

PLANNING ADVICE FOR INTEGRATED WATER MANAGEMENT

Supplementary Case Studies



Prepared as part of the Cambridge Natural Capital Leaders Platform
Sink or Swim Water Collaboratory

Summary

Many planners do not think about water issues in a joined-up way, and until now there has been no single source of information on how the water sector works. There is a growing awareness of the important role of planning in joining up land use and water management. But there is a need to get the message across to planners that water is important and getting involved in partnerships to manage water will bring many benefits.

The '*Planning Advice for Integrated Water Management*' note shows planners what is possible in practice. This '*Supplementary Case Studies*' document highlights the case studies, drawn from across the water sector, that support each section ranging from managing surface water and flood risk and enhancing biodiversity to providing housing, business development and infrastructure needs. It aims to empower planners to engage with water issues and encourage innovation in meeting development needs in a more sustainable way.

Acknowledgements

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Introducing the Case Studies

These case studies illustrate the advice for planners on integrating water management at the strategic scale of planning and design to achieve environmental, economic and social balance. They supplement and support the '*Planning Advice for Integrated Water Management*' document.

The examples of best practice presented in these case studies show what is possible in practice. The common themes of the case studies are partnership working and achieving multiple benefits. They show how coordinated spatial planning can use land creatively to:

- Manage surface water and flood risk;
- Provide natural water treatment and pollution control;
- Enhance local water resources;
- Improve biodiversity;
- Provide public amenity/recreation space; and
- Provide much needed housing, business development and infrastructure.

The case studies show how in best practice these outcomes are complementary, and can be achieved at less cost by working in partnership.

The case studies are grouped according to the sections in '*Planning Advice for Integrated Water Management*'. However most of the case studies also illustrate aspects covered in other sections.

Section 2: Benefits of integrating water issues in local planning

By working in partnership from the catchment to the individual building scale, planners can get multiple benefits and create opportunities to regenerate communities and provide vital housing, and at the same time enhance biodiversity and water availability and quality, reduce flood risk across whole communities and improve the public realm.

#	Case Study	Summary	Page No.
2A	Atlantic Gateway	<i>Regional scale regeneration involving three Local Enterprise Partnerships, based on renovating the water environment.</i>	7
2B	Taunton town centre regeneration	<i>A strategic partnership approach to managing floods that facilitated regeneration and reduced the risk to a whole town, while providing additional amenity benefits.</i>	9
2C	River Quaggy flood alleviation plan	<i>Reducing risk to the community by restoring floodplain to provide flood storage; much improved amenity space, and more biodiversity in a very built-up and biodiversity-poor part of London.</i>	10
2D	Worcester Waterworks	<i>Reducing flood risk to the community by regenerating a redundant water works and restoring floodplain, providing a park and sustainable new housing.</i>	12
2E	Mayesbrook Park	<i>Restoration of the Mayes Brook and its floodplain in Mayesbrook Park to provide multiple benefits: improving flood storage, biodiversity and adaptation to climate change within a city environment.</i>	13
2F	Stamford Brook	<i>Master-planning to help deliver water sensitive development - incorporating holistic water management, through a strategic approach to green infrastructure planning and hydrological design, into a development scheme to ameliorate flood risk and improve environmental quality and a series of connected greenways and wildlife corridors.</i>	16

Case Study 2A: Atlantic Gateway

Regional scale
regeneration
based on
renovating the
water
environment



Atlantic Gateway



Source:
Atlantic
Gateway

The Atlantic Gateway is a sub-regional area covering the city regions of Manchester and Liverpool, as well as the wider shared hinterland of both city regions across Warrington, Chester and northern Cheshire. It is at the heart of what was the first region in the world to industrialise on a massive scale in the 19th century. It paid a heavy price in terms of pollution and environmental degradation.

The Atlantic Gateway initiative is an area-based local partnership, covering three Local Enterprise Partnership (LEP) areas (Greater Manchester, Cheshire and Warrington and Liverpool City Region).

The initiative aims to develop the Liverpool and Manchester City regions to become the second most significant growth centre in the UK, achieving levels of growth not previously achieved in the UK outside of London. By 2030, the aim is to create 250,000 new jobs within the Atlantic Gateway area with £14 billion of new investment.

The growth plan for the Atlantic Gateway is underpinned by sustainability objectives including to adapt and 'green' the landscape, to respond to the challenges of climate change and also to improve the local area, capturing the multiple benefits of natural spaces for business, residents and visitors.

The three LEPs, with the Environment Agency, have established a Programme Board to realise the most significant opportunities for investment and growth in the Gateway area. The Atlantic Gateway partners are working to ensure environmental issues and opportunities are fully considered. This involves identifying and managing strategic risks, opportunities and interdependencies of development and flood risk, climate change, waste and energy needs, water supply and water quality. The Atlantic Gateway aspires to become one of Europe's leading low carbon, economic growth areas, supported by improving the quality of the environment.

The Environment Agency provides the secretariat to the Atlantic Gateway

environment sub-group which is developing a strategic investment framework programme for waste, water, flood risk and green infrastructure projects to underpin economic growth plans over the next 30 years.

Regenerating waterways is at the core of the project. The infrastructure work programme builds on the long-term clean-up programme of rivers including the Mersey and Irwell. Water quality improvements have helped stimulate private sector investment in waterfronts across the area, improving the local environment while also driving economic growth.

The Irwell River Park is creating an international waterfront destination, connecting more than £3bn of investment by linking MediaCityUK (new home for the BBC and ITV) to the centre of Manchester. The multi-agency Mersey Waterfront Regional Park programme, a successful collaboration between local authorities and developers, has opened up new areas of the estuary for development, investment and the growing visitor economy.

Liverpool's "City Deal" proposals include making the river Mersey "the cleanest river in an urban setting in the world" as well as "habitat offsets" and "carbon banking" in the Atlantic Gateway. A low carbon pilot project aims to reduce regulatory burdens, streamline local planning and accelerate over £100m investment in off-shore wind infrastructure.

The first 'pilot' project to benefit from this approach is for a development that will allow offshore wind farm vessels to operate. Overall, the Atlantic Gateway adds value through a whole systems approach across the entire area. Its "greening" programme will:

- Underpin sustainable economic growth
- Enable climate change adaptation and mitigation
- Support enhanced ecological systems and wildlife and their multiple benefits
- Help improve perceptions of place by businesses, residents and visitors
- Provide space for leisure, recreation, play, culture, sport and events
- Connect people to employment, education, leisure and each other
- Engage people and deliver health benefits
- Support infrastructure upgrades and requirements relating to power, water and waste to provide capacity for growth of key sectors

Contact: John Thompson, Sustainable Places Manager - Environment Agency North West

Further Information

For more information click [here](#) and [here](#). Also refer to environmentnw.org.uk for latest environmental news and views and enviroeconomynorthwest.com for a range of environmental data and evidence.

Case Study 2B: Taunton town centre regeneration



Source: Environment Agency

A good example of how a strategic partnership approach to managing floods can facilitate regeneration and reduce the risk to a whole town, and provide additional amenity benefits.

Flood risk was identified early as a major constraint to the much needed redevelopment of Taunton town centre.

‘Taunton Vision’ was set up with key partners Taunton Deane Borough Council, Environment Agency, Somerset County Council, South West of England Rural Development Agency and the Government Office for the South West, to agree strategic options and to reduce flood risk in the long-term.

Taking a strategic approach, upstream floodplain storage to reduce peak flows and flood levels and replace all the flood storage capacity lost through the town centre reach of the River Tone was shown to be a better, more sustainable option than an individual site-by-site approach or flood management capital scheme in the town. This was clearly demonstrated by studies which were able to draw on long-term data to provide a detailed understanding of flood risk. The upstream

storage solution also gave additional amenity benefits through a landscaping scheme to enhance the flood storage area as public open space.

Considering flood risk from the outset in developing regeneration options for Taunton town centre has had the following benefits:

- Strategic development of options was possible, meeting the needs of Taunton. A piecemeal approach would not have resulted in the same beneficial outcomes
- All parties were fully committed to working together and seeking solutions which included taking account of wider socio-economic issues, so greatest gain was made from investment and development proposals achieved multiple objectives
- Investment decisions became much clearer with more certainty on funding for flood risk management measures
- Using the best data and local knowledge provided robust and shared understanding of flood risk to make this strategic approach possible

Case Study 2C: River Quaggy flood alleviation plan



Source: Lewisham Council

The Quaggy Flood Alleviation Plan provides flood storage; much improved amenity space, and more biodiversity in a very built-up and biodiversity-poor part of London.

During development of Lewisham, Lee, Kidbrooke and Eltham in the 1930s, the River Quaggy was diverted underground using tunnels and culverts. This worked well except during heavy rainfall when Lewisham town centre would flood. The solution to this was to reduce the amount of culverting and allow the river to run above ground. The aim was to re-establish it as a meandering, more 'natural' watercourse. This Quaggy Flood Alleviation Plan had three main benefits:

- Better control over waterflows
- Enhanced public open space

- Increased biodiversity

Central to the scheme was the regeneration of Sutcliffe Park.

A 'holding area' where floodwaters could be contained in times of high rainfall was developed in Sutcliffe Park in 2002. The new Sutcliffe Park was opened in 2004 to alleviate flooding in Lewisham Town Centre and creating a wetland site, rich in bio-diversity and of huge ecological and amenity benefit. Further information can be found [here](#).

The restoration of Chinbrook Meadows contributed to reducing flood risk in the

Quaggy catchment. Breaking the river Quaggy out of its concrete corridor in Chinbrook Meadows Park and allowing it to flow more naturally through the park reduced flood risk as well as reintroducing river bank areas to encourage wildlife. The scheme, completed in 2002, includes the creation of boardwalks and bridges to enable visitors to interact better with the river.

The public footpath running through the meadows forms part of the South East London Green Chain Walk and the regional Capital Ring. The park was awarded the prestigious Green Flag award in 2005/6 for the third consecutive year. The award is designed to recognise and reward standards of excellence in parks and green spaces.

More information can be found [here](#) and [here](#).

The Quaggy Flood Alleviation Plan inspired the larger Ravensbourne River Corridor Improvement Plan, which covers the area of the Ravensbourne corridor that lies within the boundary of the Thames Gateway, but also links to the rivers Pool and Quaggy, to especially focus and influence areas of planned growth and investment.

Click [here](#) for the Ravensbourne River Corridor Improvement Plan on the Lewisham Borough Council website.



Source: Images courtesy of Worcester City Council

Former Waterworks Site (now Gheluvelt Park) Worcester: A good example of how to redevelop a site to appropriate uses and reduce flood risk more widely, whilst also improving local amenity.

For over 200 years the public water supply for Worcester came from a waterworks on a four hectare site on the banks of the River Severn in the urban area (top left). The site was within the recognised floodplain but a flood defence was in place with a high concrete wall.

When the de-commissioning of the Waterworks took place the owners, Severn Trent Water, in partnership with the City Council and the Environment Agency agreed a

scheme to restore the land to public park. Major improvements to flood management were achieved by removing the flood wall, removing the 17 brick and concrete tanks, recontouring the site and restoring the active floodplain. The spoil was used to fill deeper tanks and develop housing on an adjoining site, not at flood risk (bottom right). A local brook (Barbourne Brook) with main river status was also broken out of culvert and released to flow freely through the park and into the river (bottom left). In the 2007 floods the park provided valuable flood storage to reduce the impact of the floods on Worcester (top right) and the new housing on the periphery did not flood. The park was back in use, hosting a folk festival and craft fair shortly after the 2007 floods.

Case Study 2E: Mayesbrook Park

Mayesbrook Park in Dagenham, East London is a large and varied park with sporting facilities, an attractive nature reserve and a newly restored river landscape. The southern section of the park features two large lakes which are rich in wildlife. The park provides over 40 hectares of open space with benches, picnic tables and weather shelters and is home to a number of the Borough's sports clubs.

Restoration of the Mayes Brook in Mayesbrook Park is a good example of an approach that has multiple benefits for improving flood storage (floodplain that could hold water in the event of a flood), biodiversity and adaptation to climate change within a city environment.



Source: LB Barking & Dagenham

A new wetland landscape has been developed to help the park to cope with more extreme changes in climate including heavy rainfall and drought.

Since it first opened in the 1930s Mayesbrook Park has been a much loved green space at the heart of the Barking and Dagenham. The Mayesbrook Climate Change Park was born when a group of partner organisations collectively agreed to undertake a demonstration project of urban river restoration within Mayesbrook Park. The project received a £300,000 grant from Global Insurance firm RSA, via the Thames Rivers Restoration Trust, and a £400,000 grant from the Mayor of London's 'Help a London Park' initiative. A host of other partners helped to

fund and deliver the project including London Borough of Barking and Dagenham, Natural England, the SITA Trust, the Environment Agency, The Department of Education and the London Organising Committee of the Olympic Games (LOCOG).

Local people were consulted on their views and a Masterplan was produced to bring the whole park back to life.

In 2011 the first phase of works started to improve the park. The Mayes Brook has been brought back into the park within a widened meandering river channel creating an attractive river landscape. This new river system, with a gravel river bed and banks, provides an ideal wetland habitat for wildlife

and at times of high rainfall it is able to rise in a controlled and natural way within a newly created floodplain.

At the same time the water quality of the brook has been improved by tackling pollution at source. All this work has helped the Mayes Brook to get closer to the new higher standard for rivers set by the European Union (EU) Water Framework Directive.

Surface water drainage from the adjacent Olympic training facility has been 'plumbed in' to the restored river to help the area cope with high rainfall.

More trees have been planted to provide shade in hotter drier summers, and to filter airborne pollution. In many places the grass has been left longer to give it more chance of surviving hot, dry summers.

All of these changes will help the park to be more resilient to a changing climate with more winter floods and summer droughts predicted for the future.

With the Mayes Brook released from its metal fence and concrete channel it has now become a haven for wildlife. This has extended the Site of Interest for Nature Conservation from the southern section to the whole one mile length of the park.

Aquatic plants such as reeds and rushes have been planted in ponds and backwaters, creating a rich habitat for wetland species. 5,000 new trees have been planted, providing shade from the sun and a habitat for birds and insects. A dedicated nature reserve with limited public access creates a quiet space for nesting birds and small vertebrates.

A second phase of improvements, dependant on further funding, will see a new visitor centre, a café and a garden with plants suited to a changing climate. The park's two lakes will also be restored to ensure cleaner water so that angling and boating facilities can once again be provided.

The project has been made possible thanks to an innovative public, private and voluntary sector partnership between the London Borough of Barking and Dagenham, the Environment Agency, the Mayor of London, Thames Rivers Restoration Trust, RSA, Natural England, London Wildlife Trust, and the SITA Trust.

A recent assessment of the scheme by the Environment Agency and Queen Mary College has shown that restoration of the Mayes Brook will bring benefits worth up to seven times the cost of the whole regeneration scheme.

