



# Anglian Water 2015 Water Resource Management Plan

Strategic Environmental Assessment  
Environmental Report Volume II: Appendices

December 2013  
Anglian Water



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# Appendix A. Plans and Programmes Review



Table A.1: Review of Relevant Plans, Policies and Programmes

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
<b>International</b>		
UN Framework Convention on Climate Change (1992)	The stated objective is to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.	The WRMP will indirectly contribute to achieving the UK's climate change commitments by meeting demand for sustainable water resources now and in the future.
Kyoto Protocol on Climate Change (1997)	The protocol was ratified in 2004. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. The Kyoto Protocol requires the EU to cut its greenhouse gas emissions to 8% below 1990 levels by 2008-2012.	The WRMP will indirectly contribute to achieving the UK's climate change commitments by meeting demand for sustainable water resources now and in the future.
Berne Convention on the Conservation of European Wildlife and Natural Habitats (1979)	The aims are to conserve wild flora and fauna and their natural habitats and to promote European cooperation. Particular importance is placed on the need to protect endangered natural habitats and endangered vulnerable species, including migratory species.	The WRMP will need to take into account the presence of protected species and designated sites.
Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979)	The Convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range.	The WRMP will need to take into account the presence of any migratory species and their habitats.
Ramsar Convention on Wetlands of International Importance especially as Wildfowl Habitat (1971)	Provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The aim is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world". The Convention uses a broad definition of the types of wetlands covered, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.	There are a number of designated Ramsar sites within the WRMP area. The WRMP will need to be mindful of such sites and take into account any potential impacts on such sites.
<b>European</b>		
EU Biodiversity Strategy to 2020: Our life insurance, our natural capital (2011)	Strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets and 20 actions to help Europe reach its goal. The six targets cover: <ul style="list-style-type: none"> <li>• Full implementation of EU nature legislation to protect biodiversity;</li> <li>• Better protection for ecosystems, and more use of green infrastructure;</li> <li>• More sustainable agriculture and forestry;</li> <li>• Better management of fish stocks;</li> </ul>	There are a number of European designated sites (designated Special Protection Areas (SPA); Special Areas of Conservation (SAC) and Ramsar sites) within the WRMP area. The WRMP will need to be aware of these and take into

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	<ul style="list-style-type: none"> <li>• Tighter controls on invasive alien species; and</li> <li>• A bigger EU contribution to averting global biodiversity loss.</li> </ul> <p>The strategy is in line with two commitments made by EU leaders in March 2010. The first is the 2020 headline target: "Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss"; the second is the 2050 vision: "By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided."</p>	account any potential impacts on such areas.
EC Water Framework Directive (2000/60/EC)	<p>The WFD has the following key aims:</p> <ul style="list-style-type: none"> <li>• Expanding the scope of water protection to all waters, surface waters and groundwater;</li> <li>• Achieving "good status" for all waters by a set deadline;</li> <li>• Water management based on river basins;</li> <li>• "Combined approach" of emission limit values and quality standards;</li> <li>• Getting the prices right;</li> <li>• Getting the citizen involved more closely; and</li> <li>• Streamlining legislation.</li> </ul> <p>There are a number of objectives in respect of which the quality of water is protected. The key ones at European level are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015.</p>	The WRMP has a key role in delivering the aims and objectives of the Directive.
Council Directive concerning Urban Waste Water Treatment (91/271/EEC)	The objective of this Directive is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors. The Directive concerns the collection, treatment and discharge of such waste water.	The WRMP should comply with this Directive and consider ways to reuse waste water.
EC Drinking Water Directive (98/83/EC)	<p>The Drinking Water Directive sets out the following objectives:</p> <ul style="list-style-type: none"> <li>• Sets quality standards for drinking water quality at the tap (microbiological, chemical and organoleptic parameters) and the general obligation that drinking water must be wholesome and clean;</li> <li>• Obliges Member States to regular monitoring of drinking water quality and to provide to consumers adequate and up-to-date information on their drinking water quality; and</li> <li>• Member States may exempt water supplies serving less than 50 persons or providing less than 10 m<sup>3</sup> of drinking water per day as an average and water in food-processing undertakings where the quality of water cannot affect the wholesomeness of the foodstuff in its finished form.</li> </ul>	The WRMP has a key role in ensuring that the requirements of this Directive and the objectives are fulfilled.
EC Directive on Bathing Water (76/160/EEC); and	The overall objective of the Directive remains the protection of public health whilst bathing, but the revised Directive also offers an opportunity to improve management practices at bathing waters and to standardise the information provided to	The WRMP should ensure that the potential impacts on bathing water

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Directive 2006/7/EC repealing Directive 76/160/EEC (from 2014)	bathers across Europe and aims to set more stringent water quality standards and also puts a stronger emphasis on beach management and public information.	quality are taken into account.
EC Freshwater Fish Directive (2006/44/EC)	The Freshwater Fish Directive is to be repealed in 2013 by the EC Water Framework Directive. The EC Freshwater Fish Directive (2006/44/EC) was originally adopted on 18 July 1978 but consolidated in 2006. The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters.	The WRMP has a key role in ensuring that the requirements of this Directive are fulfilled and that fish habitats and stocks are not affected.
EC Groundwater Directive (2006/118/EC)	<p>This directive establishes a regime which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater. The directive establishes quality criteria that takes account local characteristics and allows for further improvements to be made based on monitoring data and new scientific knowledge.</p> <p>The directive thus represents a proportionate and scientifically sound response to the requirements of the Water Framework Directive (WFD) as it relates to assessments on chemical status of groundwater and the identification and reversal of significant and sustained upward trends in pollutant concentrations. Member States will have to establish the standards at the most appropriate level and take into account local or regional conditions. The groundwater directive complements the Water Framework Directive. It requires:</p> <ul style="list-style-type: none"> <li>• Groundwater quality standards to be established by the end of 2008;</li> <li>• Pollution trend studies to be carried out by using existing data and data which is mandatory by the Water Framework Directive (referred to as "baseline level" data obtained in 2007-2008);</li> <li>• Pollution trends to be reversed so that environmental objectives are achieved by 2015 by using the measures set out in the WFD;</li> <li>• Measures to prevent or limit inputs of pollutants into groundwater to be operational so that WFD environmental objectives can be achieved by 2015;</li> <li>• Reviews of technical provisions of the directive to be carried out in 2013 and every six years thereafter; and</li> <li>• Compliance with good chemical status criteria (based on EU standards of nitrates and pesticides and on threshold values established by Member States).</li> </ul>	The WRMP will need to ensure that the quality criteria are adequately considered and that other measures are identified to ensure the Directive is fully satisfied.
EC Marine Strategy Framework Directive (2008/56/EEC)	The aim of the Marine Strategy Framework Directive is to protect more effectively the marine environment across Europe. It aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. The Directive enshrines in a legislative framework the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use.	The WRMP will need to consider the measures that are applicable to the protection of the marine environment, as outlined in the Directive.
EU Directive 2007/60/EC on the Assessment and Management of Flood Risks	Its aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.	The WRMP will need to consider the measures that are applicable to flood risk, as outlined in the Directive.

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EC Directive on the Conservation of Wild Birds (79/409/EEC)	<p>Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (this is the codified version of Directive 79/409/EEC as amended). This Directive ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures. There are a number of components to this scheme:</p> <ul style="list-style-type: none"> <li>• Member States are required to designate Special Protection Areas (SPAs) for 194 particularly threatened species and all migratory bird species. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network set up under the Habitats Directive 92/43/EEC;</li> <li>• A second component bans activities that directly threaten birds, such as the deliberate killing or capture of birds, the destruction of their nests and taking of their eggs, and associated activities such as trading in live or dead birds (with a few exceptions); and</li> <li>• A third component establishes rules that limit the number of bird species that can be hunted (82 species and subspecies) and the periods during which they can be hunted. It also defines hunting methods which are permitted (e.g. non-selective hunting is banned).</li> </ul>	There are a number of European designated sites (designated Special Protection Areas (SPA); Special Areas of Conservation (SAC) and Ramsar sites) within the WRMP area. The WRMP will need to be aware of these and take into account any potential impacts on such areas.
EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC)	The main aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. While the Directive makes a contribution to the general objective of sustainable development; it ensures the conservation of a wide range of rare, threatened or endemic species, including around 450 animals and 500 plants. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. The Directive provides for a ban on the downgrading of breeding and resting places for certain strictly protected animal species. Exceptions to the strict protection rules can be granted under very specific conditions. The Habitats Directive also establishes the EU wide Natura 2000 ecological network of protected areas. For these areas it provides a high level of safeguards against potentially damaging developments. Together with the Birds Directive, the Habitats Directive forms the backbone of EU nature protection legislation.	There are a number of European designated sites (designated Special Protection Areas (SPA); Special Areas of Conservation (SAC) and Ramsar sites) within the WRMP area. The WRMP will need to be aware of these and take into account any potential impacts on such areas.
The European Landscape Convention (2004)	Also known as the Florence Convention - promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues.	The area contains a number of landscape designations including AONBs. The WRMP will need to consider potential effects arising from its implementation on the character and special features such areas.
EC Nitrates Directive (91/676/EC)	The Nitrates Directive aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices. This Directive forms integral part of the Water Framework Directive and is one of the key instruments in the protection of waters against agricultural pressures.	A large proportion of land within the Anglian region falls within nitrate vulnerable zones. The WRMP shall accord with the measures outlined in this Directive.
EU Air Quality Directive (2008/50/EC)	It establishes ambitious, cost-effective targets for improving human health and environmental quality up to 2020. The EU objective on air quality is "to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment."	The WRMP is unlikely to affect air quality. However, the WRMP should take the requirements of the

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		directive into consideration.
Limiting Global Climate Change to 2 Degrees Celsius: The Way Ahead for 2020 and Beyond (2007)	This document sets out the EU Strategy on climate change for 2020 and beyond. The document sets out concrete steps to limit the effects of climate change and to reduce the risk of massive and irreversible disruptions to the planet. The EU and its Member States have confirmed their target to limit the global average temperature increase to 2° Celsius compared with pre-industrial levels, the point beyond which the impact of climatic change is believed to increase dramatically.	The WRMP will indirectly contribute to achieving the UK's climate change commitments by meeting demand for sustainable water resources now and in the future.
Council Regulation No. 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel	Advice from the International Council for the Exploration of the Sea (ICES) in 2006 indicated that the stock of the European eel ( <i>Anguilla anguilla</i> ) is outside safe biological limits across European waters. The population has declined significantly, reducing to 5% of the original 1980s stock levels. In response to this advice, the European Union adopted Council Regulation (EC) No 1100/2007, which requires Member States to undertake a series of measures aimed at the recovery of eel stock. The goal is to achieve 40% escapement of adult eels, relative to that in absence of anthropogenic factors, to sea to spawn. The EU Regulation was transposed into UK law under The Eels (England and Wales) Regulations 2009.  Eleven Eel Management Plans have been prepared, one for each River Basin District identified in England and Wales. The plans outline the current situation and how we intend to achieve the targets required by the European Regulation. Such measures include a reduction in fishing pressure, improving access and habitat quality, and reducing the impacts of entrainment. The measures that will require the installation of passes at obstructions and screens at abstraction and discharge points that prevent the migration of eels.	WRMP may affect eel populations through changing water quality and quantity and through new abstraction and discharge points. Consideration should be given to effects in eels when developing water resource schemes.
<b>National</b>		
National Planning Policy Framework (2012)	The National Planning Policy Framework (NPPF) replaces a very long list of existing guidance including all Planning Policy Statements (PPS) (except PPS10 Planning for Sustainable Waste Management), all Planning Policy Guidance notes (PPG), all Mineral Planning Statements (MPS), some Mineral Planning Guidance notes (MPG) (MPG4, 8, 9 and 14 remain in force) and some Ministerial Circulars and Letters. The main change and first policy of the NPPF is a presumption in favour of sustainable development, which it states "should be seen as a golden thread running through both plan-making and decision-taking".  The NPPF states that local authorities should adopt pro-active strategies to mitigate and adapt to climate change, taking into account flood risk, coastal change, water supply and demand considerations. Paragraphs 100-104 replace the previous advice in PPS25 on flood risk. There is associated interim technical guidance provided in a technical appendix to the NPPF, which retains the sequential test and exception test. The NPPF has changed little with regard to the principles to flood risk but the detailed analysis and guidance has been removed and will be reliant on Local Plans for local guidance.  The NPPF states that local planning authorities should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast. They should identify as a Coastal Change Management Area any area likely to be affected by physical changes to the coast.  Paragraphs 109-125 of the NPPF provide advice on biodiversity, contaminated land, land stability, geo-diversity, air pollution, noise pollution and water pollution.	The WRMP should support and accord with the planning guidance contained within the new NPPF.
Securing the future – Delivering UK Sustainable	The Strategy for sustainable development aims to "...enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations."	The WRMP will indirectly contribute to achieving the UK's

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Development Strategy (2005)	<p>Guiding principles:</p> <ul style="list-style-type: none"> <li>• Living within environmental limits;</li> <li>• Ensuring a strong, healthy and just society;</li> <li>• Achieving a sustainable economy;</li> <li>• Promoting good governance; and</li> <li>• Using sound science responsibly.</li> </ul> <p>UK priorities for immediate action:</p> <ul style="list-style-type: none"> <li>• Sustainable consumption and production;</li> <li>• Climate change and energy;</li> <li>• Natural resource protection and environmental enhancement; and</li> <li>• Sustainable communities.</li> </ul>	climate change commitments by meeting demand for sustainable water resources now and in the future.
Sustainable Farming and Food Strategy – Forward Look (2006)	<p>The Strategy sets out the Government's priorities for delivering a sustainable farming and food sector. It is structured around five priority themes, which are closely inter-related. The themes are:</p> <ul style="list-style-type: none"> <li>• Succeeding in the market</li> <li>• Improving the environmental performance of farming</li> <li>• Sustainable consumption and production</li> <li>• Climate change and agriculture</li> <li>• Animal health and welfare.</li> </ul>	The WRMP should contribute towards the priorities contained within this Strategy by ensuring water quality and availability of water resources.
Climate Change – UK Programme (2006)	<p>As the key UK document on Climate Change it contains a very broad range of issues covering the UK's strategy for climate change, actions to reduce emissions and adaptation to climate change.</p> <p>The UK's legally binding target under the Kyoto Protocol to reduce its greenhouse gas emissions to 12.5% below 1990 levels by 2008-2012 and its domestic goal of a 20% reduction in carbon dioxide emissions below 1990 levels by 2010.</p> <p>Emissions reductions are focussed in the following sectors:</p> <ul style="list-style-type: none"> <li>• Energy supply;</li> <li>• Business;</li> <li>• Transport;</li> <li>• Domestic;</li> <li>• Agriculture, forestry and land use; and</li> <li>• Public sector.</li> </ul>	The WRMP will indirectly contribute to achieving the UK's climate change commitments by meeting demand for sustainable water resources now and in the future.
Future Water: The	The Strategy sets out how the Government wants the water sector to look by 2030 and the steps required to get there. The	The WRMP will indirectly



