Selby District Council

Strategic Flood Risk Assessment

Level 1 Final Report

Updated - November 2008

Prepared for:

Revision Schedule

Selby District Council Strategic Flood Risk Assessment – Level 1 Final Report
Updated - November 2007

Rev	Date	Details	Prepared by	Reviewed by	Approved by
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Abbreviations

ACRONYM	DEFINITION
AONB	Area of Outstanding Natural Beauty
CFMP	Catchment Flood Management Plan
CC	Climate Change
DEM	Digital Elevation Model
DPD	Development Plan Documents
EP	English Partnerships
FRA	Flood Risk Assessment
GIS	Geographical Information Systems
Selby DC	Selby District Council
IDB	Internal Drainage Board
LDDs	Local Development Documents
LDF	Local Development Framework
LDS	Local Development Scheme
LiDAR	Light Detection and Ranging
LPA	Local Planning Authority
ODPM	Office of the Deputy Prime Minister
PCPA	Planning and Compulsory Purchase Act 2004
PPG25	Planning Policy Guidance Note 25: Development and Flood Risk
PPS25	Planning Policy Statement 25: Development and Flood Risk
RFRA	Regional Flood Risk Assessment
RPG	Regional Planning Guidance
RSS	Regional Spatial Strategy
SAR	Synthetic Aperture Radar
SA	Sustainability Assessment
SFRA	Strategic Flood Risk Assessment
SPG	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Drainage Systems

Glossary

TERM	DEFINITION
Aquifer	A source of groundwater comprising water-bearing rock, sand or gravel capable of yielding significant quantities of water.
Catchment Flood Management Plan	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.
Climate Change	Both natural and human actions causing long term variations in global temperature and weather patterns.
Culvert	A channel or pipe that carries water below the level of the ground.
Flood Defence	Infrastructure used to protect an area against floods as floodwalls and embankments; they are designed to a specific standard of protection (design standard).
Flood Outline	The extent by which floodwater covers an area during an extreme event.
Flood Plain	Area adjacent to river, coast or estuary that is naturally susceptible to flooding.
Flood Storage	A temporary area that stores excess runoff or river flow often ponds or reservoirs.
Fluvial Flooding	Flooding by a river or a watercourse.
Groundwater	Water that is in the ground, this is usually referring to water in the saturated zone below the water table.
Indicative flood Plain Map	A map that delineates the areas that have been predicted to be at risk of being flooded during an event of specified probability.
Internal Drainage Board	Independent bodies with responsibility of ordinary watercourses within a specified District.
Inundation	Flooding.
Local Development Framework (LDF)	The core of the updated planning system (introduced by the Planning and Compulsory Purchase Act 2004). The LDF comprises the Local Development Documents, including the Development Plan Documents that expand on policies and provide greater detail. The development plan includes a core strategy, site allocations and a proposals map.
Local Planning Authority	Body that is responsible for controlling planning and development through the planning system.
Mitigation Measure	An element of development design which may be used to manage flood risk or avoid an increase in flood risk elsewhere.
Risk	The probability or likelihood of an event occurring.
Sequential Test	A risk based approach in to assessing flood risk, which gives priority in ascending order of flood risk, i.e. lowest risk first.
Sewer Flooding	Flooding caused by a blockage or overflowing in a sewer or urban drainage system.

TERM	DEFINITION
Stakeholder	A person or organisation that has an interest in, or affected by the decisions made within a site.
Sustainability Appraisal	A process used to identify if policies, strategies or plans promote sustainable development and further used for improving policies. It is a requirement for Regional Spatial Strategies under the *Planning and Compulsory Purchase Act 2004.*
Sustainable Drainage Systems	Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques.
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations meeting their own needs.
1 in 100 year event	Event that on average will occur once every 100 years. Also expressed as an event, which has a 1% probability of occurring in any one year.
1 in 100 year design standard	Flood defence that is designed for an event, which has an annual probability of 1%. In events more severe than this the defence would be expected to fail or to allow flooding.

Executive Summary

Planning Policy Statement (PPS) 25 provides best practice guidance for development and flood risk. The guidance emphasises the active role Local Planning Authorities (LPAs) should have in ensuring flood risk is considered in strategic land use planning and encourages LPAs to undertake a Strategic Flood Risk Assessment (SFRA).

A SFRA assesses flood risk at a district level by collating all relevant and available information on flood risk from a diverse range of sources. In the case of Selby this included data from Selby District Council, the Environment Agency (Dales and Ridings Area), Internal Drainage Boards, North Yorkshire County Council, the Highways Agency, Yorkshire Water Service Limited and British Waterways. The findings of the data collection and analysis are collated and used to inform future land use planning and ultimately direct development to areas with a lower risk of flooding wherever possible.

Selby District Council commissioned Scott Wilson Ltd to undertake a SFRA for Selby District in June 2007 and the data collection and analysis was undertaken between June 2007 and September 2007.

Selby District is mostly low lying, comprising a series of drainage basins and associated wash lands. The Rivers Ouse, Wharfe, Aire and Derwent cross the district and are fed by numerous drainage ditches.

The SFRA for Selby District is being undertaken in two stages – Level 1 and Level 2. This report covers the Level 1 assessment, which provides background information and a preliminary review of all available flood risk data, to enable Selby District Council to undertake sequential testing of the suitability of future development sites in light of the flood risk findings.

The Environment Agency categorises flood risk into four distinct zones, flood zone 1 has a low risk of flooding, flood zone 2 has a medium risk of flooding, flood zone 3a has a high risk of flooding and flood zone 3b forms the functional floodplain.

The Level 1 SFRA found that 66.4% of the total administrative area of Selby District is located within flood zone 1, 8.7% is located in flood zone 2, 2.4% is located in flood zone 3a and 22.5% is located in flood zone 3b. Please note that flood zone 3b is subject to a hybrid approach, see section 3.5 Functional Floodplain.

This assessment therefore shows that significant flood risk exists within relatively large areas of the district, affecting the Principal Town (Selby), parts of the Local Service Centres (Tadcaster and Sherburn) and a number of Service Villages.

The Regional Spatial Strategy (RSS) for Yorkshire and the Humber and Selby's emerging Core Strategy, identify Selby as the most sustainable location for the concentration of future development, which will fulfil regeneration objectives and help provide an alternative source of employment for long distance car commuters. Some development to meet local needs may also be accommodated in the Local Service Centres and the emerging Core Strategy envisages very limited development in Primary Villages, but overall the main focus for development will be Selby Town.

As a significant number of potential development sites in Selby and other sustainable locations are likely to fall within higher flood risk areas it is anticipated that the process of identifying land to satisfy the development aspirations will need to be subject to a process of sequential testing.

PPS25 states where sequential testing reveals there is insufficient land available within flood zone 1 (low risk of flooding) to accommodate development needs in order to achieve wider sustainability and regeneration objectives, development should preferably be located in flood zone 2 (medium risk of flooding). Again, where this may not be possible, sites in flood zone 3 (high risk of flooding) can be considered. The RSS specifically refers to the need for flood management in areas such as Selby District where little development land is

available outside high flood risk zones provided the sequential test demonstrates there are no suitable lower risk sites available.

Any potential or previously allocated development sites either wholly or partly situated in either flood zones 2 or 3 will require the application of the exception test. The exception test provides a method of managing flood risk whilst allowing necessary development to occur.

The final Level 1 SFRA was completed in February 2008 and a revision of the Level 1 SFRA was undertaken between September and November 2008 to update the maps and report to align the work with the ongoing progress of Selby DC's Core Strategy. This document and the accompanying maps represent the output from the revision of the original Level 1 SFRA and should be considered to supersede the previous version.

1 Introduction

The Planning and Compulsory Purchase Act 2004 (PCPA) (HMSO, 2004) requires Local Planning Authorities to produce Local Development Frameworks (LDFs) to replace the system of Local, Structure and Unitary Development Plans. Local Development Frameworks are a portfolio of documents (Local Development Documents (LDDs)) that collectively deliver the spatial planning strategy for the authority area. The PCPA 2004 requires LDDs to undergo a Sustainability Appraisal (SA) which assists Planning Authorities in ensuring their policies fulfil the principles of sustainability. Strategic Flood Risk Assessments (SFRAs) are one of the documents to be used as the evidence base for planning decisions; they are also a component of the SA process and should be used in the review of LDDs or in their production.

The release of Planning Policy Guidance Note 25: Development and Flood Risk in July 2001 (PPG25)(DTLR, 2001) introduced the responsibility that Local Authorities have to ensure that flood risk is understood and managed effectively using a risk-based approach as an integral part of the planning process.

Planning Policy Statement 25 superseded PPG25: Development and Flood Risk (PPS25) in December 2006. PPS25 re-emphasises the active role Local Authorities should have in ensuring flood risk is considered in strategic land use planning. PPS25 encourages Local Planning Authorities to undertake SFRAs and to use their findings to inform land use planning. In February 2007, a "Living Draft" of the Practice Guidance for PPS25 was released for consultation. Although this is a consultation document, the approach to SFRAs that it suggests should be considered.

To assist Local Authorities in their strategic land use planning, SFRAs should present sufficient information to enable Local Authorities to apply the Sequential Test to their proposed development sites. The SFRA should have regard to river catchment wide flood issues and also involve a:

"Process which allows the Local Planning Authority to determine the variations in flood risk across and from their area as the basis for preparing appropriate policies for flood risk management for these areas".

In addition, where development sites cannot be located in accordance with the Sequential Test as set out in PPS25 (i.e. to steer development to low risk sites):

"The scope of the SFRA should be increased to provide the information necessary for the application of the Exception Test."

In addition to being a tool for use in strategic land use planning, an SFRA should also be accessible and provide guidance to aid in the general planning process of a local authority.

1.1 The Selby District Council SFRA

Selby District is primarily a rural area, with a dispersed settlement pattern of market towns, villages and hamlets interspersed with open arable landscapes of high quality farmland. The area is well served by good transport links and in spite of the rural

character of the area the southern part of the district is dominated by an industrialised landscape.

The District is mostly low lying, comprising parts of the Humberhead Level and a series of drainage basins and associated washlands The Rivers Ouse, Wharfe, Aire and Derwent cross the district and are fed by numerous drainage ditches.

In order to achieve a sustainable future for the wider district Selby DC has introduced changes to the local planning system. The Selby District Local Plan (SDLP) is to be replaced by the Local Development Framework (LDF) alongside the new Regional Spatial Strategy (RSS), which will deliver the spatial planning for the district.

The spatial planning of any proposed development must be considered with regard to the current and future risk of flooding from a number of sources, including fluvial, tidal, surface water (storm water) management and groundwater. It is therefore vitally important that flood risk is considered at a strategic scale to inform land allocations and future developments proposed by the emerging Local Development Framework.

In accordance with the recently released Practice Guide Companion to PPS25, Strategic Flood Risk Assessments may be completed in two consecutive stages. The Level 1 SFRA should present sufficient information to enable the Local Planning Authority to apply the Sequential Test to potential development sites and to assist in identifying if application of the Exception Test will be necessary. In addition, the Level 1 SFRA provides background information and a preliminary review of available data, sufficient to scope the type of assessment necessary should a Level 2 SFRA be required. Level 1 SFRAs should be used by the Local Planning Authority, together with other evidential documents and the draft sustainability appraisal, to undertake the Sequential Test. This will help to identify where sites can be located in flood zone 1 and may require further investigation through a Level 2 SFRA. This report presents the information generated during Level 1 of the SFRA.

1.2 The SFRA Objectives

The objectives of the Selby District Council SFRA as set out in the brief dated April 2006 are: -

1. Undertake an SFRA in line with the policies and guidance presented in PPS25 and the accompanying practise guide (*'Living Draft', February 2007*) for Selby DC's administrative area;
2. Provide a robust evidence-based report to inform the Selby Local Development Framework and other Development Planning Documents about managing potential flood risk;
3. Ensure that the Local Authority meets its obligations under planning guidance: PPS25 as well as the Water Framework Directive and DEFRA's 'Making Space for Water';
4. Provide sufficient data and information to enable Selby DC to apply the Sequential Test to land allocations and potential development sites and help the council to identify specific sites for taking forward to Level 2 assessment;
5. Map the different levels of flood risk (high, medium and low) within the Selby DC administrative area and map these for statutory land use planning purposes;

6. Identify significant historical flooding within the district and engage key stakeholders in discussion of key flooding issues;
7. Provide all end users of the SFRA with suitable guidance for undertaking site specific flood risk assessments; and
8. Provide general guidance on the suitability of Sustainable Drainage Systems (SUDS).

1.3 The SFRA Structure

The Department of Communities and Local Government has released a Practice Guide Companion to accompany PPS25. The Practice Guide Companion (*'Living Draft' February 2007*) to PPS25 recommends that SFRA's be completed in two consecutive stages; this follows the iterative approach encouraged by PPS25 and provides Local Planning Authorities with tools throughout the LDF and SFRA process sufficient to inform and update decisions regarding development sites. The two stages are: -

- Level 1 SFRA – Enables application of the Sequential Test; and
- Level 2 SFRA – Increases scope of SFRA for sites where exception test is required.

