



North Somerset Council Weston Area Action Plan

Environment & Utilities Report

Baseline Evidence Review

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North Somerset Council

Weston Area Action Plan

Environment and Utilities
Report

FINAL

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1 Introduction

The Weston Action Area Plan (WAAP) is proposed to take forward the Weston Area Development Framework (WADF) so that it can be progressed to adoption as a Local Development Document (LDD) within North Somerset's emerging Local Development Framework (LDF).

The WADF, published June 2005, was based on a series of environmental constraints maps for the town which informed the siting of development within the WADF. The WADF also identified specific utility requirements to serve the population of the WADF.

The reports used at the time to inform the environmental and utility elements of the WADF have been reviewed as part of this baseline report, and where necessary recently published documentation and changes in policy and environmental designations have been incorporated.

This paper covers the following areas of environment and utilities:

- Flood Management
- Air Quality
- Archaeology;
- Nature Conservation; and
- Utilities.

The sections of the report are supported by graphical representation of environmental constraints and opportunities in the Appendices.

1.1 Report Structure

The findings from the review of environment and utilities have been structured as follows:

- **Section 1 – Introduction:** The purpose and content of the report
- **Section 2 – Flood Management:** Background on flood risk status in Weston, relevant legislation and the findings of two Pre-Feasibility reports for the River Banwell and the Uphill Great Rhyne and the sea defences PAR. Section 2 also includes a review of the *Weston-super-Mare Strategic Flood Risk Assessment* prepared by Royal Haskoning in April 2006.
- **Section 3 – Air Quality:** Summary of the proposed development proposals that could change air quality and identification of the key issues
- **Section 4 – Archaeology:** Summary of how the historical and cultural heritage of Weston could affect the proposed development proposals and identification of the key issues
- **Section 5 – Nature Conservation Designations:** Summary of how the nature conservation of Weston could affect the proposed development proposals and identification of the key issues
- **Section 6 – Utilities:** Summary of the infrastructure requirements for the development proposals based on the existing infrastructure network and identification of key issues. Contaminated land issues are included in this section.
- **Section 7 – Conclusions:** Summary of the key findings from the review.

- **Section 8 – References**
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2 Flood Risk

2.1 Background

In March 2005 North Somerset Council, on behalf of the Weston Vision Partnership, commissioned Royal Haskoning to undertake the Weston Flood Management Study. The findings of this study were not however published until April 2006. In the absence of a published strategic flood risk assessment for the town, the WADF was prepared on the basis of flooding information provided by the Environment Agency.

The publication of the Strategic Flood Risk Assessment (SFRA) in April 2006 replaced all of the flooding assumptions that underpinned the WADF. Rather than update the WADF it is more expedient to establish the impact of the findings of the SFRA on the WAAP. The SFRA for the area covered by the Weston Regeneration Area aimed to:

- Provide reference and policy document that would be part of the evidence base to inform the Local Development Framework and any subsequent plans;
- To ensure that North Somerset Council meet their obligations under the latest planning guidance (PPG25);
- To begin to shape a strategy for dealing with flood risk in Weston-super-Mare'
- To provide a tool to inform the development control process about the potential risk of flooding associated with future planning applications and to form the basis for requesting and development specific Flood Risk Assessment, as necessary.
- The SFRA sought to provide an overview of the whole of the Weston Regeneration Area and concludes the first phase of the strategic flooding study.

Flooding from a variety of different mechanisms is discussed including tidal fluvial and surface water flooding. It is evident that Weston is at risk of flooding from all 3 of the mechanisms, the risks are discussed as follows:

- **Tidal Flooding:** Much of W-s-M is below the mean high water springs water level of 6.0m OD. Without defences, flooding due to high still water levels would occur frequently. W-s-M has a variety of tidal defences. To the north of the area, there are flood banks and New Bow sluice which prevent tidal waters entering the town. The banks and gates give a 1 in 200 year protection. The low area of Uphill and to the south of W-s-M is protected by flood banks and sluices which also offer 1 in 200 year flood protection.

The area from Knightstone Island to the southern end of Marine Parade is protected by sea walls. These defences currently have a standard sea defence of between 1 in 5 and 1 in 10 years¹.

- **River Flooding:** River fluvial flooding in W-s-M arises from the 2 separate catchments of the River Banwell and Uphill Great Rhyne. Extensive work including hydrological analysis and hydraulic modelling has been undertaken in the Weston Flood Management Study. There are 3 main problems which affect both catchments. These are river channel capacity, conveyance and tide locking. Flooding in both catchments is caused by a combination of these problems.
- **Surface Water Flooding:** In urban areas such as Weston rainfall runoff is collected by a drainage or sewerage system. In periods of heavy rainfall these systems can fill up and fail to drain the surface water. Much of the town

¹ Weston Seafront Strategy Study, Royal Haskoning, July 2004)

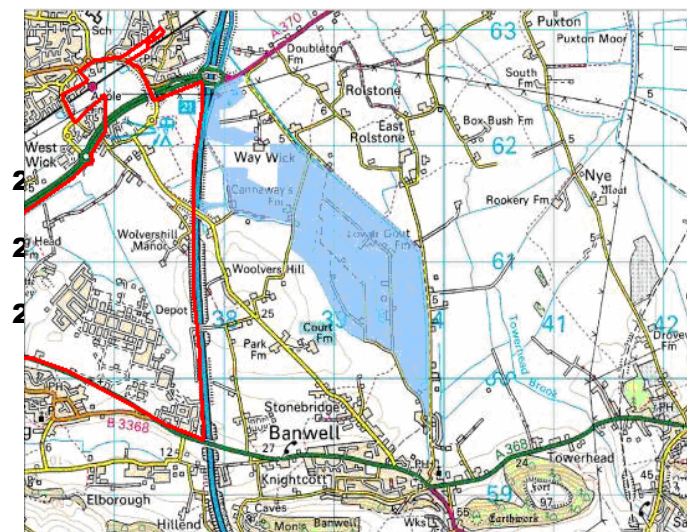
centre is drained by a Victorian sewer system which drains to Black Rock pumping station. Capacity improvements have been made to the Black Rock pumping station which means that flooding in the town centre from surface water flooding is now less likely.

