North Tyneside Council
Preliminary Flood Risk Assessment

DRAFT Preliminary Assessment Report

June 2011
EXECUTIVE SUMMARY
This Preliminary Assessment Report (PAR) is a key document informing the preparation of future Local Flood Risk Management Strategies as required by the Flood and Water Management Act 2010.

The report identifies key flood risk areas within North Tyneside Council and fulfils the Council’s obligations as a Lead Local Flood Authority (LLFA) under the requirements of the Flood Risk Regulations 2009).

The PAR along with the supporting Annex spreadsheets and figures fulfil the first stage Preliminary Flood Risk Assessment (PFRA) requirements of the Regulations. The PFRA is a high level screening exercise that brings together easily available information from a number of sources to assess local flood risk. The methodology for producing this PAR and the PFRA is based on the Environment Agency’s Final PFRA Guidance and Defra’s Guidance on selecting Flood Risk Areas, both published in December 2010.

For the PFRA all readily available data was collated from key stakeholders within North Tyneside. This allowed for the identification of significant historic flood events within the borough. These have been summarised in Annex 1 of the Preliminary Assessment spreadsheet.

Future flood risk within North Tyneside has been assessed by looking at the borough as a whole and assessing potential risk areas based on a variety of local flooding sources. The Environment Agency’s Areas Susceptible to Surface Water Flooding, Flood Map for Surface Water, Fluvial Flood Zones and the British Geological Society’s Groundwater Susceptibility Maps were used to identify areas at risk. Based on the FMfSW approximately 2,500 properties are at risk of flooding to a depth of 0.3 metres in a 1 in 200 year rainfall event. Future flood risk has been summarised in Annex 2 of the Preliminary Assessment spreadsheet.

The Environment Agency used criteria set by DEFRA and the Flood Map for Surface Water to develop a national dataset which identified Indicative Flood Risk Areas. There are no identified Flood Risk Areas in North Tyneside.