The results of the Level 1 SFRA will enable Selby District Council to review the current preliminary site allocations and to inform the scope of the Sustainability Appraisal. Following consultation with Selby District Council, the findings of the Level 1 assessment will also enable the scope of the Level 2 SFRA to be defined.

Level 1 SFRA

The objective of the Level 1 SFRA is to collate and review available information on flood risk for the study area. Information has been sought from a variety of stakeholders including the Selby District Council, the Environment Agency (Dales and Ridings Area), Internal Drainage Boards, North Yorkshire County Council, the Highways Agency, Yorkshire Water and British Waterways. In addition to the review of data and consultation with local stakeholders, Level 1 also reviews the available data to meet the requirements of a Level 2 SFRA where required. Where necessary the report also identifies works beyond the critical scope that may benefit the assessment.

The information presented in a Level 1 SFRA should not be considered as an exhaustive list of all available flood related data for the study area. The Level 1 SFRA report is a presentation of flood sources and risk based on data collected following consultation with and input from the partner Local Authorities and agencies within the timeframe available. If required, a Level 2 SFRA will enable the contacts and relationships with key stakeholders developed in Level 1 to continue to assist in providing data and information for the SFRA.

Level 1 SFRA Document

This document comprises the revised version of the Level 1 SFRA Report along with a series of printed maps, 21 x A3 settlement maps bound into the report itself and 5 x A1 district maps. A complete set of all the maps are listed below:

A3 Settlement Maps

- Barlby Village;
- Brayton;
- Brotherton / Byram;
- Camblesforth;
- Carlton;
- Cawood;
- Church Fenton;
- Eggborough;
- Escrick;
- Fairburn;
- Hambleton;
- Hemingbrough;
- Kellington;
- Monk Fryston;
- Riccall;
- Sherburn in Elmet;
- South Milford;
- Tadcaster;
- Thorpe Willoughby;
- Ulleskelf; and
- Wistow.

A1 District Maps

- Selby Town;
- District Wide Flood Risk;
- River Catchment;
- Internal Drainage Board Area; and
- District Wide Geology.

Level 2 SFRA

The Level 2 SFRA will provide sufficient information to facilitate the application of the Exception Test where required. This will be based on information collected for the Level 1 SFRA and additional works where necessary.

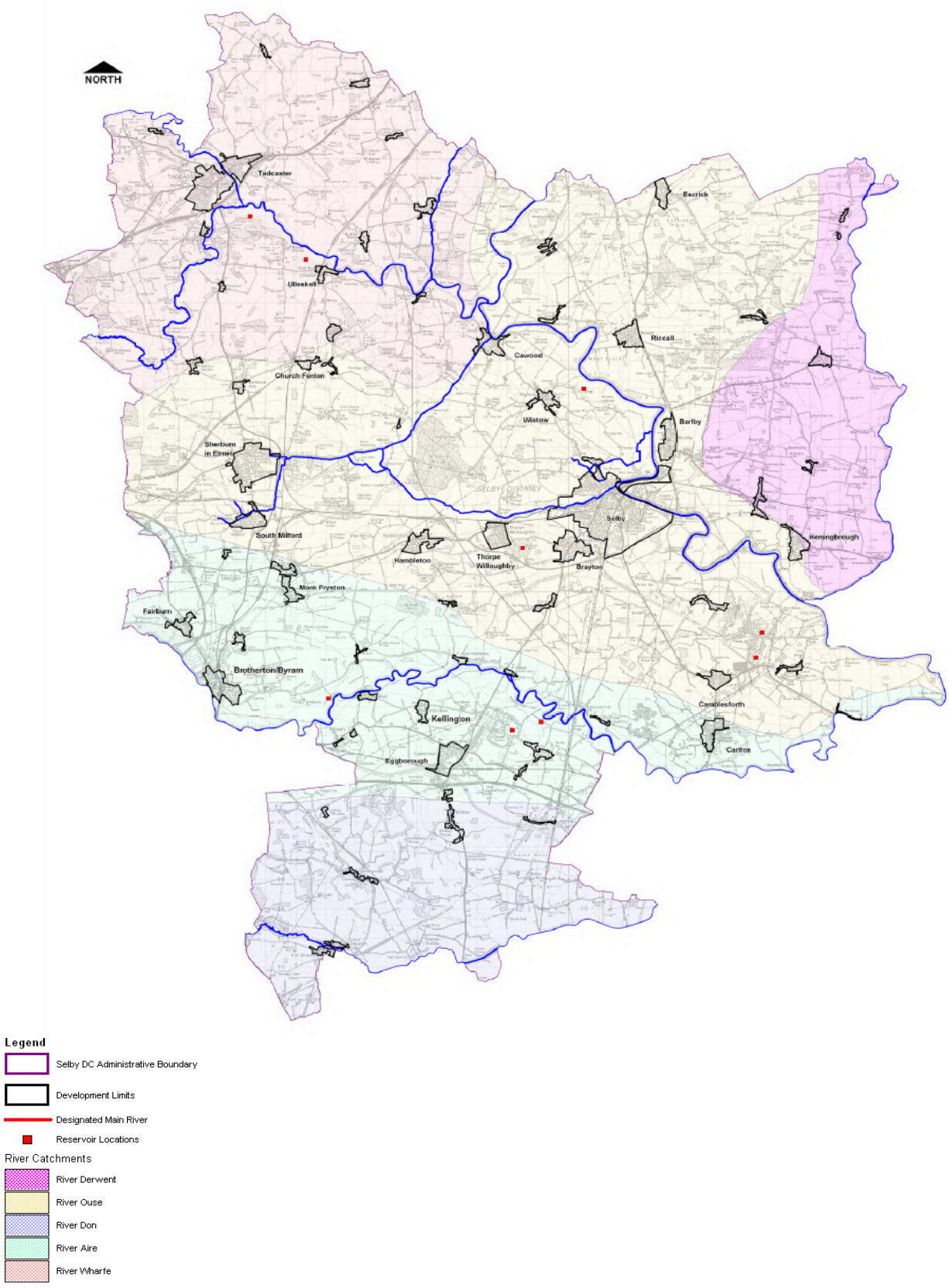
2 Study Area

The study area is defined by the administrative boundary of Selby DC, with a total study area of approximately 600 km². Selby District is a local government district of North Yorkshire and is based around the town of Selby. Selby provides services to a large geographical area made up of market towns, small villages and agricultural areas. The district was formed in 1974 following the amalgamation of Selby Urban District and parts of Derwent Rural District, Hemsworth Rural District, Osgoldcross Rural District and Tadcaster Rural District. The 2002 census indicated that Selby DC had almost 80,000 residents.

Employment within the Selby District had been traditionally based around agriculture, associated industry and power generation. However, the decline in employment opportunities in these areas has lead to economic and social issues. The closure of the Selby coalfield, in 2004, further reduced employment opportunities and now a large number of residents work outside the district. More recently, the Principle Town of Selby has experience growth and become a large town, with new job prospects.

As with many other parts of West and North Yorkshire, house prices are on the rise in Selby District, and this is a result of rapid growth of Leeds and York and an earlier increase in house price in these major centres, forcing people to move to areas more affordable. The waterfront of Selby town is now characterised by fashionable townhouses and apartments.

Selby town is the transport hub of the district and features a bus and train station running routes to many places around the area. Selby train station runs direct trains to London, Leeds, Manchester and York. The M62 motorway runs east to west along the south of the district while the M1 north/south link lies just to the west of the district.


NORTH
Tadcaster
Escrick
Ulleskelf
Riccall
Cawood
Church Fenton
Wistow
Barlby
Sherburn in Elmet
Selby
South Milford
Hemingbrough
Hambleton
Thorpe Willoughby
Brayton
Monk Fryston
Fairburn
Brotherton/Byram
Kellington
Camblesforth
Carlton
Eggborough
Legend
Selby DC Administrative Boundary
Development Limits
Designated Main River
Reservoir Locations
River Catchments
River Derwent
River Ouse
River Don
River Aire
River Wharfe

2.1 Hydrology and Flood Sources

The main river catchments within the study area are listed below and general information for each of these catchments has been extracted from the Environment Agency's various Catchment Flood Management Plans (CFMPs):

- The River Ouse and tributaries;
- The River Aire and tributaries;
- The River Derwent and tributaries;
- The River Wharfe and tributaries; and
- The River Don and tributaries.

The River Ouse & Tributaries

The River Ouse is formed from the River Ure at Cuddy Shore Reach near Linton-On-Ouse, approximately 6 miles downstream of the confluence of the River Swale with the River Ure. It generally flows in southeasterly direction for approximately 100 km, through the city of York and the market towns of Selby and Goole, before joining the River Trent at Trent Falls near the village of Faxfleet to form the Humber Estuary. The Ouse catchment, which is the most predominant catchment by area in the Selby DC boundary, also includes the settlements of Sherburn in Elmet, South Milford and Riccall.

The Ouse catchment is a wide, flat plain, with an approximate catchment size of 735 km^2; heavy rainfall in the river's catchment area can bring severe flooding to nearby settlements. In recent years Selby and surrounding villages, have been very badly affected. The river has two weirs with locks, at Linton and Naburn, so that boats of 45.7 m length and 4.6 m beam can reach York. To protect properties at risk from the River Ouse there are approximately 86 km of defences, the standard of protection of these defences ranges from greater than 20% to less than 0.5% in places.

There is a well-documented history of flooding from the River Ouse, with records dating back as far as 1263. The principal flood risk to the Selby district is through storm surges that flow upstream from the tidal reach of the Ouse. More recently, the Ouse hit local and national media as a result of widespread flooding in autumn 2000, with Selby town and Barlby worst affected. Immediately following these floods, the Environment Agency constructed emergency works at Selby to provide increased temporary protection to the town. A £13.7 million scheme to make these permanent is nearing completion and will protect approximately 2500 homes.

The River Aire & Tributaries

The River Aire catchment covers over 1,100 km^2 of land between its source at Malham in the Yorkshire Dales and where it joins the River Ouse near Goole and is home to almost 1.1 million people. The Aire flows through an elongated catchment for almost 150 km with an average catchment width of 14 km. The Aire generally flows in a southeasterly direction to its confluence with the Ouse, where the lower 26 km between Chapel Haddlesey and Goole are tidally influenced.

The Aire flows through contrasting scenery and locations. At source it flows through green meadows and limestone scenery, which are characteristic of the Yorkshire Dales. Through Gargrave the Aire follows a broad glaciated valley and skirts the market town of Skipton. Below Skipton the River Aire enters industrial West Yorkshire, which includes Bingley, Shipley, Leeds and Castleford. Downstream of Castleford the River Aire reaches the flat open plains of Selby and Goole, thus allowing for large areas of potential inundation. Large areas of Selby DC area are at risk from flooding from the River Aire, the villages of, Byram, Kellington, Carlton and Camblesforth, particularly affected.

The main tributary of the River Aire is the River Calder. The River Calder has its source at Heald Moor near Todmorden and flows in a North Easterly direction to its confluence with the River Aire, downstream of Castleford. It flows for a distance of almost 44 km and drains approximately 300 km^2. The catchment is heavily reservoired, with 39 reservoirs licensed to provide water and the river itself is canalised for much of its length, becoming the Calder & Hebble Navigation and Aire & Calder Navigation. Principle industrial areas on the River Calder include Elland, Dewsbury and Wakefield.

The River Derwent & Tributaries

The River Derwent catchment area covers approximately 1000 km^2 and includes the River Derwent, River Rye, Sea Cut, River Hertford, Costa Beck, Bielby Beck, Pocklington Canal and other tributaries. The rivers rise in the Vales of Pickering and York, Yorkshire Wolds and North York Moors before joining the River Derwent, which joins the River Ouse at a tidal barrage at Barmby, which is used to control water levels in the lower Derwent. The Derwent catchment covers the north east section of Selby DC area, with North Duffield and parts of Cliffe and Hemingborough within the catchment.

The catchment is predominantly rural and generally the population and industry are concentrated in and around the towns and villages of Barmby, Bubwith, Elvington, Malton and Norton-on-Derwent, Pickering, Pocklington, Scarborough and Stamford Bridge. The River Derwent, its tributaries and associated wetlands are highly valued for nature conservation, ecology and landscape. The river is designated as a Site of Special Scientific Interest and also a Special Area of Conservation. It is also used extensively for public water supply and for recreation, including fishing.

The River Wharfe & Tributaries

The River Wharfe, for much of its length, forms the county boundary between West and North Yorkshire. The Wharfe has its source at Langstrothdale Chase in the Yorkshire Dales National Park and flows through Kettlewelll, Grassingtonn, Bolton Abbey, Addingham, Ilkley, Burley in Wharfedale, Wetherby, Tadcaster, and then flows into the River Ouse at Cawood. The village of Cawood, flooded regulary in winter. But since the floods of 1982 (whose height is recorded in the village), flood defences have been raised so that the fields on the northern side (Kellfield Ings) are now the only areas that flood. The Ings were operational in autumn 2000 and protected the village from serious flooding. The entire catchment is almost 1000 km^2. The section of the river from its source to around Addingham is known as *Upper Wharfedale* and has a very different character to the river downstream.