Areas to the east of the town including Worle have separate surface water drainage systems. Generally, these areas drain by gravity to the rivers and the rhynes areas, but some are pumped. Parts of the town such as Worle may only have an old inadequate system and may therefore be at risk of flooding from surface water. This potential surface water flooding is not included in the Environment Agency Flood Zone.

River Banwell Catchment

The majority of flooding from the River Banwell occurs on Banwell Moor shown in Image 1 opposite. This area consists mainly of farmland which is used for grazing livestock. The area is very low lying and is a natural flood plain. Schemes to protect the property in this area would either have to be very large in scale or centred on the use of individual property protection systems. There is no upstream area that can provide the volume of storage that is currently provided by Banwell Moor. Preventing flooding on Banwell Moor would increase water levels in the urban areas downstream. The SFRA recommends that no scheme is pursued to alleviate flooding. The SFRA recommends that the area of Banwell Moors be used as flood storage to facilitate future development proposed in the areas of West Wick, Worle and RAF Locking.

Figure 1: Flood extents on Banwell Moor



Uphill Great Rhyne Catchment

Flooding in the Uphill Great Rhyne catchment covers a number of different areas. The main areas of study are:

- 1) Bournville Road Area
- 2) Cricket Ground and Boundary Close
- 3) Coleridge Road Area
- 4) Winterstoke Road Playing Field
- 5) Weston Airfield
- 6) Locking Moor

Figure 2: Flood extents - Uphill Great Rhyne and Cross Rhyne areas 1 - 6

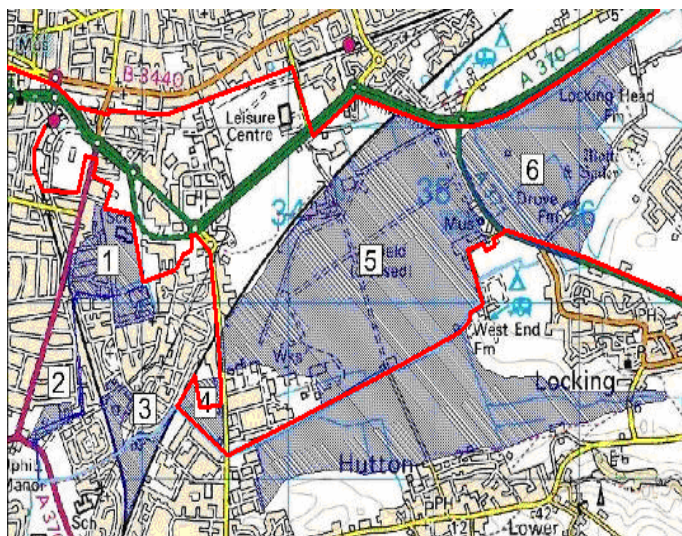


Image 2 above shows the modelled flood extent for a 1 in 100 year event for the Uphill Great Rhyne and Cross Rhyne. The areas that fall within the WAAP boundary are reviewed in more detail below:

- Area 4: Winterstoke Road Playing Field
Area 4 floods due to discontinuous flood banks adjacent to Cross Rhyne. The land affected is playing fields and it is unlikely that any existing properties would suffer from internal flooding in the area during an extreme event.
- Areas 5 & 6: Weston Airfield and Locking Moor
The flood extent of areas 5 and 6 covers Weston Airfield, the valley between Hutton and Locking villages, and some of Locking Moor. Where development exists ground levels have been raised.

An assessment within the SFRA was made of the potential benefits of protecting the currently developed areas at risk of flooding within the Uphill Great Rhyne Catchment. This found that for a scheme protecting the existing development to a standard of 1 in 100 years could produce benefits of some £15million over the life of the scheme.

The current planning policy on flood risk, Planning Policy Guidance 25: Development and Flood Risk (PPG25) was published in July 2001 (and is due for revision in mid-2006 as a Planning Policy Statement). PPG25 is intended to provide guidance to local planning authorities to ensure flooding is taken as a material consideration during the planning process. The guidance advocates a sequential approach to managing flood risk, which should ensure that further land development avoids the areas of highest risk, and where development is considered favourable over flooding issues, that appropriate measures are carried out to create a safe development.

PPG25 also requires the impact of climate change to be considered. The SFRA report carried out modelling which included a 50% increase in flows due to uncertainty.

It is clear from the SFRA that W-s-M is vulnerable to flooding as a result of parts of the town and its environs occupying the natural flood plain area and, therefore, these areas could be affected by flooding from rivers and/or the sea. These flood risk areas and the WAAP boundary are shown in Figure 1 in the appendices of this report

There are only two locations (occupying a relatively small area) within the WAAP that currently have no flood risk; Hutton Moor is an area of higher ground located immediately

northwest of Weston Airfield, and the motte and bailey to the northwest of RAF Locking.

