



ENVIRONMENT
AGENCY

Project Appraisal Report

Authority Scheme Reference

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Environment Agency – Southern Region

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Sussex Ouse Flood Management Strategy 2004 Update



Flooding in Lewes – October 2000

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SoD COVERSHEET

1. EXECUTIVE SUMMARY/RECOMMENDATIONS

1.1 Introduction

This is the Environment Agency's updated Project Appraisal Report (PAR) (2004) for the Sussex Ouse Flood Management Strategy located in the Districts of Lewes and Wealden in the County of East Sussex. Preparation of a flood management strategy for the Sussex Ouse had been planned for some years, but was advanced following severe flooding of the Sussex Ouse catchment on 12 October 2000, which flooded more than 1000 properties and caused estimated financial losses of £130 million. This strategy has been prepared ahead of a Catchment Flood Management Plan (CFMP), which is programmed for 2006-07.

Compared with the original strategy (Aug 2002), this Strategy update includes major changes to Government appraisal guidelines, including reassessment of flood damages and revised discount rates with an appraisal period of 100 years. Scheme costs have been reassessed and 60% optimism bias has been included. Further details are provided in Section 2.1.2.

This updated Strategy has also included a further review of the existing condition of the Lewes river/flood walls and recommendations for future construction works. This review has involved the following tasks:

- Review of initial condition survey results, by Consultants, Black and Veatch
- Independent condition survey and review of initial survey results, by Peer Review consultants, Halcrow
- Workshop undertaken to review 'Best Estimate' costs associated with the river/flood walls, attended by the Agency Project Manager and Project Executive; representative from the Consultants, Black and Veatch; representatives from the condition survey Peer Review consultants, Halcrow; and Mackley Construction (Van Oord).
- An asset management methodology, previously produced for the Agency's Thames Region, has been used to assess the requirements for maintenance, refurbishment or replacement of the walls.

This process has been undertaken to provide better confidence to future work (and costs) required on the river and flood walls over the 100 year appraisal period. The workshop concluded that undertaking physical investigation of the walls would be uneconomic and would be unlikely to provide greater cost certainty.

For the development of the Sussex Ouse Flood Management Strategy, appropriate upstream and downstream boundaries have been identified. Hydraulic constraints and previous studies demonstrate that any flooding problems in Newhaven are not affected by fluvial flows in the Sussex Ouse. The study area therefore extends from Piddinghoe (NGR TQ 433 032) north of Newhaven, upstream to Goldbridge on the River Ouse (TQ 428 214), and from the Uck/Ouse confluence to the north-east of Buxted (TQ 524 257).

1.2 The flooding problem

The rural floodplains of the Sussex Ouse and its tributaries, including the river Uck, are regularly inundated upstream of Lewes where land management practices are well adapted to

such flooding. Outside of the urban centres of Uckfield and Lewes only around 60 properties were flooded on 12 October 2000.

In Uckfield, flooding of the High Street was experienced on three occasions in 2000 in addition to the severe flood of 12 October 2000 when 18 residential and 115 commercial, retail and public premises were flooded. The prime cause of this flooding is the small channel capacity near to the High Street bridge and the absence of any functional floodplain at this point. This report estimates that at present, flooding of the High Street in Uckfield is experienced with a return period between 1 in 10 and 1 in 15 years. In a 1 in 20 year flood, 68 properties in the centre of Uckfield are at risk of flooding. The flood damage that would be experienced in Uckfield with minimum maintenance of the river channel (Do Minimum strategy) is estimated to have a present economic value of £28.8 million over the 100 year appraisal period.

On 12 October 2000, the first flood in Lewes since 1960 flooded 613 residential and 223 other properties. Although flooding in Lewes is infrequent, damages can be severe, with 302 residential and 172 other properties at risk of flooding in a 1 in 50 year flood, which is the approximate standard of protection provided by the existing defences. The prime causes of flooding are that the floodplain through Lewes has been developed and the river channel is narrow and constricted by the small Cliffe Bridge waterway. Development over the past 400 years has prevented the floodplain from performing its natural function within the town and down to the sea at Newhaven. The flood damage that would be experienced in Lewes with minimum maintenance of flood defences (Do Minimum strategy) is estimated to have a present economic value of £61.1 million over the 100 year appraisal period.