The River Don & Tributaries

The River Don catchment (also called Dun in some locations) encompasses the southern section of Selby DC administrative area. It rises in the southern Pennines and flows for approximately 112 km through the Don Valley, passing the large conurbation of South Yorkshire to join the River Ouse at Goole. The Dons major tributaries are the Loxley, the Rivelin, the Sheaf, the Rother and the Deane. The River Don is one of the most engineered rivers in the UK, with works going back to 1627 with the Vermuyden marshland drainage project. The Don catchment covers the southern area of Selby DC area; however no settlements within this study are affected by the catchment.

2.2 Tidal Influences

Tidal influences affect both the River Ouse and River Aire within the study area. The River Ouse tidal limit is located at Naburn Weir (NGR SE 592 445). The River Aire is tidally influenced for 26 km downstream of the lock and weir at Chapel Haddlessey, (NGR SE 581 259). Although a high astronomical tide may not be sufficient on its own to cause flooding, when it coincides with a fluvial event or storm surge, river levels can be raised locally resulting in overtopping and subsequent inundation.

As a result of sea level rise and land mass tilt, sea levels along the east coast are predicted to rise by up to 15 mm/year by 2115 increasing flood risk in the lower reaches of the Ouse and Aire catchments. However planned realignment schemes in the Humber estuary and potential schemes on the Ouse may offset the sea level rise.

2.3 Sewers

The majority of sewers are built to the guidelines within “sewers for adoption” (WRC, 2006). These sewers have a design standard of the 1 in 30 year flood event and therefore it is likely that the majority of sewer systems will surcharge during rainstorm events with a return period greater than 30 years (e.g. 100 years). Yorkshire Water Service Ltd record incidents of both internal and external sewer flooding on the DG5 database and these data have been provided for incidents within the Selby DC administrative area.

2.4 Groundwater

Groundwater flooding can originate from various sources beneath the ground surface including water seepage through permeable strata. It may also arise from human action where groundwater levels rise following reduction in groundwater abstraction.

The contribution of groundwater to the total flow is low within the Ouse catchment and no incidents of groundwater flooding have so far been reported. However, higher intensity and longer rainfall events in the future combined with traditionally high water tables in the Selby district may increase groundwater levels and could result in flooding, so careful monitoring is likely to be required.

2.5 Administrative Areas

Environment Agency

The Selby DC administrative area falls in both the Environment Agency's Ridings and Dales areas. The Environment Agency, Ridings Area and Dales Area, has discretionary powers under the Water Resources Act (1991) for all Main Rivers and their associated flood defences within the study area.

Internal Drainage Boards

The Selby DC administrative area is covered by eight Internal Drainage Boards (IDBs):

- Selby Area IDB;
- Ouse and Derwent IDB;
- Acaster IDB;
- North Wharfe IDB;
- South Wharfe IDB;
- Appleton, Roebuck and Copmanthorpe IDB;
- Went IDB; and
- Knottingley to Gowdall IDB.

IDBs are independent bodies, created under various statutes to manage land drainage in areas of special drainage need. Each board operates within a defined area in which they have permissive powers under the Land Drainage Act 1991 to undertake flood defence works, other than on watercourses that have been designated as 'Main'.

Drainage

Yorkshire Water is responsible for storm water and foul water management across the district. In addition, private individuals may be responsible for drainage systems that operate prior to discharge either into a watercourse or into a public sewer.

2.6 Specific Local Information

The Selby DC administrative area is predominantly rural, with various market towns and smaller settlements. A relatively high level of flood risk exists when compared to some surrounding districts. Environment Agency data, including historical flooding information and Catchment Flood Management Plans (CFMPs) indicate major flooding on the Rivers Ouse and Aire has occurred in the past as a result of both tidal and fluvial sources. Flooding from other sources is also significant within the district and information from Yorkshire Water and Selby DC Emergency Response teams indicating sporadic flooding hotspots in numerous settlements across the district.

Table 2-1: Selected Historical Flooding from main rivers and associated tributaries, taken from Catchment Flood Management Plans

Event Date	Watercourse	Known towns affected
December 1823	River Ouse	Tremendous storm. Barges lost on canal at Selby.
1910	River Wharfe	Tadcaster.
1921	River Wharfe	Large areas of the Lower Wharfe Valley.
March 1947	River Aire, River Wharfe, River Ouse and Selby Canal	Selby, Barlby, New Barlby.
December 1978	River Aire	Continual high water levels caused severe problems at Castleford and down stream. Levels at Brotherton exceeded those of 1947 flood. All the washlands in the Aire were wholly or partly filled during the event and overtopping occurred at several locations from, Knottingley to Beal. A riverbank was breached at Birkin. Several properties were flooded in Ferrybridge area, at Brotherton and at Knottingley. The Beal to Birkin road was closed for a week.
January 1982	River Wharfe, River Ure, Ripon Canal, River Ouse	Tadcaster, Selby.
Autumn 2000	River Derwent	Over 200 properties in the Derwent catchment were affected by flooding.
October/ November 2000	River Aire	Serious flooding on whole length of Aire after a long period of heavy rainfall (250mm over a two week period at some locations) throughout the catchment.
November 2000	River Wharfe, River Skell, River Nidd and River Ouse, River Ure, Cod Beck, Gilling Beck, River Swale	Tadcaster, Selby, Barlby, Riccall. River Ouse reached its highest recorded level.
February 2002	Collingham Beck, River Wharfe	Tadcaster.
August 2002	River Aire	The River caused flooding at Beal to Birkin Road.

3 Level 1 SFRA – Methodology

3.1 Objective

As outlined in Section 1.2 the objective of the Level 1 SFRA is to collect, collate and review flooding related information available within the study area. This information is then presented in a format to enable Selby DC to apply the Sequential Test to their growth areas, and where necessary, apply the Exception Test during a Level 2 assessment. Gaps in the data/information have also been identified in order to ascertain additional requirements needed to meet the objectives of a Level 2 SFRA.

3.2 Tasks

The sequence of tasks undertaken in the preparation of the Level 1 SFRA was, in order:

- Inception meeting with the Selby District Council on 22nd June 2007;
- Established the local key stakeholders;
- Consultation with key stakeholders requesting data/information;
- Collated and reviewed data and populated data register;
- Presentation of available relevant information on flood sources and flood risk;
- Reviewed received data against the SFRA objectives; and
- Identified gaps in data.

All tasks were completed between June 2007 and September 2007.

3.3 Key Stakeholders

The stakeholders that were contacted to provide the data/information for the SFRA were:

- Selby District Council;
- Environment Agency;
- Internal Drainage Boards;
- Yorkshire Water Services Ltd;
- Highways Agency; and
- Adjoining Local Authorities.

The principal contact and associated details for each of the key stakeholders are presented in Appendix B.

3.4 Data and Information Collected

Data and information was requested from key stakeholders outlined above and integrated with Scott Wilson's GIS system where possible to facilitate a review. The data requested was based on the following categories: -

- Hydrology e.g. main rivers, ordinary watercourses and catchment boundaries;
- Hydrogeology e.g. groundwater emergence zones and vulnerability maps;
- Flood defences and critical structures e.g. flood banks, sluices;

- Reservoirs Act (1975) water bodies;
- Environment Agency modelled flood levels;
- Flood risk assessments e.g. on previous development sites;
- Environment Agency flood zone maps;
- Environment Agency areas;
- Local Authority Information e.g. local development schemes, settlement development limits, Adopted Local Plan and the emerging Core Strategy of the Local Development Framework; and
- Historical flooding incidents i.e. sewer flooding problems and historical flood outlines.

All the data received was registered on receipt and its accuracy and relevance reviewed to assess a confidence levels for contribution to the SFRA (Table 3-1). Details of all the data collected at the time of production are presented in Appendix C.

Table 3-1: Method for qualitative confidence ranking of data received

		RELEVANCE		
		1 - VERY RELEVANT	2 - PARTLY RELEVANT	3 - NOT RELEVEANT
ACCURACY	1 - EXCELLENT	**VERY GOOD**	GOOD	GOOD
	2 - GOOD	GOOD	GOOD	FAIR
	3 - FAIR	GOOD	FAIR	FAIR
	4 - POOR	FAIR	FAIR	POOR
	5 - VERY POOR	FAIR	POOR	**VERY POOR**

3.5 GIS Layers

Using the data collected a series of GIS layers were produced to visually assist Selby DC in their sequential testing, site allocation decisions and development control activities. The layers can be broadly classified into planning policy, informative and flood risk categories.

Using these GIS layers, the data was analysed and interrogated to provide a broad scale assessment of flood risk statistics for the District as a whole and for individual settlements (see section 4.1). Table 3.2 summarises the main GIS layers used in the SFRA.

GIS Data Gaps & Assumptions

Some of the data, that would ideally be required to incorporate in the SFRA, was either incomplete, not directly available from the key stakeholders or not in a readily available GIS format. In order to present as complete and contiguous GIS layers as possible, the information has been converted to GIS format where possible; however this has not been possible in all cases. Where the data has not been directly available from key stakeholders or a 'work in progress', it has been necessary to make certain assumptions in agreement with Selby DC and the Environment Agency, so that data gaps could be filled.

Table 3-2: GIS Layers used in SFRA

Planning Policy	Informative	Flood Risk
Selby DC administrative area	Main rivers	Flood zones 1, 2, 3a and 3b
Development limits	Ordinary watercourse network	Historical flooding
	Major water bodies under the Reservoirs Act (1975)	Flood defences
	Catchment boundaries	Flood warning areas
	Environment agency areas	Areas benefiting from defences
	Internal drainage boards areas and managed watercourses.	Groundwater vulnerability and monitoring maps
	OS data	Superficial geology layers
	Superficial geology layers and aquifer classification	Historical flooding
	British waterways infrastructure – watercourses, structures inc: flood gates, locks, weirs, sluices and culverts	Tidal limit
		Site specific flood locations through local knowledge
		Flood storage areas
		Sewer flooding records

Flood Risk GIS Layers

Due to the absence of layers to represent modelled flood outlines in the study area, it has been necessary to rely on the Environment Agency's broad scale flood zone maps. This issue has been discussed with both Selby DC and the Environment Agency and it has been confirmed that modelled flood levels do exist for a number of watercourses in the study area. However at the time of writing, these levels had not been mapped and made available.

Functional Floodplain

One of the requirements of PPS25 is for the Functional Floodplain (flood zone 3b), to be mapped to highlight those areas where only water-compatible development and land use is recommended. PPS25 defines flood zone 3b as the flood with an annual probability of 1 in 20 (5% AEP) or greater. As the 5% flood outline has not yet been delineated for all the main rivers within the District boundary, the following conservative approach to delineating the functional floodplain has been agreed with the Environment Agency, until more detailed information is available.

- Outside development limits in undefended areas Flood Zone 3 is represented as Flood Zone 3b (functional floodplain)
- Inside development limits and in defended areas Flood Zone 3 is represented as Flood Zone 3a (High Risk), since existing built-up / defended areas are unable to function as 'natural' floodplain.

It should be noted that the 'assumed' extent of functional floodplain is insufficient for development control purposes. Further detailed investigation of prospective development sites within Flood Zone 3 will be required to establish the precise extent of functional flood plain (Flood Zone 3b), and the area defended to a standard of 1 in 20 annual probability (Flood Zone 3a). This work may be incorporated in site specific FRA's.

Floodplain – Selby Dam

The Selby Dam and Tributaries study was completed in August 08 and the final modelled flood outlines for the Selby Dam and its associated tributaries was provided by the Environment Agency for inclusion in the revision of the Level 1 SFRA. These data represent the most up to date delineation of the flood zones associated with the Selby Dam and tributaries and therefore provide the best available representation of flood risk. The study outputs also provide a higher degree of confidence in the definition of flood risk across the flood plain superseding the otherwise conservative approach of representing Flood Zone 3 outside development limits in undefended areas as Functional Floodplain. Selby DC and the Environment Agency have agreed the watercourses associated with Selby Dam and tributaries should be represented by the output of the recent study.

The new data layers for Selby Dam and tributaries are represented on the A3 and A1 Selby maps as flood zone 3a - high risk (green) and flood zone 2 – medium risk (light blue), replacing the flood zone 3b (dark blue).

As referred to above the functional floodplain, 1 in 20 year or 5% AEP flood outline has not yet been delineated and is not available to put on the maps.

The Effects of Climate Change

To ensure sustainable development now and in the future, PPS25 requires the effects of climate change be taken into account in a SFRA and that flood outlines delineating climate change should be presented, where available. Due to a lack of modelled flood outlines and modelled levels incorporating an allowance for climate change in accordance with PPS25, Selby DC and the Environment Agency have agreed Flood Zone 2 should be used as a surrogate to represent the potential impact of climate change across the entire Selby District.

Historical Flood Mapping

Historical flood outlines were made available from the Environment Agency, that delineates approximate areas that have flooded in past. Much of the information used to create the outlines is estimated following a flood and some inaccuracies may exist. However the layers serves a useful purpose to highlight to Selby DC that there are areas – potentially outside the flood zone maps – that have experienced flooding in the past.

Storm Water and Sewer Flooding
The locations of sewer flooding incidents have been presented as polygons within the GIS layer. This layer will help to highlight to Selby DC that there are certain areas where the drainage network can be overwhelmed during periods of high intensity rainfall and therefore new development in these areas must take this into account. DG5 data was supplied by Yorkshire Water and indicated streets within a settlement that are known to have a flooding history. The GIS layers supplied identify the whole street affected as house specific data was not supplied.