2.5 Flood Risk Areas

When a local planning authority is considering its response to a planning application, PPG25 expects a risk-based approach to flood risk and explicitly describes the need to apply a sequential test for considering the relative risk of flooding in the location of interest. Essentially, this means that the location will fall into one or more of three flood risk zones (as indicated in PPG25):

Zone 1 Areas with little or no risk: These are suitable for development and, therefore (with respect to the flood risk issue only), can be termed 'priority' development areas;

Zone 2 Low to Medium Risk: Suitable for most development, but generally excluding essential civil infrastructure, e.g. hospitals, fire stations etc.

Zone 3 High Risk: Developed areas may be suitable for residential, commercial and industrial development provided the appropriate minimum standard of flood defence can be maintained for the lifetime of the development. Undeveloped and sparsely populated areas are generally not suitable for residential, commercial and industrial development unless a particular location is essential, e.g. essential transport and utilities infrastructure, and an alternative lower-risk location is not available.

The guidance in PPG25 and the EA Vulnerability Maps suggest that if a development strategy for the WAAP were to be based solely on flood risk factors, the phasing of the development should be as described in Table 1 with only the development of the Locking Urban Village being progressed in the same phase as proposed in the WADF; however, this

phasing does not take into account other economic, social and environmental factors.

Table 1 Development Sequence of WADF Regeneration Areas and Neighbourhoods based on relative flood risk

Area/Neighbourhood	Flood Risk Zone	Phase
RAF Locking Urban Village	1 (Little or No Risk)	1
Rhynes	2-3 (Mostly Low to Medium Risk)	2
Airfield	2-3 (Mostly Low to Medium Risk)	3
West Wick & Worle	1-3 (Mostly Low to Medium Risk, some High Risk)	4
Town Centre & Seafront	1-3 (Mostly High Risk)	5
Town Centre Gateway	1-3 (Mostly High Risk)	6

These flood risk areas and the WAAP boundary are shown in Figure 1 (as of December 2005) (see Appendix One), and can be explained as follows:

- Flooding from rivers or sea without defences:
 - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance or greater of happening each year;
 - For flooding from the sea the map indicates the extent of a flood with a 0.5% (1 in 200) chance or greater of happening each year;
- Extent of an extreme flood with a 0.1% (1 in 1000 chance of happening each year).

There are only two locations (occupying a relatively small area) within the WAAP that currently have no flood risk; Hutton Moor is an area of higher ground located immediately northwest of Weston Airfield, and the motte and bailey to the

northwest of RAF Locking. Flood defences that have been built in the last 5 years (to a certain standard) are also shown on Figure 1.

2.6 Strategic Flood Risk Assessment update on the WADF

The Government aims to reduce the risk to people and the developed and natural environment from flooding by discouraging further built development within floodplain areas. The WADF set out a series of neighbourhoods, of which a number were within the identified flood plain,

Town Centre & Seafront: Regeneration of this area comprises redevelopment of several key sites and initiatives such as 'Civic Pride' and landmark buildings. The area is highly developed. The majority of this area is currently in Flood Zone 3a and is at risk from tidal flooding.

North Somerset Council is currently promoting a tidal defence scheme which aims to protect the area from tidal flooding. As a scheme is currently being promoted for this area the SFRA did not address the town centre and seafront.

Town Centre Gateway: Development in this area mainly comprises of mixed use, retail and leisure development. Parts of this area are currently within Flood Zone 3a due to the risk of tidal flooding.

The coastal flood defence scheme being promoted by North Somerset Council would also protect this area.

Weston Airfield: This area is shown in the WADF as containing a mixture of residential, employment and leisure

use developments. The majority of the land is currently in Flood Zone 3a as part of this area is already developed.

Flood Zone 3a "may be suitable for some development provided a minimum standard of flood defence can be maintained". Any development within this area will therefore require a flood risk assessment and mitigation measures will need to be taken to allow development in this area.

Rhynes: Development in this area is shown in the WADF as comprising residential mixed use with some strategic open space. Much of this development would take place on previously undeveloped land. The majority of this site is in Flood Zone 3c – functional floodplain.

RAF Locking: This area is shown in the WADF as containing a mixture of employment and residential development as well as open spaces. Some of the site is within Flood Zone 2 and is therefore "suitable for most types of developments".

The constraints of development will need to deal within increased surface water runoff.

West Wick and Worle: This area is shown in the WADF as containing a mixture of employment and residential development as well as open spaces. The majority of this site is within Flood Zone 2 and is therefore "suitable for most types of development".

The constraints to development will be the need to deal within increase runoff.

2.7 Strategic Flood Risk Assessment for the AAP

This section of the report seeks to provide the framework of flooding constraints which will be used in the options stage of

the WAAP process. PPG25 states that when allocating sites for development that sites should be identified in descending order of flood risk. The order of preference for the development of sites within W-s-M in the context of the WAAP, and based on the flooding constraints are as follows:

- **RAF Locking – Flood Zone 1/2**
Suitable for most development except strategic infrastructure
- **West Wick and Worle – Flood Zone 2**
Suitable for most development except strategic infrastructure
- **Town Centre Gateway – Flood Zone 3a**
Suitable for residential development provided the appropriate minimum standard of defence is provided. This may be achieved by the sea defence scheme proposed for the town
- **Town Centre and Seafront – Flood Zone 3a**
Suitable for residential development provided the appropriate minimum standard of defence is provided. This may be achieved by the sea defence scheme proposed for Weston
- **Weston Airfield – Flood Zone 3a**
Suitable for residential development provided the appropriate minimum standard of defence is provided
- **Rhynes Neighbourhood – Flood Zone 3c**
Development must be wholly exceptional.

