

Spelthorne

Strategic Flood Risk Assessment

Part II

**Planning Services
Strategic Directorate (Community)
Borough of Spelthorne
Council Offices
Knowle Green
Staines
Middlesex
TW18 1XB**



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1. Introduction

- 1.1 The purpose of this document is to assess the findings of the Strategic Flood Risk Assessment prepared for the Council by Consultants Jacobs in December 2006 and to identify an appropriate policy approach to flooding for the emerging Spelthorne Development Plan – Core Strategy and Policies DPD and the Allocations DPD.
- 1.2 The report follows the requirement of PPS25 ‘Development and Flood Risks’, also published in December 2006, and has been agreed by the Environment Agency.
- 1.3 Together with the Jacobs report they provide both technical evidence to support the emerging DPDs as well as their Sustainability Appraisals.

2. Background

- 2.1 All Authorities are required by PPS25 to prepare a Strategic Flood Risk Assessment to inform both the preparation of Local Development Frameworks and Emergency Plans.
- 2.2 Jacobs were appointed by the Council in July 2006 to undertake a Strategic Flood Risk Assessment for the Borough. The primary purpose of the study was to establish factual evidence about the extent and nature of flood risk. It has also made certain recommendations about the policy direction the Council should consider.
- 2.3 The report was prepared on the basis of the guidance in the then draft PPS25 which was published in December 2005. The Jacobs study and their final report was prepared with the direct involvement of the Environment Agency and is agreed by the Agency.
- 2.4 This SFRA Part II takes account of the technical findings of the Jacobs report and also the guidance in the final version of PPS25.
- 2.5 The government has indicated an intention to publish a draft Companion Guide to PPS25 and for it to be adopted in a final form toward the end of 2007. This report may need reviewing to take account of any changes in the interpretation of PPS25.

3. PPS25 ‘Development and Flood Risk’

- 3.1 PPS25 recognises that, although flooding cannot be wholly prevented, its impacts can be avoided and reduced through good planning and management. Flood risk is required to be taken into account at all stages in the planning process to avoid inappropriate development in areas of flood risk and to direct development away from areas of highest risk. This is referred to in the guidance as a sequential approach.
- 3.2 Where there are large areas at flood risk (Zones 2 and 3) and where a sequential approach would not enable necessary development to take place, it recognises that, for wider sustainability reasons to avoid social or economic blight, an ‘exceptions’ approach may be appropriate. Where such circumstances exist, decision-makers should apply it at the earliest stage possible in the planning process.

- 3.3 The guidance defines zones of differing probabilities of flood risk and also uses appropriate to different flood risk zones according to their vulnerability to flooding. The most vulnerable uses are identified for zones with the lowest level of flood risk and those with the least vulnerability for zones of highest risk.
- 3.4 The highest risk zone (3) is areas of a 1 in 100 year risk of flooding or worse. This is divided into 3a and 3b with zone 3b identified as land where water has to flow or be stored in times of flood and having a risk of flooding of 1 in 20 or greater (also referred to as the functional flood plain). For zones 3a and 3b the guidance proposes that existing development is relocated to land in zones with a lower probability of flooding. Zone 2 is areas with a risk between 1 in 100 and 1 in 1000. Zone 1 is areas beyond the 1 in 1000 area.
- 3.5 The guidance also identifies the issue of climate change and likelihood of increased flood risk over time and the account which needs to be taken of this.
- 3.6 The guidance requires local planning authorities to prepare and implement planning strategies that help to deliver sustainable development by:
- a) Appraising risk – through the preparation of SFRAS
 - b) Managing risk by:
 - i. Framing policies to locate development which avoids flood risk to people and property.
 - ii. Only permitting development in areas of flood risk where there are no reasonable available sites in areas of lower risk and benefits of development outweigh the risk of flooding.
 - c) Reducing risk by:
 - i. Safeguarding land from development required for current and future movement of flood water, storage and defence.
 - ii. Reducing flood risk to and from new development through location, layout and design incorporating sustainable urban drainage systems (SUDS).
 - iii. Using opportunities offered by new development to reduce the causes of impacts of flooding.
 - d) A partnership approach involving:
 - i. Working effectively with the Environment Agency
 - ii. Ensuring spatial planning supports flood risk management policies and plans.
- 3.7 PPS25 recognises that SFRA will refine information on the probability of flooding identified in Environment Agency flood zone maps and the SFRA maps should be used for defining flood zones where they are available.
- 3.8 Finally, the guidance refers to the importance of development which is allowed in areas of flood risk to be designed to be flood-resilient in the way it is constructed and where possible, flood resistant – the amount of water entering buildings is minimised.