Flood Defences
There are significant lengths of flood defences through out the Selby DC area and the condition and standard of protection is recorded, where available, in the Environment Agency's NFCDD database. The location of Environment Agency maintained flood defences has been shown as a separate GIS layer. However, information about the standards of protection and defence condition could not be thematically mapped, as the information has not been included in the data layers provided.

An assessment of the condition and standard of protection for flood defences can be undertaken, where this information is readily available and can be provided by the Environment Agency, for specific sites as part of the Level 2 SFRA.

Flood Warning Layers
Areas benefiting from an Environment Agency flood warning have been shown as a separate GIS layer. Emergency Planning Officers can use the flood warning layers in conjunction with the flood zone maps and flood defence information to assist in developing emergency plans for areas at risk of flooding within the District.

Superficial Geology Mapping
Selby DC superficial geology maps have been presented as a thematic map to highlight areas that overlie aquifers with a high vulnerability. Major aquifers with a high vulnerability tend to have a more permeable surface geology. How much rainfall is absorbed and stored in the ground is determined by the permeability of the underlying strata and moisture conditions at the time, otherwise rainfall runs overland straight to the watercourse. Where there is storage available the rainfall runoff is lower and consequently the opposite is the case if there is limited storage available.

Reservoir Act (1975) Water Bodies
A layer displaying major water bodies falling under the regulation of the Reservoir Act has been provided by the Environment Agency. This can assist Selby DC in assessing sites immediately downstream of major water bodies. Selby DC may wish to undertake more detailed analysis of particular water bodies to determine any potential flood risk.

Planning Policy GIS Layers

Administrative Area Boundaries
In addition to the flood zone and flood source GIS layers, Selby DC has provided a series of planning and policy layers. These include administrative development limit boundaries derived from the Adopted Local Plan and ensures the SFRA is using the same information used in the Selby DC LDF process.

4 Level 1 SFRA – Flood Risk Review

A suitable Level 1 SFRA will collate and review existing information on flood sources and flood risk to assist the Local Planning Authority in its obligation to consider flood risk in strategic land allocations and developing future policies. The Level 1 SFRA will achieve this by providing sufficient information to enable Local Planning Authorities to apply the Sequential Test (as set out in PPS25) to assist them in determining the suitability of sites for development. In accordance with PPS25 and its Companion Guide, where there are no reasonably available sites in flood zone 1 it may be necessary to locate development in flood zone 2, potentially through the successful application of the Exception Test. Only where there are no reasonably available sites in flood zones 1 and 2 should development be located in flood zone 3 and where necessary, successful application of the Exception Test will require information to be provided in a Level 2 SFRA.

4.1 Broad Scale Assessment

Broad-scale information, received from the key stakeholders and is of use to the Local Planning Authorities in applying the Sequential Test at a District Level is presented in Appendix A and in the accompanying maps, and GIS layers are summarised in Table 4-1 below. The broad-scale assessment has been based on the GIS layers highlighted in Section 3.5. Using GIS, the various layers were queried against one another to determine total areas of intersection for each flood zone.

Table 4-1: Selby District-Level Broad-Scale Assessment

Question	Area (km^2)	% of Area	
Total Area of Selby Administrative Area	600.2	100%	
Area of Selby in Zone 3b (Functional Floodplain)	135.2	22.5%	Of total area
Area of Selby in Zone 3a (High Flood Risk)	14.1	2.4%	Of total area
Area of Selby in Zone 2 (Moderate Flood Risk)	52.3	8.7%	Of total area
Area of Selby in Zone 1 (Low Flood Risk)	398.6	66.4%	Of total area
Area of Zone 3 that is defended	14.63	2.4%	Of Zone 3a/3b
Total Developed Area	18.6	3.1%	Of total area
Existing Development in Flood Zone 3b	0.1	0.01%	Of dev. Area
Existing Development in Flood Zone 3a	3.9	0.6%	Of dev. Area
Existing Development in Flood Zone 2	232.7	38.8%	Of dev. Area
Drainage Problem Areas	Potential drainage flooding across the entire district		

Focussed Settlement Assessments

The emerging Selby DC Core Strategy identifies three levels of settlement within the District. Each level of settlement has a varying level of potential for future development, with Selby as the Principle Town being the main focus for future sustainable development.

Table 4-2: Selby DC Principal and Local Service Centres, and Primary Villages.

Principle Town	
Selby*	
Local Service Centres	
Sherburn in Elmet	Tadcaster
Primary Villages	
Barlby Village**	Brayton***
Brotherton	Byram
Camblesforth	Carlton
Cawood	Church Fenton
Eggborough	Escrick
Fairburn	Hambleton
Hemingbrough	Kellington
Monk Fryston	Riccall
South Milford	Thorpe Willoughby
Ulleskelf	Wistow

* In addition to Selby Town the Selby urban area includes Barlby Bridge, Ousebank, and the area between the River Ouse and the Selby Bypass in Barlby Parish, together with residential and employment development on the edge of Selby in Brayton Parish)

** Excludes Barlby Bridge, Ousebank and the area contained by the River Ouse and Selby bypass which are physically separate from Barlby village, and which are considered as part of the Selby urban area.

*** Excludes residential and employment estates on the edge of Selby which are physically separate from Brayton village and which are considered as part of the Selby urban area.

In addition to the District-level assessment a more focussed, local-level assessment has been carried out for the Principle Town, the Local Service Centres and the Primary Villages within the District and is presented in Appendix A. This local-level assessment consists of the same information used in the District-level assessment, but at a smaller scale, allowing planners to assess flood risk information at a higher resolution. In addition, these assessments provide a table which identifies the development strategy for each settlement. The development strategy is based upon aspirations for future development in the District set out in the RSS, the current Local Plan and the emerging Core Strategy. A summary of the identified flood risk in each settlement is also provided here.

4.2 Summary

Selby District Council has a total administrative area of 600 km². Using the flood zone maps, it is apparent that 22.5% (135.2 km²) of the total administrative area is located within flood zone 3b (Functional Floodplain), 2.4% (14.1 km^2) is located in flood zone 3a (High Risk), 8.7% (52.3 km^2) is located in flood zone 2 (Medium Risk) and 66.4% (398.6 km^2) is located within flood zone 1 (Low Risk).

The information provided in Table 4-1 and Appendix A indicates the geographical extent of flood zones 1, 2 and 3 for the administrative area of Selby DC (within the River Ouse, Aire, Derwent, Wharfe and Don Catchments).

The broad-scale and settlement-level assessments show that significant flood risk exists within relatively large areas of the district, affecting the Principal Town (Selby), parts of the Local Service Centres (Tadcaster and Sherburn) and a number of the Primary Villages (listed in Table 4-2).

In line with PPS25 and the RSS, Selby DC should apply the Sequential Test as early as possible and at all stages in the planning process, with the aim of directing new development towards areas that have a low probability of flooding. Where potential development sites are at risk from flooding, Selby DC must determine the individual sites suitability for development based on the Sequential Test and vulnerability classifications presented in Tables D1 and D2 of PPS25.

As a significant number of potential development sites in Selby and other settlements are likely to fall within higher flood risk areas it is anticipated that the process of identifying land to satisfy the development aspirations outlined in the RSS and Selby's Core Strategy will need to be subject to a process of sequential testing.

The RSS identifies Selby, the Principal Town, as the most sustainable location for the concentration of future development, which will fulfil regeneration objectives and help provide an alternative source of employment for long distance car commuters. Some development to meet local needs may also be accommodated in the Local Service Centres and very limited development in the Primary Villages, but overall the main focus for development will be Selby.

PPS25 states that where sequential testing reveals there is insufficient land available, within flood zone 1 to accommodate development needs in order to achieve wider sustainability and regeneration objectives, development should preferably be located in flood zone 2. Again, where this may not be possible, sites in flood zone 3 can be considered. Any potential or previously allocated development sites that are either wholly or partly situated in either flood zones 2 or 3 will require the application of the exception test. To help inform and satisfy this exception test, these sites will require further assessment in a Level 2 SFRA.

Information on the application of the Sequential Test is provided in the following section and, guidance on strategies for managing flood risk, guidance on the potential use of Sustainable Drainage Systems (SUDS) and guidance on site specific Flood Risk Assessments (FRAs) is provided in Section 7.

5 Sequential Test

5.1 Background

The sequential approach is a simple decision-making tool designed to ensure that sites at little or no risk of flooding are developed in preference to areas at higher risk. It can be applied at all levels and scales of the planning process, both between and within flood zones. All opportunities to locate new developments (except water-compatible) in reasonably available areas of little or no flood risk should be explored, prior to any decision to locate them in areas of higher risk.

The Sequential Test refers to the application of the sequential approach by Local Planning Authorities (LPA). This allows the determination of site allocations based on flood risk and vulnerability (see Table 5-1 and Table 5-2, provided below). Development should be directed to flood zone 1 wherever possible, and then sequentially to flood zones 2 and 3, and to the areas of least flood risk within flood zone 2 and then flood zone 3, as identified within this SFRA. A flow diagram for application of the Sequential Test from the Practice Guide Companion to PPS25 is also provided.

Table 5-1: Flood zones as defined in Table D1, Annex D of PPS25
(full description provided in Appendix D of PPS25).

FLOOD ZONE	DEFINITION		PROBABILITY OF FLOODING
	FLUVIAL	TIDAL	
Flood zone 1	< 1 in 1000 year (< 0.1%)	< 1 in 1000 year (< 0.1%)	Low Probability
Flood zone 2	Between 1 in 1000 year (< 0.1%) and 1 in 100 year (1%)	Between 1 in 1000 year (< 0.1%) and 1 in 200 year (0.5%)	Medium Probability
Flood zone 3a	> 1 in 100 year (> 1%)	> 1 in 200 year (> 0.5%)	High Probability
Flood zone 3b	Either > 1 in 20 (5%) or as agreed by between the Environment Agency and LPA	Either > 1 in 20 (5%) or as agreed by between the Environment Agency and LPA	Functional Floodplain

The application of the sequential approach aims to manage the risk from flooding by avoidance. This will help avoid the promotion of sites that are inappropriate on flood risk grounds. The application of the Exception Test through a Level 2 SFRA will ensure that new developments in flood risk areas will only occur where flood risk is clearly outweighed by other sustainability drivers.

A LPA must demonstrate that it has considered a range of possible sites in conjunction with the flood zone information from the SFRA and applied the Sequential Test, and where necessary, the Exception Test (see Appendix D of PPS25), in the site allocation process.

Table 5-2: Flood Risk Vulnerability Classification (from PPS25, Appendix D, Table D2)

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes), which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	• Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.
More Vulnerable	• Hospitals. • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in 'more vulnerable'; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment plants. • Sewage treatment plants (if adequate pollution control measures are in place).
Water-compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel workings. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

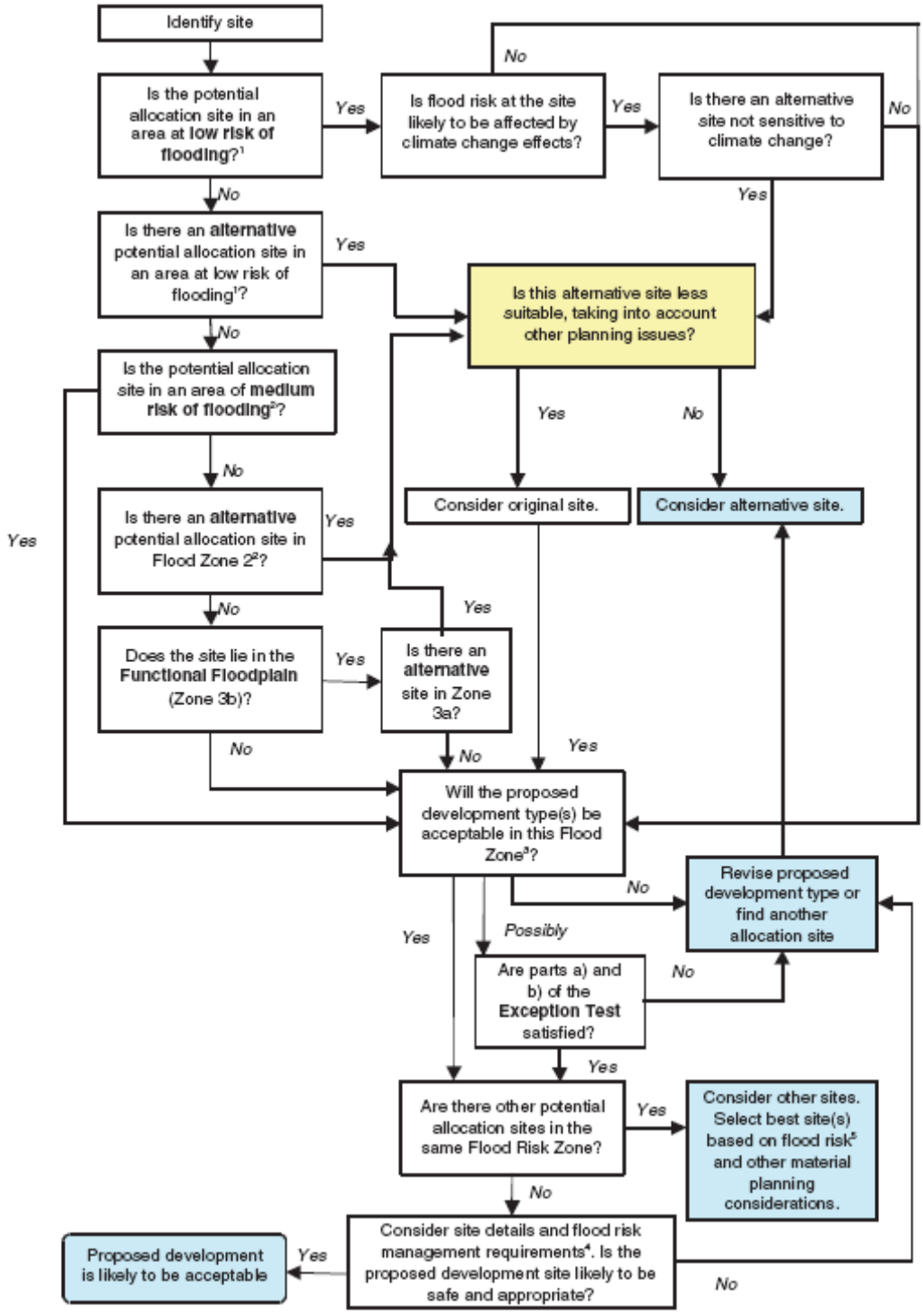


Figure 5-1: Flow diagram illustrating the application of the Sequential Test (from PPS25 Practice Guidance – April 2007)