The SFRA provides guidance for development planning to undertake development in Weston. Guidance is provided for each development area and is general guidance only. The guidance covers most development however essential civil infrastructure such as hospitals, fire stations, emergency depots etc may have more rigorous requirements. As the Weston Strategic Flood Risk Assessment is developed the guidance contained in the published SFRA will be updated. The guidance for each development area is:

RAF Locking

For development in this area developers should

- Undertake a site specific flood risk assessment;
- Ensure that finished floor levels are 600mm above the 1 in 100 years plus climate change flood level;
- Ensure that finished ground and road levels are 300mm above the 1 in 100 plus climate change flood level;
- Ensure that flood storage on the site is not reduced
- Ensure that the development does not impede flows;
- Ensure there is a strategy for dealing with any increased runoff. This could be in the form of on site storage, offsite storage or a combination of both.

West Wick and Worle

For development in this area developers should:

- Undertake a site specific flood risk assessment;
- Ensure that finished floor levels are 600mm above the 1 in 100 year plus climate change flood level;

- Ensure that flood storage on the site is not reduced;
- Ensure that the development does not impede flows;
- Ensure there is a strategy for dealing with any increased runoff. This could be in the form of on site storage, offsite storage or a combination of both.

Town Centre Gateway

For development in the town centre gateway developers should:

- Undertake a site specific flood risk assessment;
- Satisfy planners and the Environment Agency that their property will be protected against a 1 in 200 year plus climate change tidal event. It is likely that most properties will be protected by the scheme promoted by NSC;
- Ensure that finished flood levels are 600mm above the 1 in 100 year plus climate change fluvial flood level;
- Ensure that finished ground and road levels are 300mm above the 1 in 100 year plus climate change fluvial flood level;
- Ensure that flood storage on the site is not reduced;
- Ensure that the development does not impede flows;
- Ensure there is a strategy for dealing with any increased runoff; and
- Ensure that safe access and egress are maintained.

Town Centre and Seafront

Development in this area can be divided into two main areas:

- Development set back from sea wall; and
- Development directly adjacent to sea wall (for example Knightstone Island, Tropicana and Birnbeck Island)

In both cases the following actions should be undertaken by developers however it is expected that there will be more onerous requirements for properties directly adjacent to the seawall. For development in this area developers should:

- Undertake a site specific flood risk assessment;
- Satisfy planners and the Environment Agency that their property will be protected against a 1 in 200 year plus climate change tidal event. This may be covered by the sea defence scheme promoted by North Somerset Council however some properties may require additional works. Ensure that flood storage on the site is not reduced;
- Ensure that the development does not impede flows;
- Ensure there is a strategy for dealing with any increased runoff;
- Ensure that protection from coastal erosion is considered; and
- Ensure that safe access and egress are maintained.

Weston Airfield

For development in this area developers should:

- Undertake a site specific flood risk assessment;
- Ensure that the development will be protected by a 1 in 100 year plus climate change fluvial event. This may be done by a combination of the following measures:

- raising finished floor levels and finished ground levels;
- provision of flood storage;
- local flood defences in the form of banks or walls; and
- Modification to structures which impede flow.
- Ensure that flood storage on the site is not reduced;
- Ensure that the development does not impede flows;
- Ensure there is a strategy for dealing with any increased runoff. This could be in the form of on site storage, offsite storage or a combination of both; and
- Ensure that safe access and egress are maintained.

Further details of the proposed option for flood defence for the catchment is being developed as part of the Detailed Strategic Flood Risk Assessment. This will give developers more details on their obligations with regard to protecting their properties from flooding and providing the necessary flood storage.

Rhynes

For development in this area developers should:

- Undertake a site specific flood risk assessment;
- Ensure that the development will be protected in a 1 in 100 year plus climate change fluvial event. This may be done by a combination of the following measures:
 - Raising finished floor levels and finished ground levels;
 - Provision of flood storage;

- Local flood defences in the form of banks or walls; and
- Modification to structures which impede flows.
- Ensure that flood storage on the site is not reduced;
- Ensure that the development does not impede flows
- Ensure there is a strategy for dealing with any increased runoff. This could take the form of on site storage, offsite storage or a combination of both; and
- Ensure that safe access and egress are maintained.

Further details of the proposed options for flood defence for the catchment will be developed as part of the Detailed Strategic Flood Risk Assessment. This will give developers more details on their obligations with regard to protecting their properties from flooding and providing the necessary flood storage.

2.8 Strategic Options for Flood Management within the WAAP

The published SFRA includes a number of flood management options for each catchment. Each of these options will be refined during the next stages of the SFRA study, and a preferred option will be chosen on the basis of economics, environmental factors, regeneration and technical feasibility. Consultation on the preferred flood management options will be consulted upon to gain potential partners and to identify a procurement strategy. The options are as follows:

River Banwell Options

The options for flood management in the River Banwell catchment seek to deal with the increased runoff that is expected should the areas of West Wick, Worle and RAF Locking be developed further.

- Option 1 – Do Nothing: In this option no operations or maintenance would be carried out for the River Banwell. This option therefore has no cost attached to it.
- Option 2 – Do Existing: The existing operation and maintenance regime would continue for the River Banwell; however no capital scheme would be undertaken.
- Option 3 – Do Maintenance: The maintenance regime on the River Banwell would be increased. This would include more weed cutting and clearing, rubbish removal and bank repairs.
- Option 4 - Storage on Banwell Moor: This option would formalise flood storage on the area known as Banwell Moor. This would be achieved by constructing at least 2 new control structures; 1 located on the River Banwell Rhyne and 1 on Old Yeo to open water during a flood event. This would reduce water levels downstream in the River Banwell so that water from the West Wick and Worle and RAF Locking could drain freely. This option would make flooding more frequent and severe on Banwell Moor.

