APPENDIX A

Rotherham Metropolitan Borough Council
Where Everyone Matters

Rotherham Metropolitan Borough Council
Preliminary Flood Risk Assessment Report

June 2011

DRAFT

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Produced by: Streetpride Drainage Team
Environment & Development Services

EXECUTIVE SUMMARY

The Flood Risk Regulations 2009 implement the requirements of the European Floods Directive, which aims to provide a consistent approach to managing flood risk across Europe.

The regulations impose new duties on Lead Local Flood Authorities (LLFA) including responsibility for managing local flood risk in particular from ordinary watercourses, surface runoff and groundwater.

The approach consists of a six year cycle of planning based on a four stage process of:

1 Undertaking a Preliminary Flood Risk Assessment (PFRA).
2 Identifying flood risk areas.
3 Preparing flood hazard and risk maps.
4 Preparing flood risk management plans.

The PFRA is a high level exercise based on existing and available information.

Over 8,500 residential properties in Rotherham have been identified as potentially at risk from surface water flooding, compared with less than 300 at risk of flooding from rivers.

106 areas have been identified for prioritisation in subsequent flood risk management planning, items 3&4 above.

Indicative Flood Risk areas are areas deemed to be of national significance and are defined as clusters numbering in excess of 30,000 people at risk of surface water flooding.
There are no indicative flood risk areas within Rotherham. The only flood event considered to be significant on a European scale and included on the reporting spreadsheet is the flood of June 2007

Rotherham has no indicative flood risk areas which are deemed to be of national significance. The requirement of the Floods and Water Management Act (F&WMA) is for Rotherham as the Lead Local Flood Authority (LLFA) to develop and maintained its own Local Flood Risk Strategy (LFRS). The general principles of the Local Flood Risk Strategy:

- Community focus & partnership working
- Sustainability
- Risk Based Approach
- Proportionality
- Multiple benefits
- Beneficiaries allowed to invest in local flood risk management

The unaltered Flood Map for Surface Water produced by the Environment Agency is to be used to define Locally Agreed Surface Water Information.

This report does not consider flooding from main rivers, reservoirs or as a consequence of sewer blockages.

GLOSSARY

Assets	Structures, or a system of structures used to manage flood risk.
AStSWF	Areas Susceptible to Surface Water Flooding
Catchments	An area that serves a watercourse with rainwater. Every part of land where the rainfall drains to a single watercourse is in the same catchment.
CFMP	Catchment Flood Management Plan
Cultural heritage	Buildings, structures and landscape features that have an historic value. These are also known as heritage assets.
Defences	A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area (for example a raised embankment or sea wall)
Defra	Department for Environment, Food and Rural Affairs
FCERM	Flood and coastal erosion risk management
FEO	Flood Event Outline.
Flood	The temporary covering by water of land not normally covered with water
Flood Risk Area	An area determined as having a significant risk of flooding in accordance with guidance published by Defra and WAG.
FMfSW	Flood Map for Surface Water
Groundwater	Water which is below the surface of the ground and in direct contact with the ground or subsoil.
HSWGW	Historic Surface Water and Groundwater.
IDB	Internal Drainage Board
Indicative Flood Risk Areas	Areas determined by the Environment Agency as indicatively having a nationally significant flood risk, based on guidance published by Defra.
ISWMG	Integrated Surface Water Management Group.
LLFA	Lead Local Flood Authority.
Local flood risk	Flood risk from sources other than main rivers, the sea and reservoirs, principally meaning surface runoff, groundwater and ordinary watercourses.
MAFP	Multi-Agency Flood Plan
Main River	A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers
NRD	National Receptor Dataset – a collection of risk receptors produced by the Environment Agency.
Ordinary watercourses	All watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, IDBs.
Pathway	The connection between a particular source and a receptor that may be harmed.
Preliminary assessment report	A high level summary of significant flood risk, based on available and readily derivable information, describing both the probability and harmful consequences of past and future flooding.
Preliminary assessment spreadsheet	Reporting spreadsheet which LLFAs need to complete. The spreadsheet will form the basis of the Environment Agency's reporting to the European Commission.

PFRA	Preliminary Flood Risk Assessment
PPC	Pollution Prevention and Control.
Receptor	Something that may be harmed by flooding.
Regulations	The Flood Risk Regulations
Resilience	The ability of the community, services, area or infrastructure to withstand the consequences of an incident.
RFDC	Regional Flood Defence Committee.
Risk	Measures the significance of a potential event in terms of likelihood and impact.
Risk assessment	A structured and auditable process of identifying potentially significant events, assessing their likelihood and impacts, and then combining these to provide an overall assessment of risk, as a basis for further decisions and action.
River basin district	There are 11 river basin districts in England and Wales, each comprising a number of contiguous river basins or catchments. The Environment Agency is responsible for collating LLFA reports at a river basin district level.
SFRA	Strategic Flood Risk Assessment – spatial planning documents prepared by local planning authorities under PPS25 in England.
S-P-R	Source-Pathway-Receptor.
Source	The origin of a hazard (e.g. heavy rainfall, strong winds, surge etc).
Surface runoff	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer.
SWMP	Surface Water Management Plan

