Darlington Borough Council

Preliminary Flood Risk Assessment (PFRA) report

DRAFT -June 2011

Executive Summary

Darlington Borough Council has a responsibility as the Lead Local Flood Authority (LLFA) under the Flood Risk Regulations (The Regulations) and the Floods and Water Management Act 2010 to manage local flood risk. (Further responsibilities of the Lead Local Flood Authority can be found in section 2)

The European floods directive which is implemented through The Regulations provides a consistent approach for managing floods across Europe. The approach is a six year planning cycle which has four main elements to it, these are:

- Undertaking a preliminary flood risk assessment (PFRA)
- identifying flood risk areas
- preparing flood hazard and risk maps
- preparing flood risk management plans

The PFRA process is aimed at providing a high level overview of flood risk from local flood sources including surface water, groundwater, ordinary watercourses and canals. As the LLFA, Darlington Borough Council will submit their draft PFRA report to the Environment Agency by 22 June 2011 and it will be confirmed as a final version once Darlington Borough Council's Cabinet has endorsed the document.

The following report is the first element of the planning cycle and details information on past (historic) and future (potential) floods within the Darlington area.

Contents

1 Introduction

1.1 *Scope*

Darlington Borough Council as the Lead Local Flood Authority (LLFA) is responsible for assessing risk from local sources of flooding i.e. surface water ground water and ordinary watercourses.

The Environment Agency is responsible for assessing flood risk from main rivers, the sea and reservoirs and therefore flooding exclusively from these sources will not be included in this report. The report, however, will need to consider the impacts of flooding from main rivers on the risk from local sources.

1.2 *Aims and objectives*

The PFRA is a high level screening exercise to locate areas in which the risk of ordinary watercourse, surface water and groundwater flooding is significant. It is not a stand alone process and is closely linked to the preparation of the early stages of Surface Water Management Plans (SWMP) and other planning, environmental, operational and sustainability outcomes.

The aim of this PFRA is to provide an assessment of local flood risk across the study area, including information on past floods and the potential consequences of future floods.

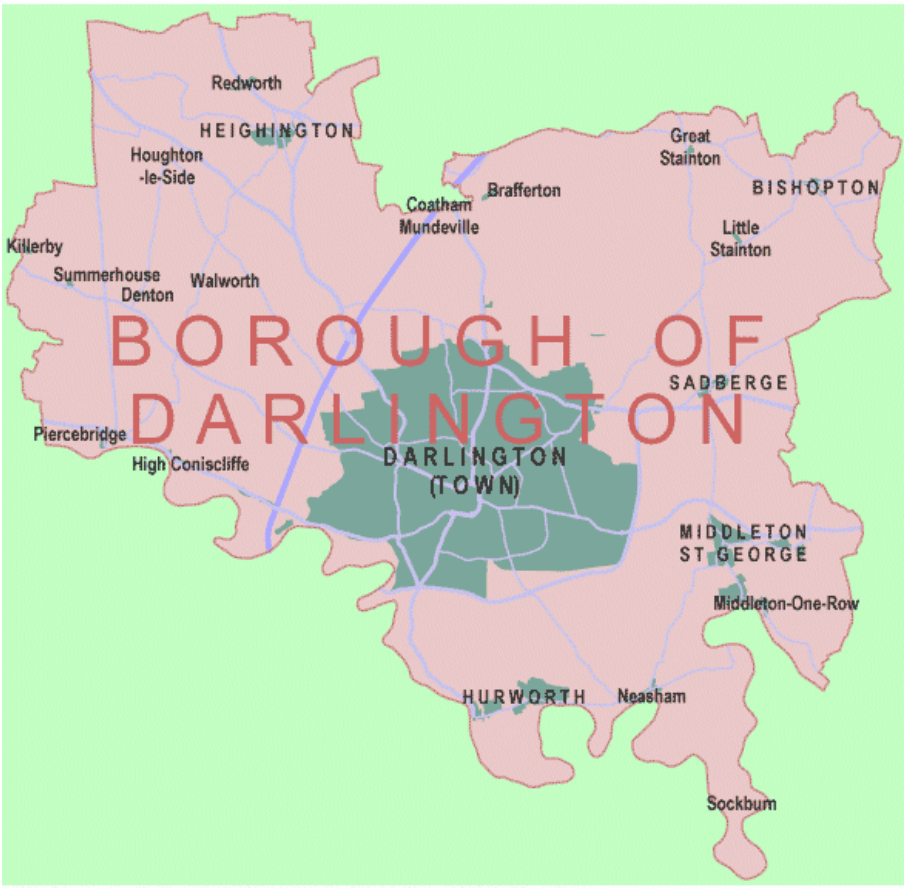
The key objectives can be summarised as follows:

- 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;
- 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 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 Darlington's Local Flood Risk Strategy;
- Assess the potential harmful consequences of future flood events within the study area;

1.3 *Study Area*

The Study area for the PFRA is defined as the administrative boundary of Darlington Borough Council. The borough of Darlington covers an area of

approximately 76 square miles and has a population of 100,400[1], the majority of whom live in Darlington town itself. South of Darlington is North Yorkshire; Teesdale is to the west; and County Durham to the north. To the east of Darlington are the boroughs of Stockton, Middlesbrough, Hartlepool and Redcar and Cleveland which along with Darlington make up the Tees Valley.



[1] 2009, http://www.teesvalleyunlimited.gov.uk/information-forecasting/documents/place_instantatlas/area_profile/atlas.html

2 Lead Local Flood Authority Responsibilities

The Flood and Water Management Act 2010 received royal assent on 8 April 2010. The act revises, modernises and consolidates significant legislation covering flooding, land drainage coastal erosion and reservoir safety. It strengthens and extends existing flood and water legislation including implementing appropriate recommendations from the Pitt Review into the floods of 2007. The act creates lead local flood authority status (LLFA) which will be a new duty for the council. This responsibility sets out a strong leadership role for the council in managing local flood risk and their key duties include:

- **Local Strategy for flood risk** – LLFA's are responsible for developing, maintaining and applying a strategy for local flood risk management which should include risks from surface water run off, groundwater and ordinary watercourses
- **Partnership working** – LLFA's are required to convene and coordinate any bodies necessary to deliver an effective joined up management of flood risk (see Section 3)
- **European Flood Directive requirements** LLFA's should fulfil the requirements of the EU floods directive in relation to sources of flood risk including a requirement to complete Preliminary Flood Risk assessments and prepare surface water management plans for areas of greatest risk.
- **Flood Expertise** –LLFA's need to develop centres of engineering and flood risk expertise in partnership with other key partners.
- **SUDs approving body** –LLFA's are required to approve, adopt and maintain sustainable drainage systems (SUDS) that meet national standards for development
- **Investigation flood incidents** – LLFA's will have a duty to investigate and record details of significant flood events in their area.
- **Asset register**-LLFA's will be required to maintain a register of structures or assets that may have an effect on flood risk, the register must be available for inspection and should have details of ownership and condition
- **Works powers** – LLFA's will also have powers to undertake works to manage flood risk and also to designate structure or assets that are relied on for flood risk management