Restoring natural river processes can offer multiple benefits: The approach shows that, from limited resources, the additional benefits to health and wellbeing and economic improvements to deprived areas are substantial. Improvements to the natural environment and wildlife will enhance: the regulation of climate, air quality and flood risk, bring recreation and educational opportunities and provide habitats for wildlife. If the annual value of the restored environment to health, recreation and tourism are pooled, they account for over 95 per cent of the total annual benefits from the Mayesbrook Park regeneration scheme.

The overall economic benefits of the Mayesbrook Park regeneration are likely to be substantial compared to the planned investment. Assessed over 40 years (and with increase in property values assessed over 100 years), the lifetime benefits of the parkland and river restoration should amount to about £27 million. When compared to the estimated costs of the whole Mayesbrook Park regeneration scheme of just under £4 million (including the river restoration works), this produces a benefit-to-cost ratio of £7 for every £1 invested.

In creating a thriving, multifunctional landscape, the Mayesbrook Climate Change Park demonstrates how an urban river park restoration can successfully deliver public,

private and voluntary sector objectives simultaneously. It shows how by combining knowledge, data and resources, different sectors can deliver large projects that provide a wide range of benefits that no single organisation could afford to fund alone.

The Mayesbrook Park restoration would not have been possible without this successful partnership approach. As landowners and lead partners, local councils are in a good

position to maximise the benefits to local communities and their public spaces by linking together a variety projects.

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For more information click [here](#), [here](#) and [here](#).

Case Study 2F: Stamford Brook

The Stamford Brook development is a good example of how holistic water management, through a strategic approach to green infrastructure planning and hydrological design, can be incorporated into a

development scheme to ameliorate flood risk and improve environmental quality and a series of connected greenways and wildlife corridors.



Source: "Volume: Delivering Sustainable Housing - learning from Stamford Brook" courtesy of the National Trust

This residential development on National Trust property was developed by a partnership of The National Trust, Redrow Homes and Bryant Homes. Over 750 residential units have been built with associated river restoration and water management through a whole-site approach to the management of water.

The 'green' and 'blue' infrastructure at Stamford Brook is a defining feature of the development which goes far beyond the function of aesthetics. Breaking away from the conventional mould of unit-driven housing layouts, the holistic approach to master-planning, which included a whole site approach to the management of water, has ensured that a strong spatial framework of landscape and open spaces has determined the layout and structure of the scheme as a whole. Central to this network of open spaces is a sustainable urban drainage system which

attenuates and manages surface water across the site, and which includes a uniquely restored 1.8km stretch of river, Sinderland Brook, at the northern boundary of the development.

Sinderland Brook was canalised in the 1970s. In the late 1990s a proposal to restore the brook and its floodplain was prepared by The National Trust, the implementation of which became a condition of the Development Agreement between the developers and the Trust. The aim of the project was to transform the canalised watercourse, which was previously restricted to a floodplain offering only limited protection to the development site and established residential properties to the north, to a dynamic meandering river allowed to adjust within its own seminatural floodplain.

Using the Environment Agency's data, it was possible to model the area required to contain the flow of a 1 in 100 year rainfall event. The National Trust then added 20% to the flow to account for climate change scenarios, and calculated the increased flood water level. Taking account of the topography of the wider site area, engineers instructed by the developers added 600mm to this level to ensure that drainage of all utilities within the development could be drained by gravity away from property without the need for any pumping equipment.

Key features and benefits of the landscape and water environment at Stamford Brook include:

- A restored and dynamic river environment, based on an interpretation of historic mapping and photographic records, which contributes significantly to local environmental quality and which significantly enhances flood protection for the site and an established residential community to the north. The initial 1.3km of the restoration scheme was funded by The National Trust and the developers, with the Environment

Agency contributing to the final phase of around 500 metres.

- A semi-natural sustainable urban drainage system comprising swales and storage basins which enhance ecology and ensure that surface water run-off into Sinderland Brook does not exceed the greenfield rate for the site as a whole.
- A series of well-connected greenways and wildlife corridors planted with species that are native locally and which facilitate movement by wildlife and people.
- A hierarchy of formal and informal open spaces designed with strong reference to local landscape character and which provide recreational opportunity, visual amenity and adaptive capacity in the context of a changing climate.
- Carefully designed boundary treatments and private gardens which maximise the use of native hedgerow and tree planting to further enhance ecological and landscape value within the heart of the built environment.



Source: "Volume: Delivering Sustainable Housing - learning from Stamford Brook" courtesy of the National Trust

There was initial strong public opposition to the development, on open land surrounded by existing residential development. However through a concerted and transparent public engagement exercise using a dedicated community engagement officer in the early planning and design stages of the scheme, community consultation events and regular meetings with local interest groups, and a website and newsletters, this opposition was overcome. Following completion of the scheme, 85% of respondents to a stakeholder survey, which includes local residents, agreed that the landscaping of the development and the river restoration have improved the local area – a significant achievement when it is considered that the development is located on a greenfield site to which many people attached an intrinsic value. In fact, a good number of respondents think that these have been the most significant success at Stamford Brook.

The project also aimed to make the development more sustainable in terms of energy and water efficiency of the homes that were built. Passive environmental performance principles were embedded from the beginning of the design process. New more efficient fittings such as low-flush toilets were used in the buildings. The house builders are now also using these products on their other current developments.

This whole-site approach to sustainable development required an holistic approach to master-planning and detailed design through which all elements of the scheme were considered collectively. To achieve this, the National Trust worked with TEP landscape planners and JJK architects and involved Haycock Associates with the floodplain modelling and river restoration proposal. This was done prior to the developers being appointed and there was a partners group which was used as a sounding board for the Masterplan (involving organisations such as Groundwork, the Environment Agency and Trafford MBC and Manchester University). This has directly contributed to the realisation of a scheme that takes all practicable steps to minimise the impact of the development on the environment at all levels and creates a development which enhances the local environment for the existing and future community.

Further supporting information is contained in the report “Volume: Delivering Sustainable Housing - learning from Stamford Brook”, found [here](#).

This report is informed by monitoring work done by the Surveying and Sustainable Housing Department at Leeds Metropolitan University.

[Please note there are no case studies for Section 3 of the Advice Note.]

Section 4: Integrated Catchment Management

Understanding what integrated catchment management is, what it does and why this is important is an essential pre-requisite for integrating water management into planning. The challenges for making it work include communication between communities who can make things happen and the authorities planning what needs to happen; and linking those with the money to fund what is needed with the communities and landowners who can do it.

Partnership working through the catchment-based approach can meet these challenges. These case studies exemplify the wider benefits of the catchment-based approach and how it can be integrated into the preparation of local plans to resolve water quality and availability and flood risk issues while also improving local environments and public amenity, and increasing biodiversity. They explain how the catchment-based approach provides ecosystem services and how ecosystem services can enable new development and give social benefits including enhanced well-being; and opportunities for sustainable business growth.

#	Case Study	Summary	Page no.
4A	The Northampton Drainage Plan	<i>A partnership project for the regeneration of Northampton promoting efficient use of existing infrastructure, to meet the challenge of high levels of proposed growth in an area that is already at high risk of river and surface water flooding.</i>	21
4B	Maldon Strategic Drainage Workshop	<i>A workshop to discuss the infrastructure needed to support growth in two settlements, Maldon and Heybridge, and to discuss potential opportunities to reduce flood risk, improve water quality, and deliver Water Framework Directive objectives.</i>	22
4C	Cambridge Plan	<i>Integrated water and flood risk planning policy in a local plan, drawing evidence from regional and catchment wide studies to provide a locally applicable policy that integrates water management into new developments within Cambridge.</i>	22
4D	Peterborough Flood and Water Supplementary Planning Document (SPD)	<i>A comprehensive planning document bringing together policy on flood risk, sustainable drainage and the protection of aquatic environments to achieve multiple benefits and reduce the likelihood and consequences of flooding and pollution, addressing Water Framework Directive requirements.</i>	25
4E	Cuckfield Neighbourhood Plan	<i>A neighbourhood plan that recognises catchment-wide issues, with policies in the plan to ensure that new development has SuDS principles embedded into designs, and therefore does not increase flood risk downstream, in line with national policy.</i>	27
4F	Bristol Surface Water Management Plan	<i>Developing an innovative model to inform a strategic surface water management plan, using water sensitive urban design principles to reduce flood risk and provide benefits to socially deprived areas.</i>	28

#	Case Study	Summary	Page no.
4G	Greater Norwich Joint Core Strategy	<i>The Greater Norwich Development Partnership Joint Core Strategy (JCS) demonstrates how the water environment can be embedded as part of the vision that can be traced throughout the strategy to meet the challenge of enabling major development next to the Broads National Park.</i>	29
4H	Margate Surface Water Management Plan	<i>Integrated catchment management to develop a joined-up approach to managing surface water and water quality to enable growth in Margate.</i>	31

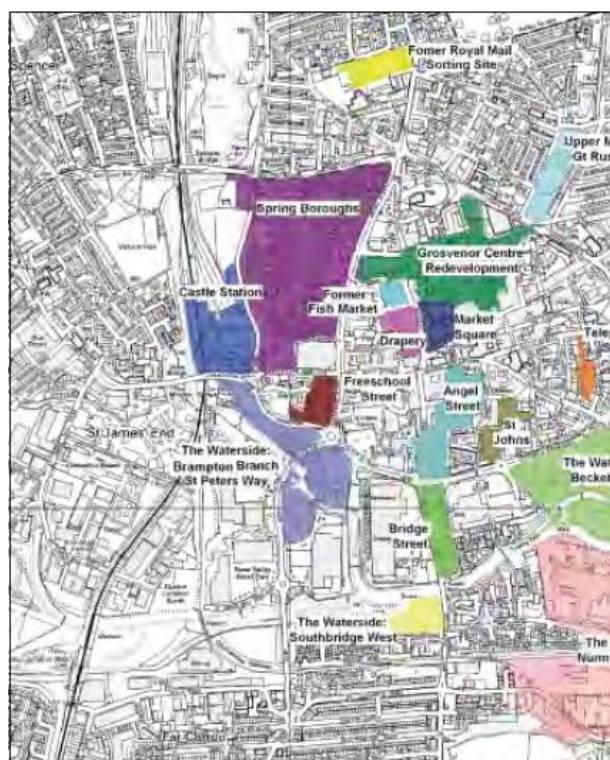
Case Study 4A: The Northampton Drainage Plan

The Northampton Drainage Plan was a partnership project for the regeneration of Northampton, supporting the Waterside Enterprise Zone and promoting efficient use of existing infrastructure. It was led by Northampton Borough Council, in partnership with Anglian Water, the Environment Agency and Northamptonshire County Council.

Northampton has high levels of proposed growth in an area that is already at high risk of river and surface water flooding. This was identified by the Northampton Water Cycle Study and investigated in detail within the Northampton Drainage Assessment. Both were supported by Anglian Water modelling. A Central Area Action Plan was prepared with specific planning policy to secure the

separation of surface water flows from the combined system in redevelopments. This will help to reduce the quantities of operational carbon, volumes of water pumped and treated, sewer flooding risks, numbers of pollution incidents, and as a result will contribute to meeting WFD objectives and climate change adaptation in Northampton.

Published in August 2012, the drainage plan recommendations have since been incorporated into Northampton Borough Council's Central Area Action Plan (adopted January 2013). The Planning Inspector recognised the work as best practice. Developers are also supportive of the principle, which is reflected in recent planning applications submitted to the Council.



Source: Northampton Borough Council

Case Study 4B: Maldon Strategic Drainage Workshop

Maldon District Council held a strategic drainage workshop in December 2012 with stakeholders and strategic landowners (and their agents/consultants) who were included in their Local Plan Preferred Approach consultation.

The purpose of the meeting was to discuss the infrastructure needed to support the proposed growth identified in two of their settlements, Maldon and Heybridge, and to discuss potential opportunities to reduce flood risk, improve water quality, and deliver Water Framework Directive objectives. The Environment Agency attended and presented at the workshop along with the Flood and Water Management Team at Essex County Council and Anglian Water. The workshop provided a good opportunity for stakeholders

to work together and demonstrated the benefits of close partnership working between the Environment Agency, water companies and planners.

Following Environment Agency and Anglian Water involvement in the strategic drainage workshop, they are continuing to work closely with the council and other stakeholders to ensure that the decisions on the location and viability of strategic growth are based on good evidence. They are also helping to identify possible environmental gains that the council can use in weighing up their decisions for growth in their Local Plan.

Contact: Neil Dinwiddie (Environment Agency); Sue Bull (Anglian Water)

Case Study 4C: Water and flood risk planning policy for Cambridge Local Plan 2014

The Cambridge Local Plan will set out the planning framework to guide the future development of Cambridge. It will be one of the development plan documents which comprise the city council's Local Development Framework.

- The Cambridge Local Plan makes provision for 14,000 new homes and 22,100 jobs between 2011 and 2031.
- Cambridge is a dense urban environment with significant surface water flood risk.
- Based on Cambridge Water's Water Resources Management Plan the Cambridge region could face a long-term scarcity of water if no action is taken now.

There are strategic objectives for the implementation of this local plan and one of these is to require all new development in Cambridge to be highly water efficient, contribute to overall flood risk reduction through water sensitive urban design, and help to improve the quality of the River Cam and other water features in the city.