4. Findings of the SFRA

- 4.1 The Jacobs SFRA report for Spelthorne has looked at all forms of flooding including fluvial (rivers), surface water, ground water, sewerage and other man-made structures, including reservoirs. It was prepared prior to the final publication of PPS25

but has, nevertheless, anticipated such changes that were made from the draft PPS25.

- 4.2 It has identified a significant part of the Borough is at risk of flooding from the River Thames, Rivers Colne, Colne Brook, Wraysbury and the River Ash. The Colne, Colne Brook and Wraysbury are referred, in this report, to the Colne System.
- 4.3 Flood maps have been prepared by Jacobs which provide a more detailed and accurate picture of the extent of flooding than the Environment Agency Flood Zone Maps. The SFRA modelling and maps have identified:
- a) Areas outside the 1 in 1000/1 in 100 + 20% outline (Zone 1)
 - b) Areas within a 1 in 1000 year flood event (Zone 2). The study also assessed the impact of climate change over the next 50 years by assessing the 1 in 100 year flood area plus a 20% increase in rainfall. This area broadly resembles the 1 in 1000 year area. For the purposes of the SFRA a precautionary approach has been taken so the maximum extent of the 1 in 1000 and 1 in 100 + 20% has been taken as representing the 1 in 1000 extent – that is the extent of Zone 2.
 - c) Areas flooded in a 1 in 100 year event (zone 3a).
 - d) Open areas of land which are ‘frequently flooded’ in a 1 in 20 event and are predominately open and have fast flowing water (equates to zone 3b and is identified in the Jacobs report as areas 3ai and b). This zone also included areas where water is stored in times of flood.

4.4 The areas covered by these zones and the approximate number of homes within the zones is summarised in the following table:

Table 1 Extent of Flood Risk in Spelthorne.

Risk	% of Borough	% of urban Area	% of urban area plus dry islands ¹	Approx no. of homes in each zone ²
Zone 1	52%	50.8%	-	20,155
Zones 2 and 3	48%	49.2%	-	13,926
Zones 3a and 3b	23.2%	14.1%	-	5,594
	-	-	20.3%	8,054
Zone 3b	8.5%	-	-	594

¹ Dry islands are areas wholly surrounded by flood water in a 1 in 100 year event and from which there is, by definition, no dry route of escape and residents could not live without external support or travel through flood waters during a flood event. The Environment Agency object to additional residential development in these circumstances.

² Number of dwellings calculated by taking the % of the total Borough dwelling stock of 39,675 as at 1st April 2006.

4.5 The above table shows significant areas of the Borough are at some degree of flood risk. The area of the Borough at most risk covers broadly the southern area of Spelthorne and the Colne Valley going north from Staines to Stanwell Moor. Floods of a risk up to 1:100 can extend as much as 1.3 miles from the River Thames and a

1:1000 year event up to 1.85 miles from the Thames – in places this is more than 2/3 across the entire width of the Borough.

- 4.6 In addition to the extent of fluvial flooding (e.g. from rivers) there are areas of the Borough affected by surface water flooding, groundwater flooding and occasionally sewer flooding. Thames Water were unable to provide the study any details of sewer flooding, however, from recent flood events, this is thought to be limited in its geographical extent and generally could be associated with fluvial flooding when the sewer system is surcharged with flood water in excess of it's capacity rather than sewerage overload on its own. In the floods of 2003 there were some instances of groundwater flooding – water accumulating in depressions as a result of high water table and sub-ground flow from surrounding land. Most of the known areas are also within the identified fluvial flood plain.
- 4.7 There are small areas of surface water flooding in Stanwell, Ashford and other parts of the Borough. These are shown on the maps in the Jacobs report. This is largely due to ground saturation following periods of sudden extreme rain or prolonged periods of rain. The very flat nature of the Borough and limited hydrological gradient¹ limits the ability of rivers and ditches to drain these areas quickly. This study has recommended that this source of flooding and its extent is not a limitation on development. It does however underline the importance of sustainable drainage systems in new development.
- 4.8 There are four major water supply reservoirs in the Borough as well as other smaller man-made water storage and water transfer channels and pipes. The risk of failure of reservoirs is assessed by Jacobs as 1:50,000 and not recommended as an issue to constrain the location of development but nevertheless an emergency planning issue.
- 4.9 Flooding has a disproportionate impact on some existing towns and local centres. Whilst the centres of Ashford, Sunbury Cross and Stanwell are unaffected by flood risk, Staines, Shepperton and Lower Sunbury are affected. The following table summarises the approximate degree of risk these centres face:

Table 2 Flood risk in Staines, Shepperton and Lower Sunbury centres

Degree of Risk	Staines Town Centre	Shepper-ton Centre	Lower Sunbury Centre
Zone 1 – outside the 1 in 1000/100 + 20%	5%	50%	-
Zone 2 – 1 in 100 to 1 in 1000/100 +20%	50%	50%	75%
Zone 3 – up to 1 in 100	45%	-	25%

*In Staines town centre the only areas outside the 1 in 1000/1 in 100 + 20% area are dry islands.

- 4.10 The Environment Agency is investigating measures to reduce flooding from the Thames in the Spelthorne area. As a result of floods in 2003 work on a Lower Thames Strategy commenced looking in particular at the area between Datchet and Teddington. Phase 3 of the strategy was completed in November 2005. It has put forward a two-part approach with an engineering component and a floodplain

¹ Hydrological gradient is the degree of fall in water levels within watercourses or ground water across a given area. In Spelthorne the gradient from the highest point in Stanwell at about 23.5m above sea level to Lower Sunbury at about 7.5m is approximately 1 in 400.

management component. The engineering component would include three diversion channels between Datchet and Walton respectively on the east bank around Wraysbury (within Windsor and Maidenhead), the west bank north of Chertsey (in Runnymede) and east/north bank at Shepperton (in Spelthorne). Defences would need to be built to protect small groups of houses between Walton and Teddington and riverbed re-profiling is being investigated through Staines town where relief channels and/or protection is not feasible. In financial terms the Strategy currently has a low Defra priority score and will be reviewed again in 2010. It is understood the low score reflects its affordability which whilst it could benefit a large number of people it is also very costly (approx. £200m). The EA nevertheless propose to progress work on the floodplain management component particularly on warning systems, resilience work and emergency planning. The Lower Thames Strategy as a whole has yet to be completed.

- 4.11 There are some limited existing flood defences on the River Colne and also on the River Ash. These are shown on the flood maps in the Jacobs report. In the context of the extent of flood risk in the Borough as a whole they have only a limited and very local benefit and, in the case of the River Colne, flooding from the Thames merges or subsumes much of the lower Colne flood plain. The overtopping of these defences has little, if any additional impact overall on the extent of flood risk in the Borough.

5. Development Plan Implications

- 5.1 The Jacobs report has established there is an extensive flood risk area in the Borough with significant levels of existing development including some 5594 (or 8054 if dry islands are included) dwellings in the 1 in 100 year flood risk area (Zone 3) and nearly half of the commercial and shopping area of Staines Town centre. Only half of the Borough is free of flood risk (Zone 1) which places significant limitations on the scope for the Borough to meet future development needs. This section of the report considers the implications of the presumption in PPS25 that existing development within Zone 3 will be relocated to lower flood risk areas and that new development must comply with the sequential test – areas of low probability of flooding are considered for development first.

Relocation

- 5.2 Table 1 has identified that some 594 dwellings lie within Zone 3b (up to 1 in 20 risk) and some 5594 dwellings lie in Zone 3a (up to 1 in 100 risk). The following table summarises the financial and land area implications of seeking to relocate what is a substantial amount of existing residential development. It looks at both the 1 in 20 area and up to 1 in 100. The figures for Zone 3a and 3b do not include the cost of relocating commercial premises within the areas.

Table 3 Financial and Land Area implication of relocating residential development from Flood Risk Zone 3.