The PAR will be reviewed in 2016 which the next PFRA cycle will begin.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASfSWF</td>
<td>Areas Susceptible to Surface Water Flooding</td>
</tr>
<tr>
<td>ASfGWF</td>
<td>Areas Susceptible to Ground Water Flooding</td>
</tr>
<tr>
<td>Catchment</td>
<td>An area that serves a river with rainwater. Every part of land where the rainfall drains to a single watercourse is in the same catchment.</td>
</tr>
<tr>
<td>Catchment Flood Management Plan, (CFMP)</td>
<td>A high-level planning strategy through which the Environment Agency works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk.</td>
</tr>
<tr>
<td>Climate Change</td>
<td>Long term variations in global temperature and weather patterns caused by natural and human actions.</td>
</tr>
<tr>
<td>Critical Drainage Area (CDA)</td>
<td>Areas of significant flood risk, characterised by the amount of surface runoff that drains into the area, the topography and hydraulic conditions of the pathway (e.g. sewer, river system), and the receptors (people, properties and infrastructure) that may be affected.</td>
</tr>
<tr>
<td>Cultural Heritage</td>
<td>Buildings, structures and landscape features that have an historic value. These are also known as heritage assets</td>
</tr>
<tr>
<td>Culvert</td>
<td>A channel or pipe that carries water below the level of the ground.</td>
</tr>
<tr>
<td>DEFRA</td>
<td>Department for Environment, Food and Rural Affairs</td>
</tr>
<tr>
<td>DG5 Register</td>
<td>A water-company held register of properties which have experienced sewer flooding due to hydraulic overload, or properties which are ‘at risk’ of sewer flooding more frequently than once in 20 years.</td>
</tr>
<tr>
<td>Flood</td>
<td>The temporary covering by water of land not normally covered with water</td>
</tr>
<tr>
<td>FMfSW</td>
<td>Flood Map for Surface Water</td>
</tr>
<tr>
<td>Flood Risk Regulations 2009</td>
<td>Transposition of the EU Floods Directive into UK law. The EU Floods Directive is a piece of European Community (EC) legislation to specifically address flood risk by prescribing a common framework for its measurement and management.</td>
</tr>
<tr>
<td>Floods and Water Management Act 2010</td>
<td>Part of the UK Government’s response to Sir Michael Pitt’s Report on the Summer 2007 floods, the aim of which is to clarify the legislative framework for managing surface water flood risk in England.</td>
</tr>
<tr>
<td>Fluvial Flooding</td>
<td>Flooding resulting from water levels exceeding the bank level of a main river.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Water which is below the surface of the ground and in direct contact with the ground or subsoil.</td>
</tr>
<tr>
<td>Indicative Flood Risk Areas</td>
<td>Areas determined by the Environment Agency as indicatively having a significant flood risk, based on guidance published by Defra and WAG and the use of certain national datasets. These indicative areas are intended to provide a starting point for the determination of Flood Risk Areas by LLFAs.</td>
</tr>
<tr>
<td>LDF</td>
<td>Local Development Framework</td>
</tr>
<tr>
<td>Lead Local Flood</td>
<td>Local Authority responsible for taking the lead on local flood...</td>
</tr>
<tr>
<td><strong>Authority (LFFA)</strong></td>
<td>risk management</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Main River</strong></td>
<td>A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers</td>
</tr>
<tr>
<td><strong>Ordinary Watercourse</strong></td>
<td>All watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, Internal Drainage Boards</td>
</tr>
<tr>
<td><strong>Preliminary Assessment Report (PAR)</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Pitt Review</strong></td>
<td>Comprehensive independent review of the 2007 summer floods by Sir Michael Pitt, which provided recommendations to improve flood risk management in England</td>
</tr>
<tr>
<td><strong>PPS25</strong></td>
<td>Planning Policy Statement 25</td>
</tr>
<tr>
<td><strong>Ramsar site</strong></td>
<td>Ramsar sites are wetlands of international importance, designated under the Ramsar Convention</td>
</tr>
<tr>
<td><strong>Receptor</strong></td>
<td>Something that may be harmed by flooding</td>
</tr>
<tr>
<td><strong>Regulations</strong></td>
<td>Flood Risk Regulations 2009</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>Measures the significance of a potential event in terms of likelihood and impact</td>
</tr>
<tr>
<td><strong>Sewer Flooding</strong></td>
<td>Flooding caused by a blockage or overflowing in a sewer or urban drainage system</td>
</tr>
<tr>
<td><strong>SFRA</strong></td>
<td>Strategic Flood Risk Assessment</td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td>The origin of a hazard (e.g. heavy rainfall, strong winds, surge etc)</td>
</tr>
<tr>
<td><strong>Site of Special Scientific Interest (SSSI)</strong></td>
<td>SSSI is a national conservation designation denoting a protected area in the United Kingdom. Sites notified for their biological interest are known as Biological SSSIs, and those notified for geological or physiographic interest are Geological SSSIs</td>
</tr>
<tr>
<td><strong>Stakeholder</strong></td>
<td>A person or organisation affected by the problem or solution, or interested in the problem or solution. They can be individuals or organisations, includes the public and communities</td>
</tr>
<tr>
<td><strong>Sustainable Urban Drainage Systems (SUDs)</strong></td>
<td>Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques</td>
</tr>
<tr>
<td><strong>Surface Water</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>SWMP</strong></td>
<td>Surface Water Management Plan</td>
</tr>
</tbody>
</table>
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1.0 INTRODUCTION

1.1 Background

The Flood Risk Regulations (the Regulations) came into force in December 2009 to implement the requirements of the European Floods Directive. The aim of the Directive is to provide a consistent approach to managing flood risk across Europe. It establishes four stages of activity within a six year flood risk management cycle. The diagram below shows the stages of the cycle, what is required and the timescales.

![Diagram of Flood Risk Management Cycle]

1.2 The Preliminary Flood Risk Assessment

The Preliminary Flood Risk Assessment (PFRA) is a high level screening exercise to identify areas of significant risk. This document is the Preliminary Assessment Report (PAR) which forms part of the PFRA exercise.

