

**WEST LANCASHIRE DISTRICT COUNCIL
LOCAL DEVELOPMENT FRAMEWORK**

Strategic Flood Risk Assessment

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1 Introduction

Strategic Flood Risk Assessments

- 1.1 Strategic Flood Risk Assessments fit into a hierarchy of flood risk assessments that are now a requirement through both the Water Framework Directive and ODPM guidance contained in PPS25. Such assessments are designed to identify areas of flood risk, to manage that risk and to ensure future development is located in those areas at lowest risk of flooding, where possible. The development of a Strategic Flood Risk Assessment will be a useful background document promoting sustainable development through the Local Development Framework.
- 1.2 The highest tier within the hierarchy is 'River Basin Management Plans', which are to be developed for each river basin within England and Wales. Such Plans are high level, strategic documents and will confirm the environmental objectives for each water body within the basin and summarise the programme of measures needed to achieve them.
- 1.3 Catchment Management Plans, along with Shoreline Management Plans, provide greater detail on fluvial and coastal flooding risks. Both types plan aim to develop flood-risk management policies that can be implemented on the catchment as a whole.
- 1.4 Strategic Flood Risk Assessment sits at the lowest level of the strategic plan hierarchy and involves the assessment of flood risk at the local level. The assessment process involves the collection of relevant data to identify areas of flood risk and development pressure. Development pressures can then be compared to flood risk to ensure that new development is directed towards the low risk areas in the first instance, in accordance with the Sequential approach set out in PPS25.
- 1.5 Within PPS25, which relates to Development and Flood Risk, a key requirement is for local authorities to develop a Strategic Flood Risk Assessment for their authority area. Within PPS25 it states that:

“Local Planning Authorities (LPA’s) should prepare SFRA’s in consultation with the Environment Agency 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 and enable local authorities to determine the acceptability of flood risk in relation to emergency planning capability. The SFRA should either form part of the Sustainability Appraisal for Local Development Documents (LDDs), or be used to inform it and will inform the sequential approach to flood risk in the development allocation and development control process.”

2 Methodology

- 2.1 The SFRA has been divided into two stages, stage one will relate to the collection of data on flooding issues, defining the flood risk areas and identify development pressures within the District. Within the second stage of the study, which will only be conducted on specific areas proposed for development, consideration will be given to more detailed modelling works of the flood risk posed to that site and to the surrounding areas.

Stage One of the Strategic Flood Risk Assessment

- 2.2 Through discussions with Environment Agency (NW) a brief summary has been produced outlining the matters to which the Environment Agency wish to be considered within a SFRA. The summary has been based on best practice guidance produced jointly by the Environment Agency and North West Regional Assembly.
- 2.3 Data Collection is identified as a key aspect of an SFRA, the review of relevant data sources will assist in identifying that areas within the local authority are at high, medium or low risks of flooding and what the sources of flooding. Relevant data sources are considered as:
- National Flood and Coastal Defence Database (NFCDD)
 - Section 105 Surveys
 - Catchment Flood Management Plans

- Flood Maps
 - Defended Areas
 - Asset Surveys / condition / crest heights
 - Culvert surveys / reports / condition
 - Other Structure acting as defences
 - Topographic Surveys
 - Known or possible non-fluvial sources of flooding e.g. groundwater, sewer surcharges, canals, reservoirs etc.
- 2.4 The collation of as much relevant data as possible will assist in identifying high, medium or low flood risk areas. Areas that are protected by some form of flood defence should still be considered as 'at risk' as should the defence fail or be overtopped significant flooding is still possible.
- 2.5 The SFRA also requires local authorities to identify the main areas of development pressure with the District. Such pressure could result from the Council allocating land for future development through the Local Development Framework, or know focuses of development where the future potential for development is great.
- 2.6 The development of such robust evidence base should provide the District Council with adequate information on whether a site is at risk from flooding.

Stage Two of the Strategic Flood Risk Assessment

- 2.7 All development proposals require screening to ensure that the issue of flooding and flood risk has been properly addressed. If development is proposed on a site which, through assessment of data compiled through stage 1 of the SFRA process, is considered to be in a high or medium flood risk area, then further detailed work will be required to demonstrate that the development is appropriate for the location and that it will not be at an unacceptable risk of flooding. Further assessments may also required for developments that may impact on surface water run-off and lead to an increase in flood risk elsewhere.

2.8 Stage 2 of the SFRA will represent a more detailed assessment of flood risk, and will be required when:

- a) The District Council is seeking to allocate a specific site within a flood risk area for future development through the Local Development Framework; and
- b) A developer / landowner submits development proposals for a windfall site which is within a flood risk area.

2.9 Any mitigation measures put forward should be in accordance with guidelines set out with PPS25.

3 Data Collection:

3.1 River Basin Management Plans (RBMPs)

3.1.1 At present there is no River Basin Management Plan developed for the North West Area. However, through the legislation provided within the Water Framework Directive there is a requirement for such a plan to be published in its final form by December 2009, the Framework also sets out that a draft Management Plan should be in place by December 2008. As a result this SFRA cannot be informed by such a document.

3.2 Catchment Flood Management Plans (CFMPs)

3.2.1 There is a variety of Catchment Management Plans (CFMP) that will affect the District, again the majority of these are at a very early stage of preparation.