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	187/44/DR002	Areas Susceptible to Surface Water Flooding
	187/44/DR003	River Flooding
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	187/44/DR006	Critical infrastructure at Risk from Surface Water Flooding
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Appendix B Preliminary Assessment Report Spreadsheet
Appendix C PFRA Review Checklist

1 INTRODUCTION

1.1 Scope

This Preliminary Flood Risk Assessment (PFRA), has been undertaken by Rotherham Metropolitan Borough Council, to assess the flood risk within Rotherham Borough. The report satisfies the first requirement of the Flood Risk Regulations 2009. The Regulations implement the requirements of the European Floods Directive, which aims to provide a consistent approach to managing flood risk across Europe.

The approach consists of a six year cycle of planning based on a four stage process of:

- Undertaking a Preliminary Flood Risk Assessment (PFRA).
- Identifying flood risk areas.
- Preparing flood hazard and risk maps.
- Preparing flood risk management plans.

Under the Regulations, and in line with responsibilities under the Flood and Water Management Act 2010 (the Act), Lead Local Flood Authorities (LLFAs) are responsible for undertaking a PFRA for local sources of flood risk, primarily from surface runoff, groundwater and ordinary watercourses. As a unitary authority, Rotherham Metropolitan Borough Council is therefore the LLFA for the Borough of Rotherham.

The PFRA is a high level screening exercise which involves collecting information on past (historic) and future (potential) floods, assembling it into a preliminary flood risk assessment report, and using it to identify Flood Risk Areas which are areas where the risk of flooding is locally significant. The following table summarises the main steps.

1	Set up governance & develop partnerships
2	Determine appropriate data systems
3	Collate information on past & future floods and their consequences
4	Determine locally agreed surface water information
5	Complete preliminary assessment report document
6	Record information on past & future floods with significant consequences in spreadsheet
7	Illustrate information on past and future floods
8	Review indicative Flood Risk Areas
9	Identify Flood Risk Areas
10	Record information including rationale

Table 1 Flood Risk Screening (from Environment Agency 2010)

LLFAs are required to submit their preliminary flood risk assessment report to the Environment Agency (EA) by 22 June 2011.

1.2 Sources of Flooding

The PFRA considers local flood risk, namely the following sources of flooding:

Surface water runoff – rainwater (including snow and other precipitation), which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer. Flooding from surface runoff is sometimes called pluvial flooding. Note that the term 'surface water' is used generically to refer to water on the surface.

Ordinary watercourse – any river, stream, ditch, cut, sluice, dyke or non-public sewer which is not a main river.

Artificial water bearing infrastructure – includes reservoirs (see below), sewers, water supply systems and canals. Flooding from canals that are non main river should be included in a PFRA. LLFAs do not need to assess flooding from sewers, unless wholly or partly caused by rainwater or other precipitation entering or otherwise affecting the system. Floods of raw sewage caused solely, for example, by a sewer blockage do not fall under the Regulations. The Regulations also do not apply to floods from water supply systems, e.g. burst water mains.

Groundwater – water which is below the surface of the ground and in direct contact with the ground or subsoil. It is most likely to occur in areas underlain by permeable rocks, called aquifers. Within Rotherham, deep flows within aquifers do not cause flooding. Whilst flow of groundwater underground at shallow depths may contribute to localised flooding where it emerges as springs, the flow closely mirrors surface flows and is not related to a widespread rise in groundwater levels. Groundwater flooding has therefore not been addressed separately to surface water flooding.

The PFRA does not consider the following sources of flooding:

Main river – watercourses legally defined and marked as such on the main river map. Generally they are larger streams or rivers, but can be smaller watercourses. The Environment Agency has legal responsibility for them.

Reservoirs – The Environment Agency are responsible for regulating large (presently over 25,000 m³) raised reservoirs under the Reservoirs Act 1975. This will reduce to10,000 m³ by the commencement of provisions of the Flood and Water Management Act. Reservoirs below this size are unlikely to present significant flood risks in the context of the Regulations.

The interaction of surface water flooding with river flooding or reservoirs is considered, for example where high water levels within river impede the discharge from an ordinary watercourse.

Further information on river flooding is contained in the Strategic Flood Risk Assessments.
A Level 1 Strategic Flood Risk Assessment (SFRA 1) for the whole Borough was published by RMBC in 2008.
A Level 2 Strategic Flood Risk Assessment (SFRA 2) for the town centre is expected to be published shortly by RMBC.

1.3 Aims and Objectives

Aims and objectives; identifying Flood Risk Areas and supporting local flood risk management strategy. The aims and objectives of the PFRA are as follows:

- Compile historical flood record
- Review predicted flood data based on local knowledge and historical data

- Produce report which satisfies the requirements of the Regulations
- Develop strategy for flood risk management and prioritise areas based on relative flood risk

1.4 Introduction to the Study Area

The Borough of Rotherham is situated in South Yorkshire and covers an area of 286km^2 and has a population of approximately 253,900 (2009 census).