The PFRA involves:
- collecting information on past (historic) and future (potential) floods;
- assembling the information into a Preliminary Assessment Report (PAR); and
- identifying Flood Risk Areas.

This PAR will complete the first two stages of the Flood Risk Management Cycle. The identification of any Flood Risk Areas will establish where the final two stages of preparing hazard and risk maps and flood risk management plans are required.

The PFRA (along with the Strategic Flood Risk Assessment 2010, the Surface Water Management Plan 2011 and the Water Cycle Study 2011) will form part of the local flood risk management strategies that Local Lead Flood Authorities (LLFAs) are required to prepare by the Flood and Water Management Act 2010 (FWMA).
1.3 Scope of Report
As a LLFA, North Tyneside Council is responsible for managing local flood risk in particular from ordinary watercourses, surface runoff and groundwater. The Environment Agency (EA) is responsible for managing risk from main rivers, the sea and large raised reservoirs. As identified in the Regulations, flooding associated with the sea, main rivers and reservoirs is the responsibility of the EA and does not need be considered by the LLFA as part of the PFRA process, unless it is considered that it may affect flooding from local flood sources.

The scope of the PFRA is to consider past flooding and possible future flooding from surface water runoff, groundwater and ordinary watercourses. The PFRA must consider floods which have significant harmful consequences for human health, economic activity and the environment.

1.4 Aims and Objectives
The aim of this report is to fulfil the obligations of North Tyneside as the LLFA under the requirements of the Regulations. The PRA aims to identify areas in which the risk of flooding is significant and warrants further examination through the production of flood maps and flood risk management plans.

The key objectives can be summarised as follows:
- Identify relevant partner organisations involved in future assessment of flood risk; and summarise means of future and ongoing stakeholder engagement;
- Describe arrangements for partnership and collaboration for ongoing collection, assessment and storage of flood risk data and information;
- Provide a summary of the systems used for data sharing and storing, and provision for quality assurance, security and data licensing arrangements;
- Summarise the methodology adopted for the PFRA with respect to data sources, availability and review procedures;
- Assess historic flood events within the study area from local sources of flooding (including flooding from surface water, groundwater, canals and ordinary watercourses), and the consequences and impacts of these events;
- Establish an evidence base of historic flood risk information, which will be built up on in the future and used to support and inform the preparation of the Council’s local flood risk management strategy;
- Assess the potential harmful consequences of future flood events within the study area; and
- Review the provisional national assessment of indicative Flood Risk Areas provided by the Environment Agency and provide explanation and justification for any amendments required to the Flood Risk Areas.

1.5 The Study Area
The study area for this PFRA is the administrative boundary of North Tyneside (see figure 2). It is one of five metropolitan districts within the Tyne & Wear conurbation, with an area of 82 square kilometres. North Tyneside falls within the Northumbria River Basin District, which is served by one water company, Northumbrian Water, and the Environment Agency North East region.
Figure 2: Map of the Study Area, North Tyneside
2.0 LOCAL LEAD FLOOD AUTHORITY RESPONSIBILITIES
The Flood Risk Regulations 2009 transposes the requirements of the European Floods Directive into UK law in England and Wales. The aim of the Directive is to provide a consistent approach to managing flood risk across Europe.

The Flood and Water Management Act, (FWMA) 2010 defines new responsibilities for flood risk management based on the recommendations of the Pitt Review.

2.1 Governance and partnership working
As the designated LLFA, North Tyneside Council is responsible for leading local flood risk management across the borough. Much of the local knowledge and technical expertise necessary for the Council to fulfil its duties as LLFA lies with partner organisations. It is therefore crucial that the Council works alongside these partner organisations to ensure effective and consistent management of local flood risk throughout the borough, which contributes to the provision of a coordinated and holistic approach to flood risk management across the borough.

Regulation 35 of the Regulations and Section 13 of the FWMA require relevant authorities to cooperate with one another.