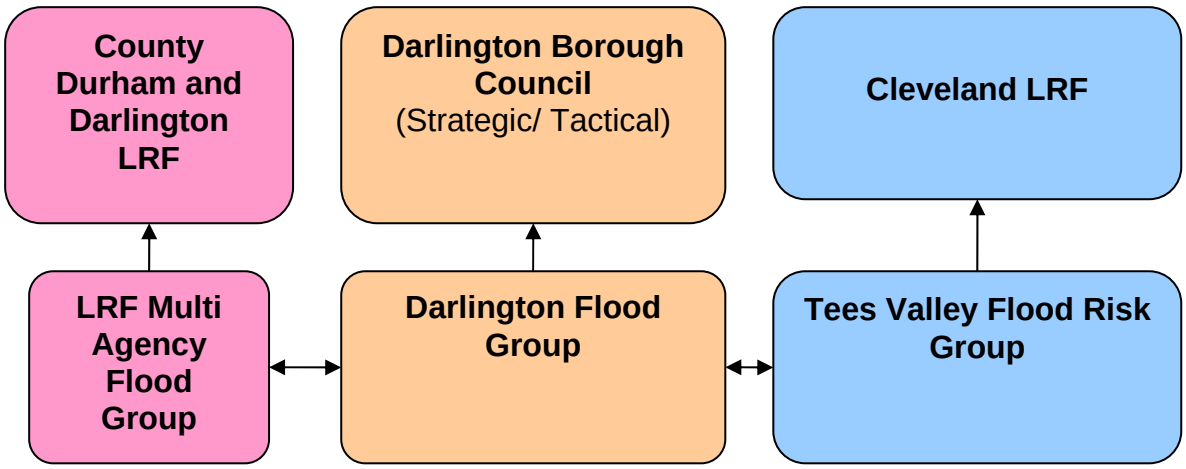
2.1 *Coordination of flood risk management*

One of the key recommendations from the Pitt Review in the review of the 2007 Floods was *Recommendation 14: Local authorities should lead on the management of local flood risk, with the support of the relevant organisations.* Coupled with the emphasis on partnership working within the Flood and Water Management Act, Darlington Borough Council has an important role to play in the coordination of flood management.

Although Darlington Borough Council is the LLFA, much of the technical expertise and the knowledge of flood risk lies with other organisations and this therefore requires close working with these partner organisations to ensure a coordinated and consistent management of local flood risk.

Within the Darlington area are a number of groups that facilitate this multi agency working, this is documented in FIG 1 below.

FIG: 1



2.2 *Multi Agency Partners*

Memberships of the above groups consist of a variety of different organisations. These include:

- Durham Constabulary
- Cleveland Police
- Durham and Darlington FRS
- Cleveland Fire Brigade
- Environment Agency
- Redcar & Cleveland Borough Council
- Hartlepool Borough Council
- Middlesbrough Council
- Stockton Borough Council
- Durham County Council
- Highways Agency
- Northumbrian Water

3 Methodology and data review

3.1 *Introduction*

3.1.1 EA guidance and Template

The PFRA final guidance was produced by the Environment Agency and released in December 2010. It was this guidance and outline template which was used to lead the production of the PRFA report.

3.1.2 Strategic flood Risk Assessment (SFRA)

In May 2009 JBA Consulting was commissioned by Darlington Borough Council to produce a level 1 SFRA document which was prepared in accordance with PPS25 guidance. The PPS25 relates to development and the constraints of flood risk with its overarching aim to avoiding development in flood risk areas. This highlights the need to understand the flood risk (historic and future) within the Darlington area.

The level 2 SFRA was commissioned in February 2010 and completed by October 2010 with the purpose of providing a detailed assessment of flood risk in the Town Centre Fringe. JBA are currently preparing a detailed Flood Mitigation Strategy for the Town Centre Fringe area to identify a strategic flood risk management scheme; this is expected to include flood storage compensation, restoration of the natural floodplain, the creation of a green corridor next to the River Skerne and flood resilience and resistance measures.

3.2 *Data collection*

3.2.1 Historical flood risk data

The SFRA process involved JBA consultants collecting and collating a large amount of historical flood data from a number of different sources. These sources included Darlington Borough Council, County Durham and Darlington Fire & Rescue Service, Cleveland Emergency Planning Unit, the Highways Agency and Northumbrian Water. This information was processed and where possible, geo-referenced, to produce a historical data flood map.

This information made up the primary historical data with additional information provided by other sources detailed below.

3.3 *Other Data sources*

National flood risk mapping for different flood sources (including surface water and groundwater) are available from the Environment Agency and these data sources have been used as supporting data for this section. A description on each is included below.

3.3.1 Areas Susceptible to Ground Water Flooding

Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid. It was developed specifically by the Environment Agency for use by LLFA's to determine whether there may be a risk of flooding from groundwater and to help assist them in the PFRA process.

This data includes flooding from aquifers (chalk, sandstone etc) 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. The susceptible areas are represented by four categories (< 25%; >= 25% <50%; >= 50% <75% and >= 75%) which show the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.

In common with the majority of datasets showing areas which may experience groundwater emergence, this dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding. It should not be interpreted as identifying areas where groundwater is actually likely to flow or pond, but may be of use to LLFAs in identifying where further studies may be useful.

3.3.2 Historic Flood Map

The Historic Flood Map dataset contains combined extents from known flooding events from surface water, groundwater, rivers and the sea. It is derived from the Flood Event Outline dataset and does not include point flooding records. It has some limitations as it does not provide information on all past flood events or contain specific detail on the date or probability of flooding, it simply highlights that flooding did occur.

3.3.3 Future flood risk data

The PFRA is also required to take into account floods which may occur in the future. This includes the possibility of floods occurring from current conditions and of those occurring taking into consideration climate change. For this purpose the Environment Agency's Flood Map for Surface Water was used to highlight potential flood areas. The Flood Map for Surface Water uses a numerical hydraulic model to predict the extent of flood risk from two rainfall events (1 in 30 annual chance and 1 in 200 annual chance).

In addition, JBA undertook additional modelling of the Town Centre Fringe as part of the Level 2 SFRA and this will be the main source of data for this area as it supersedes the Environment Agency's generic modelling.

3.3.4 Identifying Flood Risk Areas

To ensure a consistent and proportionate approach Defra have identified a significance criteria and thresholds for defining Flood Risk areas. These are based on three key factors:

- Human Health
- Economic Activity
- Environment

These indicators have been used to determine areas where flood risk and potential consequence exceed a pre-determined threshold. The areas that have been identified using this methodology and exceed 30,000 people at risk have been identified as national flood risk areas.[2]

3.4 *Data limitations*

The requirement to collect and record historic flood data is one that is currently being placed on the LLFA and all future events will have to be recorded. While this will greatly assist in future flood assessments, it does mean that completing this PFRA is reliant on inconsistent and incomplete historic flood datasets.

3.4.1 Current data shortfalls

The data included in this report is that based on information which is currently available; it does not necessarily represent a complete record of every historic flood event that has occurred in Darlington. The collection of flood data in the past was done on an ad-hoc basis depending on the situation and officer responsible at the time.

3.4.2 Data Collection Systems

Not only is the historic data incomplete but there has been no system for recording and collecting the data. This has meant that the flood data is inconsistent, of varied quality and often missing. This makes comparing data and producing a consistent map of flood risk areas a difficult task. The production of a comprehensive data collection system with specific criterias for the collection of flood data is one area that needs to be addressed by the LLFA for future flood events. Once in place this will provide comprehensive the basis for future PRFA production. (See section 7)

[2] DEFRA guidance for selecting and reviewing Flood Risk Areas for local Sources of Flooding (Dec 2010)

4 Historic flood risk

4.1 *Overview of Historic Flooding in Darlington*

The history of flooding in Darlington can be traced back as far back as 1753 when Neasham was flooded from the River Tees. Since then it has experienced a number of flood events predominately from the River Tees and the River Skerne, which for the purpose of this report have been excluded. (This has been excluded as the Environment Agency will be reporting on Main River Flooding). Details of flooding from the River Skerne and the River Tees is documented in the Strategic Flood Risk Assessment (SFRA) Level 1. The most significant flood events from other sources are detailed in 4.2 below.