PPS25 acknowledges that some areas will (also) be at risk of flooding from flood sources other than fluvial or tidal systems. All sources of flooding must be considered when looking to locate new development. The other sources of flooding requiring consideration when situating new development allocations include:

- Surface Water;
- Groundwater;
- Sewers; and
- Artificial Sources.

These sources (as sources of flooding) are typically less understood than tidal and fluvial sources. Data primarily exists as point source data or through interpretation of local conditions. In addition, there is no guidance on suitable return periods to associate with floods arising from these sources. For example modern storm water drainage systems are constructed to a 1 in 30 year standard. Any storm event in excess of the 30 year return period storm would be expected to cause flooding. If a location is recorded as having experienced repeated flooding from the same source this should be acknowledged within the Sequential Test.

5.2 Using the SFRA to Apply the Sequential Test

The Sequential Test should be undertaken by the LPA and accurately documented to ensure decision processes are consistent and transparent. The Sequential Test should be carried out on potential development sites, seeking to balance the flood probability and development vulnerability of sites throughout the Local Planning Authority area.

Table 5-3: Flood Risk Vulnerability and flood zone 'Compatibility' from PPS25, Appendix D, Table D.3
(✓ - Development is appropriate, × - Development should not be permitted)

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	×	Exception Test Required	✓
	Zone 3b	Exception Test Required	✓	×	×	×

The recommended steps required in undertaking the Sequential Test are detailed below. This is based on the flood zone and Flood Risk Vulnerability and is summarised in Table 5-3.

Recommended stages for LPA application of the Sequential Test

The information required to address many of these steps is provided in the accompanying maps.

1. Assign potential developments with a vulnerability classification (Table 5-2). Where development is mixed, this should be moved to the higher classification.
2. The location and identification of potential development should be recorded.
3. The flood zone classification of potential development sites should be determined based on a review of the Environment Agency flood zones for fluvial and tidal sources. Where these span more than one flood zone, all zones should be noted.
4. The design life of the development should be considered with respect to climate change:
   - 60- years – up to 2072 for commercial / industrial developments; and
   - 100 years – up to 2112 for residential developments

1. Identify existing flood defences serving the potential development sites. However, it should be noted that for the purposes of the sequential test, flood zones ignoring defences should be used.
2. Highly vulnerable developments to be accommodated within the LPA area should be located in those sites identified as being within flood zone 1. If these cannot be located in flood zone 1, because the identified sites are unsuitable or there are insufficient sites in flood zone 1, sites in flood zone 2 can then be considered. If sites in flood zone 2 are inadequate then the LPA may have to identify additional sites in flood zones 1 or 2 to accommodate development or seek opportunities to locate the development outside their administrative area.
3. Once all highly vulnerable developments have been allocated to a development site, the LPA can consider those development types defined as more vulnerable. In the first instance more vulnerable development should be located in any unallocated sites in flood zone 1. Where these sites are unsuitable or there are insufficient sites remaining, sites in flood zone 2 can be considered. If there are insufficient sites in flood zone 1 or 2 to accommodate more vulnerable development, sites in flood zone 3a can be considered. More vulnerable developments in flood zone 3a will require application of the Exception Test.
4. Once all more vulnerable developments have been allocated to a development site, the LPA can consider those development types defined as less vulnerable. In the first instance less vulnerable development should be located in any remaining unallocated sites in flood zone 1, continuing sequentially with flood zone 2, then 3a. Less vulnerable development types are not appropriate in flood zone 3b – Functional Floodplain.
5. Essential infrastructure should be preferentially located in the lowest flood risk zones, however this type of development may be located in flood zones 3a and 3b, provided the Exception Test is fulfilled.
6. Water compatible development has the least constraints with respect to flood risk and it is considered appropriate to allocate these sites last.

On completion of the sequential test, the LPA may have to consider the risks posed to a site within a flood zone in more detail in a Level 2 Assessment. By undertaking the Exception Test, this more detailed study should consider the detailed nature of flood hazard to allow a sequential approach to site allocation within a flood zone. Consideration of flood hazard within a flood zone would include:

- flood risk management measures;
- the rate of flooding;
- flood water depth; and
- flood water velocity.

Where the development type is highly vulnerable, more vulnerable, less vulnerable or essential infrastructure and a site is found to be impacted by a recurrent flood source (other than tidal or fluvial), the site and flood sources should be investigated further regardless of any requirement for the Exception Test. This should be discussed with the Environment Agency to establish the appropriate time for the assessment to be undertaken, (i.e. Exception Test through a Level 2 SFRA or assess through a site specific flood risk assessment).

Using the SFRA Maps, Data and GIS Layers

Table 5-4 highlights which GIS layers and SFRA data should be used in carrying out the sequential test. The table poses some example questions that are not exhaustive, but should provide some guidance for a user of the SFRA.

Appendix E summarises the steps required to maintain and update the SFRA together with a revision schedule. This should be checked prior to the SFRA being used for strategic land allocation scale or Development Control purposes to ensure the most current and up-to-date version of the SFRA is being used. In addition, close consultation with some of the key stakeholders, in particular the Environment Agency, may highlight updated flood risk information that may reduce uncertainty and ensure the Sequential Test is as robust as it can be.

Table 5-4: Sequential Test Key - A Guide to using the GIS Layers.

Category	GIS Layer	Example Questions
Development Vulnerability	Not applicable refer to Table D2 in PPS25	**Question 1** – Is the proposed development defined as 'highly vulnerable' according to Table D2 in Planning Policy Statement 25?
		Question 2 - Is the proposed development defined as 'more vulnerable' according to Table D2 in Planning Policy Statement 25?
		Question 3 - Is the proposed development defined as 'less vulnerable' according to Table D2 in Planning Policy Statement 25?
		Question 4 - Is the proposed development defined as 'essential infrastructure according to Table D2 in Planning Policy Statement 25?
		Question 5 - Is the proposed development defined as 'water compatible development' according to Table D2 in Planning Policy Statement 25?
Flood zone Classification	SFRA combined fluvial & tidal FZ2, FZ3a & FZ3b layers. Also examine historical floodplain and take into consideration climate change outlines.	**Question 6** – Through consultation of the Environment Agency's flood zone maps, is the development site located in flood zone 1?
		Question 7 - Through consultation of the Environment Agency's flood zone maps, is the development site located in flood zone 2?
		Question 8 - Through consultation of the Environment Agency's flood zone maps, is the development site located in flood zone 3a?
		Question 9 - Through consultation of the Environment Agency's flood zone maps, is the development site located in flood zone 3b?
		Question 10 - Can the development be located in flood zone 1?
		Question 11 - Can the development be located in flood zone 2?
		Question 12 - Can the development be located in flood zone 3a?
	Environment Agency's main river maps.	**Question 13 -** Is the site located within 20m of a watercourse?

Category	GIS Layer	Example Questions
Other Flood Sources	SFRA combined fluvial and tidal FZ3 & FZ2 outlines plus climate change	**Question 14 –** Is the site impacted by the effects of climate change
	Sewer Flood Layer & Historical Flood Outlines	**Question 15** - Is the site in an area potentially at risk from sewer flooding?
	Historical Flood Outlines, groundwater vulnerability maps	**Question 16** - Is the site in an area potentially at risk from overland flow flooding?
		Question 17 - Is the site located in an area of rising groundwater levels?
		Question 18 - Does the site have a history of flooding from any other source?
Flood Risk Management	Flood Defence Layer (NFCDD), Flood Warning Layer, Areas Benefiting from Flood Defences Layer.	**Question 19** - Does the site benefit from flood risk management measures?
		Question 20 - Can the development be relocated to an area benefiting from flood risk management measures or of lower flood risk?

6 Policy Review

National and local policies have been reviewed against the local flood risk issues and objectives identified by the Environment Agency in the CFMPs covering the River Ouse, River Aire and River Derwent. From these policies the following catchment wide and specific area strategies have been developed under the headings Flood Risk, SUDS, Flood Mitigation and the Water Environment. Integration of these suggested policy considerations into LDF / LDD should ensure that the objectives and aspirations of the Environment Agency and national policy are met whilst strengthening the position of the Local Planning Authority with regard to Flood Risk.

6.1 Flood Risk

Catchment Wide Strategies

1. Allocate all sites in accordance with the Sequential Test, reduce the flood risk and ensure that the vulnerability classification of the proposed development is appropriate to the flood zone classification;
2. Flood Risk Assessments (FRAs) should be undertaken for all developments within flood zones 2 and 3 and sites with identified flooding sources (according to PPS25 Annex E) to assess the risk of flooding to the development and identify options to mitigate the flood risk to the development, site users and surrounding area;
3. Flood Risk Assessments are required for all major developments in flood zone 1 (according to PPS25 Annex E). These are residential developments consisting of sites greater than 0.5 ha or greater than 10 dwellings and commercial developments that are greater than 1 ha or have a floor area greater than 1000 m^2.
4. Flood Risk to a development should be assessed for all forms of flooding;
5. Where floodplain storage is removed, the development should provide compensatory storage on a level for level and volume for volume basis to ensure that there is no loss in flood storage capacity.

Area Specific Strategies

1. A large area to the east and south of the district is at risk from tidal flooding and the current flood zone outlines for these areas are not PPS 25 compliant. Therefore, site specific FRAs for new development within these areas should take this into consideration and seek to improve the accuracy of tidal flood outlines.
2. The topography of the Selby district is very low lying and many of the watercourses are heavily defended, with large areas of land protected to varying standards. Site specific FRAs for development within these defended areas need to consider, in detail, the residual risks posed to both people and properties.
3. The Environment Agency does not currently have modelled flood outlines for much of the Selby district. Model flood levels are available for the Environment Agency main rivers and it is likely that mapped outlines will be produced. However, site specific FRAs need to consider the extent of flooding from rivers in more detail and look to improve the resolution of these data at the localised level.

4. Surface water flooding should be investigated in detail as part of site specific FRAs for developments located within Category 1 and 2 settlements and early liaison with the Environment Agency and Selby District Council for appropriate management techniques.
5. Groundwater flooding should be investigated in more detail as part of site specific FRAs for developments located to the south of the District where a potential for groundwater flooding exists (see Level 1 GIS layers and mapping) or where a site is located within a defined groundwater emergence zone.

Through integration of these suggestions, the emerging LDF will comply with PPS25 and the aspirations and policies represented in the following:

- Regional Spatial Strategy for Yorkshire and the Humber to 2026 (May 2008)
- Selby District Council: Local Development Framework;
- River Ouse, River Aire, and River Derwent Catchment Flood Management Plans;
- Biodiversity Action Plan for Selby.

6.2 Sustainable Drainage Systems

A guide to Sustainable Drainage Systems (SUDS) is provided in Appendix D. Sustainable Drainage Policies should address the following issues as:

Catchment Wide Strategies

1. Sustainable Drainage Systems should be included in new developments unless where it is demonstrably not possible to manage surface water using these techniques;
2. PPS25 requires the use of SUDS as an opportunity for managing flood risk, improving water quality and increasing amenity and biodiversity;
3. Flood Risk Assessments are required for all major developments in flood zone 1 (according to PPS25 Annex E). These are residential developments consisting of sites greater than 0.5 ha or greater than 10 dwellings and commercial developments that are greater than 1 ha or have a floor area greater than 1000 m^2;
4. Runoff rates from new developments on greenfield sites should be not exceed greenfield runoff rates pre-development and should allow for climate change;
5. Runoff rates from previously developed developable land should not exceed existing rates of runoff and should seek betterment. In addition, an allowance should be made for climate change;
6. Runoff and/or discharge rates should be restricted to greenfield runoff rates in areas known to have a history of sewer and/or surface water flooding.