As more development is added the flows from the developed area into the River Banwell may increase. At present the drainage path is through narrow rhynes and crosses the motorway in a culvert. The second phase of this option is therefore to upgrade the drainage paths to the River Banwell. This could be achieved by creating a

second culvert under the motorway and widening the rhynes including Old Yeo and West Moor Rhynes.

This option could be undertaken in 2 phases, the first being the creation of a storage area on Banwell Moor. The estimated cost of this phase as set out in the SFRA is **£3,020,000**. The second phase of works which includes capacity works and a new culvert under the M5 motorway has been estimated in the SFRA to cost **£2,980,000**. In total Option 4 would cost

£6,000,000.

- Option 5 – New Watercourse between the River Banwell and Congresbury Yeo: A new channel would be constructed between the River Banwell and the Congresbury Yeo to allow more water to be drained from Banwell Moor and provide additional flood storage. This option would require the excavation of a large channel, and 2 new control structures; one to control the junction between the River Banwell and the new watercourse and a second to control outfall into the tidal estuary of the Congresbury Yeo.

This option also has the potential to incorporate river habitats and wetland enhancements along the new watercourse. The estimated cost for this option as set out in the SFRA is **£7,280,000**.

Uphill Great Rhyne Options

The options for flood management in the Uphill Great Rhyne catchment seek to reduce flood risk to existing property while reducing flood risk to future development and dealing with increased runoff that would arise from this development. The development areas within the Uphill Great Rhyne catchment

as identified in the WAAP are Weston Airfield, the Rhynes and parts of RAF Locking. The SFRA stresses that it would be wholly unacceptable to develop the Rhynes. This area was not therefore catered for in the flood management options contained in the SFRA. The options for the Uphill Great Rhyne flood catchment are as follows:

- Option 1 – Do Nothing: In this option no operations or maintenance would be carried out for the Uphill Great Rhyne and Cross Rhyne. This option therefore has no cost attached to it;
- Option 2 – Do Existing: The existing operation and maintenance regime would be continued for the Uphill Great Rhyne and Cross Rhyne however no capital scheme would be undertaken.
- Option 3 – Do Maintenance: The maintenance regime on the Uphill Great Rhyne and Cross Rhyne would be increased. This would include more weed cutting and clearing, rubbish removal and bank repairs;
- Option 4 – Upstream Storage: Under Option 4 flood storage would be created on or adjacent to Weston Airfield. To provide storage required a combination of dedicated areas, new rhynes and rhyne widening would be needed. Widening of Cross Rhyne could be achieved by removing the central bank between Cross Rhyne and the adjacent rhyne. The material removed could be used to create flood banks to protect areas. There is also a culvert running under Weston Airfield that could be made into an open channel to provide more storage. Dedicated storage reservoirs would also be needed either on the Weston Airfield site or adjacent to the site. The estimated cost of this option is **£5,640,000**.
- Option 5 – Downstream Storage: There are several open spaces adjacent to Cross Rhyne and Uphill Great Rhyne that could be considered for downstream storage. Storage would be achieved in these areas by lowering ground levels and using the material to create bunds to enclose the storage areas. While this option could be investigated further as part of a larger option it is unlikely that this option would provide sufficient storage in the correct areas to facilitate future development;
- Option 6 – Constriction Removal and Channel Widening: Uphill Great Rhyne and Cross Rhyne are constricted by a constriction and widen the channel at pinch points. This would achieve 2 things; firstly there would be more storage in the system and secondly more water could be discharged during low tide periods. This option would require modification of at least 9 structures including 2 major road structures and 2 major rail structures. This option should improve the situation for existing development. The estimated whole life cost of this option is **£12,050,000**.
- Option 7 – Constriction Removal and Channel Widening and Pumping and Storage: This option combines options 4 and 6 and includes pumping. The constrictions to flow would be removed as for Option 6 however additional discharge capacity would be gained during flood events by pumping water from Uphill Great Rhyne into the Uphill Pill. Flood storage would also be created on Weston Airfield to relieve pressure on the system at the upstream end. This solution would benefit both existing development and could provide sufficient storage to facilitate future development.

The estimated whole life cost of this option would be **£15,190,000**.

2.9 Key Issues

This review has identified the following key issues with respect to development and flood management:

- A sequential approach to determining the suitability of land for development in flood risk areas is central to the guidance and should be applied at all levels of the planning process;
- Landowners have the primary responsibility for safeguarding their land and other property against natural hazards such as flooding. Individual property owners and users are also responsible for managing the drainage of their land in such a way as to prevent, as far as is reasonably practicable, adverse impacts on neighbouring land;
- Reducing flood risk to and from new development through location, layout and design, including the application of a sustainable approach to drainage;
- Using opportunities offered by new development to reduce flood risk to communities;
- Only permitting development in areas of flood risk when there are no suitable alternative sites in areas of lower flood risk and the benefits of the development outweigh the risks from flooding;
- For development at RAF Locking provision for increased runoff into the River Banwell and Uphill Great Rhyne catchments is essential;
- For development at West Wick and Worle provision for increased runoff into the River Banwell catchment is essential;
- Development in the town centre Gateway can be undertaken provided sea defence works provide a 1 in 200 year standard of defence;
- Development in the town centre and seafront can be undertaken provided sea defence works provide a 1 in 200 year standard of defence;
- For development in the Airfield area flood defence scheme which provides a 1 in 100 year standard of defence (to the new development) is required with no net loss of storage and no impact on down stream areas;
- For development in the Rhynes area there must be a wholly exceptional justification;
- Options for dealing with the flooding issues at West Wick and Worle and RAF Locking estimated to cost between £6m and £7.28m;
- Options for dealing with flood management issues at Weston Airfield and the Rhynes estimated to cost between £4.64m and £15.19m;
- *Options for dealing with flood management issues in Weston would be unlikely to attract DEFRA funding and the works would have to be paid for by developers.*
- Further studies should target projects for reducing the flooding potential in certain areas of the AAP area to mitigate the upfront costs of flood alleviation works, subject to EA and local planning authority approvals.
- The Royal Haskoning Strategic Flood Risk Assessment is only the first phase of a more detail assessment of flooding in the town. The full findings are not expected until September/October 2006.