4.1.1 Ordinary watercourse flooding

West Beck is a tributary of Cocker Beck which originates in the north of Darlington. It converges with Cocker Beck in Cockerton just upstream of the B6279. (The Cocker Beck is classed as Main River and will be included in the Environment Agency's submission. West Beck up to the dismantled railway near the A68 is also classed as Main River) The north of the West Beck catchment is predominantly rural however the area between Faverdale and Cockerton is urbanised. The current EA flood maps show that approximately 78 properties are at risk in the West Beck Catchment from the 1% a.p. flood event. (see Fig 2) Historically there has been a number of flood events along West Beck and Cocker Beck dating back to 1976, these include October 1976, March 1979 and June 1982 (See 4.2)

4.1.2 Surface water and Sewer Flooding

Surface water flooding occurs when heavy rainfall exceeds the capacity of local drainage networks and water finds alternative routes across the ground and pools in low lying areas. Darlington has a number of known areas that have historically experienced this type of flooding. These include:

- Middleton St George
- Airport Area
- Coatham Mundeville
- Eastbourne
- Lingfield
- Pierremont
- Town Centre Fringe

As part of the Level 2 SFRA Northumbrian Water provided information on the 2009, £2 million scheme they undertook in Pieremont to reduce the risk of flooding to 14 homes on Pierremont Crescent. In 2010 the second phase of this scheme was undertaken to protect a further 12 homes on Cleveland

Avenue, Dale Road, Milbank Road, Stonedale Crescent and Woodland Terrace.

They also provided information on historical flooding incidents within the Town Centre/ Town Centre Fringe which were caused by the sewer system in the area being old and prone to problems such as culvert collapse.

Problems with sewer flooding were also noted in the Bedford Street Area, around the Fire Station and Park Place. A £2.2 million project is underway to upgrade the sewerage network in the Bedford Street area. 150 metres of new sewer pipe will be installed at South Park and Polam Lane, with 420 metres of sewer pipe upsized at Bedford Street. An underground storm water storage tank will also be installed in South Park to hold 1.75 million litres of water in times of heavy rainfall, to be returned to the sewerage network after the storm.

4.1.3 Groundwater flooding

Groundwater flooding occurs as a result of water emerging from an underground source either in one point or diffuse locations. The Catchment Flood Management Plan (CFMP) for the Tees catchment suggested that there is little documented evidence of this type of flooding in this catchment. This may be changing, however, as minewater pumping has ceased and on the western edge of the Magnesain Limestone escarpment the water table levels have risen which may have caused flooding.

This is similar in the Skerne Catchment but as groundwater flooding is usually recorded as surface water flooding there is no document evidence specifically relating to groundwater flooding.

4.2 *Historic Flood data*

As previously described much of the data collected is of varying standards and detail but to avoid losing information that may still be useful to support and inform future PFRA cycles as well as Darlington's Local Flood Risk Management Strategy, the key flood events have been documented below[3].

AREA	DETAIL OF FLOOD INCIDENTS
Town centre Fringe	November 1967, 54 properties along Valley Street, John Street, Oxford Street, Mount Street and Parkgate were flooded. Since then a number of engineering works have been undertaken and in 1979 Priestgate Bridge was overtopped and the ring road flooded but no properties were affected.

[3] The information below is taken from Historic recorded information from DBC officers, and the SFRA level 1 & 2

Neasham & Hurworth	In March 1968 heavy rainfall caused 30 properties to flood in Hurworth place and 12 in Neasham. In 1995 a prolonged flood event caused flooding on the river tees, effecting properties at Hurwoth, the Caravan Park, Newbus Grange and Neasham. In June 2000 heavy rainfall produced flooding from a combination of sources across the Darlington area. 13 properties in Neasham suffered flooding from the Kent Beck when seepages occurred through holes in the left defence bank. The Public House in Neasham - the Fox and Hounds also suffered flooding of the cellars.
Faverdale & Morton Park	In November 2000 heavy rainfall caused extensive flooding across the Darlington area. This included surface water flooding in a number of streets in the Faverdale and Morton Park areas and combined flooding from the River Tees and surface water runoff in Hurworth. 23 properties in total were affected.
Cockerton	In 1982 Severe Storms over West Darlington caused overtopping of West Beck at Newton Lane Culvert. Two residential properties were flooded (number 90 and 111 The Green) and the road was impassable. The new development of sheltered Flats at Newton Court was also surrounded by water but not flooded.
Pierremont	Historically this area has seen a number of properties flooded from sewer and surface water flooding, however work by Northumbrian Water in 2009 & 2010 should alleviate this problem.
Heighington	Heighington experienced surface water flooding on 6 November 2000. Records show that the A6072 was closed and Redworth Road and Cross Lanes Road opposite Dog Inn were blocked. A number of properties were also affected.
Town Centre & Longfield Road, North Road, Brian Road, 30 Burtree Lane	In July 2007 heavy rainfall caused surface water flooding at Harrowgate Hill and within the Town Centre. At least 4 properties were affected by this incident.

4.3 *Consequences of Historic Flooding*

As a result of the issues discussed in Section 3.4, insufficient data is available to draw definitive conclusions on the impacts and consequences of historic flood events on people, the economy and the environment, as this information has not been recorded in the past.

The legislation does not provide a definition of ‘significant’ and for the purpose of this exercise, due to lack of comprehensive information on the past floods, those that are recorded above are not considered within the national perspective to have had ‘significant’ harmful consequences. Details of these flood events will be kept to build a comprehensive picture of risk areas and will help inform future work as described above.