The north-west and central areas of the Borough drain to the river Don, which runs from Sheffield, through Rotherham town centre, where it is joined by the River Rother, then to the north east where it is joined by the River Dearne near the Boundary with Doncaster.

The south east third of the Borough drains towards the River Ryton and is hydrologically independent of the Don catchment. The boundaries between two water companies and Environment Agency (EA) regions reflect this catchment boundary, the south east being Severn Trent Water Ltd and EA Midlands region, the remainder being Yorkshire Water Services Ltd and EA North East region.

The principal rivers are shown on **Figure 1** below.

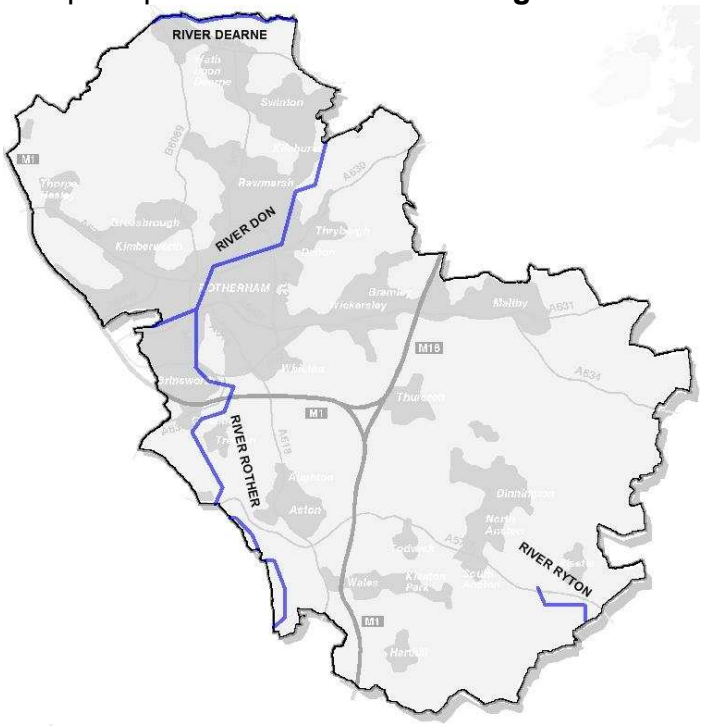

Figure 1 Rivers

Rotherham is generally underlain by the middle coal measures with predominantly impermeable soils and underlying strata. Consequently, the hydrology of the area is dominated by surface or shallow depth flows.

2 LOCAL LEAD FLOOD AUTHORITY RESPONSIBILITIES

2.1 Governance and Partnership Arrangements

An organogram of governance and partnership arrangements is provided in **Figure 2** overleaf.

