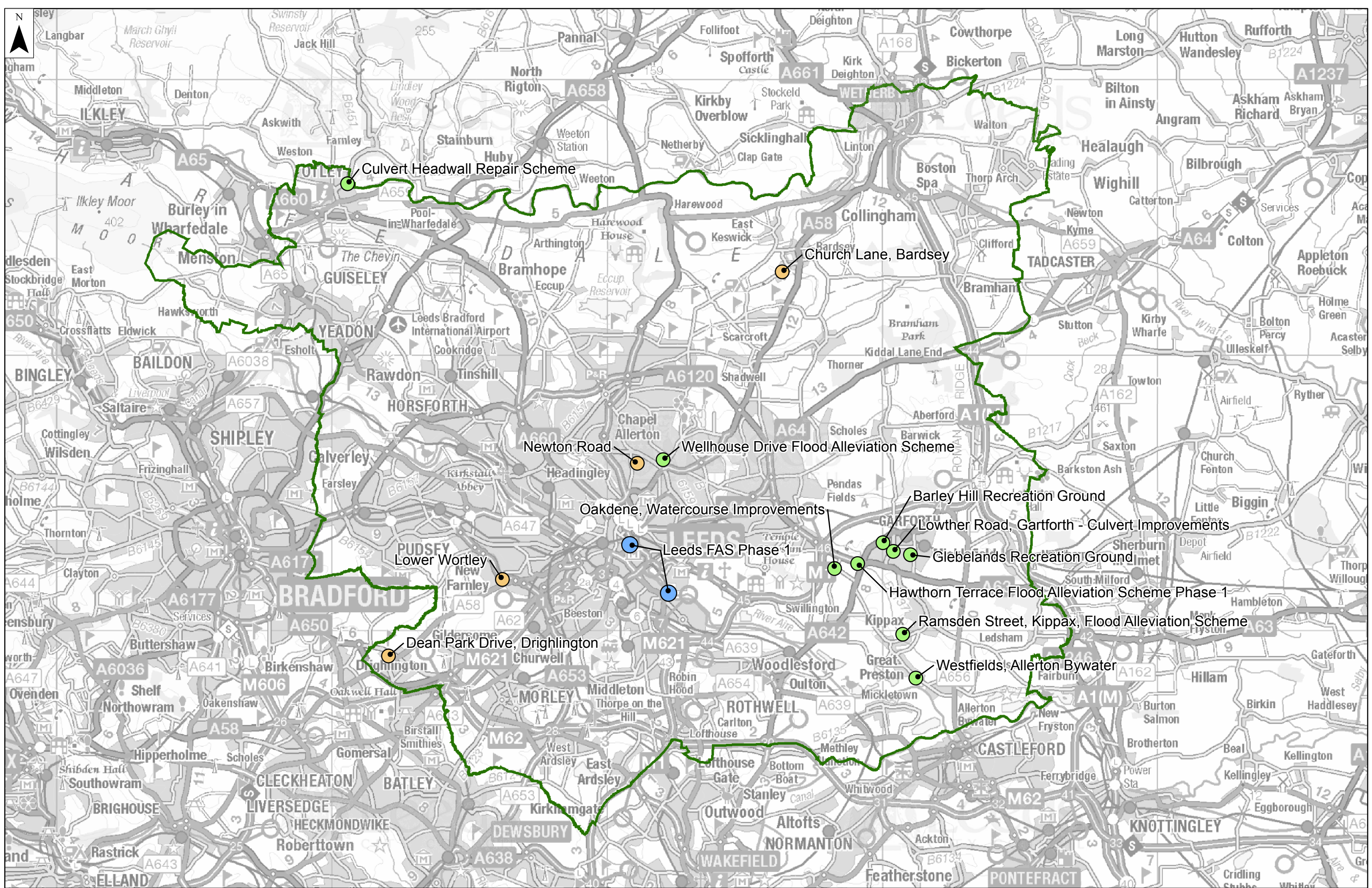
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Appendix D - Key Local Flood Risk Management Contacts			
Organisation	Office address	Department/Role	Name
Leeds City Council	St. George House, 40 Great George Street, Leeds, LS1 3DL	Flood Risk Management	Jonathan Moxon
	Merrion House, 110 Merrion Centre, Leeds, LS2 8BB	Planning and Development Control	Helen Miller
	Civic Hall, Calverley Street, Leeds, LS1 1UR	Resilience and Emergencies Team	Steve Thornton Jim Grafton
Environment Agency	Lateral, 8 City Walk, Leeds, LS11 9AT	Area Flood Risk Manager for West and South Yorkshire	Adrian Gill
		Partnership and Strategic Overview	John Woods Luke Williams
Yorkshire Water Services Ltd	Western House, Western Way, Bradford BD6 2SZ	Flood Risk and Engagement	Leah Humphries
Highways England	Lateral, 8 City Walk, Leeds, LS11 9AT	Regional Environmental Advisor	-
Ainsty Internal Drainage Board	Derwent House, Crockey Hill, York, YO19 4SR	Clerk	Williams Symons