FIG: 2

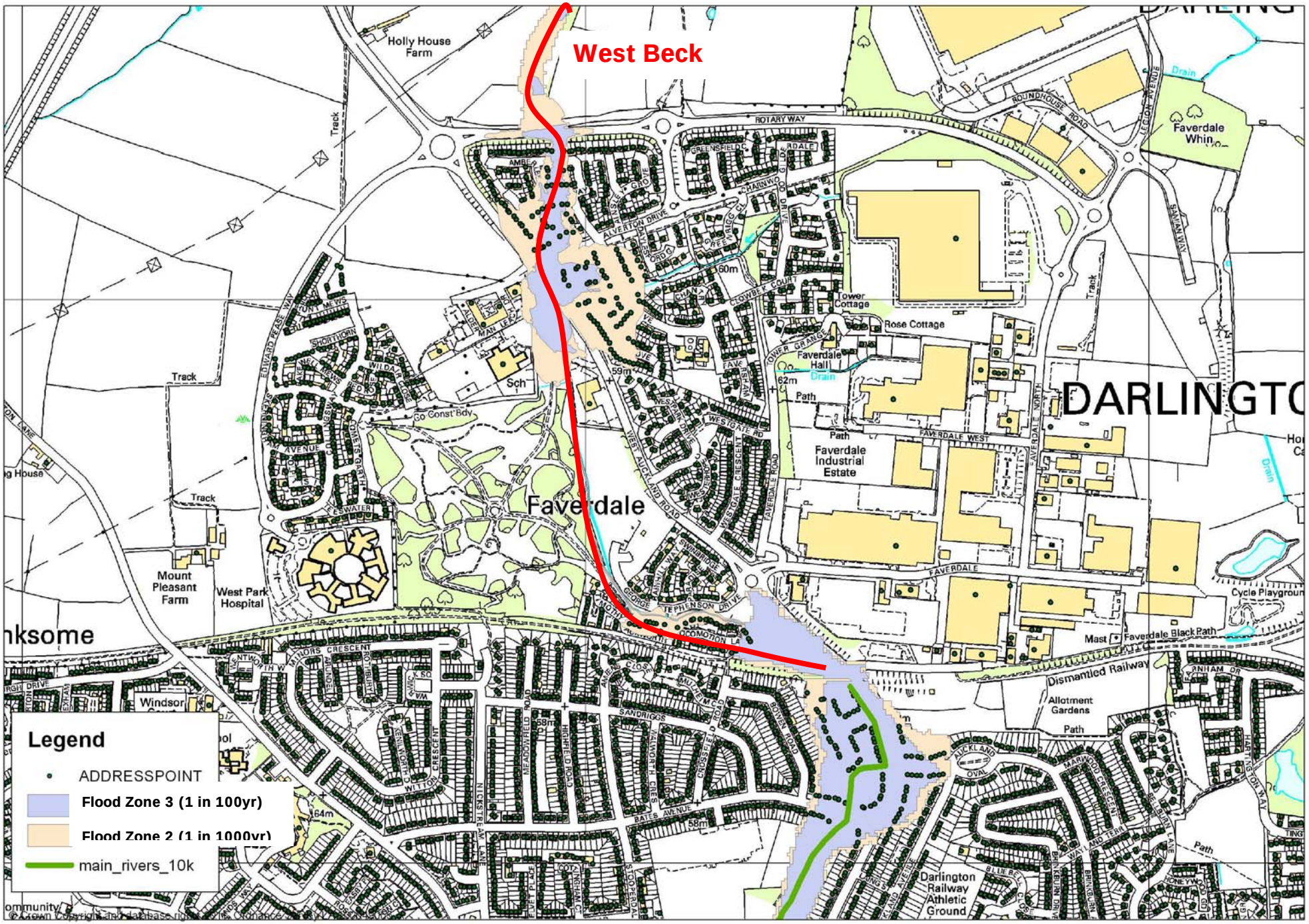

West Beck
Holly House Farm
Faverdale
Faverdale Industrial Estate
Faverdale Hall
Tower Cottage
Rose Cottage
Mount Pleasant Farm
West Park Hospital
Darlington Railway Athletic Ground
Allotment Gardens
Dismantled Railway
Faverdale Whin
Legend
ADDRESSPOINT
Flood Zone 3 (1 in 100yr)
Flood Zone 2 (1 in 1000yr)
main_rivers_10k

FIG:3

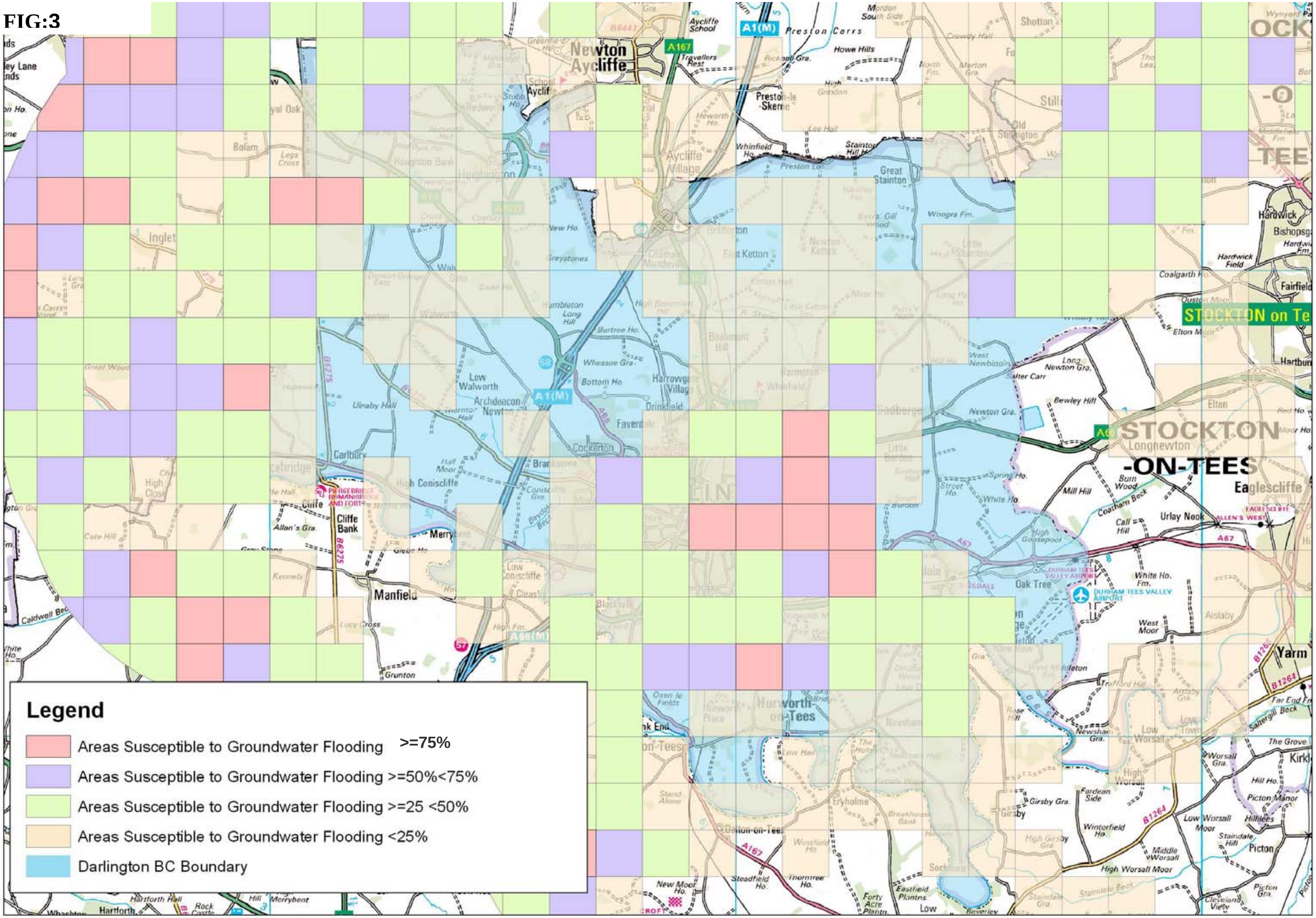
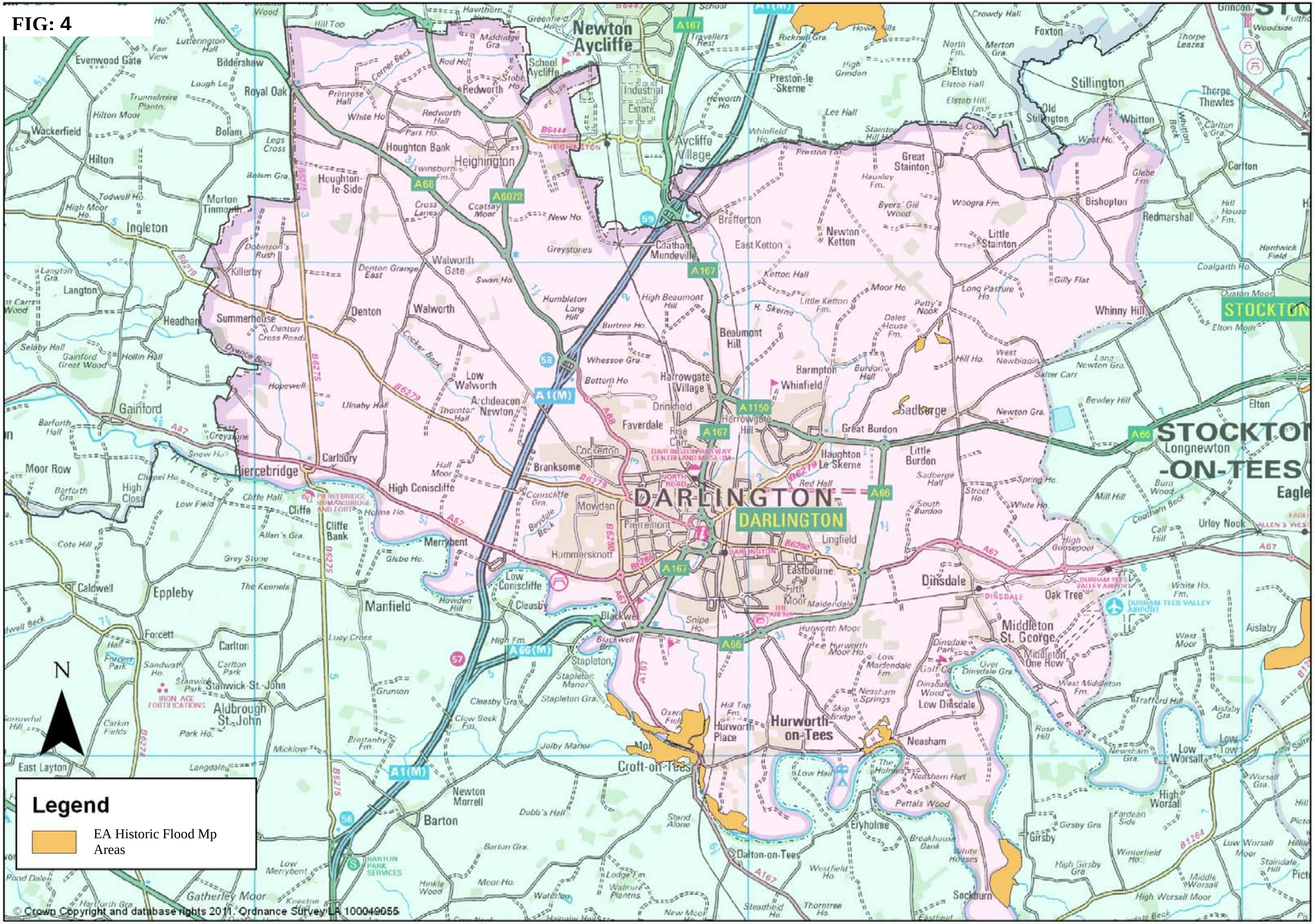