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Government's Water Strategy for England (2008)	<p>Vision for water policy and management is one where, by 2030 at the latest, the Government has:</p> <ul style="list-style-type: none"> <li>Improved the quality of our water environment and the ecology which it supports, and</li> <li>Continued to provide high levels of drinking water quality from our taps;</li> <li>Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water;</li> <li>Ensured a sustainable use of water resources, and implemented fair, affordable and cost reflective water charges;</li> <li>Cut greenhouse gas emissions; and</li> <li>Embedded continuous adaptation to climate change and other pressures across the water industry and water users.</li> </ul>	contribute to achieving the UK's climate change commitments by meeting demand for sustainable water resources now and in the future.
UK Post-2010 Biodiversity Framework (2012)	<p>The purpose of the Framework is to set a broad enabling structure for action across the UK between now and 2020:</p> <ul style="list-style-type: none"> <li>To set out a shared vision and priorities for UK-scale activities, in a framework jointly owned by the four countries, and to which their own strategies will contribute;</li> <li>To identify priority work at a UK level which will be needed to help deliver the Aichi targets and the EU Biodiversity Strategy;</li> <li>To facilitate the aggregation and collation of information on activity and outcomes across all countries of the UK, where the four countries agree this will bring benefits compared to individual country work; and</li> <li>To streamline governance arrangements for UK-scale activity.</li> </ul>	The WRMP will need to take into account the presence of any protected species and nature conservation sites. The WRMP will indirectly contribute to achieving the UK's climate change commitments by meeting demand for sustainable water resources now and in the future.
Water White Paper (2011)	This White Paper sets out a vision for future water management in which the water sector is resilient; water companies are more efficient and customer focused; and water is valued as the precious and finite resource it is. It explains that everyone has a part to play in the realisation of this vision.	The WRMP will contribute to achieving this vision by meeting demand for sustainable water resources now and in the future.
Natural Environment White Paper (2012)	<p>This White Paper recognises that a healthy, properly functioning natural environment is the foundation of sustained economic growth, prospering communities and personal well-being. It aims to mainstream the value of nature across society, including across government departments by:</p> <ul style="list-style-type: none"> <li>Facilitating greater local action to protect and improve nature;</li> <li>Creating a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature;</li> <li>Strengthening the connections between people and nature to the benefit of both; and</li> <li>Showing leadership in the European Union and internationally, to protect and enhance natural assets globally.</li> </ul>	The WRMP will need to take into account the presence of any protected species and nature conservation sites and where possible, contribute to enhancing biodiversity.
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)	<p>The Strategy sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea.</p> <p>The mission for this strategy for the next decade is: to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.</p>	The WRMP will need to take into account the presence of any protected species and nature conservation sites and where possible, contribute to enhancing

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	The Strategy identifies the key sectors that the Government will work with and the actions they will take. The sectors include Agriculture; Forestry; Planning and Development; Water Management; Marine Management; and Fisheries. For Water Management, the Strategy seeks to protect water ecosystems, including habitats and species, through a river basin planning approach; and also promote approaches to flood and erosion management which conserve the natural environment and improve biodiversity.	biodiversity.
Flood and Water Management Act 2010	The Act seeks to address the threat of flooding and water scarcity. The Act takes forward a number of recommendations from the Pitt Review into the 2007 floods and places new responsibilities on the Environment Agency, local authorities and others to manage the risk of flooding. Climate projections suggest extreme weather will happen more frequently in the future and this Act is central to reducing the flood risk associated with extreme weather.	The WRMP will need to accord with the provisions of this Act by meeting demand for sustainable water resources now and in the future and should aim to ensure security and quality of water supply.
Understanding the Risks, Empowering Communities, Building Resilience: The National Flood and Coastal Erosion Risk Management Strategy for England (2011)	<p>The Strategy's overall aim is to: "...ensure that flooding and coastal erosion risks are well managed and coordinated, so that their impacts are minimised". The Strategy was published by the Environment Agency and the Department for Environment, Food and Rural Affairs (Defra) to ensure that government, the Environment Agency, local authorities, water companies, internal drainage boards and other organisations that have a role in flood and coastal erosion risk management (FCERM) understand each other's' roles and co-ordinate how they manage these risks.</p> <p>The Strategy states that these organisations will work together with communities to:</p> <ul style="list-style-type: none"> <li>• Manage the risk of flooding and coastal erosion to people and their property. Over time, the Government will be able, where possible, to improve standards of protection;</li> <li>• Help householders, businesses and communities better understand and manage the flood and coastal erosion risks they face;</li> <li>• Respond better to flood incidents and during recovery, and to coastal erosion;</li> <li>• Move the focus from national government-funded activities towards a new approach that gives more power to local people, either at an individual, community or local authority level. Local innovations and solutions will be encouraged, too;</li> <li>• Invest in actions that benefit communities who face the greatest risk, but who are least able to afford to help themselves; and</li> <li>• Put sustainability at the heart of the actions we take, so that we work with nature and benefit the environment, people and the economy.</li> </ul>	The WRMP can contribute towards the aims of this Strategy by meeting demand for sustainable water resources now and in the future.
National Eel Management Strategy	The eel fishery is the most valuable commercial inland fishery in England and Wales, providing significant benefits to the rural economy. Eels have been exploited for thousands of years, initially through subsistence fisheries, and now by commercial fisheries supplying a wider market. They are used at all life stages, from glass eel and elver to yellow and silver eel. The fisheries are seasonal and most participants supplement their income from other sources. Catch returns are unreliable and better information is obtained from export records. Elver catches in England and Wales are believed to be about ten tonnes and those of yellow and silver eels to be a few hundred tonnes. Glass eel and elver fishing in England	WRMP may affect eel populations through changing water quality and quantity and through new abstraction and discharge points. Consideration should be given to effects in eels when developing



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	<p>and Wales occurs in tidal reaches. Fishing effort varies according to market-led demand, and the number of dip net licenses issued varied between about 1,000 during the 1980s, reaching a peak of 2,500 in 1998 and dropping to 1,900 in 1999. Sales in 2000 onwards indicate that this downward trend is continuing. Catches of glass eel in the UK, or at least the quantities exported from England and Wales, have remained relatively stable. Prices can fluctuate widely, with annual average values exhibiting a three- to four-fold difference during the 1990s.</p> <p>Licenses to fish for eels are issued on demand and, although some controls on the use and type of instruments are available through byelaws, there is no power to restrict the number of fishing units. In England and Wales, legislation and regulations are inadequate to give proper protection to stock and fishery. The eel has never attracted the recreational interest enjoyed by salmonid or coarse fish, although large eels are valued by specimen angling interests. As a consequence, there is limited awareness and understanding of the eel, despite the fact that the elver fishery is probably the most valuable commercial freshwater fishery in England and Wales.</p>	water resource schemes.
Eel Management plans for the United Kingdom - Anglian River Basin District (March 2010)	<p>The Eel Management Plan for the Anglian River Basin District (RBD) aims to describe the current status of eel populations, assess compliance with the target set out in Council Regulation No 1100/2007 and detail management measures to increase silver eel escapement. This will contribute to the recovery of the stock of European eel.</p> <p>The Eel Management Plan states that the Probability Model currently suggests that the Anglian RBD is failing the 40% silver eel escapement target, although there is very little confidence in this assessment. Therefore, the EA are implementing measures to collect more robust data on eel production and continuing to developing modelling approaches to improve the compliance assessments. The most likely causes as to why the RBD is failing are:</p> <ul style="list-style-type: none"> <li>• Barriers to migration for all life stages;</li> <li>• Wide-scale loss of habitat; and</li> <li>• Entrainment and impingement.</li> </ul> <p>Therefore, the EA are implementing a series of measures to enhance eel production in the RBD.</p>	WRMP may affect eel populations through changing water quality and quantity and through new abstraction and discharge points. Consideration should be given to effects in eels when developing water resource schemes.
<b>Regional – East of England</b>		
Sustainable Futures: Integrated Sustainability Framework for the East of England (2009)	<p>The Integrated Sustainability Framework (ISF) is a statement of the sustainable development priorities and challenges facing the region. Its vision is: "...to promote and enhance the environmental, economic and social well-being of the East of England, and ensure a better quality of life for everyone – now and in the future."</p> <p>Ten sustainable development objectives are identified for the region:</p> <ul style="list-style-type: none"> <li>• Promote sustainable growth within environmental limits;</li> <li>• Reduce poverty and inequality and promote social inclusion;</li> <li>• Reduce greenhouse gas emissions;</li> <li>• Adapt to the impacts of climate change;</li> <li>• Promote employment, learning, skills and innovation;</li> <li>• Increase resource efficiency and reduce resource use and waste;</li> <li>• Conserve, restore and enhance the region's natural and built environment;</li> </ul>	The WRMP will contribute towards the objectives of this ISF by meeting demand for sustainable water resources now and in the future.

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	<ul style="list-style-type: none"> <li>• Move goods and people sustainably;</li> <li>• Meet the needs of the changing regional demographic; and</li> <li>• Provide decent, affordable and safe homes for all.</li> </ul>	
Sustainable Tourism Strategy for the East of England (2004)	<p>The objective of this Strategy is to encourage:</p> <ul style="list-style-type: none"> <li>• Continually improving competitiveness compared to other regions and countries;</li> <li>• Continually improving quality and exceptional value for money;</li> <li>• Partnership that is action-oriented, adds value, and makes best use of resources;</li> <li>• Increased impact for tourism on the economy in terms of revenue and jobs, especially where it can assist regeneration;</li> <li>• Communication based on the promotion of destination brands and themes that are relevant to consumers;</li> <li>• Sustainability, balancing the needs of the visitor, the industry, the community and the environment. This includes, in some cases, managing visitor demand to ensure environmental and cultural assets are not adversely affected by visitor pressure;</li> <li>• Use of tourism to improve the quality of life of residents; and</li> <li>• Removal of barriers and widening access for all kinds of visitors.</li> </ul>	The WRMP will contribute towards the objectives of the Strategy by meeting demand for sustainable water resources now and in the future, assisting in conserving and enhancing the region's natural assets and supporting the needs of the tourism industry the region.
Strategic Priorities for Water Related Recreation in the East of England 2009 – 2014 (August 2009)	<p>Nearly 40% of the adult population now spend some of their leisure time enjoying water related recreation. The most popular activities are walking, swimming and visits to the beach. Boating, angling and other water recreation activities are increasing in popularity, with nearly 10% of the adult population now participating regularly. There has been a significant growth, in the region, of participation in coarse angling, open swimming, some canoe disciplines, sub-aqua and rowing, with indications that participation in motor boating will increase as facilities improve.</p> <p><b>High Priorities</b></p> <ul style="list-style-type: none"> <li>• Improving existing provision;</li> <li>• 'Access East';</li> <li>• A necklace of green, local gateway sites along the water network;</li> <li>• Best practice in environmentally friendly recreation;</li> <li>• Influencing the regional policy agenda;</li> <li>• Better provision of information to improve understanding and use; and</li> <li>• Addressing gaps in the provision for some water sports.</li> </ul> <p><b>Medium Priorities</b></p> <ul style="list-style-type: none"> <li>• The development of 'wild water parks';</li> <li>• To develop demonstration sites to pilot and test a range of approaches to improve the quality, range and benefits of water related recreation in the region;</li> </ul>	The WRMP should take water related recreation into account and consider the effects proposed schemes may have on leisure activities.

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	<ul style="list-style-type: none"> <li>Developing a network of water related recreation hubs;</li> <li>To encourage greater participation in inland and coastal activities through the public transport network, including fast light rail; and</li> <li>Improved estuary and coastal management.</li> </ul>	
<b>Regional – East Midlands</b>		
East Midlands, Integrated Regional Strategy – Our Sustainable Development Framework (2005)	<p>The IRS Framework is the region's Sustainable Development Framework. The Framework was developed to achieve consistency and integration between its component strategies. It ensures that policies and strategies are not prepared in isolation but within the wider context. The Framework prescribes 17 sustainable development objectives for the region. Moreover, the Framework identifies the regions priorities, which are to:</p> <ul style="list-style-type: none"> <li>Reduce inequalities in the region;</li> <li>Conserve and enhance the natural environment;</li> <li>Create sustainable and healthy communities throughout the region;</li> <li>Improve economic performance and competitiveness; and</li> <li>Use natural resources more efficiently and reduce the impacts on climate change.</li> </ul>	The WRMP will contribute towards the objectives of this IRS by meeting demand for sustainable water resources now and in the future. The WRMP will also need to take into account the presence of any protected species and nature conservation sites and where possible, contribute to enhancing biodiversity.
The East Midlands Tourism Strategy 2003-2010 (2003)	<p>This documents sets out a vision for the tourism sector for the period 2003-2010 and sets out how the sector can contribute to the objectives of the Regional Economic Strategy.</p> <p>The Strategy has been divided into seven strands:</p> <ul style="list-style-type: none"> <li>Branding and Marketing;</li> <li>Attractors;</li> <li>Infrastructure;</li> <li>Business Skills and Training;</li> <li>Performance Measurement;</li> <li>Special Projects; and</li> <li>Delivery.</li> </ul>	The WRMP will contribute towards the objectives of the Strategy by meeting demand for sustainable water resources now and in the future, assisting in conserving and enhancing the region's natural assets and supporting the needs of the tourism industry the region.
<b>Regional – North East of England</b>		
The Integrated Regional Framework – Achieving a better quality of life (2004)	<p>The Integrated Regional Framework (IRF) is the framework for sustainable development in North East England. The IRF presents a shared regional vision, which will ensure that regional strategies share a common purpose in achieving a sustainable future for the region. The Framework sets out 10 key objectives, which include:</p> <ul style="list-style-type: none"> <li>Strengthening the economy;</li> <li>Adapting to and mitigating against climate change;</li> <li>Living within environmental limits;</li> </ul>	The WRMP will contribute towards the objectives of this IRF by meeting demand for sustainable water resources now and in the future. The WRMP will also need to take into account the presence of any protected species and nature