There are three policies that will aid the implementation of this strategic objective:

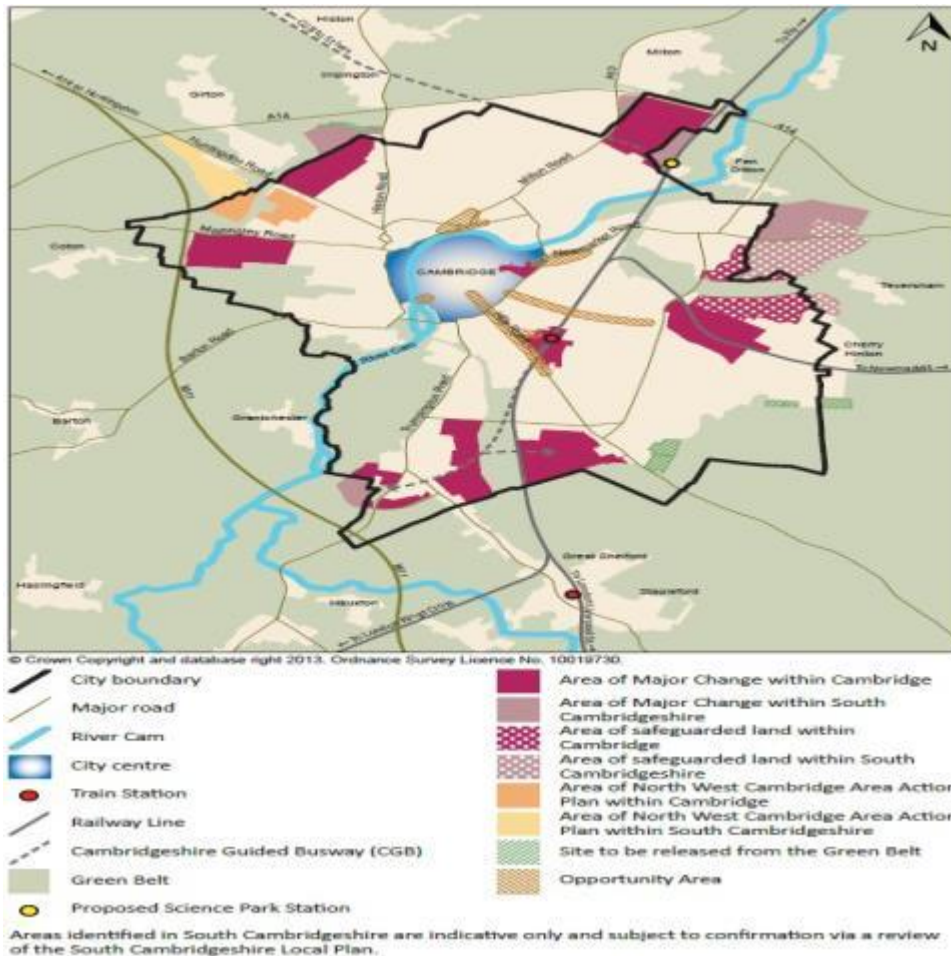
Policy 27: Carbon reduction, community energy networks, sustainable design and construction, and water use

Policy 31: Integrated water management and the water cycle

Policy 32: Flood risk

These policies draw on evidence from regional and catchment wide studies to provide a locally applicable policy that integrates water

management into new developments within Cambridge.



Source: Allocation of areas in the Cambridge Local Plan. Courtesy of Cambridge City Council

Description of policies

Policy 27 draws on evidence from Cambridge Water's Water Resources Management Plan and Cambridge Sub-Regional Water Cycle Strategies and proposes high levels of water efficiency with new homes required to achieve a water efficiency of 80 l/h/d and non-residential buildings required to achieve full credits for category Wat 01 of BREEAM.

Policy 31 again draws on national and regional studies such as the Anglian River Basin Management Plan and the Great Ouse Catchment Flood Management Plan and more local studies such as the Cambridge and Milton Surface Water Management Plan as well as the usual Strategic Flood Risk Assessment.

This policy states:

Development will be permitted provided that:

- Surface water is managed close to its source and on the surface where reasonably practicable to do so;
- Priority is given to the use of nature services;
- Water is seen as a resource and is re-used where practicable, offsetting potable water demand, and that a water sensitive approach is taken to the design of the development;
- The features that manage surface water are commensurate with the design of the development in terms of size, form and materials and make an active contribution to making places for people;

- e. surface water management features are multi-functional wherever possible in their land use;
- f. Any flat roof is a green or brown roof, providing that it is acceptable in terms of its context in the historic environment of Cambridge and the structural capacity of the roof if it is a refurbishment. Green or brown roofs should be widely used in large-scale new communities;
- g. There is no discharge from the developed site for rainfall depths up to 5mm of any rainfall event;
- h. The run-off from all hard surfaces shall receive an appropriate level of treatment in accordance with Sustainable Drainage Systems guidelines, SuDS Manual (CIRIA C697), to minimise the risk of pollution;
- i. Development adjacent to a water body actively seeks to enhance the water body in terms of its hydromorphology, biodiversity potential and setting;
- j. Watercourses are not culverted and any opportunity to remove culverts is taken; and
- k. All hard surfaces are permeable surfaces where reasonably practicable.

Policy 32 uses the same evidence as policy 31 but is more focused on flood risk as opposed to water management in its wider context.

Potential flood risk from the development

Development will be permitted providing it is demonstrated that:

- a. The peak rate of run-off over the lifetime of the development, allowing

- for climate change, is no greater for the developed site than it was for the undeveloped site
- b. The post-development volume of run-off, allowing for climate change over the development lifetime, is no greater than it would have been for the undeveloped site. If this cannot be achieved then the limiting discharge is 2 litre/s/ha for all events up to the 100-year return period event
- c. The development is designed so that the flooding of property in and adjacent to the development would not occur for a 1 in 100 year event, plus an allowance for climate change and in the event of local drainage system failure
- d. The discharge locations have the capacity to receive all foul and surface water flows from the development, including discharge by infiltration, into water bodies and into sewers
- e. There is a management and maintenance plan for the lifetime of the development, which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime
- f. The destination of the discharge obeys the following priority order:
 - Firstly, to ground via infiltration
 - Then, to a water body
 - Then, to a surface water sewer. Discharge to a foul water or combined sewer is unacceptable.

The full plan can be found [here](#).

Case Study 4D: Peterborough Flood and Water Management Supplementary Planning Document



Source: Peterborough City Council, Environment Agency, P Taylor, RiverCare, L Boddy, North Level District IDB

Peterborough is a unitary authority located in the East of England, with an estimated population of 183,600 (2011 census). It comprises a large urban area with 25 surrounding villages set in contrasting countryside. To the west and north the shallow river valleys of the Rivers Nene and Welland give way to an undulating limestone plateau, and to the east the fen landscape is flat and open and lies below sea level. Peterborough's landscape supports a rich biological diversity, with three internationally designated sites, 17 sites of Special Scientific Interest and many more County and Local Wildlife Sites.

Since the 1970s, Peterborough has experienced, and continues to experience, rapid growth requiring new housing, infrastructure and commercial/industrial development. The economy is diverse, with employment sectors covering public bodies, environmental, engineering, insurance, publishing, retailing, logistics and agricultural sectors. This growth, set alongside the rich local heritage of the river and the wide range of different water management practices and partners currently working in Peterborough, is the reason that a holistic and partnership

approach to water management is being advocated locally. Local planning policy aims not only to create safe development, but to ensure that site drainage systems and local water bodies are well designed and well managed to best protect Peterborough's communities and natural environment.

The Peterborough Flood and Water supplementary planning document (SPD) is a comprehensive planning document bringing together policy on flood risk, sustainable drainage and the protection of aquatic environments. It focuses on managing flood risk and the water environment in and around new developments in Peterborough in ways that achieve multiple benefits and reduce the likelihood and consequences of both flooding and pollution. As well as being the local planning authority, the city council is a Lead Local Flood Authority under the Flood and Water Management Act (2010) and is currently preparing an integrated flood risk management strategy to complement the approach taken in planning policy.

The SPD supports and further explains the higher level water and environment related policies of Peterborough's Local Plan. It is is

set within the context of a water and flood risk management hierarchy to help developers and decision makers understand flood and water management and to embed it in decision making at all levels of the planning process.

Detailed guidance is provided on:

- Consultation with water and flood risk management partners
- Site selection for sites within flood zones covering site vulnerability the Sequential Test; flood risk assessment; site design and management issues; and responsibilities
- Measures to manage and mitigate risk
- The gap between the planning system and the Flood and Water Management Act 2010
- Managing surface water drainage, focusing in on drainage sub catchments;

submission and evidence requirements; design principles; discharge requirements; water quality, biodiversity and habitat requirements; health and safety, access and amenity requirements; and adoption and maintenance

- The requirements of the Water Framework Directive
- Information about how people and development influence the water environment and the Water Framework Directive status of rivers
- How to assess the impacts of development on aquatic environments
- Requirements for other consents needed for works affecting watercourses.

The SPD was adopted by the Council in December 2012 and is available on the Peterborough City Council [website](#).

Case Study 4E: Cuckfield Neighbourhood Plan



Source: Andrew Burton

The Cuckfield Neighbourhood Plan is a planning document for the next 20 years for the parish of Cuckfield, West Sussex. It is a core document in determining future plans including development and infrastructure. Cuckfield was the first parish to start developing a Neighbourhood Plan in Mid Sussex and was granted Front Runner status with a financial grant to aid development of the plan.

The plan looks at a range of planning issues, including growth issues and where to put new houses, design of new development, heritage issues, protection of urban gaps, protection of biodiversity and rural areas.

Cuckfield is on the top of a ridge, so internal flooding isn't a particular issue. However, the Sussex Ouse flows to the north and Uckfield and Lewes have particular issues. Therefore, development can have an impact downstream. It was important to ensure that the drafting team were aware of potential

impacts, and ensured that new policies were included to mitigate these.

Lack of knowledge and experience of flood risk issues amongst the drafting team was a significant issue – there was a perception that it just wasn't an issue.

Policies are in place within the plan to ensure that new development has SuDS principles embedded into designs, and therefore does not increase flood risk downstream, in line with national policy.

Preparing the plan has created a greater awareness of surface water management issues in the parish planning committee to ensure that new development which is on-going adheres to SuDS principles.

The Cuckfield Neighbourhood Plan Submission documents can be found [here](#).

Further background can be found [here](#).

Case Study 4F: Bristol surface water management plan

Developing an innovative model to inform a strategic surface water management plan, using water sensitive urban design principles to reduce flood risk and provide benefits to socially deprived areas.



Source: Bristol City Council & Arup

The Department for Environment, Food and Rural Affairs identified Bristol as one of 10 high risk areas susceptible to surface water flooding in the UK.

Bristol City Council commissioned Arup to develop a strategic surface water management plan which would identify areas for prioritisation of investigation and to help deliver a comprehensively informed strategic plan of response.

Arup developed a high-definition, integrated (incorporating water company sewer data), two dimensional, 4 metre grid terrain model using innovative extreme event analysis, to understand the surface water drainage. As

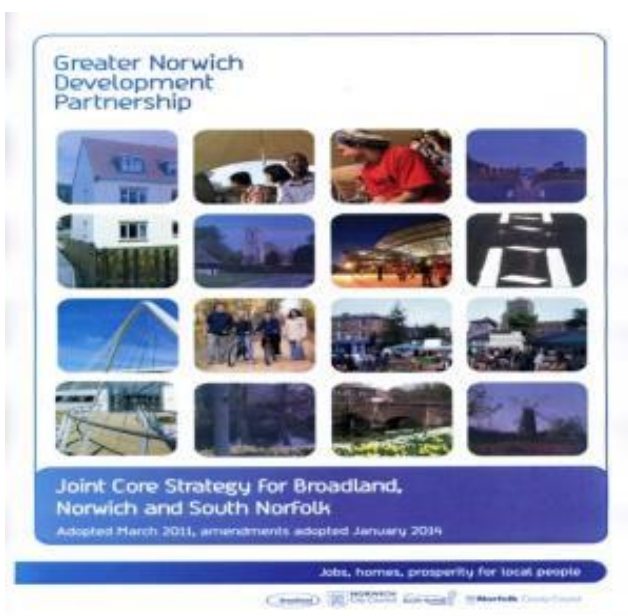
well as being the largest model for this size of catchment and at this level of detail, it is also the first of its kind in the UK. This informed the basis of the strategic plan by identifying 'hotspots' for investment to manage the surface water flooding in Bristol.

The model was used to develop interventions using water sensitive urban design principles, providing benefits beyond flood risk management. These included sympathetically designed retrofit sustainable drainage systems and associated amenities into commercial and urban streets for delivering tangible benefits to socially deprived areas within the city.

Case Study 4G: Greater Norwich Joint Core strategy

The Greater Norwich Development Partnership Joint Core Strategy (JCS) demonstrates how the water environment can be embedded as part of the vision that can be traced throughout the strategy.

The availability of water is a significant issue in the East of England. In addition to this, the JCS has to meet the challenge of enabling major development next to the Broads National Park (which relies on the quality of the water environment as a major attribute and contributor to local distinctiveness). Water was recognised as a challenging issue from the earliest stages of the JCS process. An ongoing water cycle study has been used to inform plan making and has led to close working between the stakeholders (the local authorities, EA, NE, Anglian Water and the Broads Authority) and a growing understanding of potential problems around water supply and water quality.



Cover of the Greater Norwich Development Partnership Joint Core Strategy
Source: Greater Norwich Development Partnership

This has led to the following key drivers within the Core Strategy process:

- Ensuring new development is water efficient in JCS policies up to and including the need for potential policies to require water neutrality in new development;
- Protecting water quality as a key plank of the Broads Authority's strategy, which represents a constraint on all development in the area; and
- The key role that SuDS and green infrastructure can play in improving the water environment.

The importance of these issues to sustainable development and the delivery of the JCS mean that the need to protect water quality and to ensure development is water efficient is specifically addressed in the vision section on climate change and sustainability. The vision and objectives developed for the JCS contain strong references to water, both in terms of the need to manage impacts of development on water resources and the water quality and physical characteristics of water bodies.

Objective 1 of the plan (climate change mitigation and adaptation) subsequently promotes water efficiency in development and objective 9 focuses on the creation of green infrastructure, the protection of the special qualities of the Broads and again on water efficiency.

This has led to the development of several policies within the JCS. As a result, area wide Policy 1 sets out several water related requirements in terms of addressing climate change and protecting environmental assets. This includes the requirement that all new developments will ensure that there will be no significant adverse impacts on European and Ramsar designated sites and no significant adverse impacts on European protected species in the area and beyond due

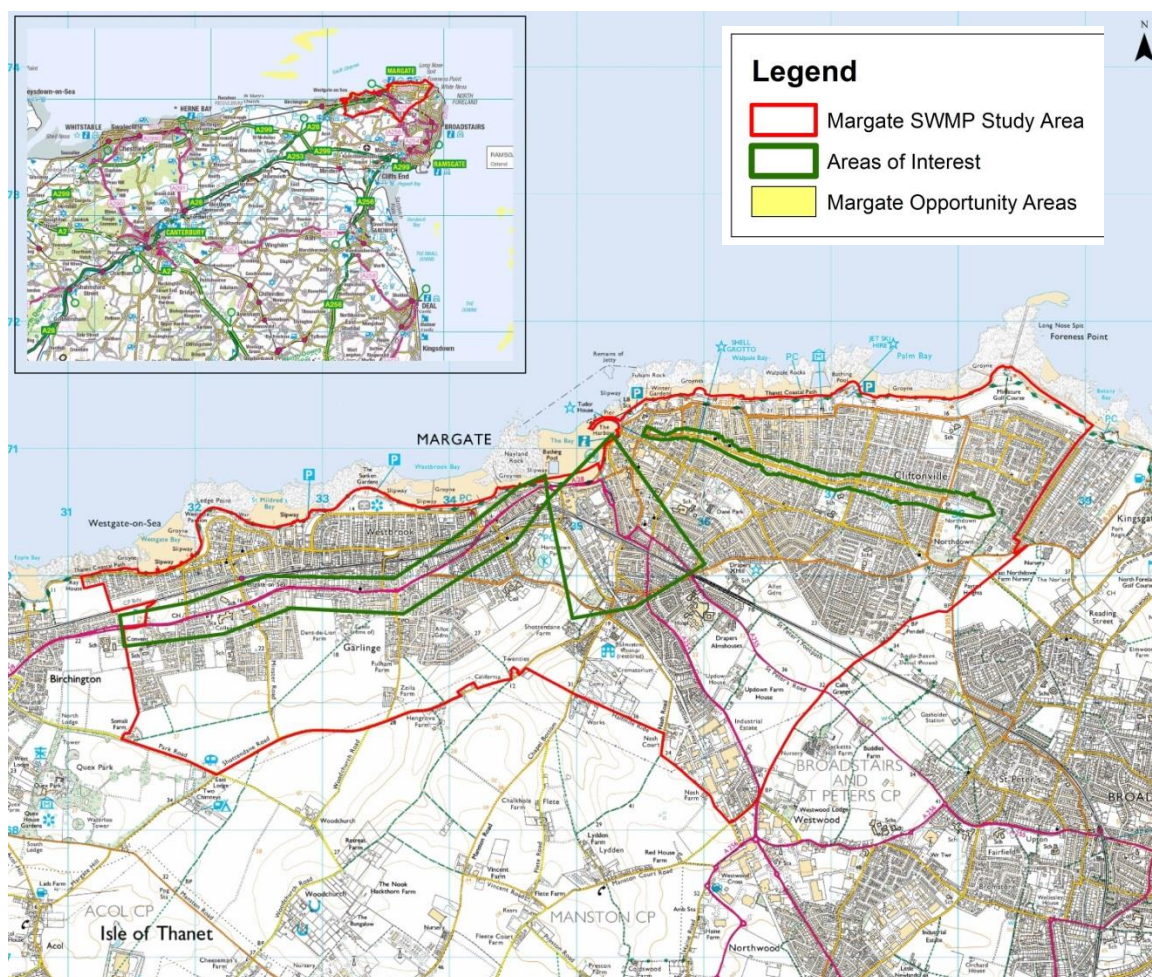
to storm water run-off, water abstraction, or sewage discharge.