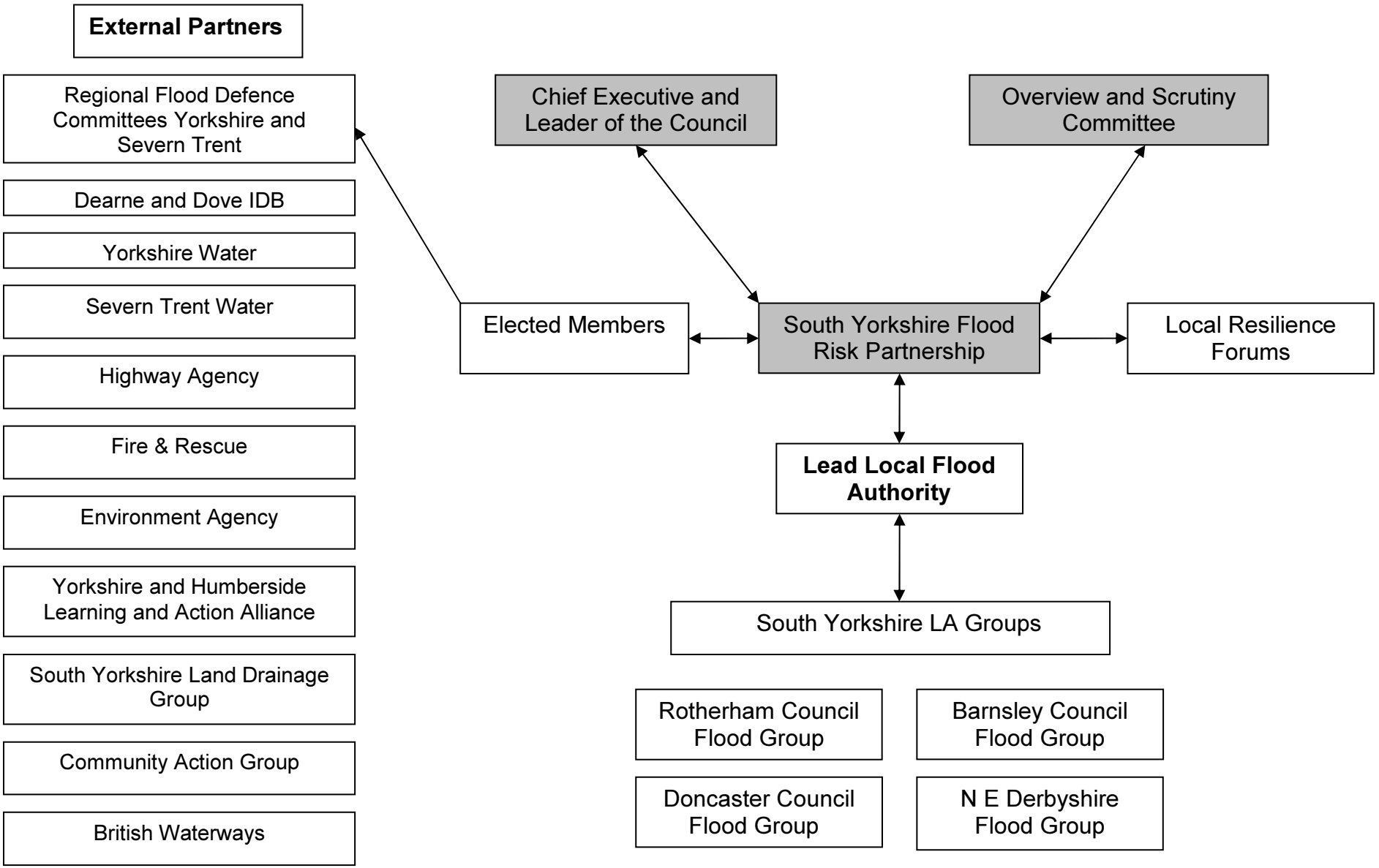

Figure 2 ROTHERHAM FLOOD MANAGEMENT GOVERNANCE

2.2 Communication with partners and the public

Information for the purposes of the PFRA has been requested and received from the following organisations:

- Yorkshire Water Services Ltd
- Severn Trent Water Ltd
- Environment Agency
- Dearne & Dove IDB
- Regional Flood Defence Committees
- Highways Agency
- South Yorkshire Fire Service
- British Waterways

Rotherham Council has engaged with the public and Community Action Groups regarding future flood risk management, to build trust, raise awareness, and gain local knowledge.

The draft PFRA report will be presented to Rotherham Council's Scrutiny Committee for approval in September 2011.

3 METHODOLOGY AND DATA REVIEW

Records of past flooding incidents were collated from several sources. Flood events in 2000, 2007 and 2009 were well documented and investigated by Rotherham Metropolitan Borough Council. Information from these flooding incidents was collated and converted into mappable MapInfo format. Where possible, records of other flooding incidents were also collated. Any available records of flooding which affected property have been mapped, even when they are below the threshold for local significance adopted for this assessment.

3.1 Availability and limitations of information

This information is located in a wide variety of other locations and formats. The information gathered provides an accurate record of recent larger flood events. Older and / or smaller flooding incidents are not well recorded.

Records of past flooding have been collated in recent years and detailed in Rotherham's Strategic Flood Risk Assessments (SFRA). Rotherham Council has previously published SFRA Level 1 and is in the process of publishing its SFRA Level 2. However, detailed information about the floods had not always been recorded consistently across the Borough in capturing local knowledge relating to the flooding incidents in various areas throughout the Borough. Rotherham Council's PFRA's has captured this information and should be read with Rotherham Council's SFRA's.

Information on the 3 recent flooding incidents 2000, 2007 and 2009 was readily available, and some of this information can be found on Rotherham Council's database.

In order to be compatible with existing Council mapping systems, data has been obtained in or converted to, MapInfo format. All data is held in a format which can easily be converted to other formats such as ArcGIS, which is used by other stakeholders and the Environment Agency.

The information will be stored on Rotherham Council's network system for security purposes.

3.2 Quality assurance, security, data licensing and restrictions

All information obtained and stored shall be in accordance with Rotherham Council's quality assurance procedures.

Details of past flooding events are recorded in the Council's database and network system for security purposes. Information obtained from Stakeholders, which contain details of apparatus etc are again contained on the Council's network system. Protocols have been agreed and signed by the Council and the appropriate Stakeholder for security reasons.

Detailed or personal information contained on Rotherham Council's network system will require the permission of the Council and Stakeholder where appropriate, before the information is released.

4 PAST FLOOD RISK

4.1 Past flood events

Rotherham has experienced 3 flooding events of major local significance since 2000, the nationally significant flood event in June 2007 and by more localised events in November 2000 and June 2009.

The flooding problems in 2000 and 2007 were mainly caused by surface water overland flows with some flooding problems caused by rivers overtopping at various locations throughout the Borough of Rotherham. The flooding problems in 2009 were caused by surface water overland flows only.

Other historical flood incidents are recorded in old hard copy files and reports. A desk study of historical flooding confirms that there have been many significant floods on the Don and Rother for as long as they have been recorded.