3.2.2 A CFMP is currently under preparation for the Alt / Crossens catchment area, which includes a significant proportion of the western part of the District including Ormskirk, western parts of Burscough and Banks. An Inception Report was produced for the catchment in November 2005 and Scoping Report prepared in April 2007.

3.2.3 The River Douglas catchment is also preparing a CFMP with a Scoping Report published in September 2005. The River Douglas catchment includes a significant proportion of land to the east of the District and includes the settlement areas of Hesketh Bank, Tarleton, Rufford, Parbold and Appley Bridge.

3.2.4 The River Mersey catchment area is also in the early stages of developing a CFMP, with a small portion of land to the south of the District contained within its area of influence. Similarly with the Alt / Crossens plan an Inception Report has been completed and work on the Scoping exercise due to commence.

3.3 Alt / Crossens Catchment Flood Management Plan

3.3.1 The Inception Report, completed in November 2005, sets out flooding issues within the Alt / Crossens catchment. A Scoping Report was prepared by the Environment Agency in April 2007.

3.3.2 It highlights that reported incidents of flooding in the Alt / Crossens catchment are limited. Only four localised flood incidents have been reported on the Alt (none of which are located within West Lancashire) and no flooding incidents have been reported in the Crossens catchment. However it is recognised there are a number of known localised flood risk sites, many of which occur on agricultural land, albeit of high grade, rather than any heavily urbanised areas.

3.3.3 The flood mechanisms within the Alt and Crossens CFMP area vary in relation to both the watercourse and location within the catchment. The tidal effects do not have much influence on the flooding mechanisms, provided that the tidal defences remain intact, as the tidal influence is restricted to downstream of the tidal barriers at Altmouth (Sefton) and Crossens pumping stations.

3.3.4 The main flood risk areas identified in the Alt catchment are primarily located outside West Lancashire, although Simonswood Brook is identified. In addition to this area other flooding within the Alt is limited to isolated urban areas (outside the District) with the exception of the agricultural flood risk at

the location of the Cheshire Lines that results from a possible breach in defence.

3.3.5 The Crossens catchment is considered to have minimal flood risk in its current condition, limited primarily to Banks, Burscough and localised areas of Southport. Although these areas are at risk of flooding, this risk is limited to larger flood events. The main potential flood risks within Crossens catchment are predominantly associated with the failure of existing assets including:

- Inoperability of pumping stations, particularly Crossens pumping station in Banks.
- Failure of existing coastal and tidal defences resulting in salt-water ingress.
- Failure of the embankment between Crossens Sluice and Banks Marsh Drain.

3.3.6 The CFMP concludes that the Crossens flood defence integrity is reliant upon the existing management approach adopted and has the potential for large scale flooding should the failure of any of the three assets above occur.

3.4 Douglas Catchment Flood Management Plan

3.4.1 The CFMP for the Douglas catchment is more advanced than plans for the River Alt / Crossens with a Scoping Report published in September 2005.

3.4.2 The Report identifies that the primary sources of flooding within the Douglas CFMP have been identified as rainfall and, to a lesser extent sea level. There is no recorded flooding in the catchment related to snowmelt from the Pennine areas.

3.4.3 The River Douglas joins the Ribble in an estuarine area and therefore storm surges, waves and tides are a potential source of flooding. The tidal limit of the River Douglas is at Rufford and this provides the upper limit to the area influenced by the sea. The only urban areas to be identified as being directly at risk from tidal flooding are areas of Hesketh Bank.

3.4.5 Raised river defences have been constructed across much of the Douglas's reach to prevent flooding and the area now has a legacy of dependency on such defences, particularly within urbanised areas in Wigan. The Douglas CFMP contains 54 flood defence structures with a combined length of 50 kilometres, 55% of the total length is maintained by the Environment Agency with the remainder the responsibility of private landowners. Most of this length of privately owned defences (80%) lines the tidally effected reaches of the Douglas. In relation to such defences the Environment Agency have permissive powers to maintain the existing flood embankments as necessary.

3.4.6 Most of the man made, purpose built structures are located on the tidally influenced areas of the Douglas and Tawd (also on the Lostock and Yarrow outside West Lancashire) and within known flood risk areas. Concentrations of flood defences can be seen surrounding Hesketh Bank. These defences within the tidal reaches of the Douglas defend significant areas of agricultural land against both river and tidal flooding and are supplemented by a network of pumping stations (similar to that found within the Alt / Crossens CFMP) to drain the low lying agricultural land. The standard of protection ranges along the catchment, from 1 in 25 year event for Appley Bridge to 1 in 150 year event in Hesketh Bank.

3.5 Flood Risk Zones within West Lancashire

3.5.1 It is made clear though the Flood Zone maps provided by the Environment Agency that significant areas of land are potentially under threat from coastal and fluvial flooding. These are identified within maps contained in the Appendix A to this report.

3.5.2 The geographical landscape of West Lancashire is of a low-lying fluvial plain, which historically makes large areas of land prone to flooding. However, much of this land is used for agricultural purposes and is sparsely populated, therefore the risk to people and properties is low.

3.5.3 The highest areas of risk are to the North and West of the District where coastal flooding is the greatest threat. The only significantly sizable settlement within such a high flood risk zone is Banks, which consists of approximately

1,364 properties and a population of 3,359. Sea embankments that are built to withstand a 1 in a 75 year event protect the settlement of Banks and the land to the south. Other settlements in the north of the District including Hesketh Bank and Tarleton are not considered as in a direct flood risk area.