The primary partners for the PFRA are North Tyneside Council (NTC), The Environment Agency (EA) and Northumbria Water Ltd (NWL). A good working relationship between the partners with a more formal arrangement set up whilst drafting other water strategies and studies. During the work it will be appropriate to work with other stakeholders and consultees. These include:

- Natural England
• The Highways Authority
• Utility Companies
• Transport Operators (ie. Nexus)
• Land Owners
• Developers
• Consultants
• Elected Members
• General Public

2.2 Communication and Engagement
This PFRA is primarily based on communication and information obtained through the North Tyneside Strategic Flood Risk Assessment, the emerging North Tyneside Surface Water Management Plan and Water Cycle Study.

During the work on the SWMP and WCS the Council and its consultants will engage the aforementioned stakeholders through the Council’s website, meetings and workshop events.
3.0 METHODOLOGY AND DATA REVIEW

The PFRA is a high level screening exercise used to identify areas of local risk, based on available and readily derivable information, describing both the probability and harmful consequences of past and future flooding.

The approach for producing this PFRA was based upon the Environment Agency’s PFRA Final Guidance, which was released in December 2010, and as required within the guidance this PFRA is based on readily available or derivable data.

3.1 Information Gathered

The Council’s SFRA provided the majority of the data required for the PFRA. In order to make sure the most up-to-date flood risk data was available the early stages of the SWMP revisited the data collection process collecting new or updated datasets from their original source.

Table 1: Data Sources

<table>
<thead>
<tr>
<th>Data Holder</th>
<th>Data Description</th>
<th>Data restrictions/availability to public</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTC</td>
<td>The Level 1 SFRA contains useful information on historic flooding and analysis resulting in the identification of Critical Drainage areas in the borough.</td>
<td>Publicly accessible but Ordnance Survey copyright applies to all maps.</td>
</tr>
<tr>
<td>North Tyneside</td>
<td>Work ongoing on the SWMP. It will provide a detailed risk assessment of surface water flooding and identify potential management options.</td>
<td></td>
</tr>
<tr>
<td>SWMP – ongoing</td>
<td>Register of flood events in North Tyneside from 2005.</td>
<td></td>
</tr>
<tr>
<td>Flood Records</td>
<td>The first generation national mapping, shows areas that are susceptible to surface water flooding with three susceptibility bandings (less, intermediate and more).</td>
<td></td>
</tr>
<tr>
<td>Areas Susceptible</td>
<td>The second generation national surface water flood mapping. This dataset includes two flood events (with a 1 in 30 and a 1 in 200 chance of occurring) and two depth bandings (greater than 0.1m and greater than 0.3m).</td>
<td>This data falls under the license agreement with the Council and the EA. Internal Use is approved only in connection with statutory purposes that comprise the preparation of any assessment. No Commercial Use is permitted nor may the Licensee permit others to make any Commercial Use of the Information or anything derived from it.</td>
</tr>
<tr>
<td>Surface Water</td>
<td>Shows the areas that could be affected by flooding from rivers/from the sea/from rivers and, or the sea (split into three zones). It also shows flood defences and the areas that</td>
<td></td>
</tr>
</tbody>
</table>
### Areas Susceptible to Ground Water Flooding

Strategic scale map showing groundwater flood areas on a 1km square grid, developed specifically for PFRAs.

### Historic Flood Map

Spatial flood extent data for flooding from all sources.

### Catchment Flood Management Plans

CFMPs consider all types of inland flooding, from rivers, groundwater, surface water and tidal flooding and are used to plan and agree the most effective way to manage flood risk in the future.

### National Receptors Dataset

A national dataset of social, economic, environmental and cultural receptors including residential properties, schools, hospitals, transport infrastructure and electricity substations.