FIG: 4


Legend
EA Historic Flood Mp Areas
N
DARLINGTON
Newton Aycliffe
Aycliffe Village
Heighington
Redworth
Houghton Bank
Houghton-le-Side
Walworth
Denton
Summerhouse
Killerby
Ingleton
Gainford
Piercebridge
Carlbury
High Coniscliffe
Low Coniscliffe
Merrybent
Manfield
Cleasby
Stapleton
Blackwell
Croft-on-Tees
Hurworth-on-Tees
Hurworth Place
Neasham
Dinsdale
Middleton St. George
Low Dinsdale
Sadberge
Great Burdon
Little Burdon
Haughton Le Skerne
Barmpton
Whinfield
Harrowgate Village
Faverdale
Cockerton
Branksome
Mowden
Pierremont
Hummersknott
Eastbourne
Lingfield
Firth Moor
Beaumont Hill
Brafferton
Coatham Mundeville
Great Stainton
Little Stainton
Newton Ketton
Bishopton
Stillington
Redmarshall
Whinny Hill
STOCKTON -ON-TEES
Longnewton
Oak Tree
Eryholme
Sockburn
Dalton-on-Tees
Barton
Newton Morrell
Eppleby
Aldbrough St. John
Stanwick-St-John
Forcett
Carlton
Caldwell
East Layton
A1(M)
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A66(M)
A67
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5 Future flood risk

5.1 *Surface water flooding*

At the time of completing this first cycle of the PRFA process, only a small amount of information on surface water flooding is available for the Darlington area. This will be addressed by the second cycle as a surface water management plan (SWMP) for Darlington will be produced in the near future.

The Environment Agency has produced two national mapping datasets on surface water flooding; the *Areas Susceptible to Surface Water Flooding* (AstSWF) and the updated model the *Flood Map for Surface Water*. This model contains two rainfall events, a 1 in 30 rainfall event and a 1 in 200 rainfall event and two depth bandings, greater that 0.1m and greater than 0.3m.

These flood maps give an indication of the broad areas likely to be at risk of surface water flooding, however they are modelled from a national perspective and do not take into account floor levels, construction characteristics or design properties of individual dwellings. They are suitable for use in identifying where properties are **in areas at risk** of flooding, where surface water flooding is strongly influenced by topography. They are **not suitable** for use to identify individual properties.

Using the Flood Map for Surface Water model the approximate number of properties at risk from this type of surface water flooding in Darlington at the different flood event and depths are shown in the table below.

MODEL	ESTIMATED PROPS AT RISK
30 year (0.1m)	450
30yr deep (0.3m)	25
200 year (0.1m)	2000
200 deep (0.3m)	300

5.2 *Groundwater flooding*

There is no local information available which provides evidence on future groundwater flood risk across Darlington therefore for this process the Environment Agency's national dataset, Areas Susceptible to Groundwater has been used. Fig 3 shows the areas at risk from groundwater flooding.

5.3 *Locally Agreed Surface Water Information*

As there is little local information on future flooding available, the 'locally agreed surface water information' as agreed by Darlington Borough Council and the Environment Agency has been based on the Flood Map for Surface water dataset.

As part of the level 2 SFRA study, modelling of flood outlines for the town centre fringe was done taking into account climate change allowance by increasing fluvial flows by 20%.

5.4 *Areas at risk from Future Flooding*

The table below and FIG 5-9 shows some areas within Darlington that may be susceptible to surface water flooding. These maps are extracted from the existing Environment Agency *Flood Map for Surface Water* model, which can be obtained, in full, from the Environment Agency.

FLOOD LOCATIONS
Town Centre areas including Branksome, Faverdale and Cockerton, Harrowgate Hill, Haughton le Skerne, Hummersknott, Park East and Park West.
Middleton St George & Lingfield
Hurworth & Neasham
Heighington

5.5 *The impacts of climate change*

5.5.1 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%.

5.5.2 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.

5.5.3 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.

5.5.4 Adapting to Change

Past emissions mean 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.

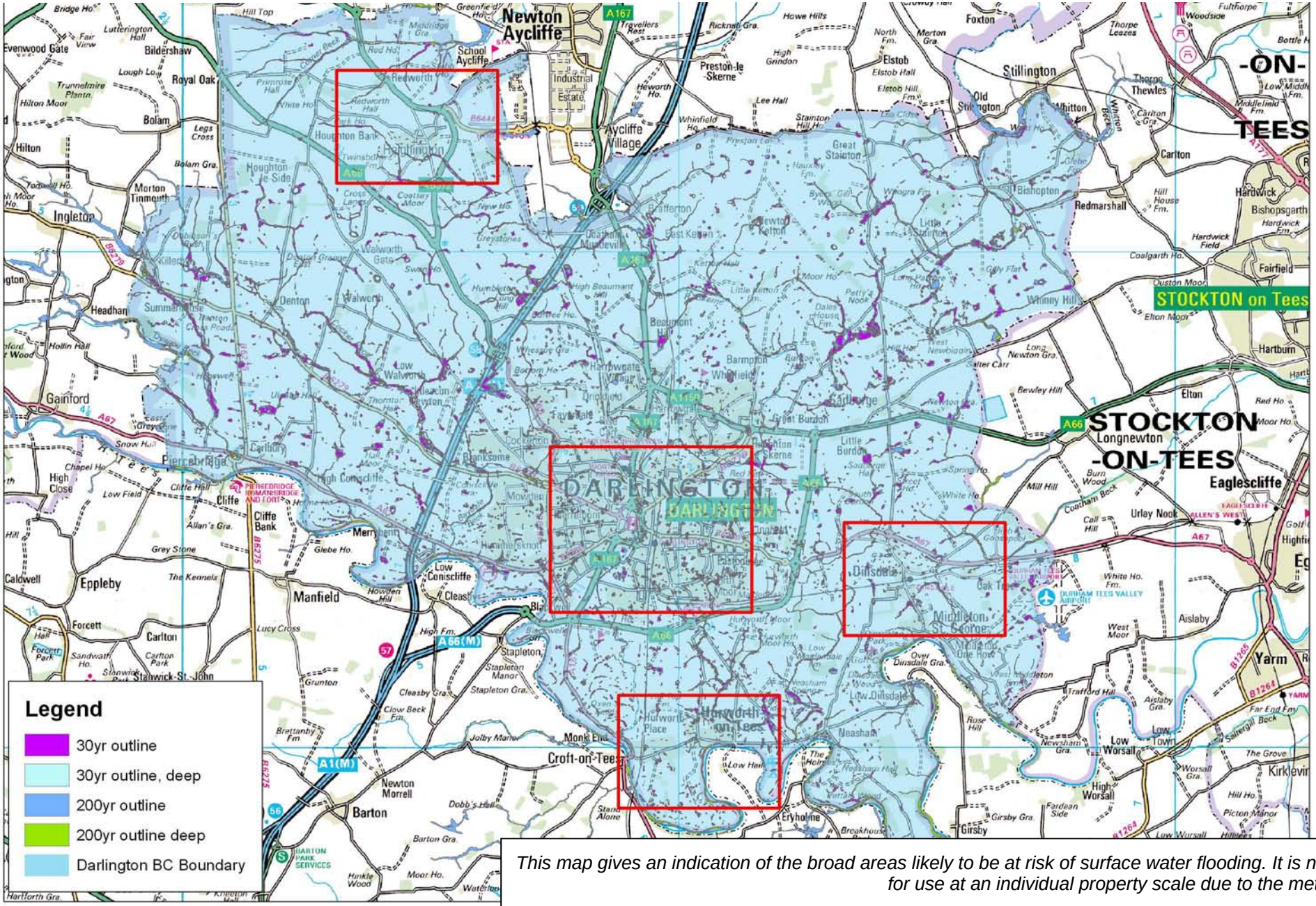
Although the broad climate change picture is clear, we have to make local decisions uncertainly. We will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that we do not increase our vulnerability to flooding.