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	<ul style="list-style-type: none"> <li>• Developing a more sustainable employment market;</li> <li>• Establishing a strong learning and skills base;</li> <li>• Improving health and wellbeing and reducing health inequalities;</li> <li>• Protecting and enhancing the environment;</li> <li>• Building sustainable communities;</li> <li>• Developing sustainable transport; and</li> <li>• Promoting and respecting the region's culture and heritage.</li> </ul>	conservation sites and where possible, contribute to enhancing biodiversity.
North East Strategy for the Environment (2008)	<p>The Strategy sets out a strategic approach to address the main environmental challenges that the region faces. It identifies four broad themes:</p> <ul style="list-style-type: none"> <li>• Sustainable communities - how the environment and cultural assets contribute towards better places to live and work;</li> <li>• Resource management - making best use of our resources;</li> <li>• Environmental infrastructure - securing key natural, physical and cultural assets and realising their potential; and</li> <li>• Integration - action to meet the region's environmental objectives whilst also delivering social and economic benefits.</li> </ul> <p>The accompanying action plan aims to ensure that the opportunities and objectives of the strategy are met.</p>	The WRMP will contribute towards the objectives of the Strategy by meeting demand for sustainable water resources now and in the future, assisting in conserving and enhancing the region's natural assets.
North East England Tourism Strategy 2005-2010 (2005)	<p>The North East Tourism Strategy (NETS) was prepared to cover the 2005-2010 period. The Strategy identifies ten objectives:</p> <ul style="list-style-type: none"> <li>• Attract more domestic and overseas tourists to the region;</li> <li>• Increase visitors' average spend and increase day visitor spend;</li> <li>• Increase visits throughout the year, not solely in the main holiday season;</li> <li>• Increase employment in tourism, and tourism related businesses;</li> <li>• Improve the productivity of the regional tourism economy;</li> <li>• Accelerate the rate of investment in the tourism product;</li> <li>• Improve the quality of the tourism product;</li> <li>• Improve the skills of the tourism workforce;</li> <li>• Improve levels of visitor satisfaction in the North East; and</li> <li>• Enhance and conserve the region's natural, heritage and cultural assets.</li> </ul>	The WRMP will contribute towards the objectives of the Strategy by meeting demand for sustainable water resources now and in the future, assisting in conserving and enhancing the region's natural assets and supporting the needs of the tourism industry the region.
<b>Regional – Yorkshire and Humber</b>		
Growing Together: Integrated Regional Framework (IRF) (June)	<p>The IRF is a high level strategy for the Yorkshire and Humber region, replacing 'Advancing Together' and the 'Regional Sustainable Development Framework'. The IRF sets out the key sustainable development challenges facing the region. The IRF presents 10 'regional challenges', which include: reducing the impact of future climate change; increasing the</p>	The WRMP will contribute towards the objectives of this IRF by meeting demand for sustainable water resources now and in the

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2008)	region's resilience to climate change; and achieving sustainable growth.	future.
<b>Regional – South East of England</b>		
Tourism ExSelle: The Strategy for Tourism in the South East (2004)	<p>The document provides the Strategy for Tourism in the South East. The Strategy:</p> <ul style="list-style-type: none"> <li>• Highlights the importance of tourism to the Region;</li> <li>• Sets out a shared vision for tourism and its potential;</li> <li>• Identifies priorities and action required from all stakeholders to achieve this; and</li> <li>• Provides a framework for the work of SEEDA, TSE and other agencies.</li> </ul>	The WRMP will contribute towards the objectives of the Strategy by meeting demand for sustainable water resources now and in the future, assisting in conserving and enhancing the region's natural assets and supporting the needs of the tourism industry the region.
<b>Environment Agency Strategies</b>		
Water for People and the Environment – Water Resources Strategy for England and Wales (2009)	<p>This Strategy sets out how the EA believes water resources should be managed throughout England and Wales to 2050 and beyond to ensure that there will be enough water for people and the environment. The vision is for the: "...management and use of water that is environmentally, socially and economically sustainable, providing the right amount of water for people, agriculture, commerce and industry, and an improved water-related environment."</p> <p>The aim for adapting to and mitigating climate change is that the EA is able to manage water resources and protect the water environment in the face of climate change. The objectives are:</p> <ul style="list-style-type: none"> <li>• Ecology is more resilient to climate change because abstraction pressures have been reduced and a diverse network of habitats has been allowed to develop;</li> <li>• The resilience of supplies and critical infrastructure is increased to reduce the impacts of climate change;</li> <li>• Flexible and incremental solutions in water resources management allow adaptation to climate change as it happens;</li> <li>• Everyone is able to make more informed decisions and choices about managing water resources, protecting the environment and choosing options to avoid security of supply problems; and</li> <li>• Greenhouse gas emissions from using water resources are minimised and properly considered in future decisions.</li> </ul> <p>The aim for a better water environment is that species and habitats that depend on water are restored, protected, improved and valued. The objectives are:</p> <ul style="list-style-type: none"> <li>• Measures will be in place to make sure that water bodies achieve Water;</li> <li>• Framework Directive objectives;</li> <li>• Abstraction is sustainable, the environment is protected and improved and supplies remain secure;</li> <li>• Environmental problems caused by historic unsustainable abstractions are resolved; and</li> <li>• Catchment management is integrated so that impacts on water resources and the water environment are managed together.</li> </ul> <p>The aim for sustainable planning and management of water resources is that good water management contributes to sustainable development by supporting people and the economy in an improved environment. The objectives are:</p>	The WRMP will contribute towards the objectives identified in this by meeting demand for sustainable water resources now and in the future.

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	<ul style="list-style-type: none"> <li>• The twin track approach of resource development with demand management is adopted in all sectors of water use;</li> <li>• In England, the average amount of water used per person in the home is reduced to 130 litres each day by 2030;</li> <li>• The Environment Agency targets and adapts its approach to reflect the location and timing of pressures on water resources;</li> <li>• In England, water companies implement near-universal metering of households, starting in areas of serious water stress;</li> <li>• Leakage from mains and supply pipes is reduced;</li> <li>• New and existing homes and buildings are more water efficient; and</li> <li>• Water resources are allocated efficiently and are shared within regions where there are areas of surplus.</li> </ul> <p>The aim for a valued water and water environment is that people value water and enjoy their water environment and understand how it contributes to their quality of life. The objectives are:</p> <ul style="list-style-type: none"> <li>• Water pricing for the abstraction and use of water acts as an incentive for the sustainable use of water resources;</li> <li>• Abstractors and users make informed choices to use water more efficiently;</li> <li>• Innovative tariffs are adopted by water companies to maximise savings and minimise issues of affordability;</li> <li>• The needs of wildlife, fisheries, navigation and recreation, as well as the environment and abstractors, are fully taken into account when allocating water resources; and</li> <li>• Innovative technology is developed to improve water efficiency by all water users.</li> </ul>	
Water for People and the Environment – Water Resources Action Plan for England and Wales (2010)	This national Action Plan for England and Wales includes the actions that the EA will take to progress towards delivering the aims and objectives of the Strategy (detailed above). The Action Plan identifies short term (5 year), medium term (5 to 25 year) and long term (25 year+) actions that are based on the objectives identified in the Strategy.	The WRMP has a key role in assisting the EA to deliver the actions identified in this national Action Plan.
Water for People and the Environment – Water Resources Strategy Regional Action Plan for Anglian Region (2009)	<p>This Action Plan shows how the EA intends to meet the challenges facing water resources in the Anglian Region. It considers local pressures and reflects the measures in River Basin Management Plans.</p> <p>The Action Plan states that the pressures in this region are greater than in most other parts of the country and that they present particular challenges now and in the future. The region is the driest in the country and despite this, many of its most valuable natural environmental features are water dependant. Furthermore, climate change is widely forecast to lead to drier summers and wetter winters, with an overall reduction in rainfall and groundwater levels. The region is one of the fastest growing in the country in terms of population and planned housing and employment growth will significantly increase the demand for water. The combination of limited resources and high demand means that over much of the region water resources are considered to be fully, if not over committed. This will be further compounded by climate change and growth.</p> <p>The actions fall into four cross-cutting themes: protecting the environment, driving water efficiency, ensuring resilience of water resources and sharing and development of water resources. The Action Plan considers how the EA will work with stakeholders, including water companies, local authorities and developers to deliver the identified actions.</p>	The WRMP has a key role in assisting the EA to deliver the actions identified in the Action Plan for the Anglian region.
Water for People and the Environment – Water	This Action Plan identifies the water resources pressures and priorities for Yorkshire and the North East and how the EA will address local issues. The EA will work with a wide range of organisations to implement these actions; to ensure there is	The WRMP has a key role in assisting the EA to deliver the

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Resources Strategy Regional Action Plan for Yorkshire and North East Region (2009)	<p>sufficient water for people and the environment both now and in the future.</p> <p>The Action Plan states that the pressures within this region include climate change, which is likely to alter the environment in the future and will affect the amount and distribution of rainfall (river flows could potentially be 80% lower than present). Increases in demand will place greater pressure on resources. Water resources will have to meet the demands of a growing population. The region is also at risk from rural and urban diffuse pollution. The impact of climate change could shift agricultural zones further north, resulting in increased demand for irrigation and more water intensive crops being grown.</p> <p>The Action Plan considers how the EA will work with stakeholders, including water companies and abstractors to deliver the identified actions.</p>	actions identified in the Action Plan for the North-East region.
<p>Catchment Flood Management Plans (CFMPs):</p> <p>Grimsby and Ancholme CFMP (2009)</p> <p>River Witham CFMP (2009)</p> <p>Louth Coastal CFMP (2009)</p> <p>North Norfolk CFMP (2008)</p> <p>Broadland Rivers CFMP (2008)</p> <p>East Suffolk CFMP (2008)</p> <p>River Nene CFMP (2009)</p> <p>Great Ouse CFMP (2010)</p> <p>River Welland CFMP (2009)</p> <p>North Essex CFMP (2008)</p> <p>South Essex CFMP (2008)</p> <p>River Tees CFMP (2009)</p>	<p>CFMPs have been produced to assess inland flood risk across England and Wales. The CFMPs relevant to the WRMP are detailed in the column to the left. The CFMPs consider all types of inland flooding: from rivers, ground water, surface water and tidal flooding (but not coastal flooding, which is covered by Shoreline Management Plans. The role of the CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. CFMPs should be used to inform planning and decision making by key stakeholders such as the Environment Agency, local authorities, Internal Drainage Boards, water companies and other utilities; transportation planners; land owners, farmers and land managers; the public and businesses to enhance their understanding of flood risk and how it will be managed.</p> <p>The CFMPs identify six generic flood risk management policies:</p> <ul style="list-style-type: none"> <li>• Policy 1- Areas of little or no flood risk where the EA will continue to monitor and advise: this policy will tend to be applied in those areas where there are very few properties at risk of flooding. It reflects a commitment to work with the natural flood processes as far as possible;</li> <li>• Policy 2 - Areas of low to moderate flood risk where the EA can generally reduce existing flood risk management actions: this policy will tend to be applied where the overall level of risk to people and property is low to moderate;</li> <li>• Policy 3 - Areas of low to moderate flood risk where the EA are generally managing existing flood risk effectively: this policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future;</li> <li>• Policy 4 - Areas of low, moderate or high flood risk where the EA are already managing the flood risk effectively but where they may need to take further actions to keep pace with climate change: this policy will tend to be applied where the risks are currently deemed to be appropriately-managed, but where the risk of flooding is expected to significantly rise in the future;</li> <li>• Policy 5 - Areas of moderate to high flood risk where the EA can generally take further action to reduce flood risk: this policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk; and</li> <li>• Policy 6 - Areas of low to moderate flood risk where the EA will take action with others to store water or manage run-off in: locations that provide overall flood risk reduction or environmental benefits. This policy will tend to be applied where there may be opportunities in some locations to reduce flood risk locally or more widely in a catchment by storing water or managing run-off.</li> </ul>	Where the WRMP is relevant to, and could impact upon the CFMP regions, it would be expected to play an implementing role in the CFMPs by considering and accounting for flood risk factors throughout these regions.



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	To select the most appropriate policy, the CFMPs consider how the social, economic and environmental objectives are affected by flood risk management activities under each policy option. The policies identified in the CFMPs will be delivered through a range of delivery plans, projects and actions.	
<p>Catchment Abstraction Management Strategies (CAMS):</p> <p>The Grimsby, Ancholme and Louth CAMS (2006)</p> <p>The Nene CAMS (2005)</p> <p>The Steeping, Great Eau and Long Eau CAMS (Consultation Draft, Jan 2007)</p> <p>The Welland CAMS (2007)</p> <p>The Witham CAMS (March 2004)</p> <p>The Broadland Rivers CAMS (2006); Update on Strategy Actions (2008)</p> <p>The Combined Essex CAMS (Feb 2007); Update on Strategy Actions (2008)</p> <p>The North Norfolk CAMS (March 2005); Update on Strategy Actions (2008)</p> <p>The Cam and Ely Ouse CAMS (March 2007); Update on Strategy Actions (2008)</p> <p>The North West Norfolk CAMS (March 2005); Update on Strategy Actions (2008)</p> <p>The East Suffolk CAMS (2008)</p> <p>The Tees CAMS (2008)</p>	<p>The Catchment Abstraction Management Strategy (CAMS) set out how the EA will manage water abstraction. They outline where water is available, and also, if relevant, where the EA needs to reduce current rates of abstraction.</p> <p>Each CAMS provides an overview of the catchment area and characteristics, including abstractions, geology, hydrology, hydrometry, water quality and discharges, ecology and conservation, recreation and navigation.</p> <p>The CAMS make information on water resources and licensing practice publicly available and allow the balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties.</p> <p>CAMS are also the mechanism for managing time limited licences by determining whether they should be renewed and, if so, on what terms.</p>	<p>Through the water resources planning process, the WRMP has a key implementing role in CAMS by helping to identify appropriate water management options including source, transfer and storage.</p>



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River Basin Management Plan – Anglian River Basin District (December 2009)	<p>River Basin Management is a continuous process of planning (to develop River Basin Management Plans) and delivery. The Water Framework Directive introduces a formal series of 6 year cycles. The first cycle will end in 2015 when, following further planning and consultation, the River Basin Management Plan will be updated and reissued. The River Basin Management Plans describe the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment in the river basin district, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment - the catchments, estuaries, the coast and groundwater.</p> <p>The Anglian RBMP recognises that water companies are major partners in the management and protection of the water environment. The RBMP states that the companies' programme of work under the periodic review of water industry investment in 2009 will make a large contribution to meeting the objectives in this plan. This includes carrying out investigations, and specific improvement schemes to address water quality or water resources. In addition, specific actions will be carried out in drinking water protected areas to help safeguard drinking water supplies.</p> <p><b>Example actions</b></p> <p>Reduce leakage through active leakage control and customer supply pipe repair policies to help ensure sufficient water for people and wildlife.</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul> <p>Complete the current round of water company asset investment to deliver water quality improvements and reduce the impact of abstraction.</p> <ul style="list-style-type: none"> <li>• Rivers, coasts and estuaries across the river basin district</li> </ul> <p>Improvements to water company assets under the next round of company investment (PR09), to deliver water quality improvements and continue to reduce the impact of abstraction under a range of environmental Directives.</p> <ul style="list-style-type: none"> <li>• Rivers, coasts and estuaries across the river basin district</li> </ul> <p>Examine the role of effluent re-use, through the Anglian Region Water Efficiency Group and Waterwise East.</p>	The WRMP will help support the RBMP through active leakage control schemes, and asset investment to deliver water quality improvements and reduce impact of abstraction.
<b>Local</b>		
Area of Outstanding Natural Beauty Management Plans	<p>The Countryside and Rights of Way Act, 2000 (The CROW Act) places a duty on the local authorities for the Norfolk Coast AONB to jointly produce an AONB management plan and to review the plan at 5-yearly intervals. Of relevance to the WRMP scheme options are:</p> <p><b>Norfolk Coast Management Plan 2009-2014</b></p> <p>The 2009 -14 Management Plan for the Norfolk Coast Area of Outstanding Natural Beauty was launched in September 2009, updating the 2004-9 plan, which was the first plan produced under the CROW Act. It comprises two key documents:</p> <ul style="list-style-type: none"> <li>• <b>The Strategy</b> - setting out the background and management framework with 5-year objectives and policies; and</li> <li>• <b>The Action Plan</b> - containing detailed actions under the objectives and policies over the five years of the plan</li> </ul>	The WRMP may affect AONB directly through construction of schemes with visual effects, or indirectly through affecting water quality and quantity which in turn may affect landscapes.