Area wide Policy 3 builds on this by setting strong requirements around ensuring sufficient water infrastructure capacity to serve development which protects and enhances the water environment. It particularly identifies investment in infrastructure, including strategic interceptor sewers, to address environmental and capacity constraints at the strategic

wastewater treatment works at Whitlingham and at local works and ensuring all housing is water efficient, by requiring that new housing development must reach Code for Sustainable Homes level 4 for water on adoption of this document and developments of over 500 dwellings must reach code level 6 by 2015. All other development should also seek to maximise water efficiency.

In full: [The Greater Norwich Development Partnership Joint Core Strategy](#).

Case Study 4H: Margate Surface Water Management Plan



Source: Atkins

Margate is a historic seaside town reliant on tourism in the summer months. The town has recently seen the implementation of new coastal defences along its frontages, but is still predicted to be at risk from pluvial flooding. An integrated approach to the management of water was required to meet a number of challenges. The town is largely drained via a combined sewer system, and is targeting an ambitious urban growth strategy. A key strategic issue is bathing water quality for tourism in the summer, which has been affected by a number of flood and water quality incidents. This project has followed on from a Stage 1 Surface Water Management Plan that identified Margate as an area where further investigation would assist in understanding its complex flood history.

Atkins worked with Kent County Council to establish a project steering group in partnership with Southern Water, Thanet District Council, and the Environment Agency. The group and wider partners were kept involved and updated via briefing notes and presentations to ensure a holistic and partnered approach was taken.

Atkins developed a fully Integrated Catchment Model (ICM) of Margate (approx. 35km²) using InfoWorks ICM. This represented the full drainage arrangement (foul, combined, storm), watercourses (approx. 3km), and tidal interactions. The ICM was verified to historical flooding and is now being used to develop an Action Plan for managing flood and water quality risk.

The Action Plan is making use of a novel “root-cause” methodology developed for the project. This identified that a summer storm falling on a saturated catchment has been responsible for over 60% of the flood and beach water quality incidents. This methodology allowed the options assessment to target the issues and ensure that they are effective when implemented.

Services Provided

- Integrated Catchment Modelling
- Concept Engineering Feasibility
- Stakeholder Engagement

Key Benefits and Success Factors

- Holistic approach
- Partnership working
- Identification of root-causes

For further information contact: Adam Cambridge, adam.cambridge@atkinsglobal.com

The Action Plan will be finalised at a stakeholder engagement event where the proposals of surface water removal (through the use of SuDS), planning restrictions, and upstream storage schemes will be agreed. This will aim to define lead agencies to ensure that water management is undertaken in a coordinated manner.

Section 5: Surface Water Management

Managing surface water is a crucial but often daunting task for those planning new development and improving urban areas. These case studies exemplify how to manage surface water at source, and through each part of its onward flow in an integrated way using sustainable drainage systems (SuDS) to: reduce the damage from flooding; improve water quality; supplement water supply; enhance biodiversity; protect and improve the environment; and improve the public realm.

They show how multiple benefits and economies can be achieved by using the natural flood risk management approach, and linking local authorities' flood risk management and spatial planning responsibilities.

#	Case Study	Summary	Page no.
5A	Manor Fields Park, Sheffield	<i>Regeneration that provides 300 new dwellings, manages surface water more cost-effectively to reduce risk to the wider community, and provides a park and recreation facilities while also enhancing biodiversity.</i>	34
5B	Upton, Northampton	<i>A mid-density residential neighbourhood with Integrated SuDS, providing significant additional housing without increasing flood risk while retaining effective greenfield runoff rates, and reducing flood risk to the wider community.</i>	35
5C	Croydon New South Quarter	<i>A mixed used development in the centre of Croydon that delivers around 800 residential units whilst enhancing the water environment and reducing risk of flooding and pollution by restoring the River Wandle and lowering surface water run-off to greenfield rates.</i>	36
5D	Ladywell Fields	<i>Restoring an urban river and its floodplain to reduce flood risk and increase biodiversity, and provide a much-needed safe park in a heavily urbanised part of London.</i>	37
5E	The Crane Valley Catchment Plan	<i>Partnership working across administrative boundaries to improve water quality, biodiversity and the public realm, and reduce flood risk in a heavily developed urban area.</i>	40
5F	Marston Vale Surface Waters Plan	<i>A catchment-scale integrated SuDS developed in partnership to enable significant growth and thousands of new homes.</i>	43



Source: Sheffield City Council

A very good example of how the NPPF approach can reduce flood risk to the wider community, whilst also providing many other benefits, including:

- Reclamation of derelict land
- Much-needed housing
- Cost saving over conventional piped drainage
- Recreational space
- Additional biodiversity
- Community involvement

A new district park for the Manor and Castle area of Sheffield manages the run-off from a 300 dwelling new housing development. Without the neighbourhood SuDS scheme the housing development would not have been viable as the SuDS was considerably cheaper than conventional piped drainage. The regeneration of this deprived area of Sheffield has replaced a lot of inadequate housing and improved the poor open space network of the area.

It was a partnership between the Council Parks Development team, Sheffield Wildlife Trust and the Green Estate Company, and Bellway Homes.

The scheme consists of:

- A series of basins positioned at different levels down the sloping topography of the park, each managing an increasing size of storm event and improving water quality down the system.
- A dry grass basin doubling as a recreational space which is designed to manage a 1 in 100 year storm event. Discharge is at greenfield run-off rate for the area.

(Management arrangements were through a commuted sum from the developer with the Council adopting. Delivery of management is through a management agreement with the Green Estate company).

The scheme performed very effectively in the June 2007 storms. The large recreational

space was covered with water but there was no increase in run-off from the site.

Case Study 5B: Upton, Northampton



Source: *The Prince's Foundation for the Built Environment*

This is a relatively dense new development that provides significant additional housing without increasing flood risk and reduces flood risk to the wider community.

Upton is an urban extension on the South-West fringe of Northampton.

The Prince's Foundation worked closely with English Partnerships and Northampton Borough Council to create a sustainable mixed use walkable neighbourhood with high quality open green spaces that also manage surface water so the development is safe from flooding whilst also reducing flood risk in the wider Nene Valley.

The SuDS reduces runoff, flooding and consequent environmental damage not only on site, but in the wider surrounding Nene Valley.

It works using a mixture of water butts, green roofs and permeable paving within courtyards to control water at source and an open green

network of swales and pipes that run along the street and provide attenuation and transfer of surface water through the system. Linked storage ponds that are located around playing fields at the end of the system store surface drainage and allow for controlled discharge.

The swale and pond network provide 'green fingers' extending from the country park into the public realm, creating habitat and enhancing local biodiversity in the area.

The scheme also improved public awareness and understanding of the risks from surface water.

The Upton master-plan and SuDS is part of and connects with an expanding green infrastructure for the Northampton area, and promotes substantial benefits for habitat and biodiversity. Since installation the system has been shown to perform well during flooding events.

Case Study 5C: Croydon New South Quarter



Source: Barratt Homes

The New South Quarter Development in Croydon is an example of how water issues can be embedded into developments through the spatial planning process to deliver high quality sustainable development which protects and enhances the water environment. The mixed-use development in the centre of Croydon delivers around 900 residential units, several commercial units and additional community uses such as a nursery, medical centre, cycle paths, footpaths and new access to the adjacent Wandle Park. The River Wandle runs through the site but was hidden from view in a deep concrete culvert.

Within the 'Section 106' agreement associated with the development, one million pounds was secured for use as river restoration and as park enhancement for Wandle Park. The agreement also includes a

maintenance programme for the restored river channel on the development site.

Benefits of the scheme have been realised through the conditions associated with the granting of permission which were developed as a result of a partnership approach between the housebuilder (Barratt Homes), the local planning authority (Croydon) and the Environment Agency.

As a result, surface water run-off rates have been lowered to the levels of a greenfield site. Restoration of the River Wandle manages flow through the site. This includes an Environmental Method Statement to mitigate ecological impacts on the river and associated habitats as part of the opening up a naturalised area of the River Wandle channel; and sustainable remediation addressed contamination risks to the river as it flows through the site.

Case Study 5D: Ladywell Fields

The river Ravensbourne at Ladywell Fields formerly ran along the edge of the park, in a concrete channel, hidden behind railings and dense vegetation. As a result it had become largely unnoticed by most park users and had little ecological value. The park itself lacked features and facilities and was under-used, and only 44% users felt safe there.

In addition, Ladywell Fields and other parts of Lewisham were at risk of flooding from the River Ravensbourne, which flows from south to north through the middle of the parklands.

A partnership between Lewisham Council, Building Design Partnership and the Environment Agency, with Fergal Contracting undertaking the physical works, carried out a project to re-meander the river through the centre of the park and create a well-used public open space. This brought multiple benefits: a busy and potentially self-policing place which has increased park usage; increased the profile of the river within the park; reduced flood risk; and improved the quality of habitats for wildlife.

The work included:

- A new meandering channel through the centre of the park, diverting

around half of the Ravensbourne's flow, whilst railings adjacent to the original channel were removed;

- In-channel river restoration work on the river Ravensbourne including: creating riffle and pool sequences, gravel bars and backwaters; bank re-profiling and out of bank landscaping works, including a new footbridge and dry storage area;
- A backwater immediately downstream of the new footbridge, and further upstream an offline ephemeral pond. This was later connected to the river via a narrow side channel dug by members of the public;
- A large swale in the southern field to ensure that overland flows entering the River Ravensbourne were reduced;
- Numerous landscape improvements including the re-use of excavated earth material to create terraces;
- New footpaths, a footbridge and entrance to improve accessibility for members of the public.



Source: LB Lewisham



Restored Ravensbourne, Source: Peter Bide



New meandering chanel, Source: Peter Bide



Off-line ephemeral pond, Source: Peter Bide



Swale, Source: Peter Bide

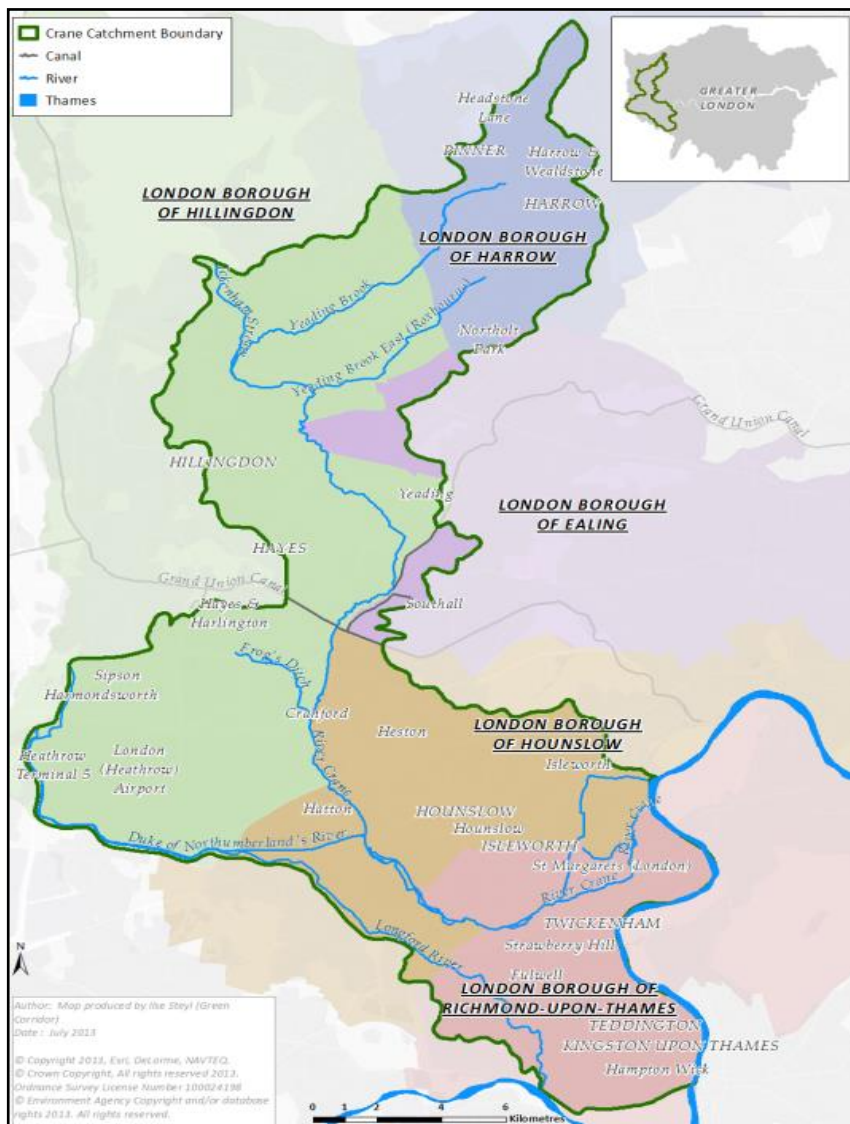
Ladywell Fields has been transformed from its previously characterless and formless landscape into a diverse, popular and accessible public open space, with surveys indicating that the public's perception of the park in terms of recreational value and safety has improved. Now 78% visitors feel safe, and use of the park has increased over two and a half times. The creation of the new gravel-bedded river channel through the centre of the park has also brought about significant improvements in biodiversity, with survey results indicating a near 100% increase in the number of species present in the park (in particular fishing birds), which are benefiting from the greater range of habitat types now

present following the restoration works. The flood risk to Lewisham has been reduced so that Lewisham's residents are now protected from 1 in 100 flood events.