- It is acknowledged that there may be a potential conflict between flood defence works and nature conservation designations.

Next Steps

- With respect to the key issues outlined above, the next steps in the WAAP should include:
- Continued consultation with the EA on their expectations and requirements for developing the area outlined in the WADF.
- Ensure that the need to manage flood risk is taken into account in the generation and evaluation of options.
- Consultation should continue with the EA, English Nature and non-statutory organisations on the potential impact of development proposals on nature conservation designations.

3 Air Quality Constraints

Although the issue of air quality has not been specifically considered in the WADF, there are sections of the report on Sustainable Energy and Transport that either make a brief reference to the subject (i.e. carbon dioxide emissions from energy production) or can be related to air quality (i.e. proposed transport modes).

The development strategy includes the provision of alternative energy sources and the intention to minimise energy usage. Low energy buildings and fuel efficient modes of transportation are promoted along with the provision of a combined heat and power plant linked to a community energy network. These measures are likely to have a positive effect on air quality; the WADF estimated that there could be a carbon reduction of approximately 30%, measured against projected carbon levels in the future. The use of alternative energy is promoted with a minimum target of 10% from renewable sources by 2020 for the Weston region (mainly through wind turbines). The inclusion of a network of cycle and footpaths linking the development areas, improved rail facilities at Worle and consideration of incorporating ULTra (an electric driverless taxi) into the proposals should improve air quality. However, the range of transport improvements related to road use (private car and bus) may cause some deterioration in air quality. This subject will be considered further as part of the SEA for the AAP and individual site EIAs.

3.1 Key Issues

The key issues on air quality are:

- any anticipated improvements in air quality through sustainable energy and transportation measures should be promoted at the earliest opportunity

- management of air quality during construction

4 Archaeology and Cultural Heritage

The WADF Technical Appendices (Appendix E2) presents the historical development of Weston in a detailed chronology on the evolution of Weston-super-Mare from Pre-History to the modern day, summarising the contents of various publications. For example, there is evidence of Iron Age and Roman occupation in the town, close to the seafront. An 'Environmental and Cultural Heritage' figure (Figure D11 of WADF Appendix E2 reproduced below) highlights Scheduled Ancient Monuments and the report also refers to excavation findings at various locations in Weston. The motte and bailey located to the northwest of RAF Locking is a Scheduled Ancient Monument. The motte and bailey area is proposed as a strategic open space within the WADF. A more thorough assessment of the archaeological potential of the WADF development area will be covered by the SEA and site EIAs.

4.1 Key Issues

The key issue on archaeology and cultural heritage are:

- Seafront development is likely to be the key location of archaeology conflict;
- A large proportion of Weston's town centre and seafront is designated as a conservation area.

5 Nature Conservation Designations

National, European and international nature conservation designations were noted in the Flood Risk review section. Appendix E2 of the WADF Technical Appendices volume contains a figure (Figure D8; reproduced below) that identifies Sites of Special Scientific Interest and Nature Reserves in Weston and the surrounding area. This indicates that the seafront is the area with the highest density of designations because it borders Weston Bay, which has multiple international and European designations (SPA, SAC and Ramsar) and is nationally designated (SSSI). It should be noted that the EA and English Nature are supportive of the sea defence proposals and no significant impact is envisaged on these designated areas. Nevertheless, the potential impact on designations from any fluvial works on the River Banwell and Uphill Great Rhyne still remains. There appears to be an absence of designated sites within the remainder of the WAAP boundary.

The development proposals appear to be mindful of the impact of transforming the existing area between the eastern limits of Weston and the M5, which is largely 'greenfield'. For example, the visual impact has been noted in the WADF report.

5.1 Key Issues

The key issue on nature conservation designations is:

- Continued consultation with English Nature, EA and other statutory and non-statutory organisations on development proposals

Figure 3 Archaeological Constraints (WADF, 2005)