5.5.5 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).

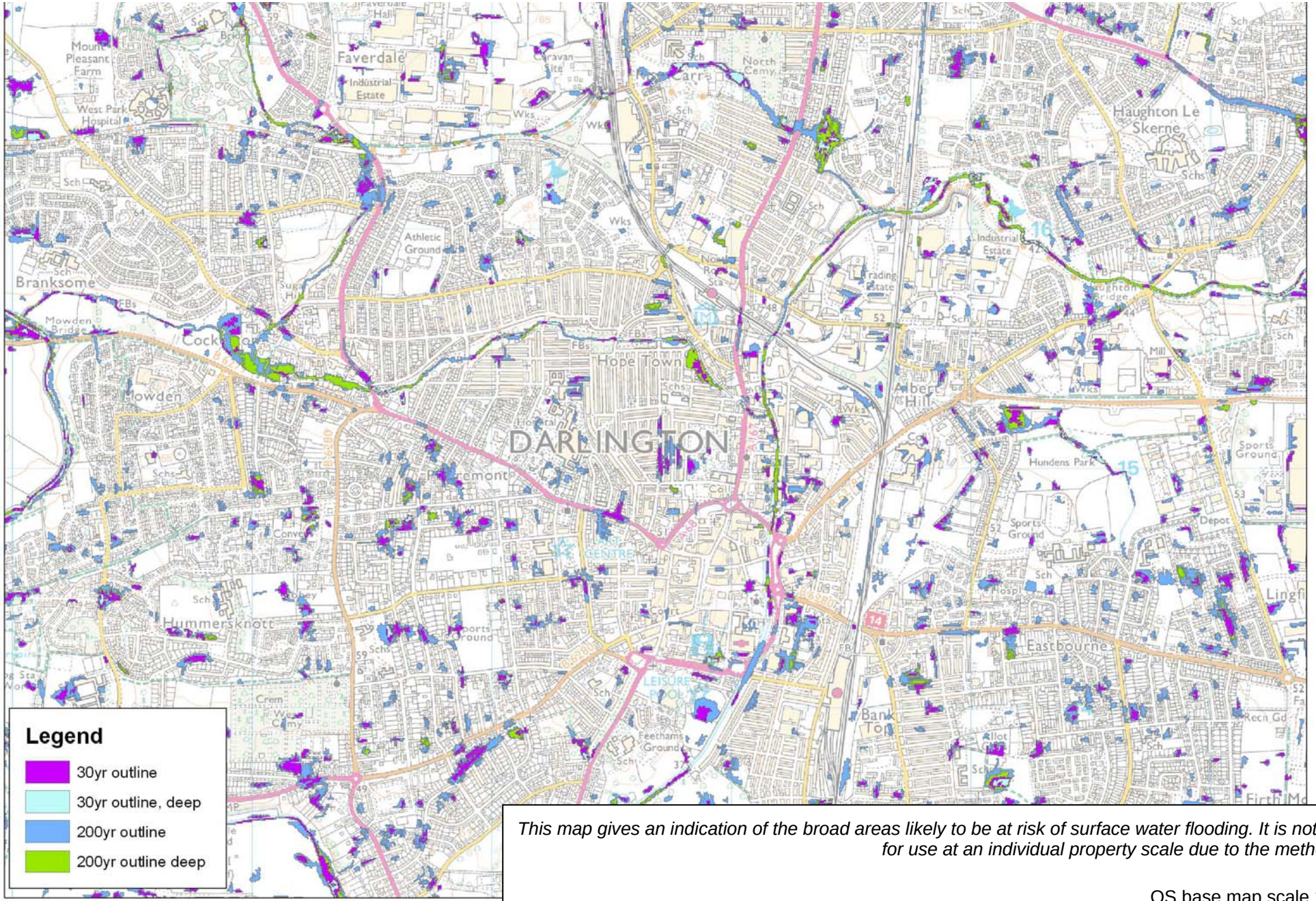
FIG: 5 Darlington Borough Council Area Overview



This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used.

OS base map scale 1:25,000
Extracted from existing Environment Agency map data (EA Flood Map for Surface Water 2010)