Between Lewes and Newhaven, the floodplain is protected by flood embankments that regularly slip. The floodplain is very sparsely populated but supports major power, rail and water infrastructure as well as arable and grazed farmland, 333ha of which is a Site of Special Scientific Interest (SSSI). Around 550ha of this floodplain has been suggested as a site for inter-tidal habitat creation, though unless mitigated this would change the interest within the SSSI.

1.3 Benefits and costs of the strategy

The priority of the different elements of the recommended PAG strategy using the Defra scheme prioritisation system, which is based on economic, people and environmental criteria are set out in Table 1.1. The capital costs, present value (PV) costs, PV damage avoided, net PV, benefit-cost ratio and incremental benefit cost ratio of the PAG recommended strategy elements are set out in Table 1.2.

Table 1.1 Priority scoring for recommended strategy elements

Strategy Element		Score			
		Economic	People	Environment	Total
Lewes Cell 1	Malling Brooks	20.0	6.8	1.0	27.8
Lewes Cell 2	Cliffe	4.5	3.2	2.0	9.7
Lewes Cell 3	Town Centre West	4.3	1.0	2.0	7.3
Lewes Cell 4,5	North Street & Talbot Terrace	8.0	0.3	0.0	8.3
Lewes Cell 7	Malling Deanery	1.9	0.9	0.0	2.8
Lewes Cell 8	North Malling	1.8	4.2	0.0	6.0
Uckfield ¹		14.8	0.2	1.0	16.0

Notes:

1 Uckfield score provisional pending results of physical modelling (currently being undertaken) and subsequent appraisal analysis.

In Lewes, implementation of the scheme in Malling Brooks should proceed as swiftly as possible in view of its robust economics and high priority score. Implementation of the works proposed for Cliffe (Cell 2) is also recommended for implementation within 5 years despite the low priority score because of the high costs that are likely to arise if these works are delayed. This is based on the fact that it would cost more to replace the walls in the future following further degradation and collapse, rather repair/replace now. Delaying works in the remaining Cells in Lewes may be acceptable for up to 10 years in view of the low priority score. This decision should be reviewed in 5 years unless sufficient private finance is forthcoming to bring forward these works.

1.4 Further studies

Downstream of Lewes the Agency and English Nature have commenced studies to enable a sustainable management plan for the area to be developed. The key issues that will be investigated are:

- Potential loss or change of interest of existing SSSI features on the Lewes Brooks and opportunities for mitigation or translocation.
- Impact of potential land use changes on existing infrastructure and settlements, especially Newhaven, sited on the flood plain downstream of Lewes.
- Impact of any managed realignment of the flood defences downstream of Lewes on the estuary geomorphology.
- Assessment of the costs and benefits of engineering works required to achieve a sustainable management plan for the area including appropriate condition surveys and site investigations required to quantify key uncertainties.
- Negotiation with landowners to allow change of land use.

Within Uckfield a physical model was recommended as part of the original strategy. This model has been built and is currently being used to evaluate flood conveyance improvements in Uckfield.

Table 1.2 – Costs and Benefits of the PAG Strategy

Strategy Element	SoP % AEP	Initial capital Cost £'000s	PVc £'000s	PVb £'000s	NPV £'000s	b/c ratio	Incremental b/c ratio	Priority Score
Lewes to Newhaven		375	2,914					
Lewes Cell 1 – Malling Brooks	0.5	2,750	3,697	45,096	41,399	12.2	7.6	27.8
Lewes Cell 2 – Cliffe	1.0	2,384	5,622	15,446	9,825	2.8	4.5	9.7
Cell 3 – Town Centre West	2.0	1,777	3,702	9,719	6,017	2.6	-1.0	7.3
Cell 4 – North Street	Not Applicable (joined with Cell 5)							
Cell 4 & 5 – North Street & Talbot Terrace	0.5	4,485	6,526	29,378	22,853	4.5	5.1	8.3
Cell 6 Landport	Exist-ing	Not Applicable						
Cell 7 – Malling Deanery	1.0	266	337	493	156	1.5*	2.6	2.80
Cell 8 – North Malling	0.5	178	232	325	93	1.4*	4.6	6.07
Sussex Ouse Lewes to Gold Bridge			1,646					
Uckfield	2.9	4,496	6,143	48,691	42,548	7.9	31.9	16.0
River Uck excluding Uckfield			905					

Notes:

- 1 Recommended strategy based on PAG 3 decision rule.
- 2 Initial capital cost includes risk allowance for river wall failure.
- 3 Malling Brooks figures unchanged from Malling Brooks PAR submitted July 2003.
- 4 Initial capital costs for cells 2-8 includes 60% optimism bias, initial capital costs for Cell 1 includes 33% optimism bias as a construction Risk Register has been completed.
- 5 Uckfield figures are provisional pending results of physical modelling (currently being undertaken) and subsequent appraisal analysis.
- 6 * The benefit cost ratio for these Cells is the maximum achieved.