3.5.4 To the far south west of the District the threat of flooding from the River Alt is considered as high. Although a pumping station operates on the lower reaches of the Alt at present no other flood defence strategy exists, however work is underway along various points of the River Alt to improve defences and a sustainable long-term strategy for flood defence within the catchment is being devised.

3.5.5 Other areas that have significant risks of flood are along the River Douglas, which stretches through the District from Hesketh Bank in the North to Appley Bridge in the South East. Along its route through the District the Douglas passes close to a number of settlements including Hesketh Bank, Tarleton, Rufford, Parbold and Appley Bridge, parts of Hesketh Bank, Rufford and Appley Bridge are in direct risk of flooding from any future extreme flood event on the Douglas. Works are currently underway to improve flood defences on the upper reaches of the Douglas in Wigan and on one of the tributaries, the River Yarrow in Croston, to improve flood defence measures. However, no improvements are planned for the river's course within West Lancashire within the near future.

3.5.6 The main settlements of Skelmersdale, Ormskirk and Burscough do not directly lie in areas of significant flood risk although properties located adjacent to the River Tawd in Skelmersdale and Sandy Brook in Ormskirk may be at some localised risk.

3.6 Flood Risk Management Systems within West Lancashire:

3.6.1 Through the National Flood and Coastal Defence Database (NFCDD), which is compiled by the Environment Agency, the local authority area is subdivided into smaller catchment systems, which are considered to be at greater or lesser risk of flooding. The paragraphs below identify the various systems

within West Lancashire; a map to show this information is attached to Appendix B.

- 3.6.2 Banks Marsh System: This is a medium risk system with a total of 37 properties identified as being at risk by the Environment Agency. The system is an area of land characterised as low lying that is enclosed by a raised sea embankment. In relation to the flood defences in this area the standard is for a 1 in 50 year event, routine and recurring maintenance is carried out with medium to low inspection frequencies.
- 3.6.3 Hesketh Bank System: This is a high flood risk system with a total of 78 properties identified as being at risk by the Environment Agency. The majority of this area is situated within the Hesketh inner marsh, which was previously been salt marsh land that has subsequently reclaimed for agricultural purposes, with an embankment constructed to keep out the sea. In relation to the flood defences in this area the standard is for a 1 in 75 year event, routine and recurring maintenance is carried out with medium to low inspection frequencies.
- 3.6.4 Martin Mere System: This is a high flood risk system with a total of 2250 properties identified by the Environment Agency as being at risk. This system includes the majority of the watercourse within the Crossens catchment, draining all of the low lying wetland area and also includes a number of satellite pumping stations. In relation to the flood defences the standard in this system is for a 1 in 40 year event, in this area routine and recurring maintenance is carried out with medium to low inspection frequencies.
- 3.6.5 Croston and Mawdsley System: This is a high flood risk system with a total of 652 properties identified by the Environment Agency as being at risk. This system covers a wide geographical area and only a small proportion is situated within West Lancashire itself. This system contains most of the low level flood plain for the River Douglas. In relation to the flood defences the standard in this system is for a 1 in 50 year event in this area routine and recurring maintenance is carried out.

- 3.6.6 Skelmersdale System: This is a high flood risk system with a total of 198 properties identified by the Environment Agency as being at risk. The system includes one of the mid-reaches of the River Douglas along with the River Tawd and its tributaries. In relation to flood defences the standard within this system is for a 1 in 60 year event, routine and recurring maintenance is undertaken within the system and monthly vermin and grid inspections carried out.
- 3.6.7 Eller System: This is a low risk flood system with a total of 5 properties identified by the Environment Agency as being at risk. The system consists of the Eller Brook and its tributaries, with the character of the system predominantly rural. Eller Brook itself is embanked for most of its reach. In relation to the flood defences the standard within this system is for a 1 in 40 year event, in this area routine and recurring maintenance is carried out.
- 3.6.8 Ormskirk System: This is a high flood risk system with a total of 242 properties identified by the Environment Agency as being at risk. The system consists of the upper reaches of Sandy Brook and Eller Brook. In relation to the flood defences the standard within this system is for a 1 in 30 year event, yearly maintenance takes place on the whole Sandy Brook reach and recurring maintenance is undertaken through the whole urban area.
- 3.6.9 Aughton System: This is a medium flood risk system with a total of 20 properties identified by the Environment Agency as being at risk. The system consists of the lowest reaches of the Sudell Brook with two tributaries that drain the villages of Aughton and Town Green. In relation to the flood defences the standard within this system is for a 1 in 70 year event, routine and recurring maintenance is carried out within the system, hence a low inspection frequency. A grid between Town Green Brook and St Michaels Park gets frequent inspections in periods of wet weather.
- 3.6.10 Bickerstaffe System: This is a low flood risk system with a total of 11 properties identified by the Environment Agency as being at risk. The system consists of the middle and upper reaches of the Sudell Brook including its tributary's just below the M58. In relation to the flood defences routine and recurring maintenance is carried out within the system, hence a low

inspection frequency, the inspection frequency in this system is also linked to the low risk to properties.