FIG: 6 Town Centre



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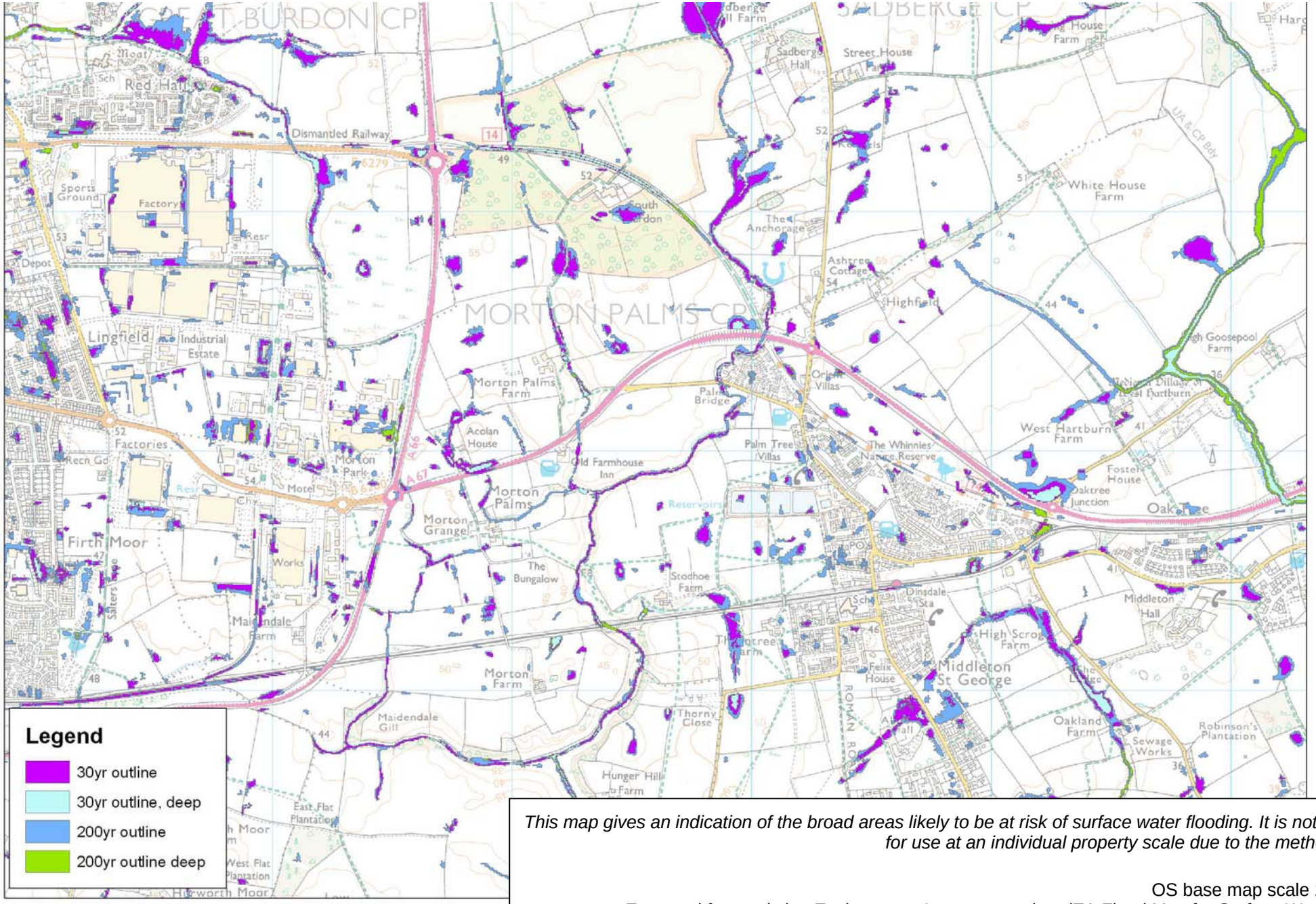
OS base map scale 1:25,000
Extracted from existing Environment Agency map data (EA Flood Map for Surface Water 2010)

FIG: 7 Middleton-St George & Lingfield Area



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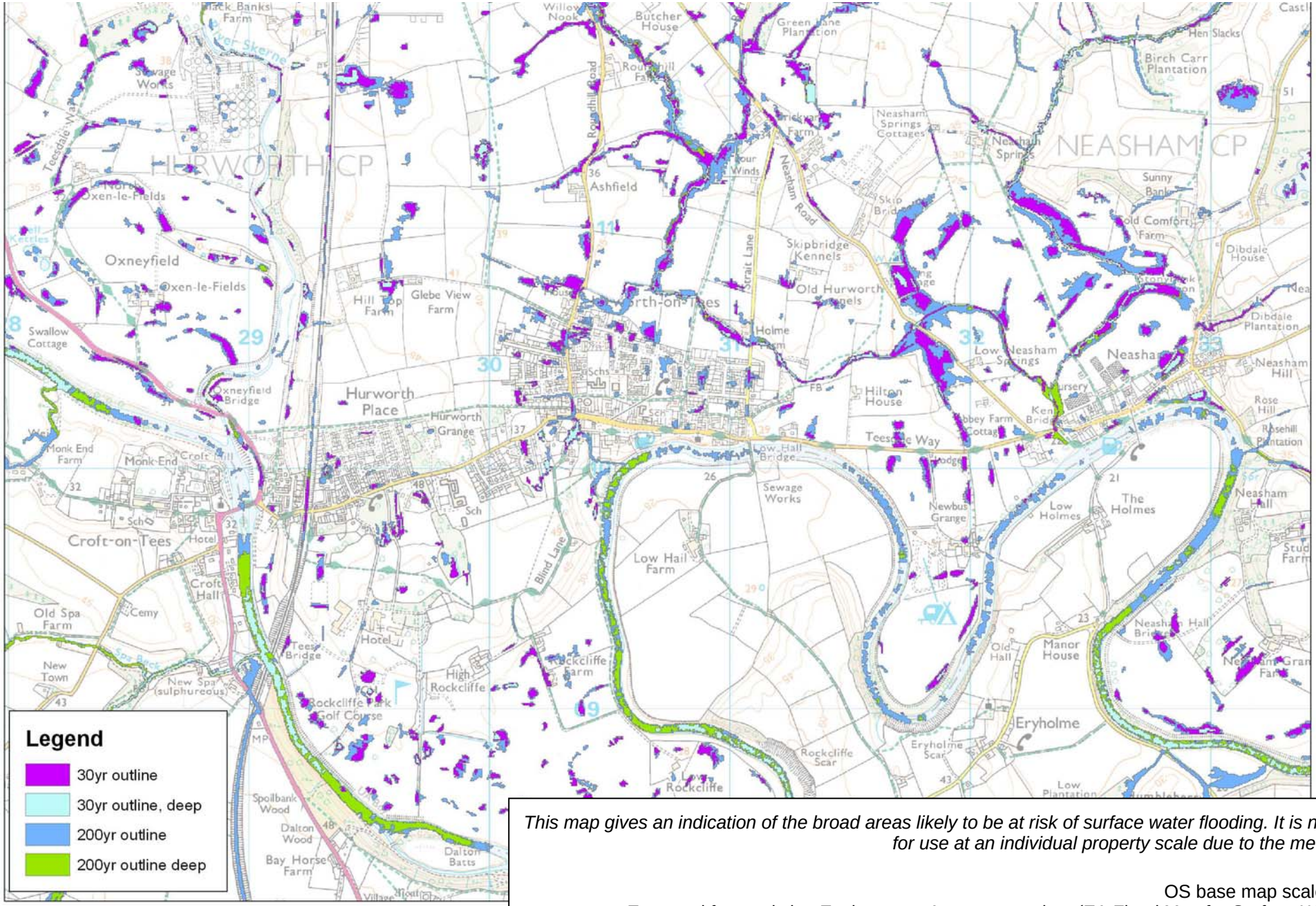
OS base map scale 1:25,000
Extracted from existing Environment Agency map data (EA Flood Map for Surface Water 2010)