1.5 Consultations

During the development of the original strategy extensive consultation with stakeholders took place. This was on four levels:

- Meetings of the External Project Board made up of officers representing the three local Authorities and English Nature.

- Meetings of a Working Group comprising of 12 representatives of the local community; including County, District, Parish Councillors and business to represent a wide range of interests throughout the strategy area.
- Public meetings and exhibitions, in Lewes and Uckfield.
- Consultation with stakeholders in preparation of the Strategic Environmental Assessment.

During the preparation of the Update more limited consultation took place. The Agency held regular liaison meetings with Defra, Lewes and Wealden District Councils (LDC and WDC) and East Sussex County Council (ESCC), one Key Stakeholder meeting has been held, and four newsletters have been distributed to the general public.

1.6 Strategic Environmental Assessment

A Strategic Environmental Assessment of the Sussex Ouse Flood Management Strategy has been prepared and accompanies this document.

1.7 Opportunities for Partnerships/Contributions

Any improvement works would be carried out under Section 165 of the 1991 Water Resources Act, with support funding from riparian owners where appropriate. Responsibility for river walls rests with the riparian owners. Where flood defence improvements works are undertaken, the Environment Agency will seek an appropriate financial contribution from riparian owners, representative of the value of work carried out on the river walls on their behalf. Negotiations will take place during scheme development, in order that the scope and cost of the works and the timescales for the delivery can be agreed.

The Environment Agency will continue to work with local authorities and other third parties to identify synergies between the proposed flood defence works and other projects, so that the benefits of a multi-objective scheme can be realised where appropriate.

1.8 Recommendation

The strategy recommendations follow PAG guidelines. In Lewes, this leads to a cell-by-cell approach as a result of natural and man-made boundaries in the town. The town centre is not treated as an homogeneous community and the recommendations do not propose a common standard of defence for the four quadrants in the town centre.

The recommended strategy has the following main elements:

- Continuation, and improvement where required, of the flood warning system for the whole Sussex Ouse catchment.
- The continued maintenance of existing flood embankments between Lewes and Newhaven. This is pending the results of further work being developed in partnership with English Nature to identify a sustainable flood and environmental management plan for this whole area. A key aim of this study will be to identify how flood management changes downstream of Lewes might contribute most effectively to mitigation of flood risks in the town, taking account of environmental and other constraints. A scoping study for this work commenced in 2003/04.
- Repair and improvement of the existing flood defences in Lewes to the following Standards of Protection (SoP), subject to available funding:

- Malling Brooks 1 in 200 years
 - Cliffe 1 in 100 years
 - Town Centre West 1 in 50 years
 - North Street and Talbot Terrace 1 in 200 years
 - North Malling 1 in 200 years
 - Malling Deanery 1 in 100 years
- Encouragement of householders in Cells where community flood defence is uneconomic (Landport) to provide their own flood defences. This policy should be adopted in other flood Cells where implementation of schemes is likely to be delayed for many years because of a low priority score.
 - Encouragement of planning authorities to implement planning policy over the medium and long term, which reduces the impact of flooding to property within the floodplains. This may be achieved by:
 - Promoting redevelopment opportunities within the floodplain that will reduce the number of people and assets at risk and provide more appropriate development for the floodplain location.
 - Preventing new 'green-field' development where an appropriate standard of protection against flooding cannot be assured over the lifetime of the development.
 - Promoting land use changes that reduce the constrictions on the river imposed by existing developments.
 - Improvement of the hydraulic performance of the area around the High Street bridge in Uckfield to the maximum extent that is economically justifiable.
 - Elsewhere in the catchment, continued management of the river, structures and flood plain to ensure they progressively provide a sustainable drainage system without adverse impacts on riverside property and interests and having due regard for environmental enhancement.