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	<p>The Norfolk Coast Area of Outstanding Natural Beauty (AONB) covers inter-tidal, coastal and agricultural land with a total area of over 450 square kilometres. Stretching from the silt expanses of the Wash in the west through the coastal marshes, soft cliffs and hinterland of north Norfolk to the dune system at Winterton in the east, it is an area of remarkable beauty, diversity and scientific importance.</p> <p>There are five themes, covering aspects of the area:</p> <ul style="list-style-type: none"> <li>• Landscape, biodiversity and geodiversity;</li> <li>• Built and historic environment;</li> <li>• Farming, forestry and fishing;</li> <li>• Sustainable communities; and</li> <li>• Access and recreation.</li> </ul> <p><b>Suffolk Coast and Heaths Management Plan 2008 – 2013</b></p> <p>The Suffolk Coast and Heaths AONB Management Plan seeks to co-ordinate the action of the organisations that make up the AONB Partnership while also setting a framework for any organisation or individual whose activities will have an impact on the objectives for the area. It sets targets for action, especially where it is important for organisations to work together or where action might fall between responsibilities. The Plan also identifies the monitoring needed to identify changes occurring in the AONB and the impacts of the management process.</p> <p>The designated area of the Suffolk Coast and Heaths AONB covers 403 square kilometres, stretching from Kessingland in the north to the River Stour in the south.</p> <p>The management of the Suffolk Coast and Heaths must meet three key requirements, arising from the purpose of AONB designation:</p> <p>Requirement A:</p> <ul style="list-style-type: none"> <li>• To conserve and enhance natural beauty; and</li> <li>• To maintain the special qualities of the landscape.</li> </ul> <p>Requirement B:</p> <ul style="list-style-type: none"> <li>• To manage the assets and resources of the AONB in a sustainable way; and</li> <li>• Seeking to meet environmental, economic and social needs.</li> </ul> <p>Requirement C:</p> <ul style="list-style-type: none"> <li>• To meet the demand for recreation where this is consistent with the conservation of natural beauty and the management of the land; and</li> <li>• Helping people enjoy, understand and value the AONB.</li> </ul> <p>To meet these requirements, there is a series of 14 aims that stem from the Vision and the factors influencing change. These can be seen as the medium term targets. To meet those Aims there is a series of objectives that we will seek to</p>	

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	<p>meet within the Plan period i.e. before or by 2013. The Aims and Objectives together define the policy approach to managing the Suffolk Coast and Heaths. To meet the objectives there is a series of actions to be implemented over the next 3 years. These are the short-term targets. The action plan will be reviewed annually, updating where relevant. There will be a new action plan created mid-way through the Plan period.</p> <p><b>Dedham Vale AONB and Stour Valley Management Plan 2010-2015</b></p> <p>The plan seeks to coordinate the management of the AONB and Stour Valley and to bring together individuals and representatives of all those organisations that have an interest in the area, to maintain and enhance its natural beauty. It is the aim of the plan that by 2025 the Dedham Vale AONB and Stour Valley is recognised as a distinctive working landscape, (one that maintains a viable agricultural production as its core function), and retains its special character. This character should be understood and appreciated by those that choose to live in, work and visit the area.</p> <p>The management plan has five themes:</p> <ul style="list-style-type: none"> <li>• Landscape, biodiversity and farming;</li> <li>• Settlements and people;</li> <li>• Enjoying the area;</li> <li>• The river and its tributaries; and</li> <li>• Traffic and transport.</li> </ul>	
<b>St Edmundsbury Borough Council</b>		
<p><b>Replacement St Edmundsbury Borough Local Plan 2016</b></p>	<p>The adopted Core Strategy supersedes some of the policies in the current Replacement Local Plan 2016.</p> <p>On 27 June 2006, St Edmundsbury Borough Council adopted the Replacement St Edmundsbury Borough Local Plan 2016. The adopted plan forms part of the development plan for the area of St Edmundsbury and forms the basis for decisions on land-use planning affecting that area.</p> <p>Under the provisions of the Planning and Compulsory Purchase Act 2004, all policies in the Replacement Local Plan 2016 were initially saved for a period of three years. In April 2009 St Edmundsbury gained a Letter of approval from Go-East to save (with the exception of two) all of the Local Plans policies until its Local Development Framework documents are adopted.</p> <p><b>General Policy – 10. Natural Environment:</b></p> <p>10.1 To achieve a balanced natural environment where the use of resources and energy is minimised, materials and waste recycled and development undertaken with minimum adverse impact, giving close regard to the principles of sustainability.</p> <p>10.2 To achieve this aim the key objectives of the Natural Environment Chapter are to:</p> <ul style="list-style-type: none"> <li>a) promote the prudent use of land, water and other natural resources;</li> <li>b) value, conserve, enhance and restore the distinct landscapes and biodiversity within the borough; and</li> </ul>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

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	<p>c) protect human health and amenity through a safe, clean and pleasant environment.</p> <p><b>POLICY NE4: NATURAL RESOURCES</b> Development will be permitted only where:</p> <p>a) The proposal will not have negative impact on:</p> <ul style="list-style-type: none"> <li>i) ground and surface water;</li> <li>ii) the flood storage capacity of the floodplain; and</li> <li>iii) the flow of floodwater, including the alignment and stability of existing watercourses; and/or</li> </ul> <p>b) The proposal will not:</p> <ul style="list-style-type: none"> <li>i) increase the risk to life and property arising from flooding;</li> <li>ii) prevent the maintenance of a watercourse channel; or</li> <li>iii) result in the irreversible loss of best and most versatile agricultural land (grades 1, 2 and 3a), except where development is the subject of a specific proposal in the Local Plan or it can be demonstrated that there are no suitable alternative sites on lower grade land.</li> </ul> <p>The local planning authority will impose conditions, or make use of legal obligations to secure the following:</p> <ul style="list-style-type: none"> <li>1) Flood mitigation, alleviation measures and/or Sustainable Drainage Systems (SuDS), including the protection and maintenance of existing watercourses and flood plains; and</li> <li>2) Remedial measures and/or monitoring processes.</li> </ul> <p>The local planning authority will require all development proposals in flood risk areas to be accompanied by a Flood Risk Assessment (FRA) in line with current planning guidance and any subsequent replacement Supplementary Planning Document.</p> <p><b>POLICY NE5: ENVIRONMENTAL QUALITY</b> Development will not be permitted where it would have an adverse effect on the natural environment, the landscape or amenity due to the contamination of land, air, water or light.</p>	
<p><b>St Edmundsbury Local Plan Core Strategy Development Plan Document (DPD) (December 2010)</b></p>	<p>The Core Strategy Development Plan Document (DPD) was adopted by the council on 14 December 2010, and now forms part of the Local Development Framework (LDF) for St Edmundsbury.</p> <p>The Core Strategy sets out the vision, objectives, spatial strategy and overarching policies for the provision of new development in the borough up to 2031.</p> <p>The Core Strategy document looks at key issues such as what housing and other land uses should be planned for, the role of the various settlements, how we can protect the environment and reduce the impacts of climate change. The document highlights that the wider Suffolk area is expected to see an increased risk of droughts as a result of climate change.</p> <p>Policy S2: Sustainable Development seeks to ensure both the protection and enhancement of natural resources in the district, including “protecting the quality and availability of water resources” and “maximising the efficient use of water”.</p>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
<p><b>Bury St Edmunds Vision 2031 Local Plan</b></p>	<p>Bury St Edmunds Vision 2031 has been compiled by the council, working with many other partners, and will set out the council's vision for the future of Bury St Edmunds and be part of the statutory planning policy for the town. This first draft has been compiled after widespread consultation so that it reflects the views of local people. Consultation on the document took place between 1 March and 30 April 2012. The next steps are that a final draft of the document will be worked up for a final period of consultation in autumn 2012. The document will then be submitted to the Planning Inspectorate for an independent examination into the proposals. If the document is found to be acceptable the council will then adopt it and it will become part of the statutory planning policy for the borough.</p> <p>Bury St Edmunds is located in the driest region of the country and obtains its water from boreholes. Responsibility for supply rests with Anglian Water who say that, subject to supply development schemes and demand management, there is sufficient capacity to accommodate growth to 2031.</p> <p>Bury St Edmunds lies at the confluence of two rivers, the Lark and Linnet. Flood risk mapping has identified areas at risk, including existing sites and property.</p> <p>Increased water runoff from hard surfaces can increase the risk of flooding.</p> <p>The environmental issues faced by Bury St Edmunds include the following:</p> <ul style="list-style-type: none"> <li>• Water supply and quality: the eastern region is the driest in the UK and Bury St Edmunds relies on underground water reserves and water transfer. Future water availability and quality will have a significant impact on local economic activity, particularly farming and the food industry; and</li> <li>• The issue of flood risk is particularly relevant to Bury St Edmunds given that the town is situated within two river valleys. While the average flow of the watercourses is low, previous experience has demonstrated the potential for extreme weather conditions to cause damage through flooding. Where development is likely to result in increased surface water runoff and flooding, suitable flood mitigation or alleviation measures must be included to overcome this risk.</li> </ul> <p>A set of draft objectives have been developed that set the context for delivering the draft spatial vision, policies and proposals in the Bury St Edmunds Vision 2031 document. The objectives also provide a framework for monitoring performance. One of the nine Objectives that relates to water efficiency is:</p> <p><b>Objective 8:</b> <i>'To ensure that development is built to high standards and addresses sustainability issues including climate change adaptation, carbon emissions reduction, renewable energy provision, waste reduction, recycling and reuse and water efficiency. (CS: J)'</i></p> <p>One of the aspirations included within the Plan for Bury St Edmunds' Infrastructure and Services is <i>'the provision of infrastructure and services meets the growing needs of the town'</i></p> <p>Proposed actions to achieve this, with regards to water supply include:</p> <ol style="list-style-type: none"> <li>a) Support Anglian Water's programme of managing water and reducing mains leakage.</li> <li>b) Encourage rainwater capture and grey water recycling.</li> <li>c) Upgrade the town centre sewerage system and manage the associated disruption.</li> <li>d) Provide new trunk sewers around the town.</li> <li>e) Provide alternative sewage treatment works to the east of the town.</li> </ol>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

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	<p>f) Replace the existing gas holder by a gas pressure reduction system, which would both remove a major hazard and enable redevelopment.</p> <p>g) Ensure that high speed broadband connections are extended to new development.</p> <p>h) Locate all new development away from areas at greatest risk from flooding.</p> <p>i) Design development to accommodate flooding and make efficient use of land.</p> <p>j) Design developments to capture runoff water and re-use it.</p> <p>k) Address existing areas of flood risk and adopt</p> <p>One of the aspirations that is included in trying to address what can be done at the local level in terms of Sustainability and Climate Change with regards to water efficiency is:</p> <p>Aspiration 2</p> <p>Both existing buildings and new developments incorporate high environmental standards and standards of resource efficiency and are resilient to a changing climate.</p> <p>The energy and water efficiency of new development and existing buildings needs to be improved to cut the use of resources and make savings in running costs.</p> <p>8.6 Proposed actions to achieve this:</p> <p>a) Set sustainable construction standards above current minimum requirements.</p> <p>b) Manage waste to minimise landfill.</p> <p>c) Set stringent CO<sub>2</sub> emission standards for new development.</p>	
<b>Kings Lynn &amp; West Norfolk Borough Council</b>		
<b>King's Lynn and West Norfolk Local Plan</b>	<p>The Planning and Compulsory Purchase Act 2004, provides for the saving of policies in adopted or approved local, structure and unitary development plans for a period of 3 years from the commencement date of the Act, which was 28 September 2004.</p> <p>Policies in adopted or approved plans at commencement date, including the King's Lynn and West Norfolk Local Plan, were to expire on 27 September 2007 unless the Secretary of State extended such policies beyond that date. The attached schedules were approved by Cabinet on 19 March 2007 and are the Council's formal request to the Secretary of State to extend local plan policies beyond the three year period.</p> <p>In formulating this request the Council has judged whether or not the policies should be retained by reference to criteria set by Government and that assessment is demonstrated within the schedules. Where policies are not saved beyond September development control decisions will be made against national planning policies, particularly Planning Policy Guidance (PPG) and Statements (PPS).</p> <p>These saved policies currently constitute part of the Development Plan for the Borough:</p> <ul style="list-style-type: none"> <li>King's Lynn &amp; West Norfolk Local Plan</li> </ul>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