Records of local flooding incidents do exist in some cases, but are incomplete and in many cases difficult to collate. The easily accessible records have been extracted and mapped. As further historical information becomes available, the flooding records will be updated.

A desk study of historical flooding confirms that there have been many significant floods on the Don and Rother for hundreds of years, including before the catchment was significantly developed. The development of the catchment and changes to the watercourses and sewers mean that the older historical information is not useful for assessment of current flood risk.

Incidents of historical flooding, based on data from Council records, British Waterways, Severn Trent and Yorkshire Water are shown on **Drawing 187/44/DR004** in **Appendix A**.

4.2 Significant harmful consequences

The only flood event considered to be significant on a European scale is the flood of June 2007, which was much more widespread than just the Rotherham borough. A combination of river and

surface water overland flooding problems caused over 400 properties in Rotherham to be flooded internally. Widespread disruption was experienced on the road network throughout the town, over 400 businesses suffered damage and 77 schools were closed. It was estimated that this event was equivalent to a 1 in 100 year return period or greater.

On a local scale, harmful consequences are significant at a much smaller level refer to **Section 6.2**. The consequences of the two flood events in Rotherham which occurred in 2000 and 2009 are also detailed in **Table 2** below:

Flood Event	Source	Significant Consequences	Included in PFRA Spreadsheet	Likely to re-occur
November 2000 Flooding was experienced in many parts of the borough, but the most serious flooding occurred at Catcliffe, where 90 properties were flooded internally. The flooded properties are all located below the level of the flood defence wall on the river Rother. The flood defences did not overtop, but water from the river did get through the flood wall in several locations. High river levels also prevented sewers and watercourses from discharging to the river. Approximate return period 50 years. Flooding problems caused by combination of river and surface water overland flows.	Surface Water / Main River	No	No	Yes
June 2007 Major flooding incident of national significance. Over 400 properties in Rotherham were flooded internally. Widespread disruption was experienced by businesses and infrastructure and on the road network throughout the town. River flooding and surface water flooding. Approximate return period 100 years. Flooding problems caused by combination of river and surface water overland flows.	Surface Water / Main River	Yes	Yes	Yes
June 2009 Very localised intense rainfall caused widespread flash flooding at Aston, Aughton and Swallownest and 175 properties flooded internally, predominantly caused by overland flows and flooding from ordinary watercourses. Approximate return period 150 years. Flooding problems caused by surface water overland flows.	Surface Water	No	No	Yes

Table 2 – Past floods and their consequences

5 FUTURE FLOOD RISK

5.1 Flood Risk Receptors

The National Receptor Dataset (NRD) supplied by the EA is a collection of risk receptors primarily intended for use in flood and coastal erosion risk management. It is a spatial dataset containing a number of GIS layers categorised into themes of information including the following:

- Residential properties
- Non residential properties
- Critical services such as schools, electricity sub-stations, hospitals
- Roads and Railways
- Environmentally sensitive sites - Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Sites of Special Scientific Interest (SSSI)
- Designated heritage assets.: World Heritage sites
  Scheduled Monuments (SMs)
  Listed buildings
  Registered parks and gardens

5.2 Environment Agency Surface Water Flood Risk Modelling

Surface water flood modelling has been carried out by the Environment Agency to indicate the broad areas likely to be at risk of surface water flooding. However, **Environment Agency surface water flood maps are not suitable for identifying whether an individual property will flood.** This is because information on floor levels, construction characteristics or designs of properties is not considered.

The modelling was carried out by applying rainfall to a digital terrain model and this was done using 2 different methodologies, namely Flood Map for Surface Water (FMfSW) and the Areas Susceptible to Surface Water Flooding (AStSWF).

The flood maps produced by the 2 methodologies were compared against each other to determine which most accurately represented the actual areas at risk of surface water flooding. This was done by comparison with recorded flooding, local knowledge of watercourses and flood routes and investigation and modelling of past floods. The 2009 flood in the Aston, Rotherham area, was primarily used for the comparison, because this was a surface water flooding incident of a magnitude close to that modelled. Both FMfSW and AStSWF were found to accurately represent the areas at higher risk. Where there were discrepancies between the two methodologies, both were found to be better in some areas. FMfSW was considered to by marginally better overall, so it was decided to use it as locally agreed surface water information.

Predicted flood areas based on FMfSW and AStSWF are shown on **drawings DR187/44DR001 & DR187/44/DR002** respectively in **Appendix A**.

Numbers of residential properties identified as at risk by the 2 methodologies are given in **Table 3** below.

	AStSWF	FMfSW	Both	Total identified by either or both methods
Residential Properties	3201	8528	1553	10176

Table 3 - Comparison between AStSWF and FMSW

Properties at risk were counted in MapInfo where any part of the predicted flooded area intersected any part of a property outline.