<table>
<thead>
<tr>
<th>NWL</th>
<th>DG5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The DG5 Register logs and records all sewer flood incidents in North Tyneside due to under capacity only. It is NOT a true register of properties/areas at risk of flooding, but a register of properties/areas that have flooded and reported it to NWL.</td>
<td>This data falls under the license agreement with the Council and NWL. The use of all data provided is restricted to the Council and their consultants for the preparation of the SWMP, SFRA and PFRA.</td>
</tr>
</tbody>
</table>

### 3.2 Availability and Limitations

There are a number of limitations with the data provided for this PFRA. The intention of the report is to collect readily available data which has been used in this PAR.

The most significant limitation relates to the lack of specific event information provided within the older flood incident records, specifically related to dates, durations and sources of flooding. Although it is good practice for the Council to record historic flood incidents, this was not a requirement until April 2011, which could be the main reason for incomplete or inconsistent historical records.

### 3.3 Sharing and Storing

A majority of the data has been specifically provided for this study (for use by the LLFA and their consultants) and is not publicly available; therefore there are restrictions on data use. A number of specific agreements have been put in place for the PFRA and SWMP to facilitate the sharing of data between partners:

- GIS and Ordnance Survey licences for mapping and data supplied by NTC
- Environment Agency Standard data licence
- Environment Agency surface water susceptibility maps licence
- Environment Agency LiDAR licence
• NWL Data Sharing protocol.

All data is kept on a secure Council server with limited access.
### 4.0 PAST FLOOD RISK

This section summarises relevant information on past floods with significant harmful consequences.

The Environment Agency is a key source of all flood risk information in England and Wales. As part of the Flood Map, the Environment Agency provides a national historical flood map layer. Those identified in North Tyneside include:

- Wheatfield Grove, Benton – Properties flooded on low lying ground along line of culvert and surface water drains 30th June 2007
- Hailsham Avenue, Longbenton – 30th June 2007
- A189 Roundabout – 6th September 2008
- Earsdon – Flooded fields due to poor drainage to Wellfield Beck 10th July 2008

The Council have a spreadsheet and GIS datasets of properties and general areas flooded since 2005; 2005 (598 properties), 2007 (74 properties) and 2008 (171 properties). Some of the same properties flooded in multiple events, however current records do not show the source or severity of the flooding rather than it was just flooded. The data represents surveys of flooding done by Traffic, Dev - Engineering, Design and Partnering and the Council’s Emergency Planner.

#### Table 2: Summary of Past Floods recorded by NTC

<table>
<thead>
<tr>
<th>Date of Incident</th>
<th>Location</th>
<th>Description &amp; Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>June/July 2005</td>
<td>Borough wide</td>
<td>Heavy rainfall led to build up of surface water, likely to be combined with sewer flooding but no records of this. Many residential properties flooded internally and externally and several transport networks became impassable.</td>
</tr>
<tr>
<td>July 2007</td>
<td>Focused in Longbenton with smaller pockets of flooding borough wide</td>
<td>Heavy rainfall led to build up of surface water, likely to be combined with sewer flooding but no records of this. Significant consequences in Longbenton with many residential properties flooded internally and externally with some effect to transport networks.</td>
</tr>
<tr>
<td>September 2008</td>
<td>Northern half of borough</td>
<td>Heavy rainfall led to build up of surface water, likely to be combined with sewer flooding but no records of this. Relatively short term with water clear within 12 hours but significant consequences to transport networks and residential properties flooded internally and externally.</td>
</tr>
</tbody>
</table>
Figure 4 (page 13) shows the extent of the historic flooding recorded by both the Council and the EA. Larger scale maps can be found on the Council’s website within the SFRA.

Detailed records of past floods with significant harmful consequences can be found in the spreadsheet in annex 1.

4.1 Significant harmful consequences

For the purpose of the PFRA, the definition of ‘locally significant flood risk’ is in line with the national definition of ‘significant flood risk’, as defined by Defra and the Welsh Assembly Government in developing the methodology for identifying flood risk areas. A flood risk area was identified as an area of 1km² where local flood risk exceeds at least one of the following indicators: greater than 200 people, greater than 1 critical service and greater than 20 non-residential properties.