Zone	Risk	No dwellings	Land Area ¹	Relocation Costs ²
Zone 3a	1 in 100	5594	160ha	£1,504 million
Zone 3b	1 in 20	594	17ha	£294 million

¹ Relevant Land area is based on 35 dwellings per hectare

² Costs of relocation are based on average house prices at 1 April 2006 of £244,456 plus 10% for disturbance in zone 3a and in zone 3b 450,000 + 10% to reflect the high value of riverside properties.

- 5.3 Table 4 identifies the existing commercial and employment sites in the Borough the Council consider should be specifically designated for protection to maintain an appropriate employment base for the borough. These include the Borough's four main centres of Staines, Ashford, Sunbury Cross and Shepperton which have an important role in terms of shopping provision and a range of other services. The table shows the proportion of those areas at flood risk, it does not include other small or isolated commercial areas and premises.

Table 4 Commercial/Employment Areas in Flood Risk Area

Area	Zone 3	Zone 2	Zone 1
	Greater than 1:100	1:100 – 1:1000 / 1:100 + 20%	Less than 1: 1000 / 1:100 + 20%
Staines Town Centre	45%	50%	<5%
Ashford Town Centre	-	-	100%
Sunbury Cross	-	-	100%
Shepperton	-	50%	50%
Windmill Road, Sunbury	25%	70%	5%
Hanworth Road, Sunbury	-	-	100%
Spelthorne Lane, Ashford	-	66%	33%
London Road, Staines	-	25%	75%
Northumberland Close, Stanwell	-	-	100%
BP, Sunbury	-	-	100%
Shepperton Studios, Shepperton	-	85%	15%

- 5.4 Staines town centre is by far the largest retail centre in Spelthorne with around 88,681 square metres of retail floor space. It serves a catchment area well beyond the Borough boundary including much of Runnymede and Wraysbury within Windsor and Maidenhead and areas of West Hounslow including parts of Feltham.
- 5.5 The Spelthorne Retail Study, April 2004 has identified a need for additional retail floor space in Staines Town Centre to meet needs up to 2016 in the order of 32,000 square metres. Such a scale of retailing could only be provided in Staines as the other centres have neither the physical scope to be expanded or could viably take such a scale of primarily comparison shopping floor space. The space could only be viably

provided in an existing major shopping centre. The two main areas of the town where provision of this scale can be provided is as a major extension to the existing Elmsleigh Centre and an expansion of the Two Rivers Shopping Area. Both areas are partly within the 1 in 100 flood risk area.

- 5.6 If provision were not made in Staines town centre the following consequences would arise:
- a) The town centre would be prevented from meeting future retail needs for residents in its catchment area and over time lose out to other town centres in the wider area particularly Woking, Camberley, Windsor, Slough, Heathrow and Kingston.
 - b) The centre would be likely to decline both relatively to the other centres but also in absolute terms and the process of continuous renewal that has been secured in recent years would not continue.
 - c) The wider role of the town in social and economic terms would be harmed.
 - d) Residents in the Borough and the town's wider catchment area would, in many cases, have to drive further to other town centres for shopping and other needs leading to less sustainable travel patterns with the consequential adverse environmental impact.
- 5.7 The presumption of relocating existing development within flood Zone 3 within Staines town centre would involve closing more than half of the Elmsleigh Centre and Two Rivers shopping area and a number of substantial office buildings. The cost would be enormous and have a devastating adverse impact on the future of the centre if such clearance were to take place. It is also wholly unrealistic in financial terms.
- 5.8 Table 4 also identifies that some 25% of the Windmill Trading Estate at Sunbury is within flood Zone 3. This is a modern estate having been almost wholly redeveloped in recent years. Relocating even part of the estate would involve a greater area than 25% being cleared as whole buildings/sites would need to be acquired. The costs would be substantial.
- 5.9 It is of note that the Lower Thames Strategy, whilst giving cursory consideration of relocation as an option to address flood risk in this area, dismissed it in cost/benefit grounds and is now pursuing the engineering and floodplain management options described in paragraph 4.10.
- 5.10 Given the enormous cost of relocation and likely consequent social and economic implications for Staines town centre and those who rely on it, and rejection of the relocation option by the Environment Agency, it is not considered realistic to consider relocation as a policy option within Spelthorne in the Council's emerging Local Development Framework.