3.6.11 Altcar and Ince System: This is a low flood risk system with a total of 40 properties identified by the Environment Agency as being at risk. The system consists of the low lying (flood plain) of the Alt catchment and is only in part situated within West Lancashire. It also includes 3 of satellite pumping stations. Although considered a low risk system this does assume that the existing sea defences remain intact. Should such features fail the area would be at risk of inundation.

3.7 Defended Areas within West Lancashire

3.7.1 There are a number of flood defences found within the local authority area that protect West Lancashire from both fluvial and coastal flooding, such structures are constructed and maintained by the Environment Agency.

3.7.2 As stated earlier, a significant proportion of West Lancashire is low lying and protected by coastal defences, located to the north of the settlement of Banks. The sea embankment here provides protection not only for the Banks itself but also for the agricultural land to the south, located within the Martin Mere flood management system. The embankment at this location is built to withstand a 1 in 75 year event. Also located in this area are a number of pumping stations that assist in the removal of water from the area. However, the land around Banks and to the south is still considered as high flood risk due to its reliance on flood defences.

3.7.3 Further flood defences are found at Downholland Brook, located in the south west of the District. This assists in protecting land from fluvial flooding via the Brook and consists of a pumping station and lengths of levees (the location of pumping stations is shown in Appendix C of this report). The defences here protect the small settlement of Great Altcar and the agricultural land surrounding the River Alt. Again, although protected by such flood defences this land remains at high flood risk.

3.7.4 Significant proportions of the watercourses with West Lancashire have raised embankments to protect from both fluvial and tidal flooding, such embankments are constructed to protect for a 1 in 50 year flood event.

3.7.5 The District also contains a network of pumping stations that assist in the movement of water away from low-lying areas in the north and west of the District. Significant proportions of land, mainly agricultural, rely on such stations to keep them free from standing water, particularly in time of heavy rain. The table over page highlights the locations of such pumping stations within the District.

<u>Types of Defence Present</u>	<u>Watercourse</u>
Satellite Pumping Stations	<ul style="list-style-type: none"> • Holmeswood Pumping Station • Mere Sands Wood Drain / Sluice • Kew Syphon • Altcar Pumping Stations • Rufford / Causeway • Banks Marsh • Fine Janes Pumping Station • New Cut Pumping Station(s) • Boundary Pumping Station • Clay Brown Pumping Station(s)
Pumping Stations with Tidal Gate	<ul style="list-style-type: none"> • Crossens Pumping Station, The Sluice, Back Drain, Three Pools Waterway. • Banks Marsh Pumping Station, Banks Marsh Pumping Station Outfall.

Table 1: Flood Defences in West Lancashire

3.8 Proposed Improvements to Flood Defences affecting West Lancashire

- 3.8.1 A number of schemes are underway to improve current flood defences, which will have a direct or indirect impact on West Lancashire. Such improvements may include structural works or flood defence strategies.
- 3.8.2 On the River Alt catchment, of which only a small proportion is located within West Lancashire, a strategy is to be prepared assessing the potential for significant flooding within the catchment area as the reliability of the pumping station (established 36 years previously) begins to diminish in reliability. It is proposed that a sustainable long-term strategy for flood defence within the catchment is required, which could include the potential for the creation of wetland habitats and controlled spill areas.
- 3.8.3 Improvements have been completed to the floodwall at Croston (within Chorley Borough Council) on the River Yarrow, which is a tributary of the River Douglas as that confluence north of Rufford. Existing flood defences, including retaining walls, are in need of replacing to prevent future failure, which would result in widespread flooding.
- 3.8.4 Improvement works on the River Douglas in Wigan also may have an indirect impact on flooding issues within West Lancashire. The improvement schemes will have to be considered as part of a feasibility study. However, the urban environment that surrounds the river in this area will limit potential solutions.

3.9 Recorded Flooding Events in West Lancashire

- 3.9.1 A number of flooding events have taken place within West Lancashire, either by fluvial, tidal or non-fluvial flooding sources. Such events are highlighted below:
- 3.9.2 In the past flooding along the Eller Brook was commonplace due to the failure of flood defence structures. However, such structures were improved during the 1970's and since there have been no reported flooding events. More recently, concerns have been expressed about flooding on the upper reaches of the Eller Brook adjacent to the Pines Estate, Ormskirk. Significant flooding

has occurred here in July and October 1994. West Lancashire District Council have recognised issues with respect to both inadequate surface water drainage and limited culvert capacity in and around this area.

3.9.3 Flooding events are also recorded at Calico Brook, Appley Bridge, which is mainly the result of limited capacity within the culvert that carries the brook underneath the Millbank Housing Estate; this is exacerbated by the hydraulic inefficiency of other structures on Calico Brook. Within weeks of completion of the estate in 1987, severe flooding to the depth of 2.5 metres was experienced. In July 1990, Bullen and Partners were commissioned to investigate options to alleviate future flooding of the Millbank Estate. The initial phase of their scheme involving diverting Calico Brook into the adjacent East Quarry which started in 1989 as an emergency measure. Further stages of the project propose modifications to the culverts as a longer-term solution; these are yet to be implemented.

3.10 Non – Fluvial Flooding Events within West Lancashire

3.10.1 Following discussions with drainage engineers within West Lancashire District Council a number of flooding events were identified that are not sourced from either tidal or fluvial actions. Such non-fluvial events may be the result of under-capacity in the drainage system, the blockages of existing culverts or through the surcharging of mains sewers. Such events and locations are identified within the Appendix D of this report.