The restoration of Ladywell Fields was part of QUERCUS (Quality Urban Environments for River Corridor Users and Stakeholders), a partnership between the London Borough of Lewisham, Chester City Council and s-Hertogenbosch part-funded through the EU's LIFE Environment Programme which aimed to enhance river corridors and establish them as attractive features of urban environments. For more information click [here](#), [here](#) and [here](#).

Case Study 5E: The Crane Valley Catchment Plan

Partnership working across administrative boundaries to improve water quality, biodiversity and the public realm, and reduce flood risk in a heavily developed urban area.



Green Corridor, Source: Ilse Steyl, July 2013

Background

The River Crane is a tributary of the River Thames, joining the Thames just south of Isleworth Ait in the London Borough of Richmond. The area of the Crane catchment is roughly 125km².

The first recorded acknowledgement of the importance of the Crane river corridor as a feature in an urban landscape came in the Ruislip and Northwood Town Planning

Scheme of 1914, which recognised and protected the green corridor along the Yeadon Brook (or upper Crane). The plan clearly intended the open space to continue into adjoining areas and thus may be the first recognition of the value of a river corridor in any town plan in the country.

In 1924, Middlesex County Council published its West Middlesex Plan, incorporating "The West London Green Chain". This chain

identified much of the River Crane and Yeading Brook corridors as valuable linear green spaces. Middlesex County Council also introduced an edict around this time, which forbade development within 50 yards of the river, and this had a lasting beneficial effect in preserving the open nature of the corridor.

In the last 60 years, urban populations have continued to grow and, with the demise of Middlesex County Council in the 1960s, there was no longer an overarching body to help recognise the overall value of the Crane corridor. The catchment was divided into five local authority areas; Harrow, Ealing, Hillingdon, Hounslow and Richmond, and there was no longer a focus on the overall value of the corridor. The catchment area is heavily urbanised. Consequently the Valley is subject to a variety of pressures, adversely impacting on the biodiversity and water quality of the river.

The Crane Valley Partnership

The Crane Valley Partnership (CVP) was founded in 2005. This partnership brought together for the first time Harrow, Ealing, Hillingdon, Hounslow and Richmond councils as the five major public landowners, alongside BAA as owners of Heathrow, the Environment Agency and Thames Water, GLA, London Wildlife Trust and FORCE, among others. Today there are over 20 groups represented in the partnership and it is the key forum for managing and improving the integrity of the river corridor.

The Crane Valley Catchment Plan

In February 2011, the UK Government - through the Defra Statement of Position - supported the Catchment Based Approach as a viable mechanism to improve the water environment as part of Water Framework Directive activities. During April 2011, the Environment Agency started piloting new approaches in 10 catchments and a further 15 pilot areas were established in January 2012, managed by external organisations. Funding from Defra was provided to assist with the catchment plan preparation.

In addition to these original 25 catchments, a further 41 initiatives on other catchments were funded, led by organisations that expressed an interest to pilot the catchment approach. The Crane catchment is one of the latter 41 selected, forming part of the London catchment within the Thames River Basin District.

The Crane catchment is included in the Thames River Basin Management Plan. The Crane catchment plan was prepared by the London Wildlife Trust in partnership with the members of the CVP. The plan aims to improve the Water Framework Directive Status of each water body in the catchment by uniting CVP stakeholders under seven objectives to guide future improvement works and influence planning authorities in the catchment:

1. A river rich and diverse in habitats and native wildlife.
2. Clean clear water.
3. A natural looking and functioning river with sustainable flow.
4. Reduced risk of flooding in built up areas.
5. Collaboration and engagement.
6. Awareness, access and appreciation.
7. A celebration of the Crane's heritage.

The plan also provides guidance in the form of 'catchment based approaches' that demonstrate how these objectives can be fulfilled.

Implementation

The Crane Valley Partnership will implement the catchment plan. This involves providing a strategic overview of the various activities and projects undertaken in the catchment in order to provide a coordinated approach to restoring the river. This will ensure that projects are carried out methodically in order to increase the resilience of the water course and its catchment area.

The objectives of the catchment plan now provide the basis of funding criteria in the catchment. Stakeholders recently applied to the CVP's Thames Water Fund to finance

projects tailored to achieve catchment plan objectives.

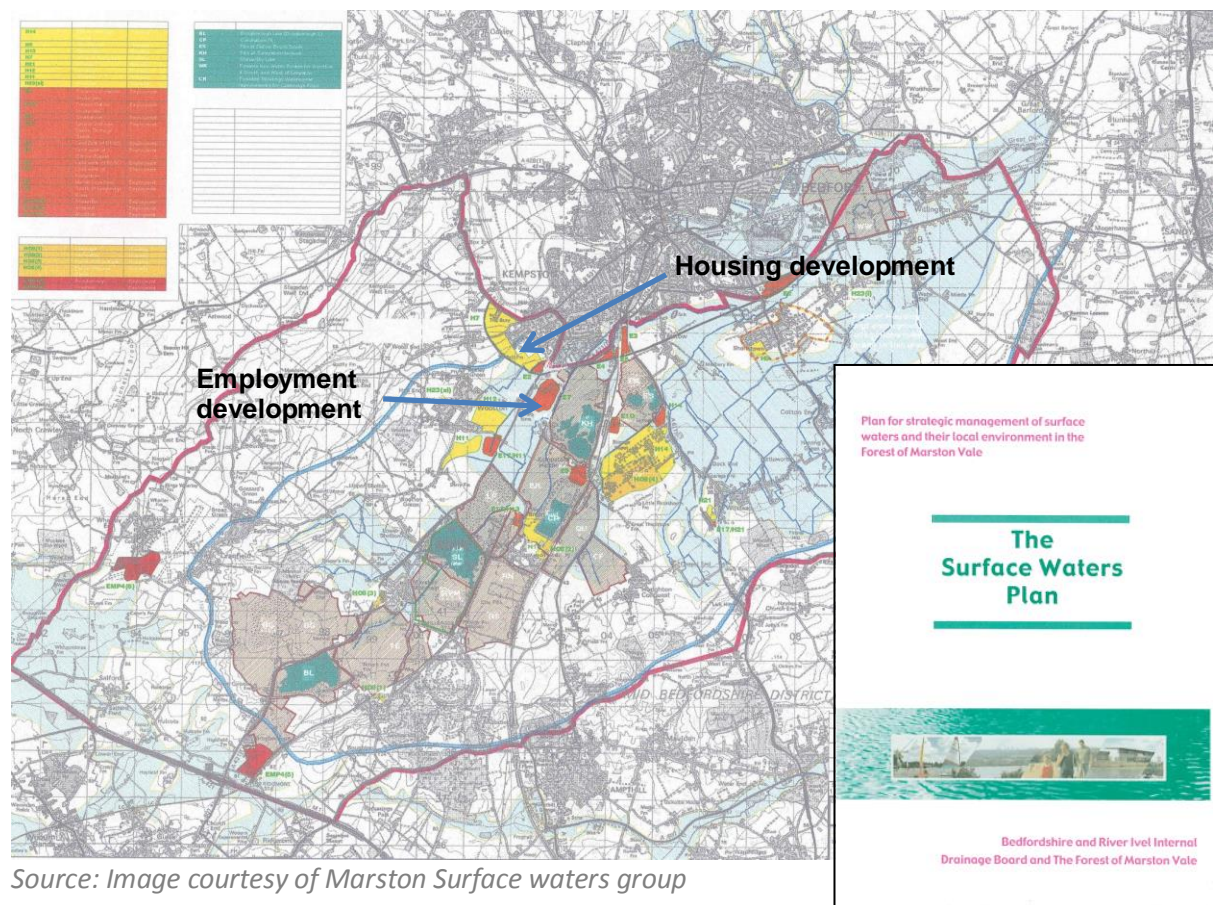
The production of the catchment plan has catalysed collaborative working amongst stakeholders in the partnership, ensuring that they stand in good stead to work together to achieve the seven objectives of this plan. Positive impacts have been achieved by sharing expertise and resources across

administrative boundaries and increasing the scale at which projects are delivered and their impacts are felt.

Contact: the Crane Valley Partnership
Development Manager, Dr Ilse Steyl
(ilse@greencorridor.org.uk)

More information can be found on the [Crane Valley Partnership website](#).

Case Study 5F: Marston Vale Surface Waters Plan



Source: Image courtesy of Marston Surface waters group

The area to the south of Bedford is a growth area with the aspiration to provide 35,000 new homes plus jobs between 2001 and 2031. To manage this pressure for development in a sustainable way the Internal Drainage Board (IDB) instigated the Marston Surface Water Group (1998) of "partners" to help align planners' aspirations of growth and IDB's requirements for drainage/flood risk management.

The Group produced the Surface Waters Plan (2002), which promoted strategic, integrated and maintainable SuDS. As the clay catchment has little capacity for infiltration, attenuation was key to managing surface water. The Group wanted to avoid piecemeal drainage in private ownership, so the IDB, as statutory authority agreed to adopt the SuDS infrastructure with commuted sums from developers, to make sure assets were maintained and continue to function in the future.

Commuted sums enabled developers to build the SuDS they wanted, which ranged from efficient and cheap to maintain dry attenuation basins to showcase lakes that support premium house sales but are expensive to maintain. The provision of SuDS in this way did not place a burden on the local community.

To facilitate good SuDS, the IDB carried out strategic modelling for the area, which the developers could adopt, develop the detailed design, and construct. This resulted in integrated SuDS for the whole development area, with individual developers responsible for the works on their land.

The integrated SuDS enabled the local planning authorities, Bedford Borough Council and Central Bedfordshire Council, to allocate sustainable sites for the new development, and to produce master plans that identify opportunities for aligning development

aspirations with strategic surface water drainage and flood risk mitigation facilities.

This is an exemplar project with strategic and integrated drainage infrastructure that is maintainable in the future by a statutory authority for the benefit of the local community. A lesson learned was to ensure legal agreements for adoption are in place

between the different parties prior to development. In many respects it is the model that the SuDS Approving Bodies are expected to use under the Flood and Water Management Act, whereby the statutory body is responsible for approving and adopting the SuDS, working in partnership with other organisations.

Examples of effective maintenance and management of SuDS are shown below.



Source: Bedford Group of Internal Drainage Boards

Section 6: Managing Water for Development

Constraints on water supply and waste water treatment can stop development unless they are understood and managed. Here case studies are used to explain how these constraints can be overcome through partnership working with water companies and catchment partnerships.

#	Case Study	Summary	Page no.
6A	Old Ford Recycling Plant	<i>Reducing water use and reducing waste water volumes in the Olympic Park with an innovative park-wide water recycling plant that achieves a 40% reduction in potable water use.</i>	46
6B	Grampian Style planning conditions (5.2)	<i>Using planning conditions that prevent the start of a development until off-site works have been agreed and the network upgraded ahead of the development being occupied to address water or wastewater/sewerage capacity issues and prevent water problems.</i>	48
6C	Rackheath Eco-Community	<i>Using water cycle studies in a partnership approach to identify and overcome the water-related constraints on a significant new town eco-town development delivering 4000 homes and associated infrastructure.</i>	50
6D	Long Stratton (5.2)	<i>Facilitating the provision of 1800 new dwellings in Long Stratton by overcoming waste water treatment constraints through a catchment-wide partnership approach based on water cycle study evidence and water quality modelling.</i>	52
6E	South Kesteven	<i>A local authority, water company and the Environment Agency working in partnership to manage water demand to enable growth in South Kesteven, phasing development to coordinate with investment in water recycling centres and catchment-wide demand management measures.</i>	53
6F	Chorley Sustainable Development Plan	<i>Local plan policy and advice/good practice that addresses water supply; reducing water use; and protection and enhancement of water quality and the water environment, including requirements to meet the provisions of the WFD and for partnership working.</i>	54
6G	Dover Core Strategy Water Management Plan	<i>Using a strong evidence base to justify very strong adopted Core Strategy policies on water efficiency.</i>	55
6H	Water company involvement in the planning process: Thames Water	<i>Proactive engagement in development planning to resolve water supply and waste water/sewerage issues, using a 'Water Services Infrastructure Guide for Local Planning Authorities' which has been circulated to all the local planning authorities in the water company's area.</i>	56

Case Study 6A: Old Ford Water Recycling Plant (the Queen Elizabeth Olympic Park Water Recycling System)



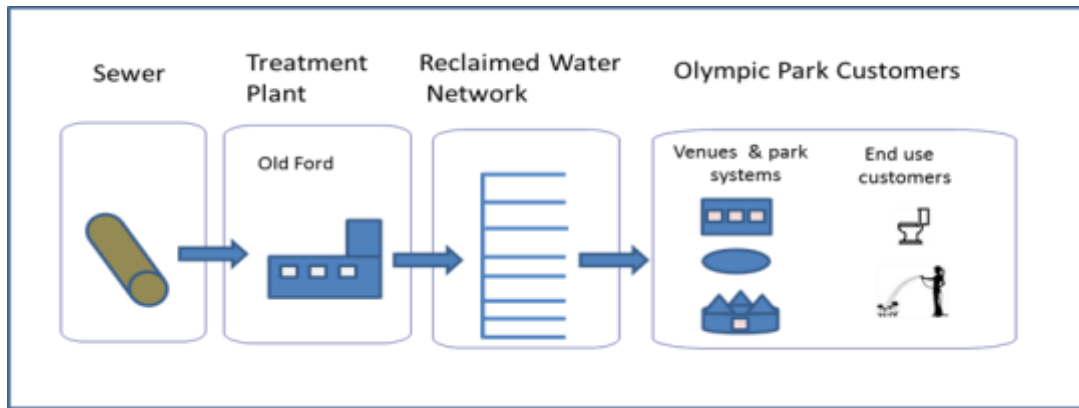
Source: Thames Water

Reduced potable water use was a key sustainability objective of the Olympic Development as stated in the Sustainable Development Strategy. This was reflected in a planning condition on the Olympic Planning Permission to achieve a 40% reduction in potable water use compared to the 2006 industry standard.

The water use planning requirements were met through demand reduction measures, such as water efficient fittings and efficient irrigation, and demand substitution by

developing and using non-potable water supply resources.

To provide the required non-potable water it was decided that a park-wide water recycling plant using membrane technology would be developed rather than alternative options such as groundwater and river water abstraction. By treating wastewater and putting it into a non-potable supply network, a true reduction in the use of local water resources was achieved.