Floods recorded in the PAR and its appendices are considered to have had significant harmful consequences.
5.0 FUTURE FLOOD RISK
Future flood risk within North Tyneside has been assessed as part of the PFRA. This involved looking at the borough as a whole and assessing potential risk areas based on flooding from a variety of local sources. The key aim of this assessment is to identify areas which are not currently known from past flood incidents.

5.1 Overview of Future Flood Risk
The following EA datasets were used to determine the Future Flood Risk. All maps were provided by Scott Wilson, commissioned to undertake the Council’s SWMP and WCS (larger maps can be provided on request).

- Areas Susceptible to Surface Water Flooding (AStSWF) including 200 year more, intermediate and less susceptible outlines (Figure 5)
- Flood Map for Surface Water (FMfSW) including 30 year and 200 year deep and shallow outlines (Figures 6 & 7)
- Fluvial Flood Zones 2 & 3 (Figure 8)
- Areas Susceptible to Ground Water Flooding (AStGWF) (Figure 9)
Figure 7: FMfSW 200yr
Surface Water Flooding

The Environment Agency has produced a series of maps based on a national assessment of surface water flood risk. The ASTSWF, released in August 2008, are a series of maps made up of three probability bandings for a 1 in 200 year rainfall event (Less, Intermediate and More). The FMfSW are the second generation maps which were generated using improved modelling techniques in November 2010. The FMfSW represents two return periods the 1 in 30 year and 1 in 200 year. The mapping for each return period has been split based on depth of flooding: shallow (0.1m-0.3m) and deep (>0.3m). Table 2 summarises surface water runoff in NTC.

Table 3: Summary of Properties at risk from Surface Water Flooding

<table>
<thead>
<tr>
<th>National Dataset</th>
<th>No. of Residential Properties Affected</th>
<th>No. of Non Residential Properties Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTSWF - Less</td>
<td>15600</td>
<td>1800</td>
</tr>
<tr>
<td>ASTSWF - Intermediate</td>
<td>4600</td>
<td>500</td>
</tr>
<tr>
<td>ASTSWF - More</td>
<td>360</td>
<td>50</td>
</tr>
<tr>
<td>FMfSW - 1 in 30 shallow</td>
<td>2900</td>
<td>400</td>
</tr>
<tr>
<td>FMfSW - 1 in 30 deep</td>
<td>370</td>
<td>50</td>
</tr>
<tr>
<td>FMfSW - 1 in 200 shallow</td>
<td>12100</td>
<td>1300</td>
</tr>
<tr>
<td>FMfSW - 1 in 200 deep</td>
<td>2500</td>
<td>250</td>
</tr>
</tbody>
</table>

North Tyneside Council are currently developing a Surface Water Management Plan. During the second phase of the plan, additional surface water modelling will be carried out to further refine the areas at risk from surface water flooding and then carry out more detailed assessment of these locations.

Ground Water Flooding

The Environment Agency’s dataset, ASTGWF, provides the basis for assessing future flood risk from groundwater.

The map was derived using the top two susceptibility bands of the British Geological Society (BGS) 1:50,000 Groundwater Flood Susceptibility Map and thus covers consolidated aquifers (chalk, sandstone etc, termed 'clearwater' in the data attributes) and superficial deposits. It does not take account of the chance of flooding from groundwater rebound. It shows the proportion of each 1km grid square where geological and hydrogeological conditions show that groundwater might emerge. Four area categories illustrate susceptible areas, which show the proportion of each 1km square where groundwater might emerge. It does not show the likelihood of groundwater flooding occurring.

Table 4: Summary of Properties at risk from Ground Water Flooding

<table>
<thead>
<tr>
<th>National Dataset</th>
<th>No. of Residential Properties Affected</th>
<th>No. of Non Residential Properties Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTGWF</td>
<td>21500</td>
<td>990</td>
</tr>
</tbody>
</table>

Further work will be carried out in the Surface Water Management Plan to provide a detailed borough wide groundwater flood risk assessment including reference to historical maps to identify groundwater springs and flooding, geological logs, geological cross sections and site investigation reports.