3.10.2 The listing found in the Appendix to this document is not considered to be finite list of non-fluvial flooding problems within the District. Not all flooding events are reported to the Council and flooding often occurs on agricultural land, which can go unnoticed. The list is subject to change with existing flooding problems being solved through the implementation of works to the drainage systems and new flooding events being recorded. As a result the listings in the appendix is not believed to be comprehensive and will need to be reviewed on a regular basis.

4. Development Pressures

As previously indicated the majority of land that is susceptible to flood within West Lancashire is located within the Green Belt and is used for agricultural purposes. The main settlement areas of Ormskirk, Burscough and particularly Skelmersdale have been defined within the Replacement Local Plan as the focus for future development. All three settlements are not located in the main flood risk areas and only suffer from localised flood risk issues.

4.1 Skelmersdale

4.1.1 The town of Skelmersdale is the main focus of development within the District and is located in the far south-eastern portion of the District. Due to the settlement being situated on higher ground, away from the coast, the flood risks within the town, particularly from tidal sources, are virtually nil.

4.1.2 The only fluvial risk for the town is the potential for flooding along the River Tawd, which runs through the town, much of the watercourse length is within the Tawd Valley Park. The risk for flooding along this watercourse has been identified within the flood zone maps for the District produced by the Environment Agency. Any development proposed within or adjacent to such high-risk areas would have to consider the direct and indirect impacts of development on this watercourse.

4.1.3 In terms of non-fluvial risks the recorded flooding events within Skelmersdale are low. This can be attributed to Skelmersdale's status as a new town with much of the infrastructure, including drains and culverts, being modern in design and capacity.

4.2 Ormskirk

4.2.1 Ormskirk is the historic centre of West Lancashire and is considered the administrative centre of the District. Again the settlement is situated on

relatively high ground to the south of the District and accordingly flood risks from tidal and fluvial sources are extremely low.

4.2.2 The only fluvial risks to the town, identified by the Environment Agency, are that of Sandy Brook, which runs into the town from the north. As with the River Tawd this poses localised flooding issues to the properties that are adjacent to the Brook. Flood problems have also been identified on the upper reaches of the Eller Brook where multiple localised flooding incidents have occurred to residential properties.

4.2.3 In terms of non-fluvial flooding risks in Ormskirk, the number of recorded flood events are significantly higher than those found within Skelmersdale. This can be attributed to the historic nature of the town with a great deal of the drainage infrastructure dating back many years. Accordingly any major development proposed within the town will need to consider its impact on these non-fluvial flood risk and whether mitigation or improvement works will be required as part of the development.

4.3 Burscough

4.3.1 Burscough is located in the centre of the District and is not considered to be within a flood risk zone, as identified by the Environment Agency. Burscough is the lowest lying of all three main settlements within West Lancashire and accordingly is in close proximity to the boundary of high flood risk areas to the north and west of the District. Therefore it should be noted that although flooding from fluvial and tidal sources is considered to be low, the risks are greater in this location than that of both Skelmersdale and Ormskirk.

4.3.2 Although flood risk zones do not affect the settlement directly there are fluvial flood risks associated with Eller Brook, which runs to the east of Burscough. Again it is considered that such a flood risk is localised and would only affect land that is directly adjacent to the Brook itself. As stated in paragraph 4.3 and 4.6 any development proposed would have to consider direct and indirect impacts of flooding in relation to Eller Brook.

4.3.3 Burscough is a historic market town and has seen significant growth over recent decades. This has resulted in a high number of recorded flood events that are attributed to non-fluvial flooding sources. A great number of flooding events are attributed to the under-capacity of the drainage infrastructure. It is proposed that significant levels of regeneration will take place in the near future. Accordingly any major development within Burscough will need to consider its impact on these non-fluvial flood risks and whether mitigation or improvement works will be required as part of the development.

4.4 Parbold

4.4.1 Parbold is situated in the east of the District and not within any high risk flood areas. The settlement area is located directly adjacent to the River Douglas, which does have associated risks from fluvial flooding. Raised embankments are in place on this length of the Douglas that will protect properties adjacent to the river from a 1 in 40 year flooding event.

4.4.2 There are a number of non-fluvial flooding events recorded in Parbold. These mainly relate to under-capacity issues and possible blockages in local culverts. Accordingly any major development within Parbold will need to consider its impact on these non-fluvial flood risks and whether mitigation or improvement works will be required as part of the development.

4.5 Appley Bridge

4.5.1 Appley Bridge is situated in the east of the District and with portions of the settlement identified within high-risk flood zone 3. As with Parbold, part of the settlement area is located directly adjacent to the River Douglas, which does have associated risks from fluvial flooding.

4.5.2 There are a number of recorded flood events relating to Calico Brook and East Quarry. It is recommended that any future development, particularly any redevelopment within East Quarry consider flooding issues in the vicinity and consider mitigation and improvement works to reduce flood risk.

4.6 Tarleton and Hesketh Bank

4.6.1 Neither settlement lies directly within a flood zone area, however land to the north of Hesketh Bank does lie within an area of high flood-risk from tidal sources and land to the east of both Tarleton and Hesketh Bank lie is an area of high-risk fluvial flooding from the River Douglas. Any major developments within these areas will have to be considered in relation to such high-risk areas.