Several areas identified at risk of flooding by the FMSW methodology were at risk only because of the presence of buildings across overland flood routes preventing the natural overland flow. Due to the inaccuracies of the digital terrain model, which is based on LIDAR data obtained aerially, flooding was sometimes predicted where it would not happen in practice because any flood water would bypass the buildings through the gaps between them which were not present in the model. It was decided not to alter these areas to create the locally agreed surface water information because it was considered useful for them to be identifiable as areas where infill development should be avoided, for example not permitting development of side extensions which would block flood routes between existing properties. The AStSWF methodology does not model buildings, so identifies a smaller number of properties as at risk, despite predicting more flooded areas. This mode of flooding affected many properties in 2009. Walls and fences, which are not modelled, were also responsible for causing flooding in 2009. Overland flow routes are therefore critical to flood risk and should be considered, even when the depths of such flow are below that which would normally flood properties internally.

5.3 Locally agreed Surface Water Information

The unaltered Flood Map for Surface Water is to be used as Locally Agreed Surface Water Information.

It was decided not to make any changes to FMSW at this stage, as there is generally not enough evidence to confidently contradict the modelled findings, but see **Section 5.2**. More detailed surveys and investigation of the identified flood risk areas will be carried out over the next two years and it is considered more appropriate to wait until this has been completed before making changes to the modelled data.

	River Flooding	FMfSW	Both	Total
Dwellings	273	8528		
Non Residential Buildings	849	2754		
A & B Roads	31	64	25	70
Listed Buildings	24	28	13	39

Table 4 - Comparison between river flooding and surface water flooding

The above figures show that whilst the infrastructure and industry is at a similar risk from river and surface water flooding, the threat to residential properties numerically is overwhelmingly from surface water flooding. See **drawings 187/44/DR001 & 003** in **Appendix A**.

The unaltered Flood Map for Surface Water has been used to predict the possible impact of future floods and their consequences. This information has been entered into the spreadsheet in **Appendix B** for national collation by the Environment Agency and submission to the European Union.

Both FMfSW and AStSWF results will be used during the next stage of flood risk planning, when at risk areas are assessed in more detail.

5.4 Effects of Climate Change

The Environment Agency commissioned work to consider the varying impacts of climate change on sources of local flood risk for each River Basin District across England and Wales.

i) The Evidence

There is clear scientific evidence that global climate change is happening now. It cannot be ignored. Over the past century around the UK we have seen sea level rise and more of our winter rain falling in intense wet spells. Seasonal rainfall is highly variable. It seems to have decreased in summer and increased in winter, although winter amounts changed little in the last 50 years. Some of the changes might reflect natural variation, however the broad trends are in line with projections from climate models.

Greenhouse gas (GHG) levels in the atmosphere are likely to cause higher winter rainfall in future. Past GHG emissions mean some climate change is inevitable in the next 20-30 years. Lower emissions could reduce the amount of climate change further into the future, but changes are still projected at least as far ahead as the 2080s.

We have enough confidence in large scale climate models to say that we must plan for change. There is more uncertainty at a local scale but model results can still help us plan to adapt. For example we understand rain storms may become more intense, even if we can't be sure about exactly where or when. By the 2080s, the latest UK climate projections (UKCP09) are that there could be around three times as many days in winter with heavy rainfall (defined as more than 25mm in a day). It is plausible that the amount of rain in extreme storms (with a 1 in 5 annual chance, or rarer) could increase locally by 40%.

ii) Key Projections for Humber River Basin District

If emissions follow a medium future scenario, UKCP09 projected changes by the 2050s relative to the recent past are:

- Winter precipitation increases of around 12% (very likely to be between 2 and 26%)
- Precipitation on the wettest day in winter up by around 12% (very unlikely to be more than 24%)
- Relative sea level at Grimsby very likely to be up between 10 and 41cm from 1990 levels (not including extra potential rises from polar ice sheet loss)

· Peak river flows in a typical catchment likely to increase between 8 and 14%

iii) Implications for Flood Risk

Climate changes can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability. Wetter winters and more of this rain falling in wet spells may increase river flooding. More intense rainfall causes more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Storm intensity in summer could increase even in drier summers, so we need to be prepared for the unexpected.

Drainage systems in the district have been modified to manage water levels and could help in adapting locally to some impacts of future climate on flooding, but may also need to be managed differently. Rising sea or river levels may also increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses. Even small rises in sea level could add to very high tides so as to affect places a long way inland. Where appropriate, we need local studies to understand climate impacts in detail, including effects from other factors like land use. Sustainable development and drainage will help us adapt to climate change and manage the risk of damaging floods in future.

iv) Adapting to Change

Past emission means some climate change is inevitable. It is essential we respond by planning ahead. We can prepare by understanding our current and future vulnerability to flooding, developing plans for increased resilience and building the capacity to adapt. Regular review and adherence to these plans is key to achieving long-term, sustainable benefits. Although the broad climate change picture is clear, we will have to make local decisions where there are any uncertainties. We will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that we do not increase our vulnerability to flooding.

v) Long Term Developments

It is possible that long term developments might affect the occurrence and significance of flooding. However current planning policy aims to prevent new development from increasing flood risk.