North Tyneside Council
Ordinary Watercourses
Flooding from ordinary watercourses can be identified using the Environment Agency's Flood Map and the Council's SFRA. Figure # illustrates the current Environment Agency Flood Map within North Tyneside.

Table 5: Summary of Properties within EA Flood Zones

<table>
<thead>
<tr>
<th>National Dataset</th>
<th>No. of Residential Properties Affected</th>
<th>No. of Non Residential Properties Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood Zone 2</td>
<td>910</td>
<td>220</td>
</tr>
<tr>
<td>Flood Zone 3 &amp; 3a</td>
<td>210</td>
<td>100</td>
</tr>
</tbody>
</table>

Sewer Flooding
The DG5 register is a performance indicator used by Water Companies to report the number of properties at risk of flooding due to overloaded sewers to Ofwat. Once a property is identified on the water companies DG5 register it typically means that the water company can put funding in place to take properties off the DG5 register and the property may not be at risk of future flooding.

NWL have classified the risk of sewer flooding in the drainage areas within North Tyneside as low, medium or high. The following areas have been classified as being at high risk of flooding:

- Benton,
- Brierdene,
- Chirton,
- Cullercoats,
- Seaton Burn valley,
- Tynemouth,
- Whitley Bay.

5.2 Locally Agreed Surface Water Information
There are currently two sources of data for surface water flooding; Areas Susceptible to Surface Water Flooding 2008 and the Flood Map for Surface Water 2010. Upon completion of the North Tyneside SWMP there will be a third source of information.

Within North Tyneside, the Environment Agency used the second-generation Flood Map for Surface Water to identify any indicative Flood Risk Areas. Until completion of the SWMP it has been agreed that the Flood Map for Surface Water, as the most up to date data, will be used for this PFRA.

5.3 Consequences of Future Flood Risk
The Environment Agency has assessed the potential consequences of future surface water flooding using the national FMfSW (1 in 200-year rainfall). The results of this have been used during the identification of indicative Flood Risk Areas.

By counting the number of people, businesses and critical services at risk, the Environment Agency has identified a number of areas within North Tyneside, which exceeds the following Defra and WAG flood risk thresholds:

- 200 or more people,
- 20 or more businesses, or
- 1 or more critical services at risk.
This assessment was carried out based on 1km² national grid squares, and the grid squares that exceed this criterion were identified. The grid squares within North Tyneside where flood risk is considered to exceed this threshold are illustrated on Figure 10. These areas represent where flood risk is considered to be the most severe across the borough.

Where these 1km² grid squares were touching they were clustered together; Clusters with fewer than 30,000 people at risk have not been designated as indicative flood risk areas. **North Tyneside has no such clustered therefore has not been designated a Flood Risk Area.**
Figure 10: Areas above Flood Risk Thresholds
5.4 Climate change and long term developments
The below text is a standardised statement on climate change and climate change predictions supplied by the Environment Agency in the PFRA Guidance.

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%.

Key Projections for Northumbria 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 10% (very likely to be between 0 and 23%)
- Precipitation on the wettest day in winter up by around 11% (very unlikely to be more than 24%)
- Relative sea level at Tynemouth very likely to be up between 7 and 38cm 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 13%

Increases in rain are projected to be greater near the coast than inland.

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 in both rural and heavily urbanised catchments. 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. Rising sea or river levels may increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses. 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.

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 have to make local decisions uncertainty. 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.

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."

In Wales, Technical Advice Note 15 (TAN15) on development and flood risk sets out a precautionary framework to guide planning decisions. The overarching aim of the precautionary framework is "to direct new development away from those areas which are at high risk of flooding."

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).

5.5 Major Developments
The current development plan for North Tyneside is being updated with the Local Development Framework. In particular, the Core Strategy document will identify major developments in the borough for the next 15 years. Currently in draft, all potential sites are undergoing sequential test in accordance with PPS25. Until
publication of the Core Strategy any major development proposals would be subject to flood risk assessments and EA scrutiny.
6.0 NEXT STEPS
As no Flood Risk Areas have been identified in North Tyneside, the Council will not have to produce flood hazard and risk maps and a flood risk management plan within the allotted timeframe. However, following further assessment through the SWMP the Council may decide to undertake the next steps of the PFRA or similar work to cover locally significant areas of flood risk.