# Appendix E



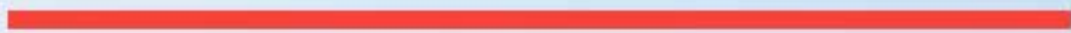
**MAP OF SCHEMES COMPLETED  
SINCE 2011**



- Completed Schemes
- Leeds FAS
- PLP Schemes

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# Appendix F



**RESPONSES OF CONSULTEES**

## Appendix F - Responses of consultees

Consultee	Consultee Response	LCC Flood Risk Management Response
<b>Leeds City Council - Planning and Development Control</b>	<p>Section 1: Legislative Context The adoption date for the Natural Resources and Waste Local Plan is January 2013, with the Minerals Transport Policies of that Plan having a further adoption date of 2015 ( due to a high court challenge of policies Minerals 13 and 14).</p>	<p>Date of Natural Resources and Waste Local Plan updated in LFRMS</p>
	<p>This section should also include the Aire Valley Leeds Area Action Plan which was adopted in 2017 as part of the LDF. This Plan includes a lot of site specific policies which include mitigation measures for flood risk so it is important that the LLFRMS includes it. The Plan also includes a green infrastructure strategy which is relevant for flood risk management.</p> <p>The Site Allocations Plan (SAP) is not adopted yet but has been submitted to the Secretary of State for independent examination and therefore is a material consideration. The Plan proposes significant housing and employment growth, some of which is in areas at risk of flooding and therefore it is relevant to mention in the LLFRMS. The SAP has been underpinned by a Flood Risk Sequential and Exception Test Background Paper which attempts to avoid development in areas at risk of flooding but where this is not possible, explains the mitigation measures which will be required for the site to be developed. Where sites are being allocated for development and include a culvert or canalised watercourse in the site, the SAP includes a requirement that development proposals should consider re-opening or restoration in accordance with saved UDP Policy N39B. The flood risk management policies in the Natural Resources and Waste Local Plan apply to all sites allocated for development and those coming forward through the planning application process.</p>	<p>Noted, to be reviewed for next update</p>
	<p>Section 6: List of Measures The sentence that reads ‘Spatial planning and development control – this includes proposals for the creation of a SuDS Approval Body, promoting sustainability and climate change adaptation’ should be amended because the Government has abandoned the requirement for planning authorities to create a SuDS approval body.</p>	<p>LFRMS amended to reflect this</p>
	<p>Section 7: Review and Monitoring Within our Authority Monitoring Report we don’t currently monitor the number of SuDS that are delivered in development but I agree that this would be a very useful thing to do and I would be interested to know if the Flood risk management Team are doing this?</p>	<p>Noted</p>
	<p>Appendix C: List of Measures P19 The Leeds SFRA is out-of –date now and needs to be updated. The data for the zone 3aii flood risk layer is no longer reliable and there are significant changes in zones 2 and 3a in the city centre. Only the zone 3b layer and areas of rapid inundation are still correct. The SFRA update is currently being scoped.</p>	<p>Noted, document update being scoped</p>
	<p>Is there any chance there could be a measure for consultation of the Peace and Emergency Planning Team on evacuation plans in planning applications? We don’t currently do this but as a long term aspiration it is worthy of inclusion. It need not be for every application but occasionally we get applications where the evacuation plan is an important part of the FRA and there is no one to check it.</p>	<p>Noted, to be reviewed for future measures</p>