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	<ul style="list-style-type: none"> <li>• Saved Local Plan policies</li> <li>• Saving Local Plan Policies</li> <li>• Site Specific Allocations &amp; Policies Development Plan Document - May 2009</li> <li>• Site Specific Allocations and Policies Document - Summary Leaflet</li> </ul> <p><b>Conserving Water Supply:</b></p> <p>Policy SS2 The Council will conserve the natural resources of air, water, and land quality to sustain valuable environmental resources.</p> <p>Guiding Principles and Aims of this Plan</p> <ul style="list-style-type: none"> <li>• To conserve identified water resources and water in the environment.</li> </ul> <p>Policy 4/3 The Council will seek to protect and improve the ecological interest of River Corridors indicated on the Proposals Map. Development which adversely affects associated wildlife habitats, river flows and river water quality will not be permitted.</p> <p><b>Protecting Water Quality:</b></p> <p>Policy 4/23 Development will only be permitted where main foul sewers and sewerage treatment works are of an adequate capacity and design or will be provided in time to serve the development. Small, private, package sewage treatment plants and other types of discharge direct to watercourses will not be accepted in sewered areas.</p> <p>Septic tanks will only be permitted if connection to a mains sewerage system is not feasible and only then if ground conditions are satisfactory and the size of plot can provide an adequate subsoil drainage system.</p> <p><b>Surface Water Disposal and Groundwater/Aquifer Protection:</b></p> <p>Policy 4/24 Development that would pose an unacceptable risk to potable water sources, the quality and flows of aquifers and surface and coastal waters by waste water discharge or disturbing contaminated land will not be permitted.</p> <p><b>Access to Water Areas:</b></p> <p>Policy 9/15 Sporting and recreational uses of water areas which do not damage acknowledged planning interests, especially those relating to inland navigation, water quality, wildlife and the rural character of the countryside, will be permitted.</p> <p><b>Development Affecting Flood Defences:</b></p> <p>Policy 9/19 Development which would be detrimental to the integrity of tidal and fluvial defences will not be permitted. Permission for works or uses affecting tidal and fluvial defences may include conditions or be associated with planning obligations requiring measures to secure the stability and continuity of the defences.</p>	
<b>Kings Lynn &amp; West Norfolk Borough Council Core Strategy Document (July 2011)</b>	<p>The Core Strategy has been developed since 2005 through a number of stages. Significant earlier work culminated in the adoption of the Core Strategy on 28 July 2011.</p> <p>The document has been the subject of formal public consultation throughout the process where comments were invited, and the document evolved in response to these. In February 2011 the Core Strategy underwent and Examination in Public by an independent Planning Inspector to consider the 'soundness' of the document.</p>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

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	<p>The stages completed prior to adoption are:</p> <ul style="list-style-type: none"> <li>• Core Strategy Schedule of Focused Changes (September 2010);</li> <li>• Core Strategy Schedule of Minor Changes (September 2010);</li> <li>• Core Strategy Proposed Submission Document (January 2010);</li> <li>• Core Strategy Reg 25 Document (February 2009);</li> <li>• Issues and Options Review (April 2008);</li> <li>• Preferred Options Paper (October 2006); and</li> <li>• Issues and Options Paper (June 2005).</li> </ul> <p>The Core Strategy recognizes that one of the key environmental issues is the potential lack of water resources due to over abstraction, and climate change leading to decreased water availability.</p> <p>Policy CS08 - Sustainable Development requires that water resources should be protected to ensure that people have access to water and that growth is sustainable.</p> <p>Policy CS14 – Implementation also recognizes that it is important that adequate planning is made for timely utilities infrastructure, including Sustainable Drainage Systems, water supply, foul drainage and sewage treatment capacity.</p>	
<p><b>King's Lynn &amp; West Norfolk Borough Council Outline Water Cycle Study Final Report (December 2009)</b></p>	<p>The Water Cycle Study (WCS) identifies if there are any water related issues that present significant obstacles to the success of development and where and when these issues may occur. The study involved working with the key stakeholders; Anglian Water, the Environment Agency, Natural England, the Borough Council and County Council to identify the key constraints within the water cycle and identify integrated solutions in order to achieve sustainable development.</p> <p>The Water Cycle Study report examines how much growth can be accommodated within the existing infrastructure and potential environmental constraints that may restrict growth and infrastructure solutions. It also explores opportunities to enhance green infrastructure through the development of water infrastructure.</p> <p>It also aims to identify the phasing of the water infrastructure requirements so that these do not constrain the timing of the proposed development. Where environmental constraints on housing growth exist that cannot be accommodated these also need to be identified.</p> <p>The objectives of the Phase 1 Water Cycle Study (WCS) are to:</p> <ul style="list-style-type: none"> <li>• Present information on the water cycle for use by Local Authority Planners;</li> <li>• Highlight the issues that are relevant to the Borough of King's Lynn and West Norfolk, arising from national and local planning policies;</li> <li>• Determine the existing and future capacity of the water supply, wastewater and drainage infrastructure in the study area;</li> <li>• Identify potential barriers to development, considering the combination of environmental and water infrastructure constraints taking into account the requirements of the Water Framework Directive as identified within the draft River</li> </ul>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>



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	<p>Basin Management Plan for Anglian Region;</p> <ul style="list-style-type: none"> <li>• Advise on how development may be best located to minimise the impact of constraints in the water infrastructure system, and sustainability; and</li> <li>• Prepare guidance for local authorities and developers.</li> </ul> <p>The Outline WCS provides a high level constraints assessment of the existing water services infrastructure and the associated impacts of planned development in the Borough of King's Lynn and West Norfolk upon the water cycle.</p> <p>It also highlights any potential problems that may need to be addressed to ensure the growth is delivered sustainably. The study has involved consultation with key stakeholders in the study area; notably Natural England, Anglian Water, the Environment Agency, the Borough Council and County Council.</p>	
<p><b>King's Lynn &amp; West Norfolk Borough Council Water Cycle Study Final Report Phase Two Final Report (October 2011)</b></p>	<p>The Outline Water Cycle Study (WCS) Report that was prepared in 2009 made recommendations for further, more detailed work in the following areas:</p> <ul style="list-style-type: none"> <li>• Water quality and waste water treatment infrastructure;</li> <li>• Drainage and flood risk including sustainable urban drainage (SuDS); and</li> <li>• Water demand management.</li> </ul> <p>The final report made the following conclusions and recommendations:</p> <ul style="list-style-type: none"> <li>• Impacts of growth of WwTWs on downstream water quality are only considered to be small and won't place a constraint on growth;</li> <li>• They may be some expansion of sewerage network capacity in some areas in line with increased development;</li> <li>• The area is classified as under "serious water stress" by the Environment Agency (2007) and so it is considered that the highest water efficiency activities are appropriate; and</li> <li>• Future planning applications should be tested against the WCS.</li> </ul>	<p>The WRMP should aim to support the findings of the Water Cycle Study.</p>
<p><b>Sustainable Community Strategy (SCS) - West Norfolk's Sustainable Community Strategy Tackling Important Local Issues 2007-2030</b></p>	<p>Central to the shared effort to achieve this vision and improve quality of life in West Norfolk is the work of key public, private, voluntary and community sector organisations.</p> <p>These organisations come together under the auspices of the West Norfolk Partnership to co-ordinate this effort and achieve more together than we can on our own through collaboration, co-ordination and commitment, making life better for people in West Norfolk.</p> <p>The Partnership does this through a cycle of developing a shared, long-term vision for the area based on a robust evidence-base to define priorities; developing and implementing project and action plans to address these priorities; using the baseline evidence to track improvements and enable monitoring against outcomes and performance management, and structuring and supporting partnership working to achieve its ambitions.</p> <p>The development of a Sustainable Community Strategy for West Norfolk reflects this ethos, following the process outlined below.</p> <p>1. The <b>State of West Norfolk research</b> provides a policy steer based on the information contained within Dawn (Data about West Norfolk) the Partnership's online data observatory.</p>	<p>The WRMP should take community effects of schemes into account.</p>

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	<p>2. Research into the <b>future drivers for change</b> and the implications for West Norfolk were considered.</p> <p>3. <b>Scenarios for the future</b>, were considered and the most likely options discussed</p> <p>4. Conclusions were drawn as to the elements that a vision for West Norfolk should contain and the priorities that will contribute to the achievement of the vision.</p> <p>5. These elements were captured in an outline strategy which has been consulted on with both the West Norfolk Partnership Management group and the Partnership Board.</p> <p>Environmental sustainability raises a number of challenges. One is to address future environmental change, particularly dealing with flood risks. One of the ambitions of the SCS that communities in West Yorkshire will benefit from is by actively seeking to limit and adapt to climate change including minimizing the risk of flooding.</p>	
<b>Fenland District Council</b>		
<p><b>Fenland Local Plan Core Strategy – Proposed Submission (February 2013)</b></p>	<p>The Core Strategy Proposed Submission document contains a number of objectives that have helped to prepare the detailed policies and proposals for Fenland. With regards to Water Resources, the following objectives are:</p> <p>1.2 Increase water efficiency and limit water consumption to levels supportable by natural processes and storage systems; and</p> <p>1.3 Avoid any deterioration of river water quality.</p> <p>In January 2013, Fenland District Council adopted its first ever Infrastructure Delivery Plan. At the time of the Core Strategy publication, some key elements of the IDP to meet the Core Strategy Vision include:</p> <ul style="list-style-type: none"> <li>- waste water network upgrade/improvements</li> <li>- waste water treatment works upgrade/improvements</li> </ul> <p>The Core Strategy also acknowledges that the district is situated within a high-water stress region. To try to achieve water neutrality the Council will encourage all new development to incorporate a range of water saving measures. Policy CS14, Part (A) aims to protect resources and their use:</p> <p>Resource Use:</p> <p>In order to address the following:</p> <ul style="list-style-type: none"> <li>(a) the urgent need to combat the causes of, and adaptation to, climate change;</li> <li>(b) the chronic levels of fuel poverty in selected parts of the district;</li> <li>(c) the need to compensate for the embodied energy of new buildings;</li> <li>(d) the need to create local jobs in Fenland;</li> <li>(e) the increasing need to use water more efficiently;</li> <li>(f) the desire to develop skills and experience in the 'green economy';</li> <li>(g) the desire to minimise, as a result of new development, the need for costly and resource intensive upgrades and</li> </ul>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

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	<p>capacity increases to the wider power infrastructure network, and</p> <p>(h) the need, generally, to upgrade existing dwellings to better energy performance (acknowledging the fact that 85% of today's existing, mostly energy inefficient, homes in the UK will likely still be in existence in 2050),</p> <p>The Council will expect all developments of one dwelling or more, or 100 sq m or more for non-dwellings, to explicitly demonstrate what reasonable contribution the development will make towards minimising resource consumption above and beyond what is required by Building Regulations and/or other standard planning policies.</p>	
<b>East Cambridgeshire and Fenland Water Cycle Study Outline Study – Main Planning Report (April 2011)</b>	<p>The Study recognizes that the districts of East Cambridgeshire and Fenland are expected to experience a significant increase in housing and employment provision over the period to 2031. This growth represents a challenge to both districts in ensuring that both the water environment and water services infrastructure has the capacity to sustain this level of growth and development proposed.</p> <p>The Study has been undertaken to identify any constraints that may be imposed by the water cycle and how these can be resolved.</p> <p>The study identified that there are several Wastewater Treatment Works WwTWs that do not have the capacity to accept and treat any further wastewater from growth at the current time. To treat the additional wastewater that will be generated as a result of growth, a solution for these catchments is required.</p>	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Suffolk County Council</b>		
<b>Transforming Suffolk – Suffolk's Community Strategy 2008 - 2028</b>	<p>The Transforming Suffolk Strategy 2008-2028 sets out the long term ambition and priorities for the county over the next twenty years. It looks ahead to the issues and challenges we face over the coming years and articulates a vision that all partners are committed to achieving:</p> <ul style="list-style-type: none"> <li>• A Prosperous and Vibrant Economy;</li> <li>• Learning and Skills for the Future;</li> <li>• The Greenest County; and</li> <li>• Safe, Healthy and Inclusive Communities.</li> </ul> <p>The strategy is the first step in planning how to meet and respond to the challenges that will affect us over the next twenty years. It will mean working with everyone in Suffolk which already has a fine tradition of genuine partnerships.</p> <p>Water and coastal management have been identified in the strategy as the most serious issues relating to climate change in Suffolk because it is one of the driest parts of the country and many of the available water resources are already overstretched.</p> <p>The need to reduce emissions, improve air quality and conserve water had also been identified as key actions for the future.</p>	The WRMP should take community effects of schemes into account.
<b>Ipswich Borough Council</b>		
<b>Ipswich Local Plan (November 1997)</b>	<p>The Ipswich Local Plan (November, 1997) still contains some saved Local Plan policies in accordance with the Planning and Compulsory Purchase Act 2004.</p> <p>The Plan sets out a vision aimed at enhancing the environment, improving the quality of life and creating economic</p>	The WRMP should take local planning policy into consideration when developing schemes.

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	<p>opportunity. It is the first Local Plan embracing the whole of the Borough for over 30 years and has been the subject of widespread public consultation.</p> <p>The Strategy consists of a set of guiding principles indicating the main direction of the Plan including a geographic description explaining broadly how new growth is to be accommodated. Broad strategic aims have been formulated and are divided into environmental, social and economic issues. The purpose of the Strategy is to provide for a well-focused framework for new development, explaining which local issues are important and how it is proposed to achieve the Plan's broad aims.</p>	
<b>Ipswich Borough Council Core Strategy and Policies Development Plan Document (December 2011)</b>	<p>The Core Strategy recognises the importance of managing water resources through the efficient use of water. Policy CS1 requires building and infrastructure design to incorporate water conservation, capture, recycling and efficiency measures and sustainable urban drainage systems.</p> <p>The Core Strategy states that the Haven Gateway Water Cycle Study Stage 1 Report identified issues with water supply and sewerage in Ipswich. It advised that sustainable drainage and other demand management techniques are used to manage water demand and surface water runoff in the Borough. It is likely that these measures will be made compulsory if the Floods and Water Management Bill is enacted.</p> <p>The Core Strategy recognises that key strategic infrastructure requirements are needed to deliver the objectives of the Core Strategy which includes water management infrastructure.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Norwich City Council</b>		
<b>Norwich City Council City of Norwich replacement local plan (RLP) (November 2004)</b>	<p>The RLP contains the policies and proposals for development in the city. The RLP provides policy guidance for developers and the council's own development management service on where and what kind of development may be permitted.</p> <p>The RLP is gradually being superseded by the emerging Local Plan and two Local Plan Development Plan Documents have been adopted – the Joint Core Strategy (JCS) for Broadland, Norwich and South Norfolk and the Northern City Centre Area Action Plan (NCCAAP).</p> <p>Two further emerging Local Plan documents, the Site allocations plan and the Development management policies plan are in production. When these plans are adopted (scheduled for 2013), RLP policies will no longer apply.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Joint Core Strategy Development Plan Document for Broadland, Norwich and South Norfolk (Adopted March 2011)</b>	See information on Joint Core Strategy under South Norfolk Council (further below).	The WRMP should take local planning policy into consideration when developing schemes.
<b>Norfolk County Council</b>		
<b>North Norfolk Core Strategy (2008)</b>	The Core Strategy recognises that limited capacity in basic infrastructure including water supply, in certain towns is an important constraint to the economy. It also recognises that new development places additional burdens on local infrastructure and facilities including water supply. The access and infrastructure policy (Policy SS6) aims to ensure that new development does not take place without adequate provision of infrastructure such as water supply. Policy EN6 also ensures water efficiency within new developments. The Core Strategy recognises that with the exception of a small area to the south east of the District which is served by the Broads, North Norfolk's water resources are entirely dependent on the	The WRMP should take local planning policy into consideration when developing schemes.