4.6.2 Similarly to Burscough both Tarleton and Hesketh Bank have seen significant growth over recent years. As a result a number of flooding events have been recorded that are non-fluvial in source, mainly due to sewerage under capacity in the area. Accordingly any major development within the Tarleton and Hesketh Bank will need to consider its impact on these non-fluvial flood risks and whether mitigation or improvement works will be required as part of the development.

4.7 Banks

4.7.1 Banks is the only settlement of a significant size to be situated within a defined high-risk flood area. Banks itself is protected by a sea embankment to the north and is reliant on this defence for protection from tidal flooding. Any proposals for development within or surrounding the Banks area must be considered in term of the risks posed from flooding. Development in this area must satisfy the Sequential Test in PPS25 and flood risk must be managed through appropriate mitigation measures.

4.8 Other Settlements within West Lancashire

4.8.1 The remainder of the District is either made up of open countryside in agricultural uses or small settlement areas surrounded by Green Belt. The District Council do not consider these areas to be the focus of significant development pressures and any major developments proposed in these areas should be judged on a case by case basis to their impact on flooding.

5. The Next Steps

The Next Steps of Strategic Flood Risk Assessment

- 5.1 As stated in Section Two of this report this initial assessment only represents a first stage in the SFRA process. It is expected that any development that is proposed within or adjacent to areas of high risk will require further detailed assessment works, including modelling works to more accurately define the risk of flooding and the impact a proposed development will have, this work will be done to a standard deemed acceptable to the Environment Agency. A similar course of action will be necessary from the District Council if proposals to allocate specific land, in an area of flood risk, for development are brought forward through the Local Development Framework.
- 5.2 All development proposals must be screened to determine whether or not the site would be at risk of flooding or whether or not the development of the site would exacerbate flood risk elsewhere.
- 5.3 Where development is proposed within the vicinity of a known non-fluvial flood risk then the direct and indirect impact of development on the potential flood risk must be considered. If, after a thorough assessment, the conclusion is the potential risk is increased, then satisfactory mitigation or improvement works should be agreed. If this is not possible, then either the site should not be allocated for development or planning permission should be refused.