In England, Planning Policy Statement 25 (PPS25) on development and flood risk aims to "ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall."

Adherence to Government policy ensures that new development does not increase local flood risk. However, in exceptional circumstances the Local Planning Authority may accept that flood risk can be increased contrary to Government policy, usually because of the wider benefits of a new or proposed major development. Any exceptions would not be expected to increase risk to levels which are "significant" (in terms of the Government's criteria).

6 IDENTIFICATION OF FLOOD RISK AREAS

6.1 Identification of Nationally Significant Flood Risk Areas

The Environment Agency has identified “places above flood risk thresholds” using 1km grid squares which satisfy one or more of the following criteria for properties for surface water flood risk based on the new Flood Map for Surface Water (deep - for 1 in 200 annual probability rainfall):

1. Number of People > 200
2. Critical Services > 1
3. Number of Non-Residential Properties > 20

Clusters are formed from all 3km squares that contain 5 or more places above the Flood Risk thresholds that are touching.

Places within Rotherham above the flood risk threshold and the 4 clusters located either wholly or partly within Rotherham Borough boundary and are shown on **Figure 3** below.

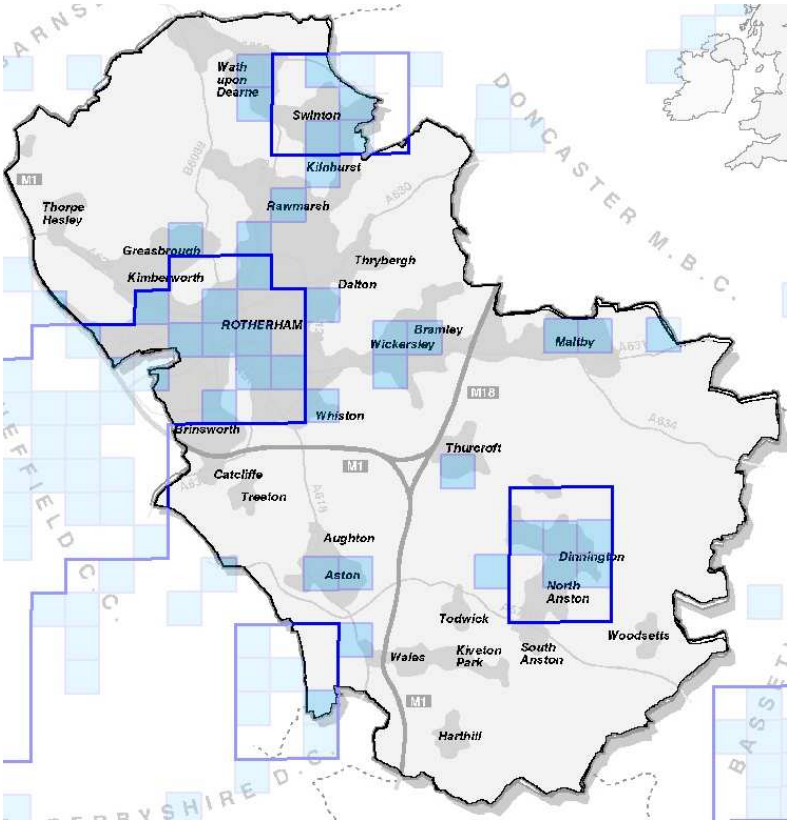

Figure 3 - 1 Km Squares and Clusters

Indicative Flood Risk areas are areas deemed to be of national significance and are defined as clusters numbering in excess of 30,000 people at risk of surface water flooding.
There are no indicative flood risk areas within Rotherham.

6.2 Identification of Locally Significant Flood Risk Areas

The above methodology based on 1km grid squares is not suitable for flood risk planning within Rotherham because flood risk areas are locally significant at a much lower threshold. Flood risk areas are considered to be locally significant where the number of residential properties is 10 or more.

The above methodology identified 132 areas which satisfied the above criteria. All these areas were visited to make an initial assessment of the accuracy of the FMfSW predictions. During these visits the following were considered:

- Topography
- The effect of buildings or other features on overland flows
- Existing drainage features, watercourses, culverts, etc.
- Floor levels of properties relative to surrounding ground levels

Generally during these initial site visits residents were not questioned about flood history, but where they were, report of past flooding or near misses correlated well with predicted flood risk. Consultation with the public in affected areas will be carried out during the next stage of investigation and planning.

Following the site visits, some amendments were made to these locally significant flood risk areas to more closely reflect whether adjacent flooded areas are hydraulically related.

100 areas with 10 or more properties at risk were then prioritised for the next stage of investigations based on number of properties. **Drawing 187/44/DR007** in **Appendix A** shows these areas and the priority assigned to each. Of the 3140 properties identified as possibly at risk, 1814 are within the areas prioritised for investigation. 6 additional areas of locally significant risk to non residential properties have also been identified.