Sequential Test

- 5.11 PPS25 sets out a sequential test where new development of greater vulnerability should be located in areas of lower flood risk. In essence this requires, amongst other detail, new residential development to be in Zones 1 and 2 and allows commercial development to be in Zones 1, 2 and 3a. The allowances under the sequential test are less onerous than the general policy presumption for Zone 3b of relocating existing uses.

- 5.12 Under the sequential test the provision of further retail development in Staines town centre is acceptable subject to land of a lower risk not being available. The Staines Retail Study has already shown that such development can only go in Staines and on the two areas identified. Proposals to extend the Elmsleigh Centre for retail purposes and longer-term provision in the Two Rivers shopping area would not conflict with the sequential test in PPS25 in these circumstances.
- 5.13 All the major commercial and employment sites in the Borough have been identified for protection. To exclude any site could reduce the employment/economic base of the Borough. This would also require people to travel further to alternative employment outside of Spelthorne with the consequent adverse environmental impacts.
- 5.14 The retention of these sites is also on the basis that smaller commercial sites within residential areas will over time be redeveloped for residential use. The use of such commercial sites outside of flood risk areas provides an important component of the Borough's housing capacity representing some 60% of that capacity. The protection of the major employment sites, including large parts of Staines within Flood Zone 3 is critical in providing sufficient housing capacity outside of Flood Zone 3 and delivering a comprehensive and sustainable approach to flood risk in the Borough.
- 5.15 No new housing is expected to be provided on sites within Flood Zone 3 unless it complies with the Exemption Test and a flood risk assessment (FRA) has identified that, on more detailed examination, the site is not at risk or there is a dry route of escape. Two Proposal sites in the emerging LDF, Bridge Street Car Park and the Elmsleigh Centre extension, have a residential element but FRAs agreed by the Environment Agency show an acceptable dry route of escape.
- 5.16 The limited area of the Borough wholly within Flood Zone 1 and not subject to physical or major policy constraints is such that the Council would not be able to meet the Structure Plan and emerging South East Plan housing requirements from that area. This is despite the use of some commercial sites. The Council has undertaken a detailed housing land availability study. The Council needs to rely on all currently identified potential housing land coming forward from Flood Zones 1 and 2. Approximately 60% of units will be from Flood Zone 1.
- 5.17 From this it is clear that, following the presumption of the sequential test of housing first being considered in Zone 1, this would not ensure an adequate housing supply. Land in Zone 2 must also be considered. PPS25 identifies that residential use in Zone 2 is acceptable where there are insufficient sites in Zone 1.
- 5.18 The Council's need to provide some housing in Flood Zone 2 therefore meets the sequential test and can meet the flood risk vulnerability advice.

Other Considerations

- 5.19 The Jacobs report has identified the scale of the flood risk problems in Spelthorne including from those already in flood risk areas. The Environment Agency through their Lower Thames Strategy is progressing engineering solutions which include flood relief channels. Given the substantial numbers at risk these potential future works in principle offer important benefits.

- 5.20 Local Development Frameworks are intended to provide a spatial planning approach to issues, which, on the basis of the Government's definition of spatial planning, includes appropriate account of the plans and programmes of other relevant organisations which affect the use of land. It is therefore appropriate and important for the emerging LDF to reflect support of appropriate flood risk management measures. This is supported by recommendation in the Jacob's report.
- 5.21 PPS25 gives particular importance to the role of sustainable urban drainage schemes (SUDS) as a means of slowing up the movement of surface water into river systems. These are recommended in the Jacob's report as important for Spelthorne and should be referred to in policy. In Spelthorne, because of the underlying gravels, most surface water is drained into soakaways already.
- 5.22 PPS25 recognises the role of new development in providing opportunity to increase flood storage capacity within the floodplain and reduce impedance to the flow of floodwater (see paragraph 3.6 above). This is also a recommended action to the Council in the Jacobs report.
- 5.23 PPS25 also expects any development that does take place in flood risk areas to be flood resistant and resilient. This is again reflected in the Jacobs recommendations.