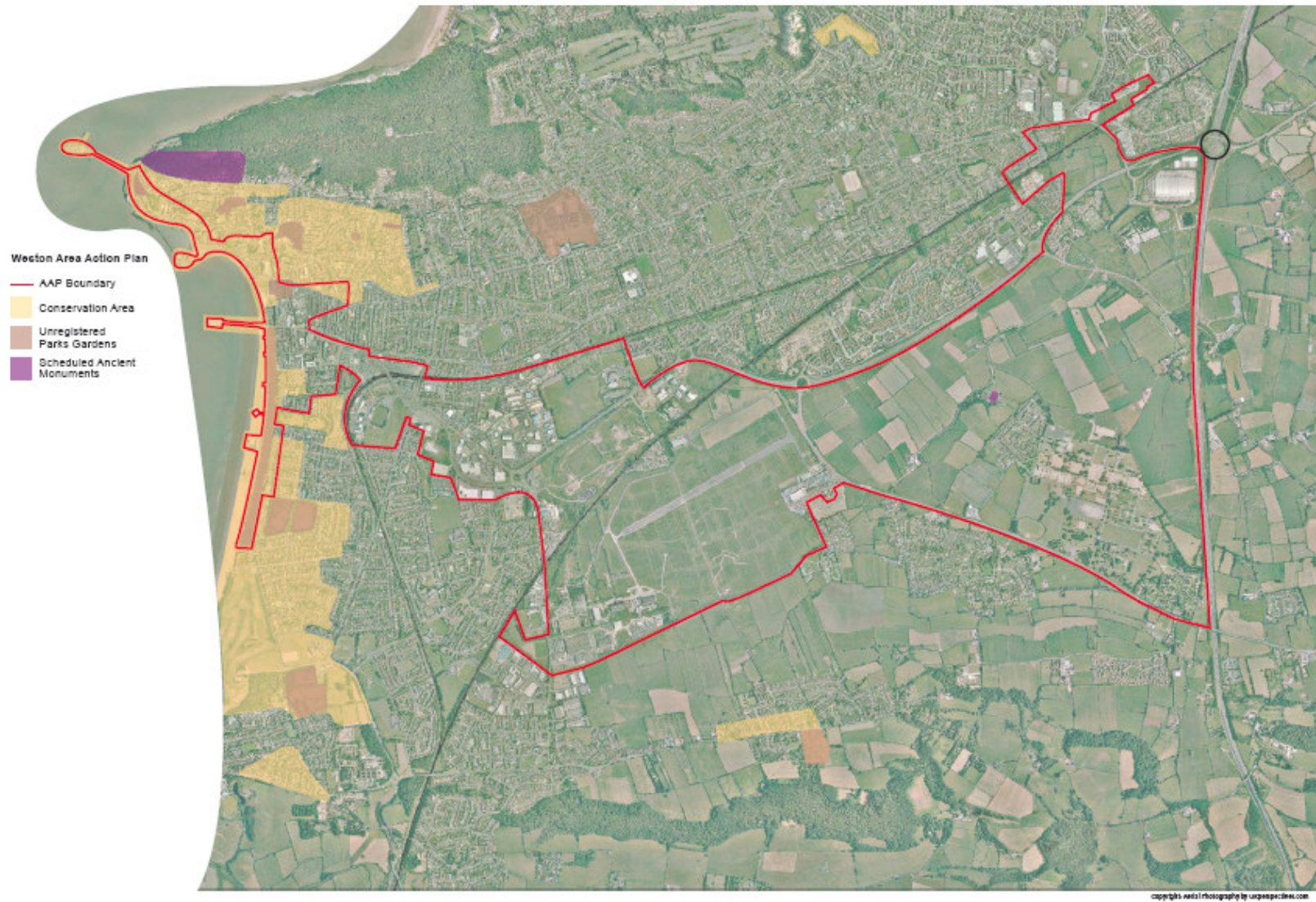


Figure 4 Nature Conservation Designations Constraints
(WADF, 2005)



6 Utilities

The WADF has consulted the statutory infrastructure service providers to gauge the deliverability of the proposals. A brief summary of their responses is bulleted below. In addition, Arup have dispatched letters to service providers (January 2006) to seek clarification on the impact of the proposals on service demands with respect to the programme phasing. This section also includes a brief summary on contaminated land.

6.1 Gas

- Capacity available in existing network to accommodate the development

6.2 Electricity

- Additional substations will be required to meet demands of the development

6.3 Water

- Early phases of development can be accommodated
- Latter phases may require an increase in reservoir storage requirements

6.4 Sewerage

- Inadequate capacity in foul network to service the development
- Extensive upgrading will be required to main sewers, pumping stations (RAF Locking) and, potentially, sewage treatment works

- Ingress of surface water into existing foul network would free up capacity in the foul network