Critical services identified as at risk are shown on **Drawing 187/44/DR006** and verification of the actual risk to each will be carried out individually.

Principal highways (A and B Roads), identified as at risk are indicated on **Drawing 187/44/DR005.**

6.3 Local Flood Risk Strategy

Rotherham has no indicative flood risk areas which are deemed to be of national significance.

The requirement of the Floods and Water Management Act (F&WMA) is for each Lead Local Flood Authority (LLFA) to develop and maintained its own Local Flood Risk Strategy (LFRS). Consultation with other risk management authorities and key stakeholders, such as affected residents within the local authority area will be necessary.

6.4 Future Development

Large areas at Wath Manvers and Waverley are either currently being developed or are to be developed in the near future. Balancing lakes or reservoirs, which maintain runoff at green-field rates have been constructed at these locations and therefore the developments will not increase local flood risk.

7 NEXT STEPS

7.1 Scrutiny and Review

The PFRA report should be presented to the Council's Scrutiny Committee in September 2011.

7.2 Future Requirements of the Flood Risk Regulations

Managing Flood Risk

The Flood Risk Regulations specify a six year cycle of planning based on a four stage process of:

		Deadline
1	Undertaking a PFRA	December 2011
2	Identifying flood risk areas.	December 2011
3	Preparing flood hazard and risk maps.	December 2013
4	Preparing flood risk management plans	December 2015

The PFRA satisfies 1 and 2 and identifies and prioritises 3 and 4, see **Drawing 187/44/DR007** in **Appendix A**

In addition, Rotherham will complete its local Flood Risk Strategy by June 2012. This strategy should be read in conjunction with other flood risk management documents as detailed in **Section 7.5** below.

7.3 Flood Risk Asset Register and Records

Under section 21 of the Flood and Water Management Act, each Lead Local Flood Authority (LLFA) in England and Wales has to establish and maintain:

(a) a register of structures or features which, in the opinion of the authority, are likely to have a significant effect on flood risk in its area, and

(b) a record of information about each of those structures or features, including information about ownership and state of repair.

In order to produce flood risk management plans, an asset database in excess of the above legal requirements will be required. Initially data collection will be carried out as flood risk within individual areas is investigated. It is not a requirement to create a comprehensive record of all relevant assets, but the database will be updated and added to as information becomes available.

7.4 Investigation of future flooding

Section 19 of the Flood and Water Management Act 2010 imposes a duty on Lead Local Authorities to investigate flooding incidents to:

(a) determine which risk management authorities have relevant flood risk management functions

(b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.

(c) publish the results of its investigation

(d) notify any relevant risk management authorities.

The records of past flooding collated and mapped for the PFRA, will be maintained and updated with future flooding as it occurs.

7.5 Local Flood Risk Strategy for Rotherham

Rotherham has no indicative flood risk areas which are deemed to be of national significance. The requirement of the Floods and Water Management Act (F&WMA) is for each Lead Local Flood Authority (LLFA) to develop and maintained its own Local Flood Risk Strategy (LFRS). Consultation with other risk management authorities and key stakeholders, such as affected residents within the local authority area, will be carried out. The general principles of the Local Flood Risk Strategy:

- Community focus & partnership working
- Sustainability
- Risk Based Approach
- Proportionality
- Multiple benefits
- Beneficiaries allowed to invest in local flood risk management

The main purpose of the Local Strategy is to present a single coherent policy for flood risk management within each LLFA. The Strategy should be carried out in conjunction with any Government national guidance and flood risk management plans, such as:

- SFRAs
- Catchment Flood management Plans (CFMPs)
- Preliminary Flood Risk Assessment (PFRA)
- Reservoir Inundation Plans
- Surface Water Management Plans
- Environment Agency's (EA) National Flood Risk Strategy
- River Basin Management Plans

The Local Strategy will form the flood risk management policy for that LLFA area. A key challenge for the LLFA will be to identify the Aims and Objectives of the Local Strategy and also to set its priorities within the increasingly challenging financial constraints present at the current time.

PFRAs should now been completed and submitted to the EA by 22nd June 2011. It is thought the Local Flood Risk Strategy's are to be completed by the end of June 2012; however the exact date for completion is still to be set.

8 REFERENCES

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Guidance for Local Resilience Forums, Regional Resilience Teams, Local Planning Authorities and Lead Local Flood Authorities v1 November 2010

Defra / Welsh Assembly Government - Selecting and reviewing Flood Risk Areas for local sources of flooding. - Guidance to Lead Local Flood Authorities
http://archive.defra.gov.uk/environment/flooding/documents/interim2/flood-risk-method.pdf

Communities of Practice for Public Services – Flood Risk and Water Management Network - Flownet.
http://www.communities.idea.gov.uk/c/2050378/home.do

Level 1 Strategic Flood Risk Assessment (SFRA 1) Rotherham 2008.

Level 2 Strategic Flood Risk Assessment (SFRA 2) Rotherham Town Centre 2010 (to be published)

Appendix A

Appendix B

Appendix C