Area Specific Strategies

1. At the site-specific FRA level, the suitability of Sustainable Drainage Systems should be investigated for each development.

A list of each settlement highlighting the underlying geology and soil, together with site-specific recommendations for SUDS and FRAs is presented in the Broad Scale Assessment of SUDS at the end of Appendix D.

Through integration of these suggestions, the emerging LDF will comply with PPS25 and the aspirations and policies represented in the following:

- Regional Spatial Strategy (RSS) for Yorkshire and the Humber to 2026 (published May 2008);
- River Ouse, River Aire, and River Derwent Catchment Flood Management Plans;
- Biodiversity Action Plan for Selby.

6.3 Water Environment

Catchment Wide Strategy

1. Development should not have a detrimental impact on the water environment through changes to water chemistry or resource;
2. Developments should look to incorporate water reuse and minimisation technology;
3. Any development should not be located within 8 metres of the riverbank to ensure access for maintenance but amongst other things should ensure a riparian corridor for improvement of the riverine environment.

Through integration of these suggestions, the emerging LDF will comply with PPS25 and the aspirations and policies represented in the following:

- Regional Spatial Strategy (RSS) for Yorkshire and the Humber to 2026 (published May 2008);
- River Ouse, River Aire and River Derwent Catchment Flood Management Plans;
- Biodiversity Action Plan for Selby.

Flood Risk Management Policies contained within the Catchment Flood Management Plans have been set out by the Environment Agency and assigned to different zones within the SFRA area. The strategies suggested above mesh with these aspirations and if integrated will aid to strengthen the position of the Local Planning Authority.

7 Flood Risk Assessment Guidance

7.1 Site Specific Flood Risk Assessment Guidance

The assessment of flood risk is a fundamental consideration regardless of the scale or type of development. Understanding the flood risk to, and arising from, a development is key to managing the risk to people and property thereby reducing the risk of injury, property damage or even death. The effects of climate change may exacerbate future flood risk. Current predictions indicate that milder wetter winters and hotter drier summers will be experienced in the future and there will be a continued rise in sea levels. These changes will potentially lead to an increase in rainfall quantities thus altering the magnitude, frequency and intensity of flood events.

Flooding is not limited to just rivers and the sea, in fact flooding can arise from a number of sources, each presenting their own type of risk and requiring management. In addition some areas currently defended from flooding may be at greater risk in the future as the effects of climate change take hold or defence condition deteriorates with age.

Opportunities to manage flooding whilst providing development exist through an understanding and mitigation of the risk. This includes the location, layout and design of developments to enable the management of flood risk through positive planning. This positive planning needs to consider the risks to a development from local flood sources but also the consequences a development may have on increasing flood risk to others. Early identification of flood risk constraints can ensure developments maximise development potential whilst achieving the principles of sustainability.

A Level 1 SFRA should present sufficient information to assist Local Planning Authorities to apply the Sequential Test and identify where the Exception Test may be required. These documents are predominately based on existing data. The scale of assessment undertaken for a Strategic Flood Risk Assessment is typically inadequate to accurately assess the risks at individual sites within the study area. The Environment Agency and SFRA flood zone mapping do not account for all watercourses within the Selby District. Although, a watercourse may not have a flood zone mapped, as a precautionary principle, it is advised that a Flood Risk Assessment should be requested for all development proposals within 20 m of a watercourse (the water environment). This will ensure that flood risk is managed and that flooding is not increased within or to the surrounding area.

Site-specific flood risk assessments are required to assess the flood risk posed to proposed developments and to ensure that, where necessary, appropriate mitigation measures are included in the development. This section presents the recommendations for site-specific flood risk assessments prepared for submission with planning applications to Selby District Council.

The guidance presented in the following sections has been based on:

- the recommendations presented in Planning Policy Statement 25 and the consultation draft of the Practice Guide companion to PPS25; and
- the information contained within this Level 1 SFRA report.

When is a Flood Risk Assessment Required?

When informing developers of the requirements of a flood risk assessment for a development site, consideration should be given to the position of the development relative to flood sources, the vulnerability of the proposed development and its scale.

In the following situations a Flood Risk Assessment should always be provided with a planning application:

- The development site is located in flood zone 2 or 3;
- The proposed development is classed as a major development and located in flood zone 1. These are residential developments consisting of sites greater than 0.5 ha or greater than 10 dwellings and commercial developments that are greater than 1 ha or have a floor area greater than 1000 m^2;
- The development site is located in an area known to have experienced flooding problems from any flood source; and
- The development is located within 20m (water environment) of any watercourse regardless of flood zone classification.

What does a Flood Risk Assessment require?

Annex E of PPS25 presents the minimum requirements for flood risk assessment. These include:

- The consideration of the risk of flooding arising from the development in addition to the risk of flooding to the development;
- Identify and quantify the vulnerability of the development to flooding from different sources and identify potential flood risk reduction measures;
- Assessment of the remaining 'residual' risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular development;
- The vulnerability of those that could occupy and use the development, taking account of the Sequential and Exception Tests and the vulnerability classification, including arrangements for safe access;
- Take consideration of the ability of water to soak into the ground may change with development, along with how the proposed layout of development may affect drainage systems;
- Fully account for current climate change scenarios and their effect on flood zoning and risk.

The Practice Guide Companion to PPS25 (consultation document) advocates a staged approach to site specific flood risk assessment with the findings from each stage informing the next and site master plans, iteratively throughout the development process.

The staged approach comprises of three stages:

Level 1 - Screening Study

A level 1 Screening Study is intended to identify if a development site has any flood risk issues that warrant further investigation. This should be based on existing information such as that presented in the Level 1 SFRA. Therefore this type of study can be undertaken by a development control officer in response to the developer query or by a developer where the Level 1 SFRA is available. Using the information presented in the Level 1 SFRA and associated GIS layers a development control officer could advise a developer of any flooding issues affecting the site. A developer can use this information to further their understanding of how flood risk could affect a development.

Level 2 - Scoping Study

A level 2 Scoping Study is predominately a qualitative assessment designed to further understanding of how the flood sources affect the site and the options available for mitigation. The Level 2 FRA should be based on existing available information where this is available and use this information to further a developers understanding of the flood risk and how they affect the development. This type of assessment should also be used to inform master plans of the site raising a developer's awareness of the additional elements the proposed development may need to consider.

Level 3 – Detailed Study

Where the quality and/or quantity of information for any of the flood sources affecting a site is insufficient to enable a robust assessment of the flood risks, further investigation will be required. For example it is generally considered inappropriate to base a flood risk assessment for a residential care home at risk of flooding from fluvial sources on flood zone maps alone. In such cases the results of hydraulic modelling are preferable to ensure details of flood flow velocity, onset of flooding and depth of floodwater is fully understood and that the proposed development incorporates appropriate mitigation measures.

At all stages, the Local Planning Authority, and where necessary the Environment Agency and/or the Statutory Water Undertaker should be consulted to ensure the Flood Risk Assessment provides the necessary information to fulfil the requirements for Planning Applications.

Appendix A:Broad Scale Assessment

Table A-1: Selby District Council Strategic Flood Risk Assessment – Settlement assessment, flooding summary

Settlement Name	Area (HA)	FZ1		FZ2 & Approximate FZ3 + Climate Change		FZ3a		FZ3b	
		Area	%	Area	%	Area	%	Area	%
Principal Town									
Selby	604.9	201.8	33.6	170.6	28.4%	227.6	38.0	N/A	N/A
Local Services Centres									
Sherburn in Elmet	167.2	157	93.8%	2.9	1.7%	7.3	4.4%	N/A	N/A
Tadcaster	209.6	185.5	88.5%	5.9	2.8%	18.2	8.6%	N/A	N/A
Primary Villages									
Barlby Bridge	41.9	0	-	0.4	1%	40.9	99.0%	N/A	N/A
Barlby Village	60.4	52.4	86.7%	1	1.7%	7	11.6%	N/A	N/A
Brayton	74.3	74	99.6%	0.3	0.4%	0	-	N/A	N/A
Brotherton	50.0	41	82.0%	5.6	11.2%	3.4	6.8%	N/A	N/A
Byram	28.5	28.5	100.0%	0	-	0	-	N/A	N/A
Camblesforth	34.4	0	-	28.4	82.5%	6.0	17.4%	N/A	N/A
Carlton	48.4	26.3	54.2%	1.6	3.3%	20.6	42.5%	N/A	N/A
Cawood	46.4	7.6	16.4%	4.6	9.9%	34.2	73.7%	N/A	N/A
Church Fenton	15.3	15	98.0%	0	-	0.3	2.0%	N/A	N/A
Eggborough	72.5	72.2	99.5%	0	-	0.3	0.4%	N/A	N/A
Escrick	32.8	28.1	85.7%	1	3.0%	3.7	11.3%	N/A	N/A
Fairburn	29.5	29	98.3%	0.1	0.3%	0.4	1.4%	N/A	N/A
Hambleton	48.0	48	-	0	-	-	-	N/A	N/A
Hemingbrough	48.0	46.7	97.3%	0.9	1.9%	0.4	0.8%	N/A	N/A
Kellington	21.2	7.8	37.7%	0	-	12.9	62.3%	N/A	N/A
Monk Fryston	19.3	18.2	94.3%	0.3	1.6%	0.8	4.1%	N/A	N/A
Riccall	51.5	50.7	98.5%	0.5	1.0%	0.3	0.6%	N/A	N/A
South Milford	53.6	51.4	95.9%	1.8	3.4%	0.4	0.7%	N/A	N/A
Thorpe Willoughby	59.3	57.8	97.8%	0.3	0.6%	1.5	5.1%	N/A	N/A
Ulleskelf	17.7	2.8	15.8%	6.5	36.7%	8.4	47.5%	N/A	N/A
Wistow	31.9	29.2	91.5%	0.1	0.3%	2.6	8.2%	N/A	N/A

Appendix B: List of Contacts

Organisation	Contact	Telephone	Email
Selby District Council	Terry Heselton	01757 705 101	theselton@selby.gov.uk
	Mike Thompson	01757 705 101	mthompson@selby.gov.uk
	Dean Richardson	01757 705 101	drichardson@selby.gov.uk
Environment Agency	Dan Normandale (York)		daniel.normandale@environment-agency.gov.uk
	Emma Maidment (York)	01904 822 688	emma.maidment@environment-agency.gov.uk
	Vicky McCausland (Leeds)		victoria.mccausland@environment-agency.gov.uk
	Matthew Roberts (Essex)	01392 352 429	matthew.roberts@environment-agency.gov.uk
North Yorkshire County Council	Matthew Robinson	0845 872 7374	emergency@northyorks.gov.uk
Internal Drainage Boards			
Shire Group	N Everard	01757 702 583	info@shiregroup-idbs.gov.uk
	Riley South	01302 342 055	riley.south@jbaconsulting.co.uk
York Consortium	David Fullwood	01904 720 785	david.fullwood@yorkconsort.gov.uk
	Ken Pratt	01904 720 785	ken.pratt@yorkconsort.gov.uk
Appleton Roebuck and Copmanthorpe	Richard Tasker	01904 489 731	rtt@stephenson.co.uk
British Waterways	Martin Walton	0113 281 6819	martin.rivas@britishwaterways.co.uk
Yorkshire Water Services	Stephanie Walden	01274 804 063	stephanie.walden@yorkshirewater.co.uk
Highways Agency	General Enquiries	08457 504030	ha_info@highways.gsi.gov.uk
Harrogate Borough Council	Rory Firth	01423 500 600	
	Andy Daniels	01423 500 600	
	Tim Richards	01423 556 538	

City of York Council	Anna Woodall	01904 551 491
East Riding of Yorkshire Council	Angela Cowen	01482 391 748
Leeds City Council	Helen Miller	0113 247 8132
Wakefield Council	Peter Gooding	01924 306 620
Doncaster City Council		01302 734 949