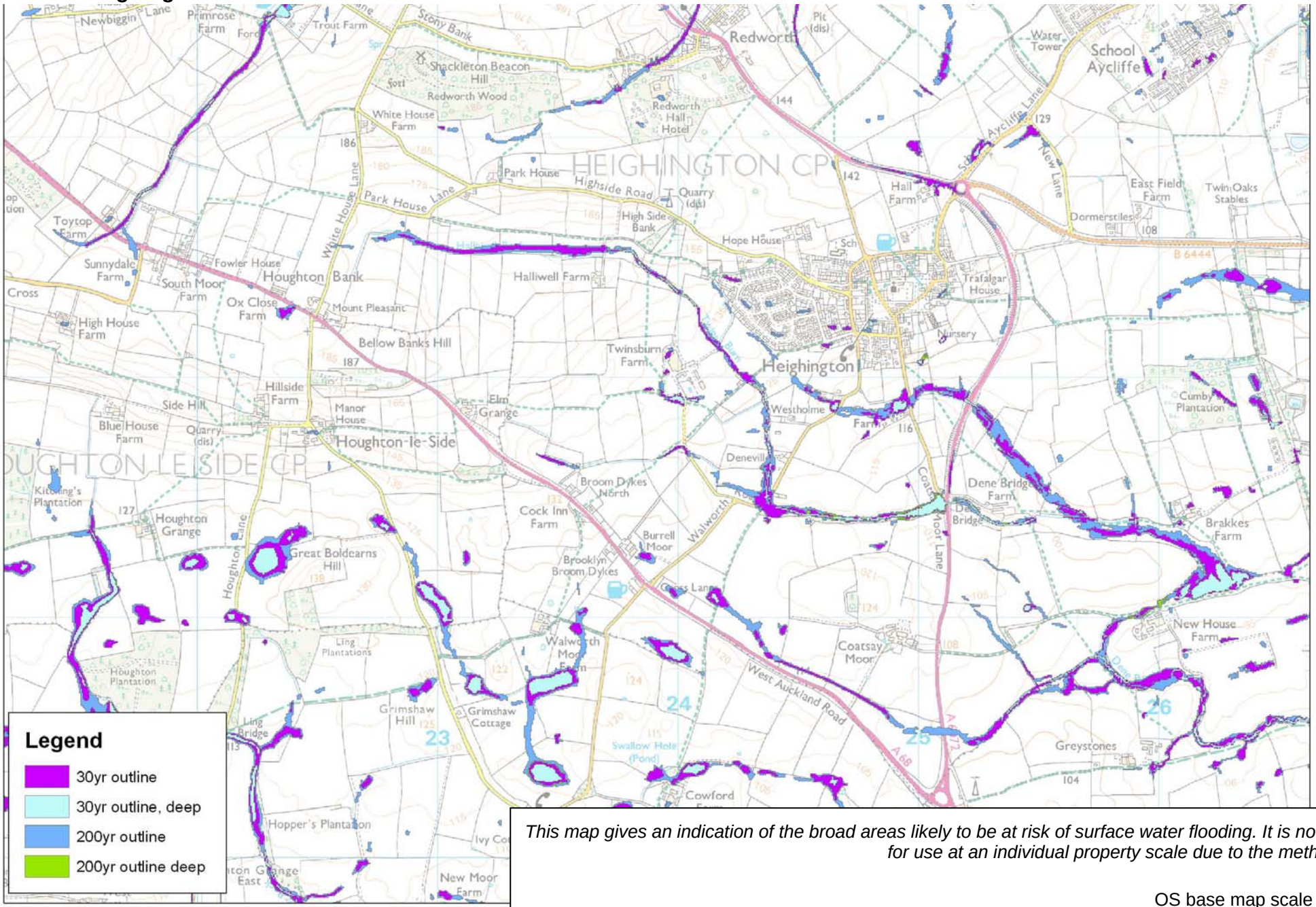
FIG: 8 Hurworth & Neasham



This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used.

OS base map scale 1:25,000
Extracted from existing Environment Agency map data (EA Flood Map for Surface Water 2010)

FIG: 9 Heighington



This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used.

OS base map scale 1:25,000
Extracted from existing Environment Agency map data (EA Flood Map for Surface Water 2010)

6 Review of indicative Flood Risk Areas

6.1 *Overview*

In order to ensure a consistent national approach, Defra have identified significance criteria and thresholds to be used for defining flood risk areas. Guidance on applying these thresholds has been released by Defra. In this guidance document[4], Defra have set out agreed key risk indicators and threshold values which must be used to determine Flood Risk Areas.

The methodology is based on using national flood risk information to identify 1km squares where local flood risk exceeds a defined threshold; where a cluster of these grid squares leads to an area where flood risk is most concentrated, and over 30,000 people are predicted to be at risk of flooding, this area has been identified as an Indicative Flood Risk Area.

The Darlington area does not have any Indicative Flood Risk Areas as defined above and therefore none will be recorded in Appendix 3 of the Preliminary assessment spreadsheet.

[4] "Selecting and reviewing Flood Risk Areas for local sources of flooding" (Defra 2010)

7 Next steps

7.1 *Future data collection*

As described in Section 2, Darlington Borough Council, as LLFA now has a duty to investigate and record details of significant flood events in their area. The collection of this data will ensure that a comprehensive record of flood data can be issued to inform future assessment and reviews and for imputing into mapping and local strategy planning.

In addition, The PRFA process is based on a 6 yearly cycle and the next submission is due in 2016. Within this next submission more information will be mandatory as part of the Appendix 1, historic flooding spreadsheet. This emphasises the need for a comprehensive recording system for future flooding to ensure that future PFRA cycles comply with the European Floods Directive.

The format of the data will be in a centralised spreadsheet and would include fields such as detail of the flood, the properties affected- including whether they are commercial, residential or other critical infrastructure; the source, extent and depth of flooding. It would also include other details of the event – i.e. rainfall duration, depth and location of relevant photographs etc.

In order to ensure consistency not only across Darlington but in neighbouring local authorities, the development of this reporting spreadsheet and supporting criteria for when to record incidents is being developed jointly within the Tees Valley Flood Risk Group (See 2.1).

7.2 *Scrutiny and Review Procedures*

The scrutiny and review procedures that must be adopted when producing a PFRA are set out by the European Commission. Meeting quality standards is important in order to ensure that the appropriate sources of information have been used to understand flood risk and the most significant flood risk areas are identified.
Another important aspect of the review procedure is to ensure that the guidance is applied consistently; a consistent approach will allow all partners to understand the risk and manage it appropriately. The scrutiny and review procedure will comprise two key steps, as discussed below.

7.2.1 Local Authority Review

The first part of the review procedure is through an internal Local Authority review of the PFRA, in accordance with appropriate internal review procedures. Internal approval should be obtained to ensure the PFRA meets the required quality standards, before it is submitted to the Environment Agency. Within Darlington, the PFRA will be considered by full Council before the final version is delivered to the Environment Agency.

7.2.2 **Environment Agency Review**

Under the Flood Risk Regulations, the Environment Agency has been given a role in reviewing, collating and publishing all of the PFRAs once submitted. The Environment Agency will undertake a review of the PFRA and ensure that they meet the required standard for the European Commission. They will also review Flood Risk Areas that have been amended and ensure the format of these areas meets the provided standard. If satisfied, they will recommend submission to the relevant Regional Flood Defence Committee (RFDC) for endorsement.

RFDCs will make effective use of their local expertise and ensure consistency at a regional scale. Once the RFDC has endorsed the PFRA, the relevant Environment Agency Regional Director will sign it off, before all PFRAs are collated, published and submitted to the European Commission.

The Darlington PFRA final submission will be made to the Environment Agency subject to Cabinet consideration. The Environment Agency will then submit it to the European Commission by the 22nd of December 2011, using the review procedure described above.

8 References

- Defra / WAG (2010) Selecting and reviewing Flood Risk Areas for local sources of flooding – Guidance to Lead Local Flood Authorities. Available from http://www.defra.gov.uk/environment/flooding/documents/research/flood-risk-method.pdf

- Defra (2010) Surface Water Management Plan Technical Guidance

- Environment Agency (2008) River Tees Catchment Flood Management Plan

- Environment Agency (2010) Preliminary Flood Risk Assessment - Final Guidance (Report – GEHO1210BTGH-E-E). Available from ttp://publications.environment-agency.gov.uk/pdf/GEHO1210BTGHe-e.pdf

- Environment Agency (2010) Preliminary Flood Risk Assessment – Annexes to the Final Guidance (Report – GEHO1210BTHF-E-E). Available from http://publications.environment-agency.gov.uk/pdf/GEHO1210BTHFe-e.pdf

- Environment Agency Building Trust with Communities

- JBA Consulting (2009) Darlington Borough Council - Level 1 Strategic Flood Risk Assessment

- JBA Consulting (2010) Darlington Borough Council – Level 2 Strategic Flood Risk Assessment

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

9 Annexes

- **Annex 1** - Records of past floods and their significant consequences (preliminary assessment report spreadsheet)

- **Annex 2** - Records of future floods and their consequences (preliminary assessment report spreadsheet)

- **Annex 3** - Records of Flood Risk Areas and their rationale (preliminary assessment report spreadsheet)

- **Annex 4** - Review checklist