6.1 Local flood risk management strategy
The PFRA, together with the SWMP and any updates of the SFRA will form part of the local flood risk management strategies that LLFAs are required to prepare under the Flood and Water Management Act 2010. Local strategies will set out how LLFAs will manage the local flood risks in their areas and will cover areas not identified as being at significant flood risk under the Flood Risk Regulations 2009.

The strategy must be consistent with the National Flood and Coastal Erosion Risk Management Strategy for England, and should be developed and maintained with consultation from other stakeholders, such as the public and other risk management authorities.

The strategy must specify:

- the risk management authorities in the authority's area;
- the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area;
- the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the FRR);
- the measures proposed to achieve those objectives;
- how and when the measures are expected to be implemented;
- the costs and benefits of those measures, and how they are to be paid for;
- the assessment of local flood risk for the purpose of the strategy;
- how and when the strategy is to be reviewed; and
- how the strategy contributes to the achievement of wider environmental objectives.

6.2 Data Collection
In order to continue to fulfil their role as LLFA, the Council is required to investigate future flood events and ensure continued collection, assessment and storage of flood risk data and information.

The PFRA cycle will start again in 2016, so it is important to ensure that information is maintained and kept up to date for future use and to support other assessments of flood risk (such as SWMPs, SFRAs) and as part of local strategies. In the next cycle, more information will be mandatory for floods that occur after 22 December 2011.

Incident Recording
The Council’s internal flood incident register should be maintained and updated as new incidents occur. To assist in the during the PFRA review process it would be beneficial to update the current spreadsheet to record more detail.

Below is an example data collection spreadsheet that could be used by the Council to collate flood event data.

<table>
<thead>
<tr>
<th>Recorded by</th>
<th>Name of staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique Reference</td>
<td>YYYY-01</td>
</tr>
<tr>
<td>Date and Time Reported</td>
<td>Could be different to the date of the event</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the flood and its adverse or potentially adverse consequences. Where available, information from other fields (Start date, Days duration, Main source, Main mechanism, Main characteristics, Significant consequences) should be repeated here.</td>
</tr>
<tr>
<td>Date of Event</td>
<td>Might not be the same as when recorded</td>
</tr>
<tr>
<td>Duration of Event</td>
<td>Number of hours or days land is covered by water</td>
</tr>
<tr>
<td>Address</td>
<td>Street and Town</td>
</tr>
<tr>
<td>Postcode</td>
<td></td>
</tr>
<tr>
<td>Description of Location</td>
<td>Particularly important where water covers a large area.</td>
</tr>
<tr>
<td>Depth of Flooding</td>
<td>Perceived depth</td>
</tr>
<tr>
<td>Main Source</td>
<td>The main source of flooding ie. surface water</td>
</tr>
<tr>
<td>Additional sources</td>
<td>Any additional sources ie. sewer flooding</td>
</tr>
<tr>
<td>Photographic evidence</td>
<td>Yes/No and give filename of where photo is stored</td>
</tr>
<tr>
<td>Significant consequences to human health</td>
<td>Were there any consequences to human health when the flood occurred or likely to happen if the flood were to reoccur</td>
</tr>
<tr>
<td>Residential Properties</td>
<td>No. of properties with flooding</td>
</tr>
</tbody>
</table>

**Asset Register**

The asset register should contain records of all existing assets within the borough and should be updated as more data becomes available.

Stakeholders and partners should be encouraged to use GIS formats to store their data in order to facilitate exchange and management of data. A data management plan would be valuable in ensuring data sets were kept up to date and consistent across all stakeholders. A future consideration could be the development of an online GIS asset register database. This would enable a wider range of organisations to contribute information.
7.0 REFERENCES