Overview of the Queen Elizabeth Olympic Park Water Recycling System (Old Ford) Source: Thames Water

Thames Water in partnership with the Olympic Delivery Authority developed a scheme for a water recycling plant. Potential sites for the facility were assessed. The site selected was partly owned by Thames Water and previously used as a water pumping station. However, its location on the edge of the Olympic Park in close proximity to residential properties and its designation as a site of nature conservation importance required sensitive design.

Significant pre-application engagement with stakeholders including the ODA, London Wildlife Trust, the EA, local authority officers and residents influenced the design of the development. Ecological enhancements were proposed within the site to address the impacts on the site of nature conservation importance. To mitigate the visual impacts of the facility the plant building has a green roof and timber cladding to blend the building into its wooded setting. Where possible reinforced grass surfaces were used for areas of hardstanding. All potentially odorous areas of the building and the external tanks are vented through an odour control unit to ensure that

the plant has no adverse impact on residential amenity.

Trees and habitat removed during construction were relocated on the site. Ecological enhancements included butterfly banks, tree planting, bird and bat boxes and the building's biodiverse green roof.

The scheme has achieved its aims and offers further potential:

- The plant was designed to produce 574m³/d (or 0.574Mld) of reclaimed water.
- The water produced is mostly used for irrigation of the public areas on the Park with the remainder used for toilet flushing. As the usage is predominantly for irrigation demand generally drops off during winter months.
- There are plans to extend the non-potable network to supply more irrigation points/venues and potentially to the energy centre for cooling waters, making the demand more sustainable.
- The plant is also being used in several research projects for plant optimisation, water quality, public perception and studying the carbon footprint of the whole process.

Case Study 6B: Grampian style planning conditions for permitting developments in areas with limited capacity

New development in areas with insufficient water or wastewater/sewerage infrastructure capacity can lead to sewage flooding of residential and commercial property, pollution of land and watercourses as well as water shortages with associated low pressure water supply constraints.

In these areas, Thames Water encourages developers to contact them as soon as possible to determine whether capacity is available and if not how capacity can be provided in time to service the development. However, developers do not always contact Thames Water and do not always provide sufficient information on water or wastewater/sewerage infrastructure with planning applications. Furthermore as a developer has a right to connect to the sewerage system there is no guarantee the developer will wait until the appropriate sewerage upgrade is in place or connect to the appropriate location in the sewerage network.

To address this and ensure that the appropriate infrastructure is in place ahead of occupation of development, 'Grampian' conditions can be attached to planning permission. A "Grampian condition" is a planning condition attached to a planning permission that prevents the start of a development until off-site works have been agreed and the network upgraded ahead of the development being occupied.

The aims of Thames Water's use of Grampian conditions are to:

1. Enable development by ensuring the essential water and waste

- water/sewerage infrastructure capacity is available to service it
2. Ensure that the necessary water supply and waste water/sewerage is in place in time to avoid unacceptable impacts on the environment such as sewage flooding of residential and commercial property, pollution of land and watercourses plus water shortages with associated low pressure water supply problems.

Botley, Oxford is a high profile scheme where the use of Grampian Conditions has been effective and avoided an increase in sewer flooding.

The Botley area was under pressure for new development, but it also experienced sewer flooding as historically development has taken place without the necessary improvements to sewerage infrastructure. The local planning authority accepted Thames Water's recommendation that Grampian conditions be attached to residential planning applications requiring that the necessary sewerage infrastructure be implemented prior to development being occupied. The local planning authority attached Grampian conditions to planning permissions so no new development can be connected to the public sewerage system before an agreed date to enable Thames Water to upgrade the sewerage system.

The £7m sewerage upgrade scheme that took place during 2012 involved the upsizing of the sewer along North Hinksey Lane, and upgrading the sewers to North Hinksey Pumping Station within Old Botley and the sewers on Cumnor Hill and Eynsham Road (as illustrated on the diagram below).



Source: Thames Water

Please find the link to Thames Water's Botley Sewer Renewal Press Release [here](#).

Case Study 6C: Water and the Rackheath Eco-Community

Rackheath, to the north east of Norwich, has been selected by the Government as one of only four eco-towns in the UK. Water provision and sewerage has been identified as a key challenge for Rackheath.

East Anglia as a whole receives the lowest annual rainfall in the UK and Rackheath is located near to the Norfolk Broads, much of which is protected by European designations due to its importance as a wetland habitat. It is therefore one of the most sensitive places to locate significant growth in the East of England. This significantly limits environmental capacity for receipt of discharges and provision of water resources without deterioration in water quality. This was evidenced in the [Greater Norwich Water Cycle Study](#).

Following on from this, a specific study on potential constraints to development in Rackheath has been included as part of the North East Norwich Water Cycle Study, which amongst other issues considers the challenge of achieving water neutrality. Both studies benefitted from practical support by a wide range of partners, including:

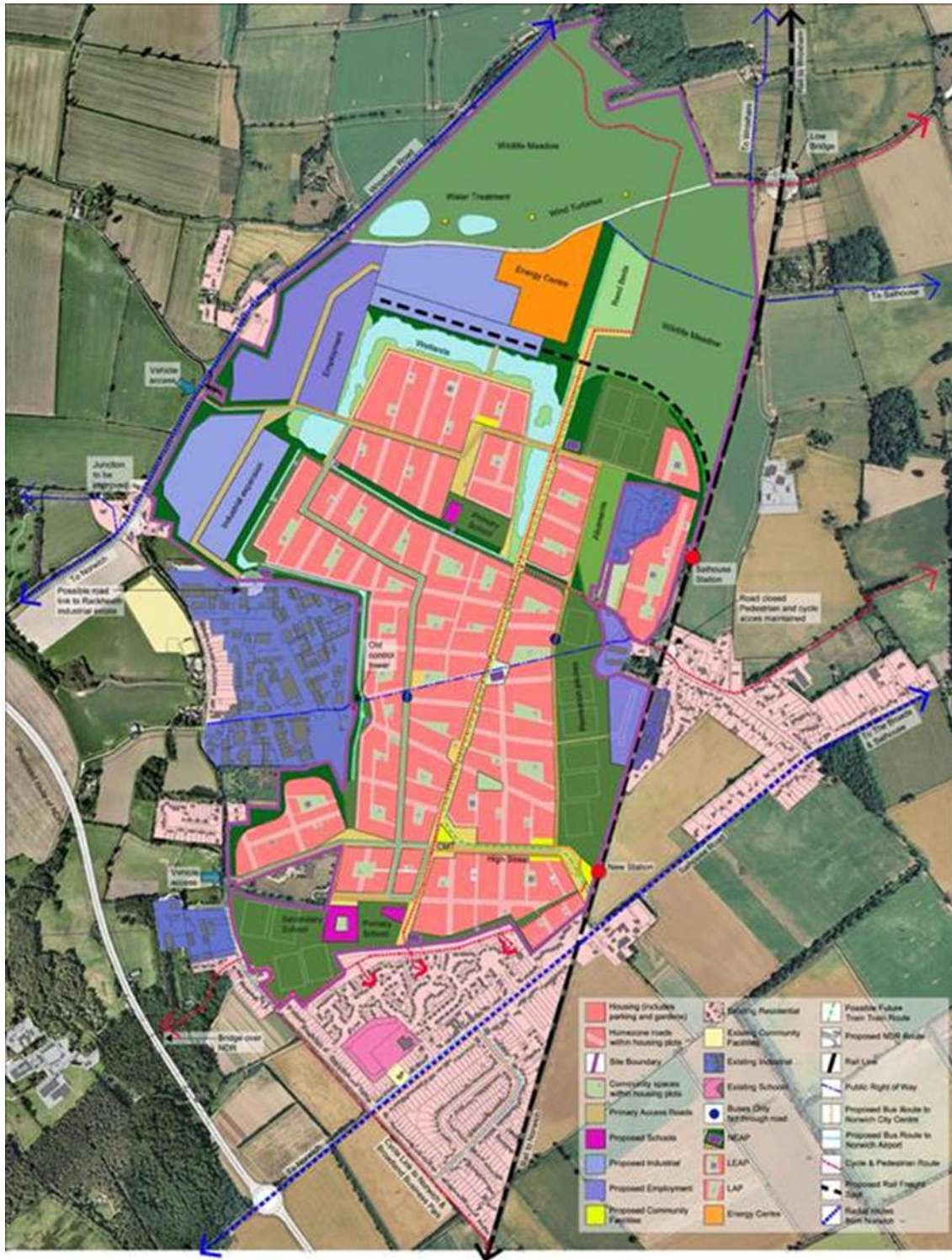
- Anglian Water Services
- The Environment Agency
- The Broads Authority
- Broadland District Council

- Natural England
- Norfolk County Council
- Internal Drainage Boards

The Environment Agency and the promoter, Building Partnerships, have developed a strong working relationship to ensure that environmental risk and opportunities are considered from the start of the Rackheath project.

Several options are now being considered with varying degrees of innovation and complexity. Rackheath will deliver 4,000 homes, 25 hectares of employment, a rail freight depot, schools, a doctors surgery, retail and other facilities so different solutions could be used in each phase and then integrated to a holistic system as part of masterplanning for water on-site.

Some of the solutions being considered for Rackheath are new to the UK and all parties agree innovation must be balanced with ensuring that systems work in the long run to protect the environment and public health. The Environment Agency's role in facilitating discussions has been recognised by both Building Partnerships and Anglian Water, and all parties are committed to continued support for this initiative in the build up to an outline planning application to ensure it is "right first time".



Notes: This report is the design solution with 100% Rackheath LEAP plus new rail for Rackheath without loss of any other concept. All dimensions are to be checked on site and the final number of units. All dimensions are to be checked on site and the final number of units. All dimensions are to be checked on site and the final number of units.

Scale: 1:1000

North Arrow

bsi architects

Barnet Stratton
Rackheath Eco-Community
Masterplan

1:1000 @ A1

25/06 / (SK) 021

Rackheath Eco-community
Source: Anglian Water/Environment Agency

Case Study 6D: Development in Long Stratton

The Greater Norwich Development Partnership Core Strategy identifies 1800 new dwellings for Long Stratton between 2008 and 2026. However the Water Cycle Study supporting this document concluded that capacity at Long Stratton Water Recycling Centre poses a potential constraint to this growth. A new flow permit would be required for development of this scale, which would require a tightening of quality permit limits to ensure no deterioration in water quality at ecologically sensitive sites downstream. As the quality permit at the Centre is already set at what is regarded as the limit of current conventional treatment technology, tightening the permit beyond this would be challenging in the short-term.

South Norfolk District Council are now progressing an Area Action Plan for Long Stratton. Working together Anglian Water Services and the Environment Agency have produced a Joint Position Statement

recognising that waste water capacity could be a constraint on development in the town, but that they are committed to working with all parties to progress solutions to enable the development proposed in Long Stratton. The need for phasing of development until capacity is made available is recognised in specific policy considerations within the proposed [plan](#).

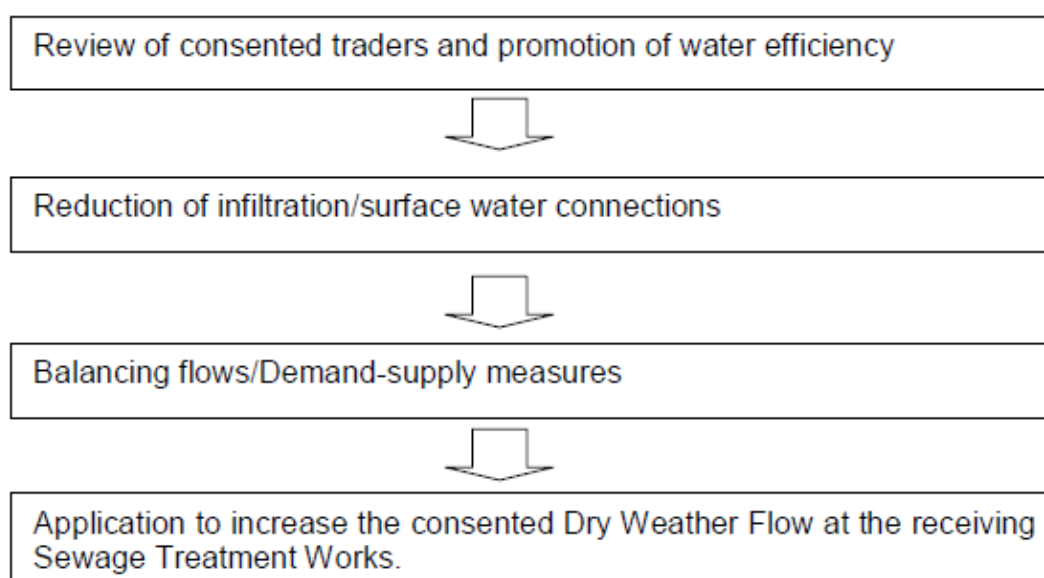
Detailed water quality modelling of the receiving river catchment is now being carried out to provide evidence to support plan making. The most likely way forward will be to take a catchment wide approach to Anglian Water assets, potentially making more sustainable improvements at other Water Recycling Centres to enable growth in the Long Stratton catchment.

For further information contact: [Martin Barrell / Louisa Johnson \(Environment Agency\)](#); [Rob Morris \(Anglian Water\)](#)

Case Study 6E: Managing Demand to Enable Growth in South Kesteven

The Water Cycle Study for South Kesteven identified a number of potential constraints to growth, which could be overcome through investment driven by changes to permits at a number of Water Recycling Centres. This can be managed through phasing of growth to enable provision of this capacity once it comes forward. However, to enable some growth to come forward ahead of the phasing plan more detailed analysis was carried out to

assess the potential for demand management measures to provide the required capacity. All parties committed to the principle of making the most efficient use of existing infrastructure before investing in new infrastructure, though this must still be considered in a long-term context. The hierarchy that was used in this case is set out below, but other catchments may support alternative demand management measures, such as inter catchment transfers for example.



Demand Management Hierarchy

For more information click [here](#).

Contact: Paul Hunt (Environment Agency),
Max Shone and Jen Dean (Anglian Water)

Case Study 6F: Chorley Sustainable Development Plan

The Chorley Sustainable Resources DPD was adopted in September 2008 and the SPD in March 2009. This sets out advice and good practice methods that can ensure that development is able to be considered sustainably.

DPD Policy SR1 on Incorporating Sustainable Resources into New Development covers water issues. This policy sets out the requirement for all development (beyond a certain scale) to minimise use of non-grey water, with surface water to be managed through implementation of SuDS where appropriate.

This is further elaborated in the SPD, which requires that applicants for development are expected to demonstrate methods integrated into proposals to reduce water use, including rainwater harvesting, greywater recycling, water saving devices, and Sustainable Drainage Systems (SuDS).

Policy SR1 goes on to state that all dwellings will be required to meet Code for Sustainable Homes Level 3 by 2010, Level 4 by 2013, and Level 6 by 2016. All other buildings will require “Very Good” BREEAM rating from 2010.