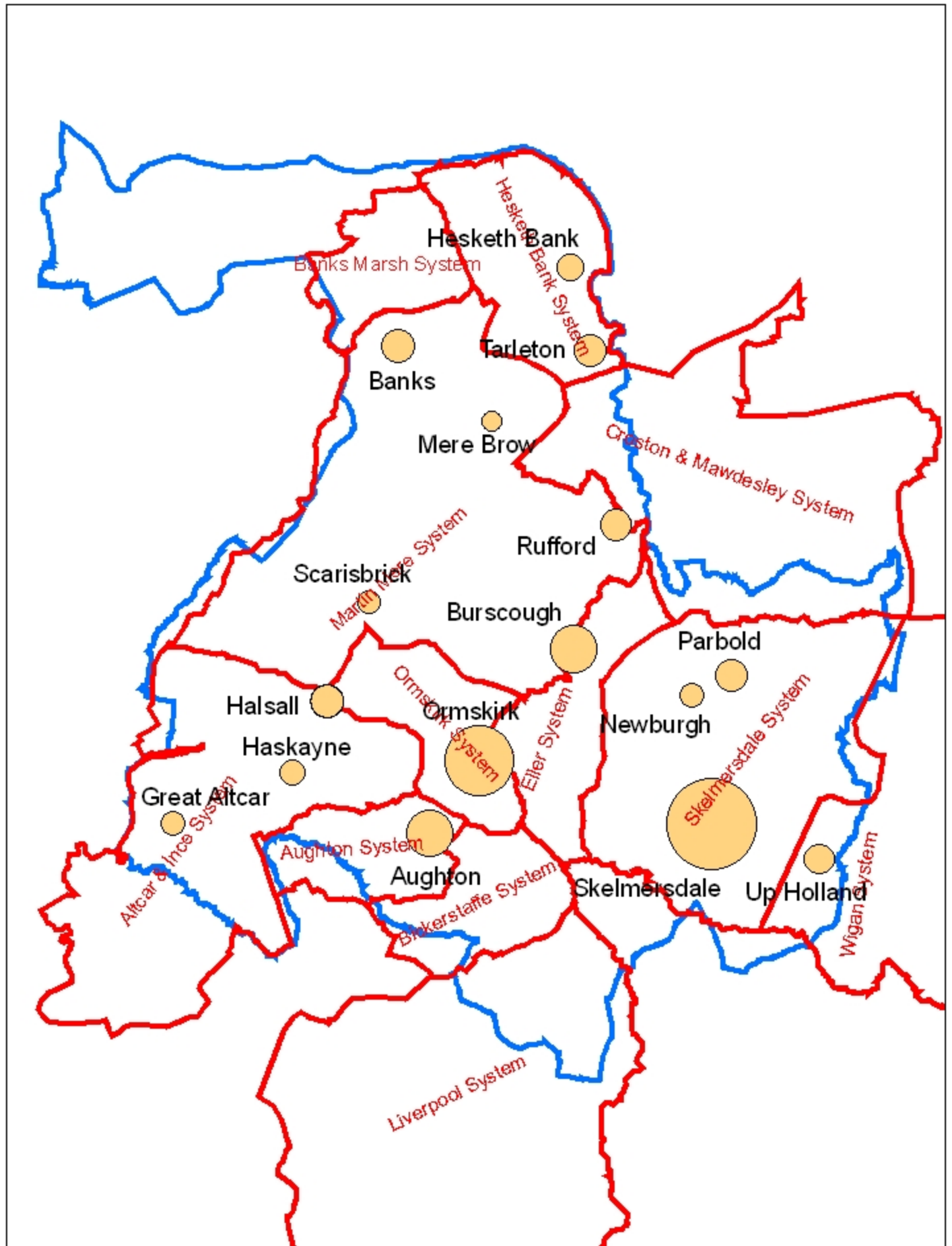
APPENDIX A - Flood Plain Zone 2



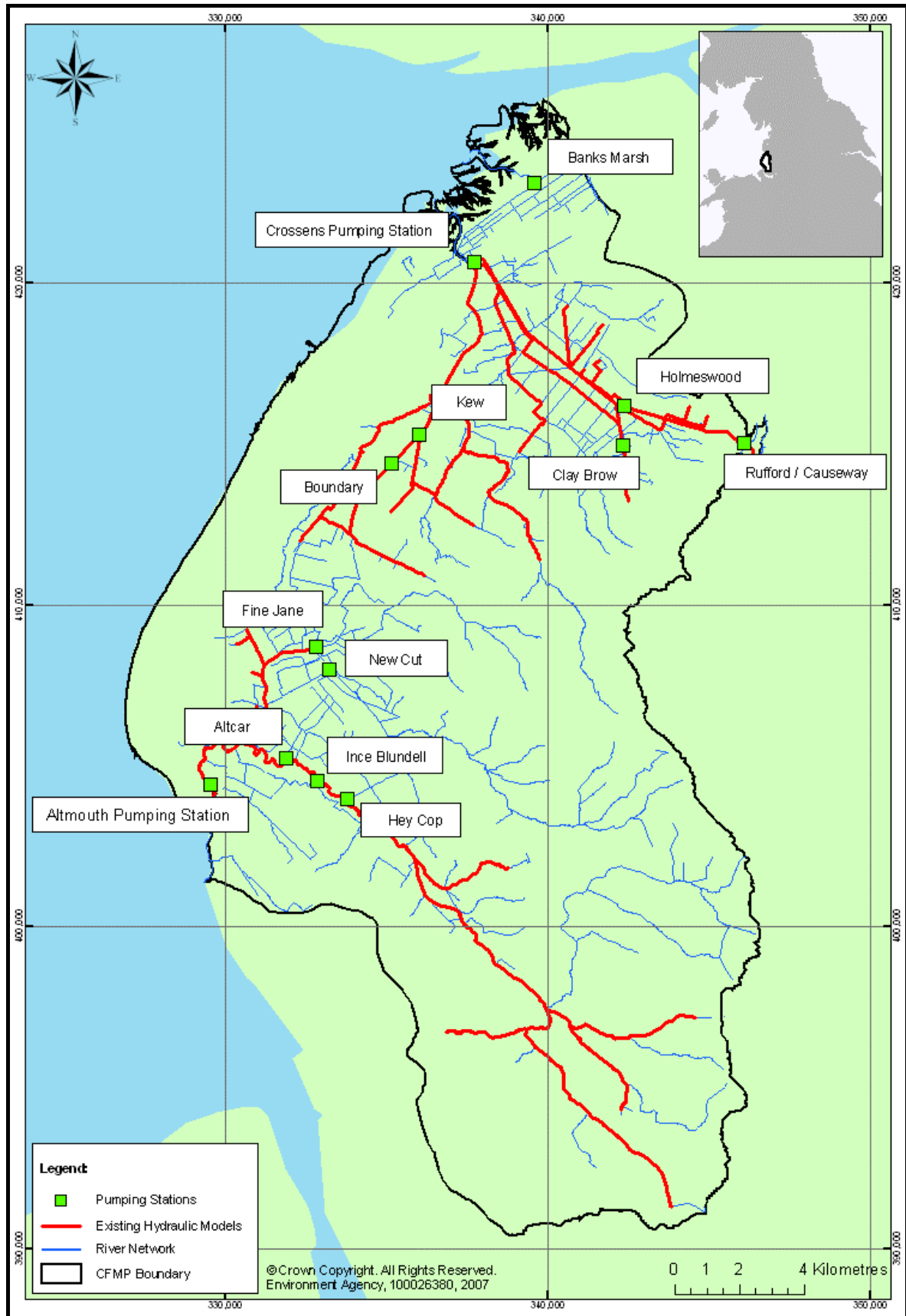
APPENDIX A - Flood Plain Zone 3



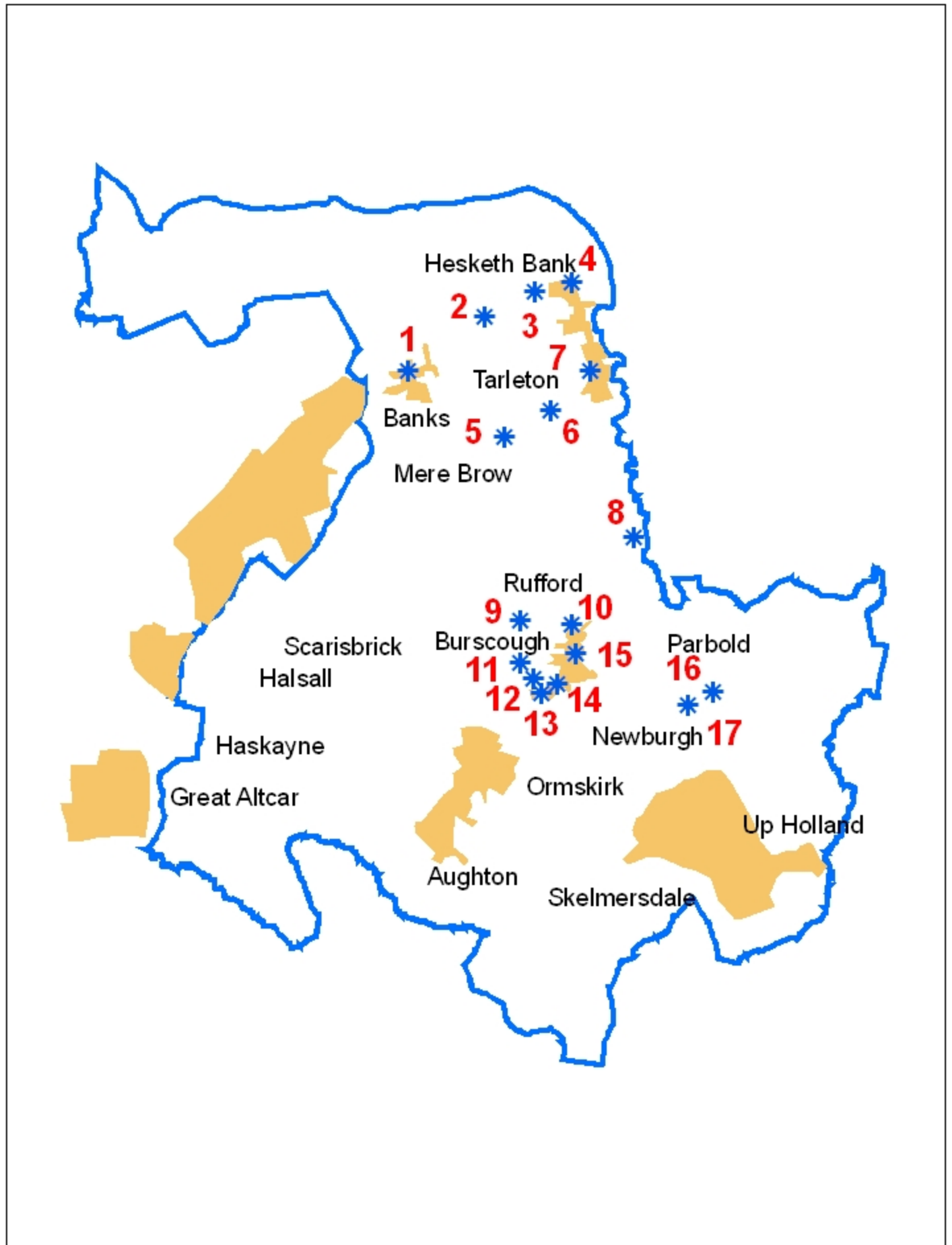
APPENDIX B - Flood Management Systems



Appendix C: A Plan to show the Alt / Crossens Catchment and associated Pumping Stations.



APPENDIX D - Non Fluvial Flood Risks



1	Church Farm, 2 Church Road	Flooding of fields to the rear of Ralph's Wife's Lane, possible pumping station under-capacity (UU)
2	Fylde View Farm, Shore Road	Flooding of the farmyard, plus adjacent fields adjoining the carriageway. Possible under-capacity issues (UU)
3	Marsh Road (The Hawthornes)	Watercourse problems in this area may be the result of culverts and the lack of maintenance
4	Poppyfields, Shore Road, Marsh Road	Flooding recorded at 20-22 Poppyfields in gardens adjacent, possible foul sewer problems associated with sewer under-capacity in Hesketh Bank. Associated problems are found on Shore Road and Marsh Road (UU)
5	12 and 42 Mere Brow Lane	Possible sewer under-capacity and pumping station problems (UU)
6	Green Lane/Blackgate Lane	Flooding of fields in this area due to poor watercourse gradient (UU)
7	Carr Lane, opposite the rugby club	Watercourse problems have arisen due to lack of maintenance on Carr Lane (south). Highways flooding and properties flooding. This could be due to a culverted watercourse in the area
8	29-37 and 39 Church Road	Flooding of gardens, possibly pumping station problems
9	113-121 New Lane	Foul flooding due to sewerage under-capacity. Flooding of carriageway, rail line and adjacent fields
10	Red Cat Lane/Moss Nook	Highway flooding which may be the result of blocked culvert
11	Ringtail Court	Possible under-capacity issues (UU)
12	School House Farm/Barkers Transport, Tollgate Road	Under-capacity issues (UU)
13	The Lion Public House, Liverpool Road South	Flooding in the cellar due to internal drains under-capacity (UU)
14	Meadowbrook	Flooding in gardens adjacent to properties and on the highway, possible under-capacity issue (UU)
15	21-31, 49-59 Mill Lane	Flooding of gardens and flooding of recently built flats by overland flooding and flooding from adjacent surcharging sewer
16	Course Lane	Non fluvial problems, source unknown
17	Dock Brook/Fairhurst Drive	Blockage of culvert leads to flooding