6. Development Plan Policy

- 6.1 The extent of flood risk, and the reasons to assist in addressing this, and the on-going development requirements require balancing to ensure a sustainable approach in economic social and environmental terms. It is also important this is comprehensive in identifying all possible means of reducing flood risk.
- 6.2 It has been demonstrated the relocation of development from the flood plain is not realistic in current of future financial circumstances. But there is the prospect of bringing forward appropriate flood risk management measures.
- 6.3 An exception to the requirements of the sequential test are required to meet future housing requirements, albeit development in Flood Zone 3 can be avoided where risks can be overcome by a dry route of escape, but some commercial development in Staines town centre in particular is essential for wider sustainability reasons. Such development, if it incorporates increased flood storage capacity could nevertheless contribute positively to reducing flood risk. The requirement of 20% additional flood storage capacity equates to the projected increase of floodwater as a result of climate change.
- 6.4 The following sets out a proposed flood policy for the Council's 'Strategy and Policies DPD' to reflect the issues identified in this report and appraisal of flood risk, its implications and sustainable responses to it. It seeks to address both the challenge of these already at flood risk, and how this may be reduced, and where new development should be located. The definitions of the terms 'less vulnerable', 'more vulnerable' and 'highly vulnerable' used in the policy are those used in PPS25.

Table 5 Flood Risk Vulnerability Classification

Essential Infrastructure	<ul style="list-style-type: none"> – Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure.
Highly Vulnerable	<ul style="list-style-type: none"> – Police stations, Ambulance stations and Fire stations and Command Centres required to be operational during flooding. – Electricity-generating power stations and sub-stations. – Hospitals. – Emergency dispersal points. – Residential institutions such as residential care homes, childrens’ homes, social services homes and student Halls of Residence and hostels. – Gypsy and traveller sites using caravans or mobile homes. – Mobile or park homes for permanent residential use. – Dwelling houses designed, constructed or adapted for the elderly or other people with impaired mobility.
More Vulnerable	<ul style="list-style-type: none"> – Buildings used for: dwelling houses (except for those in the highly vulnerable classification); drinking establishments; nightclubs; and hotels. – Non-residential institutions such as health services, nurseries and educational establishments, but excluding hospitals. – Landfill and hazardous waste facilities.
Less Vulnerable	<ul style="list-style-type: none"> – Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions; and assembly and leisure. – Land and buildings used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan. – Land and buildings used for agriculture and forestry. – Waste treatment (except landfill and hazardous waste). – Minerals working and processing. – Transport infrastructure.

6.5 Draft flood policy:

The Council will seek to reduce flood risk and its adverse effects on people and property in Spelthorne by:

- 1) supporting appropriate comprehensive flood risk management measures within or affecting the Borough which are agreed by the Environment Agency,
- 2) reducing the risk of flooding from surface water and its contribution to fluvial flooding by requiring all developments of one or more dwellings and all other development over 100m² of floor space in the Borough to have appropriate sustainable drainage schemes,
- 3) maintaining flood storage capacity within Zone 3 by refusing any form of development on undeveloped sites which reduces flood storage capacity or impedes the flow of flood water,

- 4) maintaining the effectiveness of the more frequently flooded area (Zone 3b) of the flood plain to both store water and allow the movement of fast flowing water by not permitting any additional development including extensions,
- 5) not permitting residential development or change of use or other 'more vulnerable' uses within Zone 3a or 'highly vulnerable uses' within Zone 2 where flood risks cannot be overcome,
- 6) supporting the redevelopment of existing developed sites in the urban area in Zones 3a and 3b for 'less vulnerable' uses where:
 - a) a minimum increase of flood storage capacity of 20% can be secured (all flood storage areas to be effective at all times throughout the life time of the structure/use and do not create unacceptable risks to people in times of flood).
 - b) it reduces impedance to the flow of flood water where there would be flowing flood water.
 - c) appropriate access for the maintenance of water courses is maintained
 - d) there is no adverse impact on the integrity and effectiveness of flood defence structures.
- 7) any development in Zones 2, 3a and 3b must be designed to be flood resilient/resistant,
- 8) all development proposals within Zones 2,3a and 3b and development outside this area (Zone 1) on sites of 0.5ha or of 10 dwellings or 1000m² of non-residential development or more, will require an appropriate Flood Risk Assessment.

Note – the flood areas identified in the policy are those defined in the Jacobs SFRA report. They will be shown on the Proposals Map with only the furthest extent of the flood outline shown.