Summary Points:

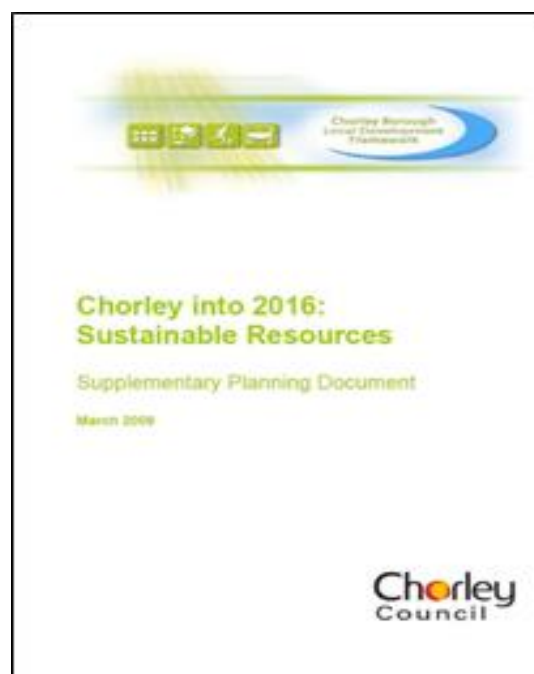
Supply of Water – Policy PCS 4 seeks to improve the water infrastructure with increased capacity of sewer infrastructure, detailed for particular areas where this is applicable.

Sustainable Use – This is particularly supported through the Sustainable Development DPD and SPDs, which set out in detail methods which can integrate reduced water use and increased efficiency as required in new developments.

Protection and Enhancement of Water Quality and the Water Environment – Policy PCS4 seeks to reduce pressure on water bodies by

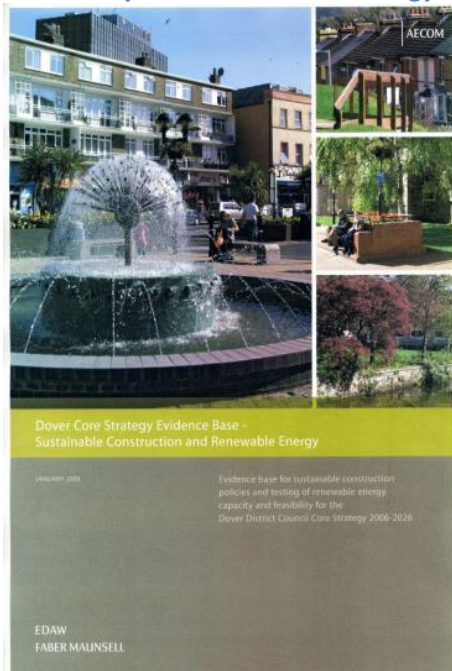
maximising the potential of green infrastructure to contribute to flood relief. PCS4 also seeks to take opportunities to improve sewer infrastructure, and promotion of investment in sewerage water treatment works in conjunction with water companies. Water quality requirements are set out in further detail in the **Surface Water Drainage SPD** currently at draft stage.

Other provisions of relevance include reference and requirement to meet the provisions of the WFD and the requirement for partnership working to enable standards set out in the RSS to be met.



Source: Chorley Council

Case Study 6G: Dover Core Strategy



Source: Dover District Council

The Dover Core Strategy is a good example of how a strong evidence base can justify very strong policies around water efficiency.

The Dover Core Strategy Evidence on Sustainable Construction and Energy is an example of an evidence base to support LDDs through the EiP process which has led to adopted Core Strategy policies on water efficiency.

Recognising that Dover District may be disproportionately affected by climate change, particularly with regards to water scarcity, this evidence document acknowledges that Dover has both a global responsibility and a local vulnerability to climate change.

It therefore recommends inclusion of policy which sets an immediate requirement for Code for Sustainable Homes level 3 for all new developments, rising to level 5 by April 2016. Residential developments of above 1000m² are also to meet BREEAM 'very good' or equivalent standards with immediate effect. The document also recommended a new Core Strategy policy to be applied to all domestic and commercial extensions and conversions

to require cost-effective energy and water efficiency measures to be included, aiming for no net increase in energy or water demand from the property.

It also recommends the completion of masterplanning and energy and water strategies and other sustainable construction requirements around water for various strategic allocation policy areas.

The sustainable development and energy core strategy evidence document clearly sets out the implications for the Core Strategy of the current water availability situation and the future impacts of climate change on this. On the back of this evidence it recommends several policies for inclusion in the Core Strategy to address climate change issues by requiring higher levels of water efficiency measures to be taken to reduce water consumption.

The Dover Core Strategy includes Core Strategy policy CP5 setting a requirement for new residential development to meet the requirements of Code for Sustainable Homes (CfSH) level 3, rising to level 5 by April 2016. Non-residential developments of above 1000m² are also required to meet BREEAM 'very good' or equivalent. Residential and commercial extensions are encouraged to include water and energy efficiency measures. This policy also requires that where developments under 1000m² can demonstrate that they can't meet these requirements on-site, permission will only be granted if the applicant makes provision for compensatory water savings elsewhere in the District.

Policy for the Whitfield strategic development area recommends development will achieve at least CfSH level 4, aspiring towards level 5, intended to encourage the move to much higher levels of water efficiency.

Click [here](#) for Dover Core Strategy Evidence – Sustainable Construction and Energy, and [here](#) for Dover Core Strategy.

Case Study 6H: Water company involvement in the planning process: Thames Water

Thames Water are proactive in consulting through the Development Planning process, assisting sustainable development coming forward by helping to ensure that essential water and waste water/sewerage infrastructure capacity is planned and available to service strategic development. Thames Water seeks to get involved at an early stage of plan making to identify strategic infrastructure issues. However, not all development sites are identified in Development Plans and development proposals often come forward prior to development plans being adopted. Therefore Thames Water relies not only on the Development Plan process to plan for strategic infrastructure, but also in ensuring appropriate local infrastructure is put in place by commenting on planning applications, and where necessary requesting appropriate infrastructure planning conditions on planning permissions.

The water and sewerage undertakers are not statutory consultees in the planning application process and therefore do not automatically get consulted on planning applications. However, past planning guidance has encouraged local planning authorities to consult the water/sewerage undertakers on planning applications which are likely to have significant implications for water and/or sewerage services.

In Thames Water's experience there has been a varying response to this guidance in that some local authorities have consulted on all applications as a matter of course (by sending local lists), some have consulted on certain types of application and some have consulted on very few applications.

Where local authorities do not regularly consult, Thames Water has proactively obtained local authorities' local lists of planning applications to review and obtain copies of appropriate applications to comment upon. This is a major task as Thames Water has around 100 local

authorities in full or part in its region (including county councils and development corporations).

To aid this process, Thames Water produced and regularly updates a 'Water Services Infrastructure Guide for Local Planning Authorities' which has been circulated to all the local planning authorities in its area. The Guide provides guidance on how best to consult with Thames Water regarding water supply and waste water/sewerage infrastructure in relation to both Development Plans and Planning Applications. It also contains a list of the types of planning application which Thames Water would seek to be consulted on. [The first version was produced in 1989 when the water authorities were privatised. Thames Water will be providing its latest updated version in the summer of 2014.]

To assist Thames Water's consultation responses to planning applications a list of standard conditions has been developed to include where appropriate in planning application consultation responses. These responses have been adapted and improved over recent years in response to changing planning policy/guidance and specific project experience.

The importance of such conditions were also increased following the Barratt Homes Ltd versus Welsh Water Supreme Court Judgement in December 2009 where it was established that developers have the right to connect to their preferred point of connection and that the planning process was important in ensuring that this does not cause problems such as sewer flooding.

A link to Thames Water Developer Services can be found [here](#).

A link to Barratt Homes Ltd versus Welsh Water Supreme Court Judgement, December 2009 can be found [here](#).

Section 7: Tools and Approaches

A range of tools and approaches are available to planners to develop the evidence base on water issues for local plans and develop planning policies to create beautiful, successful and resilient places, whilst gaining the multiple benefits described in the ‘*Planning Advice for Integrated Water Management*’ note. The case studies highlighted here give examples of where tools and approaches have been successfully applied.

#	Case Study	Summary	Page no.
7A	Anglian Region Water Cycle Studies	<i>The use of water cycle studies in a partnership approach to support local plan making across the Anglian Region, to align water and spatial planning and deal with growing pressures on the water environment at local level.</i>	58
7B	Upper Thames Catchment	<i>Using the Integrated Local Delivery (ILD) approach to identify and manage water issues in the catchment through facilitated local community involvement to achieve multiple benefits with less cost, improving water quality to support Water Framework Directive objectives and enabling masterplanning for up to 2,500 dwellings and a significant amount of employment land.</i>	60
7C	Waltham Common	<i>Using the Integrated Local Delivery (ILD) approach to inspire and enable communities to secure sustainable local water management in the area around Waltham Common, to reduce flood risk and protect the environment.</i>	63

Case Study 7A: Joint Promotion of Water Cycle Studies in the Anglian Region

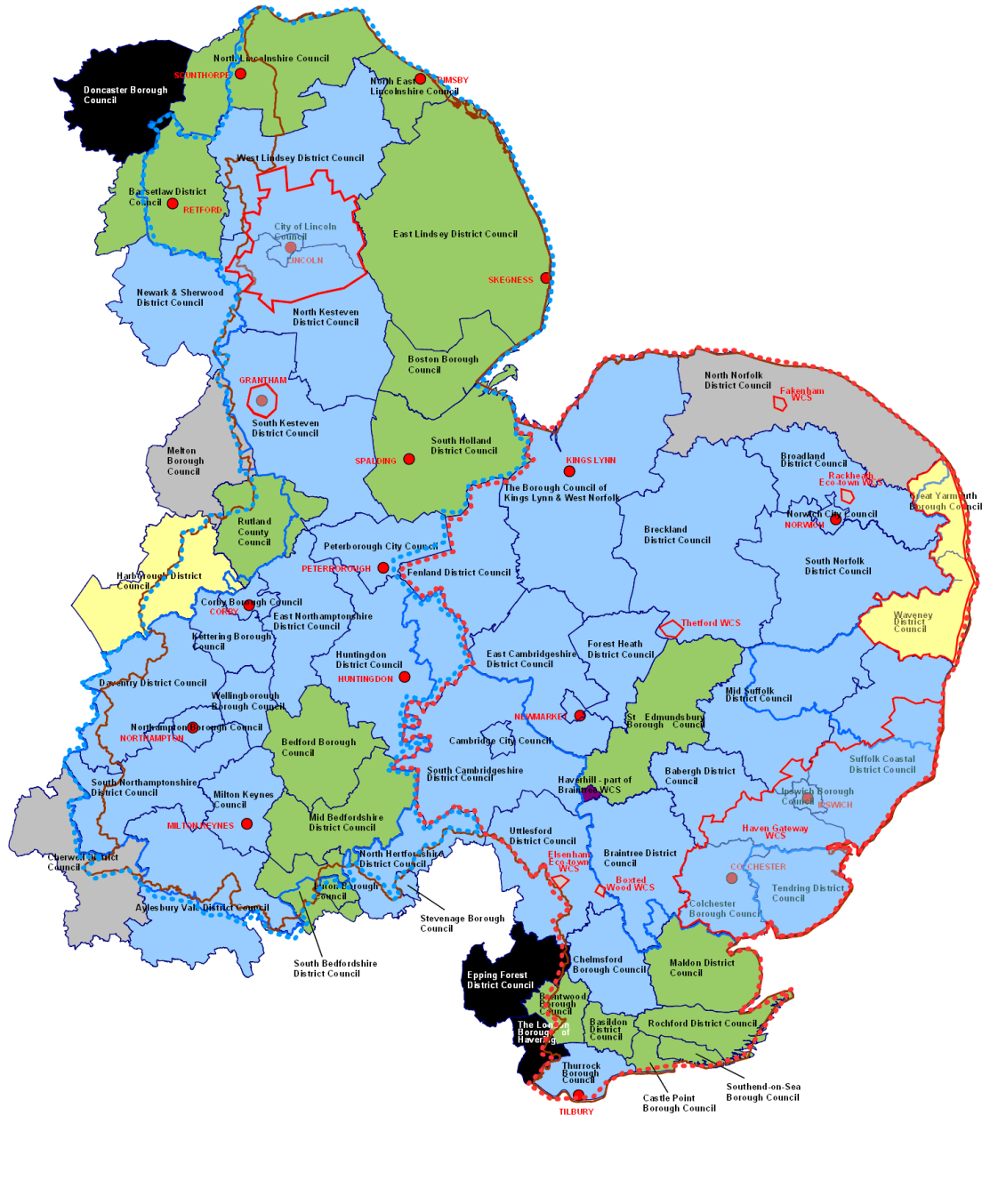
The Environment Agency and Anglian Water have worked together to champion the preparation of Water Cycle Studies as evidence to support plan making across the Anglian Region. These studies have been extremely successful at getting the required stakeholders round the table to help align water and spatial planning and deal with growing pressures on the water environment at local level.

In addition, both organisations have successfully promoted Water Cycle Studies at regional level through the East of England Water Partnership. Formed in 2008, this partnership set out to support economic growth and the sustainable use of water. It is chaired by the Environment Agency and comprises directors and senior members of water companies, Natural England, the Local

Government Association and the Consumer Council for Water.

Whilst changes to regional government and the economy have meant that this partnership has had to adapt since its inception, the agenda for growth is stronger than ever. Also, climate change and increasing expectations from Government and society on the quality of our environment mean that understanding and addressing water issues as part of spatial planning remains crucial. Since its formation the East of England partnership has backed Water Cycle Studies as a vehicle for this.

92% of the District Councils in the Anglian Water region have completed a Water Cycle Study, with the majority now having progressed to detailed stage (coloured blue in the map below)



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Key to Map:

- Mostly Outside AW Area
- Under Discussion
- Preparing Tender
- Scoping - underway or complete
- Water Cycle Study Status
- Outline - underway or complete
- Detailed - underway or complete
- Areas which sit within one planning authority but are split by another
- Urban Centres
- AWS Water Boundary
- AWS Wastewater Boundary
- Asset Planning West
- Asset Planning East
- WCS boundary where it is inside a Council boundary or includes number of Councils

The map is provided for information only and is not intended to be used as a legal document. It is not intended to be used as a legal document. It is not intended to be used as a legal document. It is not intended to be used as a legal document.