Appendix C: Data

TITLE	DESCRIPTION	CONFIDENCE
GIS Layers	10k, 50k, OS raster files (4 disks)	VERY GOOD
Adopted Local Plan	Part 1- Detailed Policies and Proposal Feb 2005	VERY GOOD
Adopted Local Plan	Part 2- General Policies Feb 2005	VERY GOOD
GIS Layers	SINCs Data	GOOD
GIS Layers	Defences	VERY GOOD
GIS Layers	Centre Lines	VERY GOOD
GIS Layers	Flood Zone 3	VERY GOOD
GIS Layers	Flood Zone 2	VERY GOOD
Selby District Strategic Flood Risk Assessment	Report and associated maps	GOOD
Mastermap	Carotg_2, Catrographic, TopographicP, TopographicL, BoundaryLine, TopographicA, LandformArea	VERY GOOD
Wakefield, Kirklees and Calderdale SFRA	Strategic Flood Risk Assessment	VERY GOOD
GIS Layers	Local Plan layers	VERY GOOD
Minerals and Waste Development Framework	Core Strategy Preferred Options - Strategic Flood Risk Assessment and Assessment under the Habitats Regulations	FAIR
Planning Document	Selby District Council Draft Incident Response Plan	VERY GOOD
DG5 Register	Properties at Risk of sewer flooding	VERY GOOD
Properties flooded during 2000 event	Word doc with street names	GOOD
Flood Risk Assessment	South Yorkshire Housing Association, Holmes Lane, Selby	GOOD
Selby Flood Risk Assessment	Boivs Homes, Selby Flood Risk Assessment, November 2005	GOOD
Flood Risk Assessment Report	Report for land at Whitley Lodge, Whitley	GOOD
Flood Risk Assessment	Report for land at Staynor Hall off Bawtry Road and abbotts Road, Selby	GOOD
EA data	EA areas (DAT/ID/MAP/TAB file)	GOOD
EA data	EA regions (DAT/ID/MAP/TAB file)	GOOD
Managing Flood Risk	Yorkshire Derwent, catchment flood management plan	VERY GOOD
Managing Flood Risk	Draft Ouse CFMP scoping report	GOOD
Managing Flood Risk	Draft Aire CFMP main stage report	GOOD
Managing Flood Risk	Draft Aire CFMP main stage report, appendix	GOOD
Managing Flood Risk	Draft Ouse CFMP scoping report	VERY GOOD
Managing Flood Risk	Draft Aire CFMP main stage report	GOOD
Managing Flood Risk	Draft Aire CFMP main stage report, appendix	GOOD
Geo Map	ESRI, artificial	VERY GOOD
Geo Map	ESRI, bedrock	VERY GOOD

TITLE	DESCRIPTION	CONFIDENCE
Geo Map	ESRI, linear features	VERY GOOD
Geo Map	ESRI, mass movement	VERY GOOD
Geo Map	ESRI superficial	VERY GOOD
Geo Map	Map info, artificial	VERY GOOD
Geo Map	Map info, bedrock	VERY GOOD
Geo Map	Map info, linear features	VERY GOOD
Geo Map	Map info, mass movement	VERY GOOD
Geo Map	Map info, superficial	VERY GOOD
Geo Map	British Geological Survey, Digital Geological Map of Great Britain (DiGMapGB) data, 2006 DiGMapGB-50 Version 3.14 data	VERY GOOD
Geo Map	British Geological Survey, Digital Geological Map of Great Britain (DiGMapGB) data, 2006, general, all datasets	VERY GOOD
Unfiltered and Filtered LIDAR data, Selby SFRA	Environment Agency, 2007- Science Enterpirse Centre, Selby SFRA 12072007-2641/2729/li ASCII Grid 1 of 3	GOOD
Unfiltered and Filtered LIDAR data, Selby SFRA	Environment Agency, 2007- Science Enterpirse Centre, Selby SFRA 12072007-2641/2729/li ASCII Grid 2 of 3	GOOD
Unfiltered and Filtered LIDAR data, Selby SFRA	Environment Agency, 2007- Science Enterpirse Centre, Selby SFRA 12072007-2641/2729/li ASCII Grid 3 of 3	GOOD
Historic_1978_aire_region	GIS layer Historic_1978_aire_region, DBF file, PRJ file, SHP file, SHX file	GOOD
Historic_1982_aire_region	GIS layer Historic_1982_aire_region, DBF file, PRJ file, SHP file, SHX file	GOOD
Historic_1995_aire_region	GIS layer Historic_1995_aire_region, DBF file, PRJ file, SHP file, SHX file	GOOD
Historic_2000 autumn_ridings_region	GIS layer Historic_2000 autumn_ ridings_region, DBF file, PRJ file, SHP file, SHX file	GOOD
Autumn2000levels	Autumn2000levels DBF file, PRJ file, SBN file, SBX file, SHP file, SHX file	GOOD
Feb2002FloodLevel	Feb2002FloodLevel DBF file, PRJ file, SBN file, SBX file, SHP file, SHX file	GOOD
Defence2_selby	Defence2_selby DAT file, ID file, MAP file, TAB file	GOOD
Defence1_Selby	Defence1_Selby DAT file, ID file, MAP file, TAB file	GOOD
Structure1_selby	Structure1_selby DAT file, ID file, MAP file, TAB file	GOOD
Structure2-selby	Structure2-selby DAT file, ID file, MAP file, TAB file	GOOD
Modelling Report Reaches 1-11	Environment Agency, River Aire Modelling Phase 1-FDMS, Reaches 1-11, Modelling report, final	GOOD
Modelling Report Reaches 1-11	Environment Agency, River Aire Modelling Phase 1-FDMS, Reaches 1-11, Modelling report, final	GOOD
GWMonitoring_sites	GWMonitoring_sites DBF, PRJ, SBN, SBX, SHP, SHX files	GOOD

TITLE	DESCRIPTION	CONFIDENCE
GWVulnerability_map	GWVulnerability_map DBF, PRJ, SBN, SBX, SHP, SHX files and XML document	GOOD
Reaches 1-11 Appendix	Reaches 1-11 Appendices B, D, E, F, G	GOOD
Lower River Aire Model data	Modelling report Reaches, Reaches 1-11 Appendices A, B, C, D, E, F, G	GOOD
Lower River Aire Model data	Modelling report Reaches, Reaches 1-11 Appendices A, B, C, D, E, F, G	GOOD
IDB shapefiles	Locations of drains etc	GOOD
List of reservoirs	Reservoirs & inland water bodies	GOOD
SelbyDistrict DG5	DG5 data	GOOD
Modelled Flood Outlines – GIS layers	Environment Agency Selby Dam and Tributaries Flood Risk Mapping Study, 2008 - 1% AEP (1 in 100 yr) and 0.1% AEP (1 in 1000 yr) Option 3 Ouse dominated scenario (Nov 2000)	VERY GOOD
Modelling Report	Environment Agency Selby Dam and Tributaries Study Report, 2008	VERY GOOD
TUFLOW 2D Breach Modelling for Selby	Modelling Report and model files, including animations	VERY GOOD

Appendix D: Sustainable Drainage Systems Review

Traditionally, built developments have utilised piped drainage systems to manage storm water and convey surface water run-off away from developed areas as quickly as possible. Typically, these systems connect to the public sewer system for treatment and/or disposal to local watercourses. Whilst this approach rapidly transfers storm water from developed areas, the alteration of natural drainage processes can potentially impact on downstream areas by increasing flood risk, reduction in water quality, loss of water resource and detriment to wildlife. Therefore, receiving watercourses have greater sensitivity to rainfall intensity, volume and catchment land uses post development.

The up grading of sewer systems to accommodate increased surface water from new development is constrained by existing development and cost. Therefore, the capacity of the system becomes inadequate for the increased volumes and rates of surface water runoff. This results in an increase in flood risk from sewer sources and pollution of watercourses. In addition, the implications of climate change on rainfall intensities, leading to flashier catchment/site responses and surcharging of piped systems may increase.

In addition, as flood risk has increased in importance within planning policy, a disparity has emerged between the design standard of conventional sewer systems (1 in 30 year) and the typical design standard flood (1 in 100 year). This results in drainage inadequacies for the flood return period developments need to consider, often resulting in potential flood risk from surface water/combined sewer systems.

A sustainable solution to these issues is to reduce the volume and/or rate of water entering the sewer system and watercourses.

What are Sustainable Drainage Systems?

PPS25 indicates that Regional Planning Bodies and Local Authorities should promote the use of Sustainable Drainage Systems (SUDS) for the management of surface water runoff generated by development. In addition, drainage of rainwater from roofs and paved areas around buildings should comply with the 2002 Amendment of Building Regulations Part H (3). The requirements are as follows:

1. Adequate provision shall be made for rainwater to be carried from the roof of the building.
2. Paved areas around the building shall be so constructed as to be adequately drained.
3. Rainwater from a system provided pursuant to sub-paragraphs (1) or (2) shall discharge to one of the following in order of priority:

    a) An adequate soakaway or some other adequate infiltration system; or where that is not reasonably practicable;
    b) A watercourse; or where that is not reasonably practicable
    c) A sewer.

SUDS seek to manage surface water as close to its source as possible, mimicking surface water flows arising from the site, prior to the proposed development. Typically this approach involves a move away from piped systems to softer engineering solutions inspired by natural drainage processes.

SUDS should be designed to take into account the surface run-off quantity, rates and also water quality ensuring their effective operation up to and including the 1 in 100 year design standard flood including an increase in peak rainfall up to 30% to account from climate change.

Wherever possible, a SUDS technique should seek to contribute to each of the three goals identified below with the favoured system contributing significantly to each objective. Where possible SUDS solutions for a site should seek to:

1. Reduce flood risk (to the site and neighbouring areas),
2. Reduce pollution, and,
3. Provide landscape and wildlife benefits.

These goals can be achieved by utilising a management plan incorporating a chain of techniques, (as outlined in Interim Code of Practice for Sustainable Drainage Systems 2004), where each component adds to the performance of the whole system:

Prevention	good site design and upkeep to prevent runoff and pollution (e.g. limited paved areas, regular pavement sweeping)
Source control	runoff control at/near to source (e.g. rainwater harvesting, green roofs, pervious pavements)
Site control	water management from a multitude of catchments (e.g. route water from roofs, impermeable paved areas to one infiltration/holding site)
Regional control	integrate runoff management systems from a number of sites (e.g. into a detention pond)

This chapter presents a summary of the SUDS techniques currently available and a review of the soils and geology of the study area, enabling the local authorities to identify where SUDS techniques could be employed in development schemes.

The application of SUDS is not limited to a single technique per site. Often a successful SUDS solution will utilise a combination of techniques, providing flood risk, pollution and landscape/wildlife benefits. In addition, SUDS can be employed on a strategic scale, for example with a number of sites contributing to large scale jointly funded and managed SUDS. It should be noted, each development site must offset its own increase in runoff and attenuation cannot be “traded” between developments.

Planning

All relevant organisations should meet at an early stage to agree on the most appropriate drainage system for the particular development. These organisations may include the Local Authority, the Sewage Undertaker, Highways Authority, and the Environment Agency. There are, at present, no legally binding obligations relating to the provision and maintenance of SUDS. However, PPS25 states that:

'where the surface water system is provided solely to serve any particular development, the construction and ongoing maintenance costs should be fully funded by the developer.'

The most appropriate agreement is under Section 106 of the Town and Country Planning Act. Under this agreement a SUDS maintenance procedure can be determined.

SUDS Techniques

SUDS techniques can be used to reduce the rate and volume and improve the water quality of surface water discharges from sites to the receiving environment (i.e. natural watercourse or public sewer etc). Various SUDS techniques are available and operate on two main principles:

- Infiltration
- Attenuation

All systems generally fall into one of these two categories, or a combination of the two.

The design of SUDS measures should be undertaken as part of the drainage strategy and design for a development site. A ground investigation will be required to access the suitability of using infiltration measures, with this information being used to assess the required volume of on-site storage. Hydrological analysis should be undertaken using industry approved procedures, to ensure a robust design storage volume is obtained.

During the design process, liaison should take place with the Local Planning Authority, the Environment Agency and if necessary, the Water Undertake to establish a satisfactory design methodology and permitted rate of discharge from the site.

Infiltration SUDS

This type of Sustainable Drainage System relies on discharges to ground, where suitable ground conditions are suitable. Therefore, infiltration SUDS are reliant on the local ground conditions (i.e. permeability of soils and geology, the groundwater table depth and the importance of underlying aquifers as a potable resource) for their successful operation.

Various infiltration SUDS techniques are available for directing the surface water run-off to ground. Development pressures and maximisation of the developable area may reduce the area available for infiltration systems but this should not be a limiting factor for the use of SUDS. Either sufficient area is required for infiltration or a combined approach with attenuation could be used to manage surface water runoff. Attenuation storage may be provided in the sub-base of a permeable surface, within the chamber of a soakaway or as a pond/water feature.

Infiltration measures include the use of permeable surfaces and other systems that are generally located below ground.

Permeable Surfaces

Permeable surfaces are designed to allow water to drain through to a sub-base at a rate greater than the predicted rainfall for a specified event. Permeable surfaces act by directly intercepting the rain where it falls and control runoff at source. Runoff during low intensity rainfall events is prevented by permeable surfaces. During intense rainfall events runoff generation may occur from permeable surfaces. The use of permeable sub-base can be used to temporarily store infiltrated run-off underneath the surface and allows the water to percolate into the underlying soils. Alternatively, stored water within the sub-base may be collected at a low point and discharged from the site at an agreed rate.

Programmes should be implemented to ensure that permeable surfaces are kept well maintained to ensure the performance of these systems is not reduced. The use of grit and salt during winter months may adversely affect the drainage potential of certain permeable surfaces.

Types of permeable surfaces include:

- Grass/landscaped areas
- Gravel
- Solid Paving with Void Spaces
- Permeable Pavements

Sub-surface Infiltration

Where permeable surfaces are not a practical option more defined infiltration systems are available. In order to infiltrate the generated run-off to ground, a storage system is provided that allows the infiltration of the stored water into the surrounding ground through both the sides and base of the storage. These systems are constructed below ground and therefore may be advantageous with regards to the developable area of the site. Consideration needs to be given to construction methods, maintenance access and depth to the water table. The provision of large volumes of infiltration/sub-surface storage has potential cost implications. In addition, these systems should not be built within 5 m of buildings, beneath roads or in soil that may dissolve or erode.