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	<p>North Norfolk Coast Cromer Ridge chalk aquifer. It states that Anglian Water has indicated that the water supply networks have capacity available.</p> <p>The core strategy also recognises the importance of designated areas within North Norfolk and aims to minimise any negative effects on these including water pollution.</p> <p><b>Core Aim 3</b></p> <ul style="list-style-type: none"> <li>• To protect the built and natural environment and local distinctive identity of North Norfolk, and enable people's enjoyment of this resource;</li> <li>• To provide for the most efficient use of land without detriment to local character and distinctiveness;</li> <li>• To ensure high quality design that reflects local distinctiveness;</li> <li>• To protect and enhance the built environment;</li> <li>• To protect, restore and enhance North Norfolk's landscape, biodiversity and geodiversity and improve ecological connectivity; and</li> <li>• To improve river water quality and minimise air, land and water pollution.</li> </ul>	
<b>Broadland District Council</b>		
<b>Broadland District Council LDF Development Management DPD – Issues and options Consultation (September 2011)</b>	<p>The proposed Development Management DPD is part of the Broadland LDF and will support and conform to the Joint Core Strategy for the Broadland, Norwich and South Norfolk regions.</p> <p>The DPD recognises that development may have impact upon water resources locally. It also recognises that the protection of ground water sources and reserves is also of importance and therefore any that would threaten the quality of groundwater will be prevented, in accordance with advice from the Environment Agency.</p>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>
<b>The Broads Authority</b>		
<p>The Broads Plan 2011</p>	<p>The Broads Plan is the key strategic management plan for the Broads. It sets out a long-term vision for the Broads and guides the decisions affecting the future of this special landscape. Broads Plan 2011 sets out a Vision for the Broads to 2030, long-term aims, and short-term objectives and actions set out under three key themes:</p> <ul style="list-style-type: none"> <li>• <b>Planning for the long-term future of the Broads in response to climate change and sea level rise</b> - Responding to the challenges facing the Broads over the next 50 - 100 years presented by climate change and sea level rise;</li> <li>• <b>Working in partnership on the sustainable management of the Broads</b> - Landscape and cultural heritage; agriculture and land management; biodiversity; and management of the navigation area; and</li> <li>• <b>Encouraging the sustainable use and enjoyment of the Broads</b> - Promoting understanding, enjoyment and wellbeing; and tourism, recreation and access.</li> </ul> <p>The Broads Plan recognises that the ecological status of the wetland habitats within the Broads (marsh dykes, fens, reedbeds and broads) is dependent upon the quality and quantity of water entering the catchment from both ground and surface water sources. Sustainable water management and land use practices in the catchment, most of which lies outside the Authority's executive area, are crucially important.</p> <p>The Plan states that water quality in parts of the Broads has improved markedly in recent decades, helped by</p>	<p>The WRMP should take the policies in the Broads Plan into account.</p>

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	<p>improvements and new initiatives in sewage treatment, agri-environmental practices and the boating industry. Water companies' forward plans are committed to continuing investment in protecting the most important habitats and species and encouraging biodiversity. However, currently, none of the 13 broads and only one of the 27 river reaches monitored for WFD purposes meets the minimum target of 'good' overall ecological status/potential.</p> <p>Strategic objective BD3: Continue the improvement of the water quality and water resource in the Broads by addressing priority issues of diffuse pollution from nutrients and managing saline intrusion</p>	
<p><b>LDF Core Strategy 2007-2021 Development Plan Document (September 2007)</b></p>	<p>The Core Strategy DPD is a key document that sets out the vision for the Broads until 2021, including environmental, social and economic objectives and primary policies for achieving that vision. The Core Strategy recognises that the Broads is threatened by water resource problems: low river flows and depleted groundwater and the threat of increased salt water incursion and tidal saltwater flooding. The main threat to water quality comes from diffuse pollution, often arising from outside the Broads boundary, e.g. farm and road run-off.</p> <p>The Authority will participate in the water quality partnership and continue to work together with partners. The Core Strategy states that together with the Environment Agency, the Authority will encourage the achievement of high standards regarding waste water discharge which recognise the special status of the Broads as equivalent to a National Park, and lobby for investment in modern infrastructure to meet the growing capacity needs of the wider area.</p> <p>The following policy requires that all development is to address its impacts on water quality and water resources.</p> <p>Policy CS7: The environment will be protected and enhanced by ensuring all development addresses impacts on air quality, water quality, water resources and waste. Opportunities should be sought for incorporating measures to achieve resource efficiency, for re-use and recycling. The Authority will seek their sustainable management and use by working with local authorities, Natural England, the Environment Agency, water companies, Internal Drainage Boards and landowners on land-use and water issues.</p>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>
<p><b>Broads Authority Development Management Policies DPD 2011-2021</b></p>	<p>The Development Management Policies DPD recognises that the Broads is faced with a number of water resource problems, including low river flows, depleted groundwater and the threat of salt water incursions and tidal flooding.</p> <p>The spatial vision for the Broads up to 2021 states that:</p> <p>The Broads will be an area thriving with wildlife, and conservation sites will all be in good condition. The water quality will remain good, with any new development contributing to maintaining this. Water quantity will have been managed effectively in times of flood, and where possible protection measures will have added to the biodiversity and ecology of the Broads. Waste will have been managed effectively so there is no detriment to the environment.</p> <p>DP3: Water Quality and Resources</p> <p>Sufficient water infrastructure capacity to meet the additional requirements arising from a development should be in place before the development commences.</p> <p>Development will only be permitted where it can be demonstrated that it will not have an adverse impact on surface or ground water in terms of quality and quantity. This should include the requirements of the Water Framework Directive and Habitats Regulations.</p> <p>Development should be connected to a foul sewer unless proven not to be appropriate. Other arrangements, including septic tanks and private sewage treatment works, will only be acceptable if the Authority is satisfied that there would be no</p>	<p>The WRMP should take local planning policy into consideration when developing schemes.</p>

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	<p>harmful effects on the environment.</p> <p>New development should incorporate measures to minimise water consumption. Water management systems, including grey water recycling and rainwater harvesting, should be incorporated into new development unless proven unfeasible.</p> <p>All new development should address surface water run-off. Sustainable Drainage Systems (SuDS) should be used unless, following adequate assessment, soil conditions and/or engineering feasibility dictate otherwise. Surface water run-off proposals should address the requirements of the Flood and Water Management Act 2010.</p>	
<b>Cambridge City Council</b>		
<b>Cambridge City Council Local Plan 2006</b>	<p>The Local Plan sets out the City Council's policies about how the demands of growth and change can be met without compromising the many qualities that make Cambridge such a wonderful place. It also sets out the proposals for future development and land use to 2016. It provides a means of guiding change over long periods of time and all planning decisions will be made in accordance with the Local Plan.</p> <p>The Local Plan:</p> <ul style="list-style-type: none"> <li>• Interprets national and regional planning policies and relates them to Cambridge;</li> <li>• Provides a framework of policies and proposals against which planning applications can be assessed;</li> <li>• Will enable infrastructure providers to plan for the future; and</li> <li>• Brings planning issues before the public for debate.</li> </ul>	The WRMP should take local planning policy into consideration when developing schemes.
<b>East Cambridgeshire District Council</b>		
<b>East Cambridgeshire District Council Core Strategy (October 2009)</b>	<p>As a result of the adoption of the Core Strategy, most of the policies in the East Cambridgeshire District Local Plan (adopted in 2000) have been superseded. However until the adoption of site-specific documents some of the policies are still 'saved'. The following water related policies are included within the Core Strategy document:</p> <p><b>Policy CS6 – Environment:</b></p> <p>All new development should contribute to the delivery of sustainable development, by being designed and located to minimise carbon emissions and the use of non-renewable resources, mitigate/adapt to future climate change, provide attractive and safe places for people, and protect and enhance the quality of the natural and built environment. Opportunities to minimise air, land and water pollution and improve water quality should be taken wherever possible, and development will be encouraged to make maximum use of renewable energy sources. New development will also be expected (but not required) to minimise the exposure of people and property to flooding.</p> <p><b>Policy CS 7 – Infrastructure:</b></p> <p>There should be appropriate infrastructure and community services and facilities in place to serve the needs of new development schemes and to deliver the objectives of the Core Strategy. Key requirements include improvements, extensions and relocations of sewage treatment facilities across the district as required. In the case of infrastructure, permission for development will not be granted unless there is sufficient capacity in existing infrastructure to meet the additional requirements arising from the new development, or suitable arrangements having been put in place for necessary improvements.</p>	The WRMP should take local planning policy into consideration when developing schemes.



Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	<p><b>Policy CS 9 – Ely:</b> Improvements to the sewage treatment facilities in the city will be required in order to facilitate development on new greenfield sites. Improvements may also be required to facilitate change of use on large brownfield sites, if a scheme would result in a significant increase in discharge to the sewer. Anglian Water will seek to ensure that the required improvements to sewage treatment facilities in Ely are completed by 2015.</p> <p><b>Policy CS 10 – Soham:</b> Improvements to the sewage treatment facilities in Soham will be required in order to facilitate development on new greenfield sites. Improvements may also be required to facilitate change of use on large brownfield sites, if a scheme would result in a significant increase in discharge to the sewer. Anglian Water will seek to ensure that the required improvements to sewage treatment facilities in Soham are completed by 2015.</p> <p><b>Policy CS 11 – Littleport:</b> Improvements to the sewage treatment facilities in Littleport will be required in order to facilitate development on new greenfield sites. Improvements may also be required to facilitate change of use on large brownfield sites, if a scheme would result in a significant discharge to the sewer. Anglian Water will seek to ensure that improvements to sewage treatment facilities in the town are completed by 2015.</p> <p><b>Policy EN 8 – Pollution:</b> All development proposals should minimise, and where possible, reduce all emissions and other forms of pollution, and ensure no deterioration in water quality. All applications for development where pollution is suspected must contain sufficient information to enable the Council to make a full assessment of potential hazards.</p> <p><b>Policy 167:</b> The Council will require developers to prepare and agree, prior to development taking place, a detailed design brief demonstrating how they intend to develop the areas of land identified for housing in Policy 11. Particular attention will have to be paid to issues relating to the attenuation and discharge of surface water run-off from housing developments on the western side of Ely in order to maintain the land drainage status quo.</p>	
<b>South Norfolk</b>		
<b>The South Norfolk Local Plan (Adopted 2003, policies saved beyond 2007 and then beyond 2011)</b>	The saved policies within the Local Plan do not discuss water resources.	The WRMP should take local planning policy into consideration when developing schemes.
<b>Joint Core Strategy Development Plan Document for Broadland, Norwich and South Norfolk (Adopted March 2011)</b>	<p>Broadland District Council, Norwich City Council and South Norfolk Council, working with Norfolk County Council as the Greater Norwich Development Partnership have produced a Joint Core Strategy for Broadland, Norwich and South Norfolk.</p> <p>The Joint Core Strategy recognises that existing infrastructure in many areas is at, or near capacity, including water infrastructure, and that significant investment in these areas are required. The spatial vision for the area includes a specific vision that 'people will use less water, the quality of water resources and the aquatic environment will be maintained or improved, and the risk of flooding will be avoided or mitigated'. Spatial planning objectives state that water efficiency will be</p>	The WRMP should take local planning policy into consideration when developing schemes.



Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	<p>a priority in both new and existing development.</p> <p>The Core Strategy recognises that water quality and availability are a key issue locally. The Water Cycle Study provided initial advice on the best locations for development in relation to water and wastewater infrastructure and subsequently identified the infrastructure required to deliver the Joint Core Strategy. The Water Cycle Study showed that existing water supplies must be used as efficiently as possible in this area of low rainfall and of water stress. The study also showed that sustainable water infrastructure, such as greywater recycling and rainwater harvesting, can be implemented more effectively on larger developments, but is less cost effective at the smaller scale. Therefore, in the light of the study, level 4 Code for Sustainable Homes water standards are required in smaller scale housing development and level 6 standards are required in larger scale housing developments over 500 homes. In the longer term, further investment will be required in new water resource schemes along with water supply infrastructure in order to provide sufficient potable water to the major growth areas.</p> <p>The Core Strategy also states where new water supply will be required because of proposed new developments. These include Diss and Harleston where significant new housing development is proposed.</p> <p>It should be noted that the following a legal challenge part of the Core Strategy was remitted by the High Court and taken back to the Regulation 19: Publication of a Local Plan stage, to be treated as not having been subject to examination or adoption. The remainder of the Joint Core Strategy remains adopted (as in the March 2011 version). The parts of the Core Strategy remitted by the High Court are currently undergoing Examination in Public.</p>	
<b>Breckland</b>		
<b>Breckland Water Cycle Study (2010)</b>	<p>The Breckland Water Cycle study was undertaken by Scott Wilson in 2010. It makes several recommendations which are as follows:</p> <ul style="list-style-type: none"> <li>• New homes should not be built until agreement has been reached with the water and wastewater provider that sufficient capacity in existing or future water services infrastructure is available in accordance with Breckland WCS;</li> <li>• Developers should be required to contribute to strategic wastewater network infrastructure required specifically to service new development areas proposed by the Breckland Core Strategy;</li> <li>• The provision of new wastewater mains will be required in Thetford, Attleborough and Watton to connect new development and transfer much of the wastewater generated to the WwTW for treatment at each town;</li> <li>• In order to meet future growth needs, WwTWs at Thetford and Attleborough will need to be upgraded/expanded;</li> <li>• Development will only be permitted at WwTWs if the distance is sufficient to allow for dispersal of odour (considered to be 400m). This is for the protection of amenity;</li> <li>• New development should not be permitted in Source Protection Zones unless the EA is satisfied that risk is acceptable. This will protect the local water resource;</li> <li>• Wastewater treatment at Dereham is at capacity, therefore there should be a limit on new development in this area; and</li> <li>• All new development should be served by separate surface water and wastewater drainage.</li> </ul>	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Breckland Core Strategy (December 2009)</b>	The Core Strategy describes Breckland as one of the driest Districts in the country. It describes the need for a strategic approach to water abstraction, supply and demand. It describes the reliance on an aquifer means it is important to ensure	The WRMP should take local planning policy into consideration