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<b>Environment Agency - Partnerships and Strategic Overview</b>	<p>Section 1: Legislative context What about the DEFRA's Surface Water Management Action Plan?</p> <p>Should there be something in here about regional policy e.g.</p> <ul style="list-style-type: none"> <li>Leeds City Region Strategic Economic Plan has a headline initiative around infrastructure and flood risk (Leeds FAS phase 1 received Local Growth Funding from WYCA, Wyke Beck is about to and Leeds FAS phase 2 is also likely to)</li> <li>The Leeds City Region Flood Review Report (December 2016)</li> </ul>	<p>Noted, to be reviewed for next update</p>
	<p>Section 2.5.1 It seems to be missing properties for the Hawthorne Terrace scheme that protected 10 properties in 15/16 (is this because further work is needed?)</p>	<p>Table 1 amended to include this protected properties</p>
	<p>Section 2.5.2 There is nothing in Micklefield SW flooding – there are 7 properties in the EA capital programme</p>	<p>This area is being investigated following flooding in December 2015, work to this area is not currently part of the LCC programme of work</p>
	<p>Section 4.3: Funding It mentions a figure of £595m of GiA but for when and over what period? Assume this is Yorkshire for the 6 year programme? Could just say £2.6 billion nationally over 6 years? Also it might be worth mentioning that additional funding is available for environmental outcomes. Is it worth eluding to PF scores and set payment rates here? It is worth noting that £20m was secured in the last Local Growth Fund bid for flood risk projects across the Leeds City Region incl. a number of projects in Leeds (see above).</p> <p>It says FDGiA but should be called – Flood and Coastal Erosion Risk Management (FCERM) GiA (this should be changed throughout incl. in the abbreviations section)</p> <p>To add:</p> <ul style="list-style-type: none"> <li>Highways England Designated Funds – Environment funds are available for flood risk projects on or near to the HE network</li> <li>Housing Infrastructure Fund?</li> <li>Yorkshire Water – incl. PR19</li> </ul>	<p>FCERM GiA description updated</p> <p>Yorkshire water funding included in this table - 'Water Company Investment'</p> <p>Other funding to be reviewed at next update</p>
	<p>Section 4.1 - Appendix D EA contact is down as John Woods. Can you put both Luke Williams and John Woods for EA PSO contact?</p>	<p>Appendix D Updated</p>
	<p>General It talks interchangeably about the council's MTP and the EA MTP a few times. Is it worth clarifying somewhere the difference and perhaps defining what they are?</p>	<p>LFRMS changes to refer to council's programme of work not MTP</p>
<b>Canals and Rivers Trust</b>	<p>I have had a look through and note no issues of concern or omissions relating to the Canal &amp; River Trust.</p> <p>I did notice a figure in one of the tables though which looks suspect; apologies if it is actually correct. It doesn't follow the pattern of change in all the other figures?</p>	<p>Table matches climate projection data</p>

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Consultee	Consultee Response	LCC Flood Risk Management Response
iCaSP	<p>Section 4.4.4 Suggest reword, as follows: iCaSP's first project helped organisations in Yorkshire to prepare in advance for the publication of new UK climate change projections due for release in November 2018 (UKCP18). In collaboration with the UK Met Office, which is responsible for producing the projections, the iCaSP project has been giving organisations including Leeds City Council an opportunity to rehearse ways of using the updated information in their operations and strategies – including for surface water flood risk management . The project was selected as a demonstrator by the Met Office to be made available nationally as part of the release guidance material . iCaSP will continue this support following the release of UKCP18 by organising a regional forum in 2019 – a one day event in designed for organisations who need to use UK climate projections for resilience planning, including flood risk management.</p>	Section updated as suggested
	<p>Leeds City Council are also a partner in a currently 'live' iCaSP project on enhanced warnings for surface water flooding.</p> <p>This iCaSP project aims to road-test the feasibility and usefulness of converting the latest advances in probabilistic rainfall forecasting and high-resolution surface water modelling into real-time forecasts and/or warnings for Lead Local Flood Authorities (LLFAs) and other decision makers.</p> <p>Leeds are a partner, as are the EA, City of York Council, Met Office &amp; FFC, JBA &amp; Yorkshire Water.</p> <p>I've attached a brief summary of the main aims of the project – I think it is worth including in the strategy given the Council's remit in responding to SWF events as part the West Yorkshire Local Resilience Forum. Let me know if you'd like more info on this.</p>	Reference to this project included in Section 4.4.4
	<p>Section 5 One of the objectives is stated as: "Promote sustainable flood risk management through WFD compliance, climate change adaptation (UKCIP, iCaSP), land management, habitat protection and creation." Suggest acronyms in parentheses are replaced. UKCIP is an organisation that advises on adaptation matters (based at the University of Oxford). Suggest removing all references to UKCIP in all Appendices too. iCaSP is a programme which involves issues beyond strictly climate change adaptation. Suggest reworded to something like: "climate change adaptation (based on latest UK projections, UKCP18 with support from iCaSP)"</p>	Reference to UKCIP removed
	<p>Appendix A: UKCP09 Climate Projections for Leeds UKCIP not related to UKCP09 in this case I suggest also referring to (recently revised) national guidance on 'climate change factors' for flood risk management: <a href="https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1">https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1</a> I suspect these will be revised (upwards) in light of UKCP18 (although this might take some time following release in Nov).</p>	Reference to UKCIP removed

# Appendix G

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**COMMENTS FROM LCC  
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