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Email: Plan_IT@anglianwater.com

APWCSMAP 1 OF 1 1:585.026

RCM RCM RCM 03/07/2012

REVISION DETAILS

AW Region with Planning Authority Boundaries and WCS Status

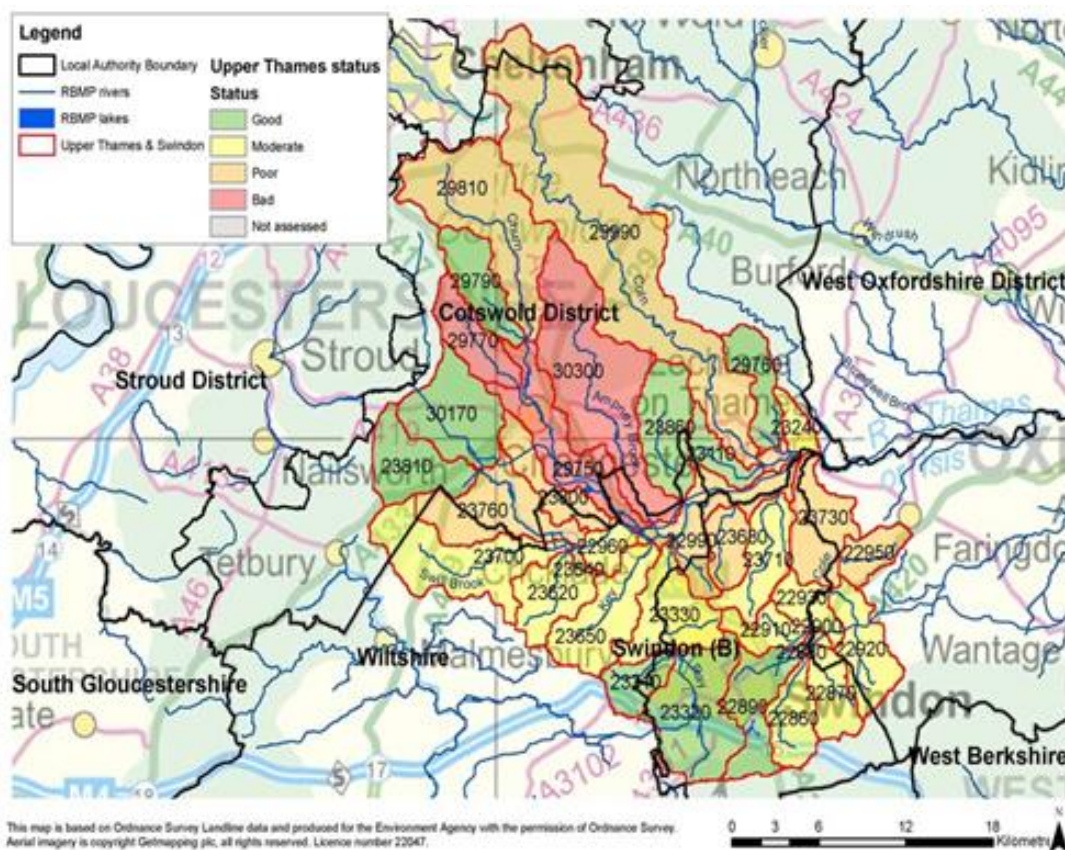
Source: Water Cycle Study Progress in the Anglian Region

Contact: Richard Thompson (Environment Agency), Steve Langlois (Anglian Water)

Case Study 7B: Upper Thames Catchment: Integrated Local Delivery

The Upper Thames Catchment is a small/medium-sized catchment in the Cotswolds, predominantly rural in character but with some urban pressures. The northern part of the catchment falls within the Cotswolds Area of Outstanding Natural Beauty and the southern catchments fall in the Cotswold Water Park. The catchment

supports a wide range of economic activity in industries such as farming, recreational fishing, tourism and recreation and is a source of private drinking water. The catchment supports a rich variety of wildlife. However the Environment Agency and Thames Water identified a range of pressures in the river systems across the catchment.



Upper Thames Catchment, Source: FWAG

The range of issues and challenges within this relatively small catchment has reinforced the need to develop a more joined-up approach to the way this catchment is managed. A number of the key organisations, Government, local authority and private, have come together to develop ways of protecting and improving the quality of the water, the wildlife of the area and the social and economic well-being of communities within the catchment. A Catchment-Based Approach pilot is using Integrated Local Delivery (ILD) as a means of scoping assets and active potential partners, organising information, engaging

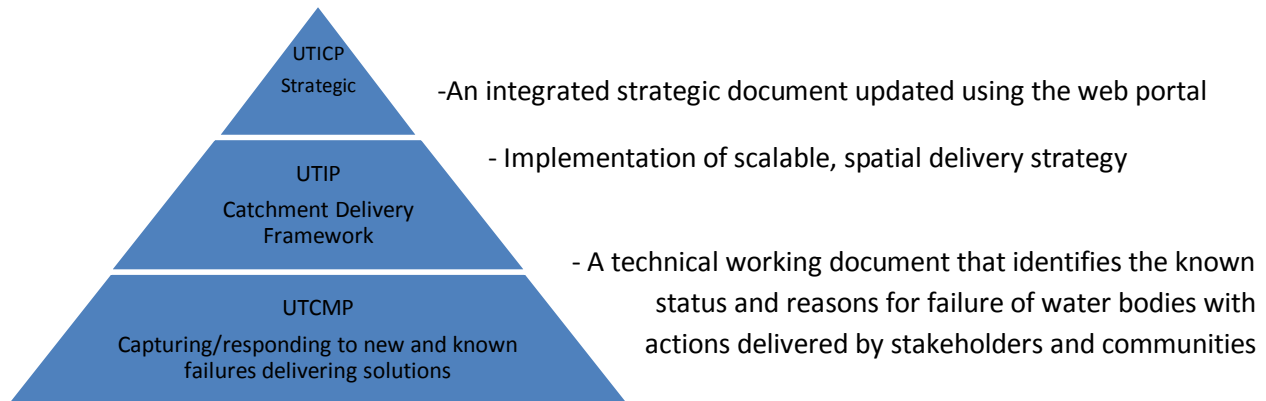
with local communities and identifying the potential for multiple benefits to be secured through coordinated action to improve water quality and meet Water Framework objectives.

The pilot has resulted in the development of an overarching strategic framework, the Upper Thames Integrated Catchment Programme (UTICP), which is delivered through the UT Implementation Plan (UTIP), an action plan targeting water quality and providing a framework for meeting Water Framework Directive (WFD) requirements.

UTIP is also informed by the Upper Thames Catchment Management Plan (UTCMP), which is an Environment Agency technical document

which identifies water quality pressures and reasons for failure in specific water bodies.

Cotswold (Upper Thames) Integrated Sustainable Implementation Strategy (ISIS)



The Upper Thames Catchment Pilot

The Upper Thames Catchment Pilot is based on the use of Integrated Local Delivery (ILD). The Plan components therefore reflect tasks focused on:

- The development of catchment-wide sources of information and analysis based on ILD;
- The organisation of ILD delivery mechanisms for improvements in water quality together with other multiple benefits, across the water bodies which make up the catchment – and the delivery of ILD in one significant group of water bodies, through the Water with Integrated Local Delivery (WILD) project; and
- A project template for the roll out of ILD approaches to more water bodies in the catchment.

The approach aims to enable immediate, medium and long-term locally led solutions for water issues through an all-inclusive partnership for rolling out the catchment based approach. It is developing:

- **Parish maps** for the whole catchment showing water bodies and failures.
- The collection of GIS data for a **web portal** (ideally to be hosted by each County Council) to overlay all partner strategies and projects to provide local data sets from an all-inclusive

- partnership to help deliver WFD projects with **multiple benefits**.
- The hosting of a Farming and Integrated Environmental Local Delivery (**FIELD**) **Coordinator** by the Council to manage data.
- The development of NFU **farmer Champions** in each parish/ward to help reconnect communities with the farmed environment to help build resilience.
- The development of an accreditation of **FIELD advisers** to work with the Rural Community Council to **facilitate** integrating environmental issues into parish planning.
- Village case studies to show resulting release of **Social Capital** - to start to identify the ownership and management of the ditch networks, land use, options appraisals, biodiversity.
- The development of a **project template** working to a spatial strategy for each water body that groups parishes to help deliver integrated WFD delivery with multiple benefits, transferable to any catchment.

Using the results from the Upper Thames Pilot

The work done and results achieved have had a significant input to the development of the

next River Basin Management Plan (RBMP) and support its implementation. The results should also inform the Cotswold District Local Plan so that new development has minimal impact on water quality, and opportunities to improve water management in the catchment and realise other benefits for communities and the environment are realised.

The ILD process utilised by the Upper Thames pilot was used to identify potential measures to address reasons for failure against the Water Framework Directive (WFD) and inform the development of the second round RBMP by the Environment Agency. To develop the RBMP:

1. A call was made to all partners to map what they were doing in each water body in the catchment.
2. An assessment matrix was developed (based on the Wessex Water model for the Frome and Piddle). This identified:
 - a. The potential interventions by type, e.g. EA direct investment in infrastructure, land use management (farmed and other), the projects of key partners such as the Wildlife Trust, Rivers Trust etc., and other local investment which could be used in meeting WFD objectives (e.g. economic development, footpath development etc.).
 - b. The potential multiple benefits of each intervention; and
 - c. Cost and risk management issues (e.g. how certain is it that the intervention would have the desired effect?)
3. A facilitated session was held to discuss and score the measures.
4. The EA are now using the results to consider prioritisation of schemes for the catchment in the second round RBMP.
5. Importantly, using the ILD process, all the other measures which could contribute (but are not EA investment priorities) are not lost. Other actors and partners have the ability and may be willing to invest in measures which help contribute to improved water quality, supporting WFD objectives and supplementing the RBMP in a complementary way, and at the same time have multiple benefits for habitats, farm management and income, tourism etc. Without this process, the potential for others' actions to be co-ordinated in support of WFD objectives would never be identified in the first place.

The Cotswold District Local Plan is currently under development and the District Council is consulting on strategic site allocations for housing and employment. A site in the Catchment, south of Chesterton on the southern boundary of Cirencester, has been identified as the location for up to 2,500 dwellings and a significant amount of employment land.

The master planning of this area presents an important opportunity to use ILD to positively influence the shape of development, its impact on water and wider environment, and to provide important investment in infrastructure. It also presents an opportunity to use ILD to address the very different issues affecting water quality in an urban setting.

For further details contact:
jenny.phleps@gloucestershirefwag.org.uk

Case Study 7C: The ILD model in action: Walmore Common



Walmore Common (photo © Copyright [Kevin Gilman](#) and licensed for reuse under [Creative Commons licence](#))

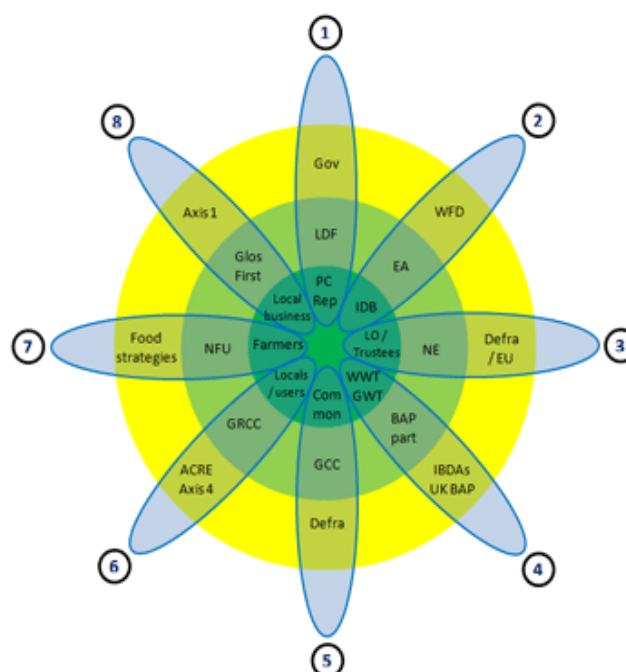
The ILD model has been used to secure sustainable local management in the area around Walmore Common, near Westbury and part of the floodplain of the River Severn in Gloucestershire.

The area is part of a network of smaller catchments that are low lying and close to the main river and drain into it through a series of ditches. The area has multiple designations at international (Ramsar and SPA) and national level (SSSI) due to its geology (lowland submerged peat) and ecology (overwintering of Berwick Swans and nesting of wading birds).

There are two separate national interests and legal obligations that come together in Walmore – reducing flood risk and environmental protection. In 2008, a series of one-to-one discussions, open meetings, site walks and other examples of direct communication between a FIELD officer from the Farming and Water Advisory Group (FWAG), interested NGOs and agencies and the local farmers were introduced. Using the ILD model the full range of assets in the wider Walmore area was established.

Each environmental feature generates a petal of integrated delivery with the defined administrative area.

This resulted in the development of the



Walmore Case Study Integrated Local Delivery Flower

Walmore Common Management group identified a number and range of tasks, the most straightforward of which have already been implemented. This is a clear contrast to the inactivity of previous years. Different types of knowledge, for example surrounding the hydrology, are now more widely recognised by a wider range of interests, although this is not always the case. Crucially,

most people feel listened to, or at least taken seriously.

Overall, there is agreement that the situation around Walmore is now closer to a shared vision, with both locals and agency staff agreeing that communication is clearer. The management group is seen as a source of accurate information on what is actually happening, thus replacing hearsay. The actions of the group and the transparent, accountable and effective nature of the meetings mean that the agencies are more confident that their legal requirements and obligations can be met locally. Conversely, the local community is beginning to take collective responsibility for management that will meet national targets and obligations as well as meeting other concerns such as flooding and access provision.

One of the major changes that the approach has brought about is the number of surrounding landowners participating in Environmental Stewardship, mostly the Higher Level Stewardship (HLS) scheme that will deliver greater environmental benefits to the area. The in-depth nature of the management decisions has meant that local members of the management group have dramatically increased their understanding of what environmental agencies are expecting on the site and this has led to an increased awareness of the uniqueness and

complexities of this wet lowland area with its high biological and productive diversity.

Wider lessons

The end result in Walmore is the introduction of a landscape scale process that is delivering far more than just the management of the designated areas within it. The surrounding areas provide a significant buffer, a key recommendation of the Lawton Review. However, this task requires high skills of facilitation and the ability to link up various strategic frameworks.

The experience within Gloucestershire suggests that an integrated approach can inspire and enable communities to help meet national environmental targets and obligations. This contrasts with the more regulatory and incentive driven approach preferred by some within the conservation movement where environmental management is determined externally and implemented using a business model rather than one more attuned to the existing custom within a landscape.

For further information, please contact:

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- *Jenny Phelps of FWAG:*
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Cambridge insight, policy influence, business impact

The University of Cambridge Institute for Sustainability Leadership (CISL) brings together business, government and academia to find solutions to critical sustainability challenges.

Capitalising on the world-class, multidisciplinary strengths of the University of Cambridge, CISL deepens leaders' insight and understanding through its executive programmes, builds deep, strategic engagement with leadership companies, and creates opportunities for collaborative enquiry and action through its business platforms.

Over 25 years, we have developed a leadership network with more than 5,000 alumni from leading global organisations and an expert team of Fellows, Senior Associates and staff.

HRH The Prince of Wales is the patron of CISL and has inspired and supported many of our initiatives.



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