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	<p>that development does not contaminate it (p.14).</p> <p>The strategic objectives of the Core Strategy include:</p> <ul style="list-style-type: none"> <li>• SO15: To prevent groundwater contamination and a deterioration in air, water and soil; and</li> <li>• SO16: To require the efficient use of water resources.</li> </ul> <p>Section 3.13 highlights the importance of water resource capacity to enable to delivery of new housing for the area. It also emphasises the need for water serving these developments to be sustainable so it doesn't deplete European Habitat designated areas which are dependent on water resources.</p> <p>Policy CP8: Natural Resources states that development must not cause a deterioration in water quality.</p>	when developing schemes.
<b>Great Yarmouth</b>		
<b>Saved Policies from the Great Yarmouth Borough Wide Local Plan (2001)</b>	Section 7.5 of the Local Plan concerns water resources. It highlights the importance of ensuring the protection of groundwater for abstraction so that it can be of the highest quality. Policy INF8 describes that development should not cause adverse impact upon groundwater quality. Policy INF11 describes how the Council will protect waste water facilities from incompatible development.	The WRMP should take local planning policy into consideration when developing schemes.
<b>Waveney &amp; Great Yarmouth Joint Water Cycle Strategy – Scoping Study (March 2009)</b>	<p>There is no Water Cycle Study for Great Yarmouth, but there is a scoping study, produced by Scott Wilson in 2009 for Great Yarmouth and the neighbouring Waveney district. The purpose of the report was to primarily examine the impact of a projected 14% increase in population in the districts by 2025/2026 upon water resources. The report highlights investment made by Anglian Water on the sewer network.</p> <p>The scoping document highlights the dependency of the Great Yarmouth Borough Council (GYBC) area upon surface water as it provides the source for nearly all potable water supplies in the district. It describes that two of the area's WwTWs are known to suffer problems following wet weather.</p> <p>It is predicted that the area will be in water surplus up until 2021, beyond which the area will be in water deficit following population growth and resulting increased demand. Concern was also raised in the scoping document of the impact arising from increased abstraction upstream in the Norwich area, which would lead to decreased flows to the Great Yarmouth area.</p>	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Rutland</b>		
<b>Rutland Local Development Framework: Core Strategy (2011)</b>	<p>The Core Strategy highlights the importance of Rutland Water reservoir, not only for supplying water, but also for nature and recreation. The Core Strategy highlights the importance of sustainable development.</p> <p>There is no specific section addressing water management.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Rutland Local Plan (2001)</b>	The Local Plan discusses the need for utility apparatus to be located underground (policy UT6).	The WRMP should take local planning policy into consideration when developing schemes.
<b>Suffolk Coastal</b>		
<b>Suffolk Coastal Local Plan (1994 – alteration in 2001)</b>	The Local Plan was first adopted in 1994, with current policies saved beyond 2007. The Local development Framework for the district is still emerging.	The WRMP should take local planning policy into consideration

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	Policy AP94 concerns surface water and aquifer protection, stating: "Development will not be permitted within areas around potable groundwater and surface water sources or over vulnerable areas of aquifers which, in the opinion of the Local Planning Authority, after consultation with the Environment Agency, pose an unacceptable risk to the availability or quality of the water resources, unless appropriate provision is made, by condition or legal agreement, to prevent this occurring."	when developing schemes.
<b>Haven Gateway Water Cycle Study: Stage 2 report (2009)</b>	<p>The Haven Gateway sub-region covers all of Colchester Borough, Ipswich Borough and Tendring District Councils, and part of Babergh, Mid Suffolk and Suffolk Coastal District Councils.</p> <p>The study made the following broad conclusions:</p> <ul style="list-style-type: none"> <li>• It was considered that water companies were confident in their abilities to meet future demand with plans in place to realise this. There was an assumption that water demand per capita would fall with metering and efficiencies;</li> <li>• In terms of wastewater, there are numerous areas where the existing infrastructure is at capacity with no room for growth, with a number of other treatment works projected to reach capacity in the near future. This will necessitate increases in their allowed discharge levels and expansion of facilities; and</li> <li>• Generally, proposed development in the area lies outside of flood risk areas, thus reducing the potential impact of flooding, although there is concern over some brownfield development near water bodies.</li> </ul>	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Mid Suffolk</b>		
<b>Mid Suffolk Local Plan (1998)</b>	<p>The Mid Suffolk Local Plan was adopted in 1998, with policies saved beyond 2007.</p> <p>The Local Plan highlights the importance of sustainable development in the district.</p> <p>Policy SC4: Protection of Groundwater Supplies states that: the Local Authority will resist changes which will result in damage to water aquifers, and they will seek to minimise the risk of contamination of underground water resources.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Haven Gateway Water Cycle Study: Stage 2 report (2009)</b>	For information on the Haven Gateway Water Cycle Study see Suffolk Coastal Council (further above).	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Babergh</b>		
<b>Babergh Core Strategy (2011-2031) Submission Draft</b>	<p>The Core Strategy provides a high-level, strategic plan for Babergh for 20 years from 2011 -2031. The policies are intended to be broad and general, overarching policies outlining the strategy for growth and steering growth to sustainable locations.</p> <p>The Core Strategy states that water efficiency and the reduction in water usage is a high priority for sustainable development and all new development will be expected to include demand management measures designed to reduce the impact of new and existing development on the water resources in Babergh district.</p> <p>Policy CS3 sets out an area specific policy for Sudbury/Great Cornard, in particular to support development of water supply network at Chilton and Sudbury.</p> <p>The Core Strategy also contains policies and strategies to protect the natural and built environment, reduce energy use and climate change effects.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Peterborough</b>		

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
<b>Peterborough Core Strategy DPD (Adopted 2011)</b>	<p>The Core Strategy is a statutory Local Plan which sets out the overall approach to development in Peterborough to 2026 and beyond.</p> <p><b>OB27: Utilities infrastructure</b> – To secure in advance the funding and delivery of sufficient infrastructural capacity to accommodate and support the levels of growth planned for the district up to 2026, in particular through increased sewage treatment network capacity and ensuring sufficient water security to accommodate new development. To reduce pressure on the area's utilities by adopting measures to manage and reduce existing and future resource demand.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Addendum to Peterborough Water Cycle Study (Detailed Strategy) - July 2010</b>	<p>The Detailed Study for Peterborough was carried out during a period of rapid change in the Water Industry. For this reason the Detailed Study was unable to confirm the full strategy for dealing with wastewater from the planned growth in the catchment. The addendum document shows how planned growth can be accommodated and summarises the subsequent work that is required to develop the strategy.</p> <p>Anglian Water's strategy for dealing with growth is a combination of demand management and capacity increase. The Addendum document concludes that Anglian Water, Peterborough City Council and the Environment Agency are satisfied that through partnership working and monitoring, any constraints on the wastewater network and treatment capacity can, and are being overcome.</p> <p>The Addendum document highlights the following constraints that there are to increasing the capacity of Anglian Water's Peterborough (Flag Fen) WwTW and these are discussed in more detail in the document:</p> <ul style="list-style-type: none"> <li>• The Water Framework Directive (WFD) – from 2015 more stringent consent limits will apply to the Flag Fen WwTW, which will protect the Counter Drain (an individual water body) from deterioration. The water quality objectives that are placed on the Counter Drain for example will need to be met by 2016 with derogation possible to 2026 as a result of the WFD;</li> <li>• Land Availability – there is currently adequate land in Anglian Water ownership to accommodate any extensions;</li> <li>• Planning Considerations – it is anticipated that Planning Permission will be required for future development on the site. The WwTW is located in an area designated as Flood Zone 3. Breach modelling does show the potential for site inundation. For planning permission to be granted it may need to be demonstrated that appropriate measures are put in place to ensure that the extended plant does not increase the impact of flood events; and</li> <li>• Land Drainage Considerations – increased discharge from the WwTW may lead to an increased flood risk from the Counter Drain. Should any extension work be required, modelling work would need to be undertaken to demonstrate whether or not the flood risk would be increased at the site. A plan would also have to be prepared to demonstrate how the flood risk would be managed. Funding for land drainage improvements may also need to be sought through Section 106 Contributions and ring-fenced by Peterborough County Council if the works are carried out in partnership, or by a single partner other than Anglian Water.</li> </ul>	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Colchester</b>		
<b>Colchester Core Strategy (2008)</b>	<p>This document sets out the vision for Colchester up to 2021. The document places emphasis upon sustainable development, with the document stating its desire to see a reduction in household energy and water consumption.</p> <p>Policy ER1: Energy, Resources, Waste, Water and Recycling focusses upon demand for resources, with an aim to reduce demand for these resources including water. The supporting text makes reference to the Haven Water Cycle Study.</p>	The WRMP should take local planning policy into consideration when developing schemes.

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
<b>Haven Gateway Water Cycle Study: Stage 2 report (2009)</b>	For information on the Haven Gateway Water Cycle Study see Suffolk Coastal Council (further above).	The WRMP should aim to support the findings of the Water Cycle Study.
<b>Essex County</b>		
<b>Essex County Council Replacement Minerals Local Plan (Pre-Submission Draft) January 2013</b>	<p>The Replacement Minerals Local Plan recognises the implications of Climate Change and the need for minerals development to adapt to climate change. One of the key issues highlighted in the document is that drought periods may become more commonplace with implications for the availability of water supplies and impacts on water tables and river levels. In order to respond to the issues associated with climate change, the Plan highlights the need to, where appropriate make use of water recycling and storage facilities, mineral site operators should install plant and devices, and use best practice methods to improve water efficiency. It also highlights that opportunities for reducing water consumption should be considered alongside the reduction of waste-water during site construction/preparation and for the life of the development/operations.</p> <p>The Plan recognises that minerals development has the potential to impact upon water resources and that it is important that all such potential impacts are investigated and addressed.</p>	The WRMP should take local planning policy into consideration when developing schemes.
<b>Joint Essex County Council and Southend-on-Sea Borough Council Waste Local Plan (adopted September 2001)</b>	<p>The Waste Local Plan highlights that the future treatment arrangements within Essex and Southend mainly affect changes to the current methods used by Anglian Water. Several of Anglian Water's sites use anaerobic digestion as a process to treat sludge. The Plan recognises that there will be higher environmental standards for discharges to watercourses and the sea in the future and this will inevitably lead to a greater volume of sludge requiring management by other means. Alternative disposal methods will therefore need to be identified for sewerage biosolids (sludge).</p> <p>Policy W5C: PROPOSALS FOR NEW OR EXTENDED SEWAGE TREATMENT WORKS MAY BE LOCATED IN RURAL AREAS. ALL PROPOSALS WILL BE REQUIRED TO MAKE PROVISION FOR ODOUR CONTROL, AN ACCEPTABLE STANDARD OF VISUAL APPEARANCE AND LANDSCAPING, AND (WHERE APPROPRIATE) ACCESS ARRANGEMENTS WHICH MEET POLICY W4C. PROVISION FOR THE RECYCLING OF SLUDGE TO PRODUCE BENEFICIAL END PRODUCTS WILL BE SOUGHT WHERE APPROPRIATE INCLUDING PROPOSALS FOR THE CO-TREATMENT OF SLUDGE WITH OTHER WASTES, SUBJECT TO ENVIRONMENTAL SAFEGUARDS REGARDING ON-SITE STORAGE OF THE PRODUCT. ALL PROPOSALS WILL BE SUBJECT TO THE RELEVANT CRITERIA CONTAINED ELSEWHERE IN THE DEVELOPMENT PLAN, IN PARTICULAR THE CONSIDERATIONS SET OUT IN POLICY W10E.</p> <p>The Plan also recognises that for any new, Preferred Sites for major waste management groundwater protection would need to be one of the key, common aspects that would have to be examined to ensure that the development would not give rise to any such issues.</p> <p>Policy W10E of the Plan states that waste management development, including landfill will be permitted where satisfactory provision is made in respect of certain criteria, which includes amongst others "the availability of adequate water supplies and the effect of the development on land drainage".</p> <p>Policy W4A of the Waste Local Plan state that "WASTE MANAGEMENT DEVELOPMENT WILL ONLY BE PERMITTED WHERE:</p> <ul style="list-style-type: none"> <li>• THERE WOULD NOT BE AN UNACCEPTABLE RISK OF FLOODING ON SITE OR ELSEWHERE AS A RESULT OF</li> </ul>	The WRMP should take local planning policy into consideration when developing schemes.

Document Name	Key Objectives, Requirements and Guidance	Relevance to Water Resources Management Plan (WRMP)
	<p>IMPEDIMENT TO THE FLOW OR STORAGE OF SURFACE WATER;</p> <ul style="list-style-type: none"> <li>• THERE WOULD NOT BE AN ADVERSE EFFECT ON THE WATER ENVIRONMENT AS A RESULT OF SURFACE WATER RUNOFF; and</li> <li>• EXISTING AND PROPOSED FLOOD DEFENCES ARE PROTECTED AND THERE IS NO INTERFERENCE WITH THE ABILITY OF RESPONSIBLE BODIES TO CARRY OUT FLOOD DEFENCE WORKS AND MAINTENANCE".</li> </ul> <p>Policy W4B: WASTE MANAGEMENT DEVELOPMENT WILL ONLY BE PERMITTED WHERE THERE WOULD NOT BE AN UNACCEPTABLE RISK TO THE QUALITY OF SURFACE AND GROUNDWATERS OR OF IMPEDIMENT TO GROUNDWATER FLOW.</p>	
<b>Northampton</b>		
<b>Northampton Local Plan (1997 – policies saved beyond 2007)</b>	This document was reviewed and no policies relevant to water resource management were found. The Plan does contain policies on the protection of the natural and historic environments.	The WRMP should take local planning policy into consideration when developing schemes.
<b>West Northamptonshire Water Cycle Study (2011)</b>	<p>The West Northamptonshire Water Cycle Study was published in 2011, undertaken by Halcrow. The study concerns the area comprising the following districts: Daventry, Northampton and South Northamptonshire.</p> <p>The study recognises that the Ruthamford Water Resource Zone (WRZ) in which the study is located is currently in surplus. However, it highlights that within the Core Strategy period, the WRZ will be in deficit. This is primarily due to increased demand resulting from predicted new housing and development. The study recommends an aim for water neutrality in the region.</p> <p>The study states that water supply infrastructure in Northampton should not be considered a constraint for growth. It states that WwTW capacity in the area is adequate, and the study agrees with Anglian Water's aim to reduce infiltration into WwTWs as preferable to increasing WwTW capacity.</p>	The WRMP should aim to support the findings of the Water Cycle Study.