6.5 Telecommunications

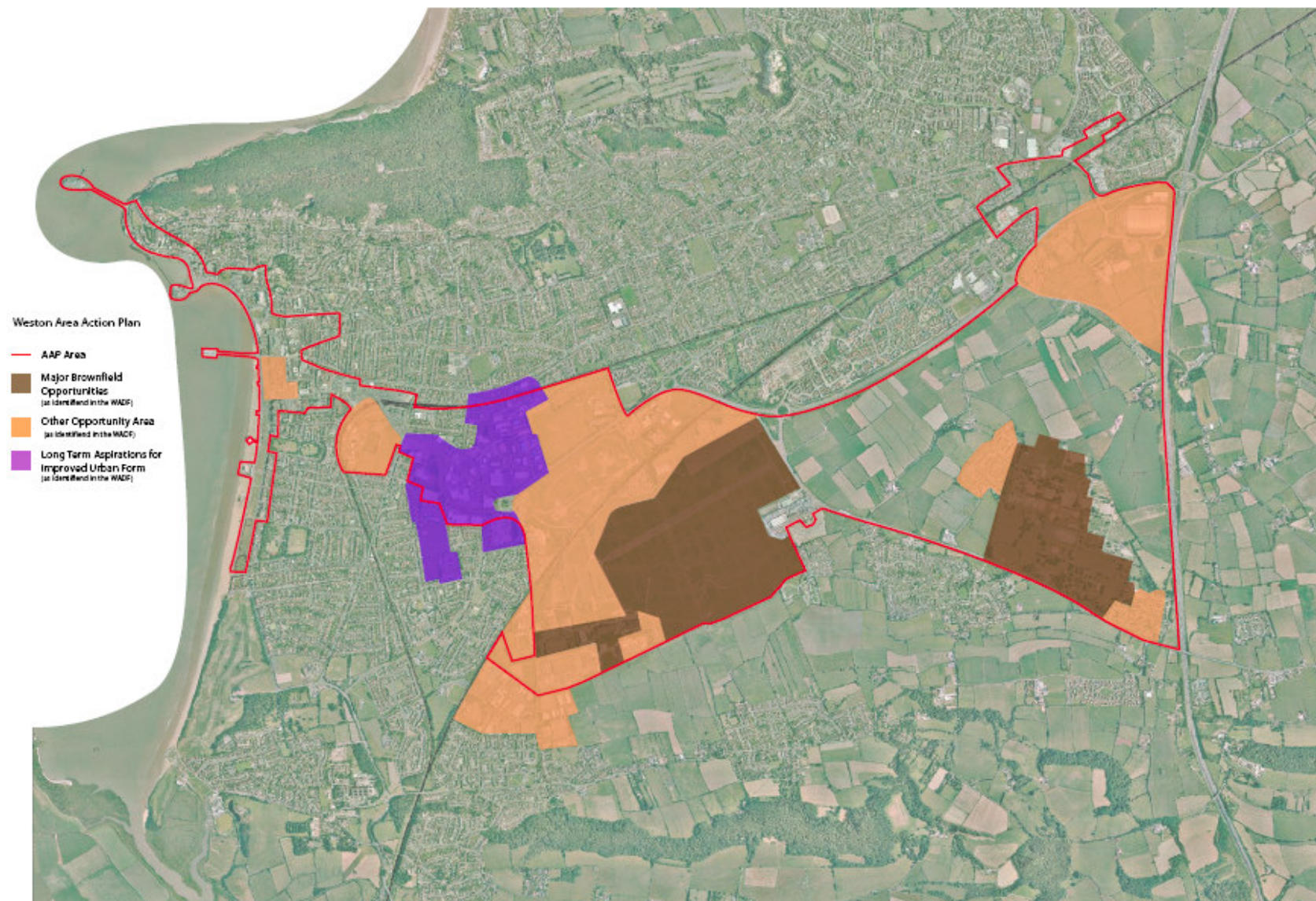
- BT does not charge for the provision of new wire services to new developments
- New fibre supplies would need to be paid for by the development
- Broadband available in Weston but not Locking area
- No cable supplies

6.6 Contaminated Land

Based on the historical development of Weston, it is anticipated that there is a risk of soil contamination in several areas. The type, magnitude and geographic extent of residual contamination are unknown, which would necessitate the requirement for a suitable site specific ground investigation to underpin the development proposals.

A number of areas are recognised as being potentially contaminated (Figure D12 in Appendix E2 of the WADF Technical Appendices shows major brownfield sites; reproduced below). The most contaminated area is likely to be the Gas Works, located off the western end of Winterstoke Road (Town Centre Gateway area). Old clay workings at Winterstoke Road provide an area of potential contamination and landfill gas risk, as does the Hutton Moor Landfill site. Although RAF Locking is generally uncontaminated, areas of elevated contamination have been previously identified. Weston Airfield is likely to be a source of contamination due to the presence of former fuel tanks, maintenance sheds, and general use of various toxic

Figure 5 Contaminated Land (WADF, 2005)



and hazardous substances. The same applies to GKN Westland's factory at the Weston Euro Park.

6.7 Key Issues

The key issues on utilities are:

- Developers will have to make significant contributions to improve infrastructure;
- Foul sewerage network needs upgrading;
- Possibility of water supply storage improvements;
- Electricity investment required;
- Obtain clarification from utility organisations on the impact of proposals with respect to the phasing programme (letters dispatched January 2006)

With respect to contaminated land the key issues are:

- Initiate ground investigations early in the programme for those areas expected to be contaminated to allow remedial works programme;
- Avoid areas of potential contamination wherever possible.
- Masterplan's should be flexible on the suitability of land uses based on the findings of the ground investigations.

7 Conclusions

The review of the WADF reports, and the Strategic Flood Risk Assessment (April 2006) have highlighted and, in some cases, reiterated key issues that could influence the development proposals for Weston. These issues could affect the cost, programme and layout of the proposals. Based on the subject themes investigated, the findings of the review are summarised in Box 1 below.

Box 1 Key findings from Infrastructure, Utilities and Constraints Review

1. Flood alleviation works are potentially needed to secure development in selected areas of the WADF/WAAP.
2. The flooding potential status will continue to evolve as further flood studies are undertaken, which could mitigate the need for flood alleviation works.
3. Implementation of sea defence improvement proposals will aid the regeneration of the seafront and town centre.
4. The EAs support for the development proposals is conditional on full risk assessments being undertaken by the partners/developers in those areas where high flood potential remains.
5. Continued consultation with statutory and non-statutory consultees (EA, English Nature, RSPB etc.) to integrate development and areas with nature conservation designations.
6. Infrastructure upgrading will require significant developer contributions, which need further clarification with respect to the phasing programme.
7. A requirement for ground investigations should be anticipated in several areas.

8 References

Planning Policy Guidance 25: Development and Flood Risk (2001) Office of the Deputy Prime Minister.

Weston Area Development Framework, Final Report (June 2005) Gillespies.

Weston Area Development Framework, Technical Appendices (June 2005), Gillespies.

Weston-super-Mare, Strategic Flood Risk Assessment (April 2006), for Weston Vision Partnership by Royal Haskoning.

Weston Seafront Defences. Project Appraisal Report (October 2005), For North Somerset Council, Royal Haskoning.

Weston-super-Mare Flood Management Study: River Banwell Pre-Feasibility Report (May 2005), Draft Report, 9R1527, Royal Haskoning.

Weston-super-Mare Flood Management Study: Uphill Great Rhyne Pre-Feasibility Report (May 2005), Draft Report, 9R1527, Royal Haskoning.

Appendix A1

Flooding Extent