Various methods for providing infiltration below the ground include:

- Geocellular Systems;
- Filter Drain;
- Soakaway (Chamber);
- Soakaway (Trench); and
- Soakaway (Granular Soakaway).

Table H-1: Suitability of Infiltration Methods towards with respect to the wider aims of SUDS.

INFILTRATION METHOD	REDUCE FLOOD RISK (Y/N)	REDUCE POLLUTION (Y/N)	LANDSCAPE AND WILDLIFE BENEFITS (Y/N)
Permeable Surface	Y	Y	N
Sub-surface Infiltration	Y	Y	N

Attenuation SUDS

If ground conditions are not suitable for infiltration techniques then management of surface water runoff prior to discharge should be undertaken using attenuation techniques. This technique attenuates discharge from a site to reduce flood risk both within and to the surrounding area. It is important to assess the volume of water required to be stored prior to discharge to ensure adequate provision is made for storage. The amount of storage required should be calculated prior to detailed design of the development to ensure that surface water flooding issues are not created within the site.

The rate of discharge from the site should be agreed with the Local Planning Authority and the Environment Agency. If surface water cannot be discharged to a local watercourse then liaison with the Sewer Undertaker should be undertaken to agree rates of discharge and the adoption of the SUDS system.

Large volumes of water may be required to be stored on site. Storage areas may be constructed above or below ground. Depending on the attenuation/storage systems implemented, appropriate maintenance procedures should be implemented to ensure continued performance of the system. On-site storage measures include basins, ponds, and other engineered forms consisting of underground storage.

Basins

Basins are areas that have been contoured (or alternatively embanked) to allow for the temporary storage of run-off from a developed site. Basins are designed to drain free of water and remain waterless in dry weather. These may form areas of public open space or recreational areas. Basins also provide areas for treatment of water by settlement of solids in ponded water and the absorption of pollutants by aquatic vegetation or biological activity. The construction of basins uses relatively simple techniques. Local varieties of vegetation should be used wherever possible and should be fully established before the basins are used. Access to the basin should be provided so that inspection and maintenance is not restricted. This may include inspections, regular cutting of grass, annual clearance of aquatic vegetation and silt removal as required.

Ponds

Ponds are designed to hold the additional surface water run-off generated by the site during rainfall events. The ponds are designed to control discharge rates by storing the collected run-off and releasing it slowly once the risk of flooding has passed. Ponds can provide wildlife habitats, water features to enhance the urban landscape and, where water quality and flooding risks are

acceptable, they can be used for recreation. It may be possible to integrate ponds and wetlands into public areas to create new community ponds. Ponds and wetlands trap silt that may need to be removed periodically. Ideally, the contaminants should be removed at source to prevent silt from reaching the pond or wetland in the first place. In situations where this is not possible, consideration should be given to a small detention basin placed at the inlet to the pond in order to trap and subsequently remove the silt. Depending on the setting of a pond, health and safety issues may be important issues that need to be taken into consideration. The design of the pond can help to minimise any health and safety issues (i.e. shallower margins to the pond reduce the danger of falling in, fenced margins).

Various types of ponds are available for utilising as SUDS measures. These include:

- Balancing/Attenuating Ponds
- Flood Storage Reservoirs
- Lagoons
- Retention Ponds
- Wetlands

Table H-2: Suitability of Attenuation Methods towards the Three Goals of Sustainable Drainage Systems.

INFILTRATION METHOD	REDUCE FLOOD RISK (Y/N)	REDUCE POLLUTION (Y/N)	LANDSCAPE AND WILDLIFE BENEFITS (Y/N)
Basins	Y	Y	Y
Ponds	Y	Y	Y

Alternative Forms of Attenuation

Site constraints and limitations such as developable area, economic viability and contamination may require engineered solutions to be implemented. These methods predominantly require the provision of storage beneath the ground surface, which may be advantageous with regards to the developable area of the site but should be used only if methods in the previous section cannot be used. When implementing such approaches, consideration needs to be given to construction methods, maintenance access and to any development that takes place over the storage facility. The provision of large volumes of storage underground also has potential cost implications.

Methods for providing alternative attenuation include:

- Deep Shafts
- Geocellular Systems
- Oversized Pipes
- Rainwater Harvesting
- Tanks
- Green Roofs

In some situations it may be preferable to combine infiltration and attenuation systems to maximise the management of surface water runoff, developable area and green open space.

Broad-scale assessment of SUDS suitability

The underlying ground conditions of a development site will often determine the type of SUDS approach to be used at development sites. This will need to be determined through ground investigations carried out on-site. A broad-scale assessment of the soils and underlying geology allow an initial assessment of SUDS techniques that may be implemented across Selby District.

Based on a review of the following maps SUDS techniques that are likely to be compatible with the underlying strata can be suggested:

- The Soil Survey of England and Wales 1983 – 1:250,000 Soils Maps (Sheet 1), and
- The Geological Survey of Great Britain (England and Wales) 1:625,000 Series Superficial and Bedrock Edition (2000).

In the design of any drainage system and SUDS approach, consideration should be given to site-specific characteristics and where possible be based on primary data from site investigations. The information presented in the following table is provided as a guide and should not be used to accept or refuse SUDS techniques.

Settlement Name	General Geology	General Drainage Assessment	Aquifer Type	Groundwater Vulnerability	SuDS Recommendation*	Settlement Area (Ha)
Selby	Sand and gravel	Soils with high ground water table	MINOR	MINOR_H	Attenuation systems	604.9
Sherburn in Elmet	Clay and silt	Loamy and sandy freely draining soils	No aquifer present	No aquifer present	Infiltration and combined infiltration, also attenuation systems	167.2
Tadcaster	Diamicton	Loamy and sandy freely draining soils	No aquifer present	No aquifer present	Infiltration and combined infiltration, also attenuation systems	209.6
Barlby Bridge	Clay, silt, sand and gravel	Loamy and sandy freely draining soils	MINOR	MINOR_I	Infiltration and combined infiltration, also attenuation systems	41.9
Barlby Village	Sand and Gravel	Loamy and sandy freely draining soils	MINOR	MINOR_I	Infiltration and combined infiltration	60.4
Brayton	Sand and gravel	Soils with high ground water table	MAJOR	MAJOR_H	Infiltration and combined infiltration** also attenuation systems	74.3
Brotherton / Byram	Sand and gravel	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	78.5
Camblesforth	Sand and gravel	Soils with high ground water table	MAJOR	MAJOR_H	Attenuation systems	34.4
Carlton	Sand and gravel	Soils with high ground water table	MAJOR	MAJOR_H	Attenuation systems	48.5
Cawood	Sand and gravel	Soils with high ground water table	No aquifer present	No aquifer present	Attenuation systems	46.4
Church Fenton	Clay and silt	Seasonally Waterlogged Impermeable soils	No aquifer present	No aquifer present	Attenuation	15.3
Eggborough	Sand and gravel	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	72.5
Escrick	Sand and gravel	Loamy and sandy freely draining soils	No aquifer present	No aquifer present	Infiltration and combined infiltration	32.8
Fairburn	No Data	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	29.5
Hambleton	Sand and gravel	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	48.0
Hemingbrough	Sand and gravel	Soils with high ground water table	No aquifer present	No aquifer present	Attenuation systems	48.0
Kellington	Sand and gravel	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	20.7
Monk Fryston	Clay and silt	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	19.3
Riccall	Sand and gravel	Soils with high ground water table	No aquifer present	No aquifer present	Attenuation systems	51.5
South Milford	Clay and silt	Loamy and sandy freely draining soils	MAJOR	MAJOR_H	Infiltration and combined infiltration**, also attenuation systems	53.6
Thorpe Willoughby	Sand and gravel	Seasonally waterlogged impermeable soils	MAJOR	MAJOR_H	Attenuation systems	59.3
Ulleskelf	Sand and gravel	Soils with high ground water table	No aquifer present	No aquifer present	Attenuation	17.7
Wistow	Sand and gravel	Soils with high ground water table	No aquifer present	No aquifer present	Attenuation systems	31.9

* Indicative only; further investigation recommended to determine appropriate SUDS for individual sites.
** Subject to Incorporation of appropriate pollution prevention measures.

Appendix E: SFRA Maintenance and Updates

How to maintain and update the SFRA

For an SFRA to serve as a practical planning tool now and in the future, it will be necessary to undertake a periodic review and maintenance exercise. This section lists a series of recommendations ensuring that the SFRA is kept up-to-date and maintained. This will allow the SFRA to follow emerging best practise and developments in policy and climate change predications.

Flood Zones and GIS Layers

As described in Section 3.5 and in the GIS section of Appendix D, the GIS layers used in the SFRA have been created from a number of different sources, using the best and most suitable information available at the time of publishing. Prior to any amendments taking place, the GiS Layers supplied with this SFRA should be securely backed up.

Should new modelled flood outlines become available, the data should be included. For example should updated modelled outlines delineating the 1 in 20 year (5%) event become available the newest data should be used instead of the hybrid approach outlined in the report.

For other GIS layers such as the Historical Flood Outlines or the Sewer Flooding Information, it is likely that data will be added rather than be replaced. For example, where a new sewer flooding incident is reported in the catchment, a point should be added to the sewer flooding GIS layer rather than creating a new layer.

All GIS layers used in the SFRA have meta-data attached to them. When updating the GIS information, it is important that the meta-data is updated in the process. Meta-data is additional information that lies behind the GIS polygons, lines and points. For example, the information behind the SFRA Flood Zone Maps describes where the information came from, what the intended use was together with a level of confidence.

For any new data or updated data, the data tables presented in Appendix C should be checked to ensure they are up-to-date.

Climate Change Predictions

The climate change scenarios based in this report are based on the best practice and predictions available at the time of publishing. However, climate change predictions are constantly being updated and refined. New predictions can have a significant effect on flood zones and therefore the SFRA. When a review of the SFRA is undertaken, it is recommended that, in liaison with the EA, the climate change scenarios are reviewed to ensure that the SFRA is still relevant to best practice and the latest available knowledge.

Updates or Additions to Development Sites

Although unlikely at the time of publication, should any updates or additions to development sites become necessary (for example, due to new flooding information), a detailed Level 2 SFRA may be required. This should be carried out according to the guidance given in PPS25 and this document. Once a Level 2 Assessment has been completed, this should be appended to a new version of this document.

For any new or updated sites, the FRA and SUDS tables and recommendations presented in Appendix D and E should be updated.

OS Background Mapping

The SFRA has made use of the OS 1:25000 and 1:50000 digital raster maps. Periodically these maps are updated. Under the SDC OS License, it is likely that these maps will be updated throughout the whole of the SDC GIS system. Updated maps are unlikely to alter the findings of the SFRA but should be reviewed as part of the SFRA maintenance.

CEH Watercourse Networks

The SFRA has made use of the CEH Digital Watercourse Network for the District. Periodic checks should be made to check if there have been any updates to the dataset. This is an important GIS layer as it locates most of the natural watercourses within the District.

Data Licensing Issues

Prior to any data being updated within the SFRA, it is important that the licensing information is also updated to ensure that the data used is not in breach of copyright. The principal licensing bodies relevant to the SFRA at the time of publishing were the Environment Agency (Ridings and Dales regions), Ordnance Survey, Yorkshire Water and Internal Drainage Boards (IDB). Updated or new data may be based on datasets from other licensing authorities and may require additional licenses.

Flooding Policy and PPS25 Practice Guidance Updates

This SFRA was created using guidance that was current in September 2007, principally PPS25 and the accompanying Practice Guidance. The Practice Guidance was a “living draft” at the time of publication (version 1 February 2007) and it is expected that the final version of the will be available later in the year. When the final version of the guidance is released, it should be carefully checked to ensure that the SFRA is still relevant to the guidance. If necessary, an update may be required.

Similarly, should new flooding policy be adopted nationally, regionally or locally, the SFRA should be checked to ensure it is still relevant and updates made if necessary.

Stakeholder Consultation and Notification

The key stakeholders consulted in the SFRA were the District Council, Water Companies and the Environment Agency. It is recommended that a periodic consultation exercise is carried out with the key stakeholders to check for updates to their datasets and any relevant additional or

updated information they may hold. If the SFRA is updated, it is recommended that the EA and the County Council Emergency Planning Department are notified of the changes and instructed to refer to the new version of the SFRA for future reference.

Frequency of Updates and Maintenance

It is recommended that the SFRA is reviewed on an annual basis, in liaison with the EA, to assess any maintenance or update work. Should SDC decide any significant changes are necessary, the SFRA should be updated and re-issued.

Reviews and updates should be recorded in the following register.

SFRA Version & Review Register

Version	Date Issued	Reviews / Amendments Made	Stakeholders Notified	Amendments undertaken by:	Document Checked by:	Document Approved by:
1	February 2008	Original SFRA	Y	n/a	Selby DC	-
2	November 2008	Revision of the Level 1 SFRA Report and Maps to include output from the Selby Dam and Tributaries Flood Risk Mapping Study and changes in the Selby Core Strategy (Further Options Report 2008)	N	SW	Selby DC	

Continue on new page if necessary

Appendix F: Figures