# Appendix B. Regional Baseline Information

## B.1. Baseline Information

The following baseline section is an overview of the regional baseline for the Anglian region as detailed in the Scoping Report. Appendix D in this Environmental Report provides scheme site specific baseline information.

Current baseline information for the environment and socio-economics was collected and examined for the Anglian Water WRMP area which covers the Anglian Region and the Hartlepool area. The baseline information collected forms an evidence base against which environmental issues or opportunities resulting from the WRMP can be predicted and assessed. The baseline information collected is presented under the following topics:

- Biodiversity, Flora and Fauna;
- Water;
- Soil ;
- Air;
- Climatic Factors;
- Population and Human Health; and
- Cultural Heritage and Landscape.

## B.2. Anglian Region

### B.2.1. Biodiversity, Flora and Fauna

The Anglian region has a rich and diverse natural environment containing a high proportion of some of the UK's rarest habitats and species, including agricultural landscapes, ancient woodland, heathlands, rivers and a long low-lying coast that supports a wide range of freshwater, brackish and saline habitats. This is reflected in the many designated sites of national and international importance contained in the region, for example the Norfolk Broads are one of Europe's most important wetlands<sup>12</sup>.

There are approximately 567 Sites of Special Scientific Interest (SSSIs), covering roughly 7% of the land area (200,000 ha), and a number of Ramsar (20), Special Areas of Conservation (SAC) (27), and Special Protection Areas (SPA) (18) (see Figure B.1). The Anglian region supports large proportions of England's wetland and coastal habitats including 45% of England's reedbeds (concentrated across Norfolk and Suffolk), 40% of England's inter-tidal mudflat area (which are important staging posts for migrating birds and feeding sites for large numbers of internationally important waders and wildfowl), 1200km (25%) of the UK's chalk rivers, and 20% of England's grazing marshes. These habitats are important for wildlife and climate change mitigation and adaptation.

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1 Environment Agency, State of the Environment - Biodiversity.

2 East of England Biodiversity Forum, East of England Biodiversity Audit 2002



**Legend**

- Special Protection Area
- Special Area of Conservation
- RAMSAR
- AW Region Boundary

**anlianwater**

**Asset Data Management Centre**  
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**Scale:** 1 OF 1  
 1:270,000

**Revision Details**

Rev	Rev Date	Rev Description
1	19/09/12	Initial Issue

**SEA - AW Region**

The draft National Environment Programme (NEP) is a list of environmental improvement schemes that ensure that water companies meet European and national targets related to water. The NEP includes requirements for water companies to undertake improvement schemes, or where more evidence is



required, to investigate a particular problem. Each water company's NEP is different, as there will be different issues in every region. However the types of actions coming forward include:

- improving the quality of water that is discharged from sewage treatment works
- investigating the risk from certain chemicals and assessing the best treatment options
- preventing chemicals from entering groundwater
- protecting the waters where there are shellfish which will improve the quality of shellfish that people eat
- ensuring that abstractions do not impact adversely on habitats which are protected by law
- improving the quality of bathing waters
- improving inland waters for fish
- reducing the risk of eutrophication (excessive plant growth and decay)

Figure B.2: Anglian Water NEP Environmental Improvement Schemes

Water Company	Improvement actions <sup>2</sup> (inc Sludge & Environmental Permitting Regulations)	Investigations <sup>3</sup> (inc. Options Identification & Appraisal)	Event Duration Monitoring <sup>4</sup>	Catchment Management (improvement actions & investigations)	Field Trials	Total
Anglian Water	116	88	0	1	0	205

Source: National Environment Programme, Environmental Agency website

## B.2.2. Water

The Anglian region is the most water stressed region in England and it has the lowest precipitation. Moreover planned growth, increased water demand and climate change will put extra pressure on its limited resources. In addition, the Anglian region also has a number of nationally and internationally important wetlands and other water-dependent habitats, for example, the Rivers Nar and Wensum are SSSIs, as well as the Norfolk Broads<sup>3</sup>. Therefore, the management of water resources is particularly important.

In the Anglian region, approximately 60% of freshwater abstracted comes from surface water; 40% from ground water sources, and 90% of abstraction is for public water supply. Agriculture accounts for 4%; however, it can be much more significant during dry weather contributing approximately 20% of all abstractions<sup>4</sup>.

Only 18% of surface waters meet the Water Framework Directive 'good' status or better for water quality. The most common reasons for the surface water not to meet the 'good' status are largely because of diffuse and point source pollution – which contribute to high nutrient levels in the surface waters – and physical modification (e.g. flood protection and urbanization).

Under the Water Framework Directive (WFD), 95% of the regions local river catchments are under pressure from diffuse pollution, while 40% are specifically 'at risk' of diffuse nitrate pollution. Approximately 90% (2.4 million ha) of the region is designated as an Nitrate Vulnerable Zone (NVZ), which is where agricultural nitrate pollution of surface and ground waters is high or rising.

<sup>3</sup> Environment Agency, State of the Environment - Water

<sup>4</sup> Environment Agency, 2009. Land use and Environmental Services. Resource Efficiency science programme. Report Reference SCHO1009BRDG-E-P.

### **B.2.3. Soil**

In 2009, 70% of the land (2.1 million ha) in the Anglian region was farmed, with 1.6 million ha used for crops and horticulture<sup>5</sup>. The region contains some of the best and most versatile agricultural land in England and much of the soil is derived from silt and peat deposits providing highly fertile soils. This helps support agriculture, an important activity not only in terms of land use, but also for the economy of the region. Cereals, oil seed rape and potatoes make up the majority of the arable crops grown.

In addition, there is an estimated 5700 ha of brownfield and contaminated land in the Anglian region, which is derelict, vacant or is in use with the potential for redevelopment<sup>6</sup>.

### **B.2.4. Air**

Air quality in the region is generally good, although there are up to 38 declared Air Quality Management Areas (AQMAs). The main sources of air emissions come from motor vehicles, especially on heavily trafficked roads in the region<sup>7</sup>. However, agriculture also contributes to the local air quality, particularly from housed livestock and spreading slurries and manures.

Trends in annual average emissions of nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and particulate matter (PM10) show the East of England on track to meet the UK Air Quality Strategy Targets.

### **B.2.5. Climatic Factors**

In 2008, the Anglian region produced 60,000 kilo tonnes of carbon dioxide (CO<sub>2</sub>), which was a 3% reduction on 2007 levels<sup>8</sup>. However, this contributes to 14% of England's total emissions (414,000 KtCO<sub>2</sub>)<sup>9</sup>. Industrial and commercial sectors made up nearly 50% of the local CO<sub>2</sub> emissions in 2008, and on average each person in the Anglian region was responsible for 9.7 tonnes of CO<sub>2</sub> (compared to the national average of 8.2 tonnes per person).

Approximately 20% of the region is in areas designated as flood zones. These include around 400,000 properties and 30% of the most productive agricultural land in the region<sup>10</sup>. Climate change and inappropriate development on flood plains are likely to increase the number of properties at risk of flooding in the future.

### **B.2.6. Population and Human Health**

Almost six million people live in the Anglian region, which has one of the fastest growing populations in the United Kingdom<sup>11</sup>. While a significant proportion of this growth is from natural increase, most is attributable to migration into the region from the UK and overseas. The high level of migration has been driven by the proximity to London for commuting, employment opportunities, quality of life, and relatively low house prices. The population is projected to grow by approximately 17% by 2028, an increase of some 900,000 residents.

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5 Environment Agency, State of the Environment – Agriculture and Land Management

6 National Land use database, 2010. NLUD 2008 Mixed Vintage Dataset.

7 EERA (2004), East of England Plan

8 Environment Agency State of the Environment – Climate Change and Energy

9 AEA for DECC, 2010. Index to Local Authority CO<sub>2</sub> emissions dataset - full dataset National Statistics.

10 Environment Agency, State of the Environment – Flood and Coastal Risk Management

11 East of England Plan >2031

Life expectancy for both men and women in the east of England is higher than in England as a whole. The average life expectancy projections (2006-2008) for residents in the region are 78.9 years for males and 82.8 years for females<sup>12</sup>.

The Index of Multiple Deprivation 2010 (IMD) allows the identification of small pockets of deprivation down to small geography areas known as Lower Super Output Areas (LSOAs). The IMD brings together 37 different deprivation indicators to create the overall IMD score for each LSOA<sup>13</sup>. 0.8% of Anglian LSOAs are classed as 'most deprived', which is approximately 45,000 people or 0.7% of the population.

### **B.2.7. Cultural Heritage and Landscape**

The region has 1,727 scheduled monuments, 57,711 listed buildings, 210 registered parks and gardens, one registered battlefield, one protected wreck, and 1,191 conservation areas<sup>14</sup>. The region is third in the country in numbers of listed buildings, conservation areas and registered parks and gardens after the South West and South East. It is fourth in the country for numbers of scheduled monuments. The East of England has over 2,300 places of worship (Norfolk alone has over 700) and the largest number of Grade I and Grade II church's.

The Anglian region is known for its rural nature and network of smaller settlements based around towns, villages and hamlets. There are five areas of outstanding natural beauty, including The Chilterns, Dedham Vale, Lincolnshire Wolds, Norfolk Coast and Suffolk Coast and Heaths (see Figure B.3). In addition, it is the arable agricultural core of England and this aspect dominates the rural landscape. The Anglian region has a diverse and contrasting landscape, including extensive flat, open spaces of intensive arable farming as well as the vast coastal areas, including Norfolk, Suffolk and Essex. 10% of England's ancient woodland is found in the Anglian region.

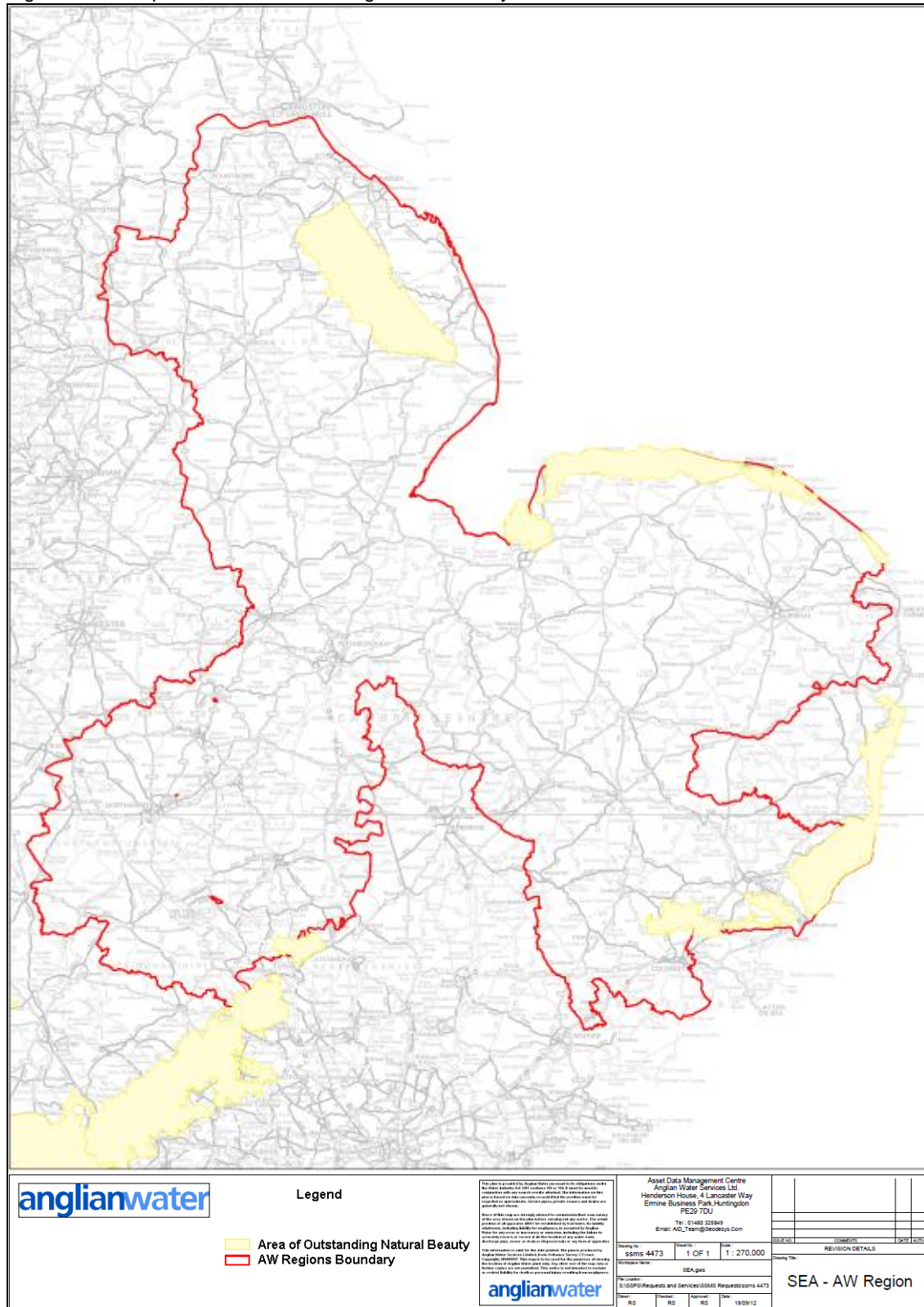
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12 Quality Intelligence East – Staying Healthy: Life Expectancy

13 Environment Agency – State of the Environment Anglian

14 English Heritage – About the East of England [online] 2012

Figure B.3: Map of Areas of Outstanding Natural Beauty



Source: Anglian Water

## B.3. Hartlepool

### B.3.1. Biodiversity, Flora and Fauna

There are three European designated ecological sites within and surrounding Hartlepool. These are:

Table B.1: European Designated Sites in Hartlepool

Site Name	Site Code	Site Area	Description
Teesmouth and Cleveland Coast SPA and Ramsar	UK9006061	1247.31 ha	<p>Teesmouth and Cleveland Coast SPA supports populations of European importance of the following species listed on Annex I of the Directive: Little Tern (breeding season); and Sandwich Tern (on passage).</p> <p>This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: Ringed Plover (on passage); Knot (over winter); and Redshank. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl. Over winter, the area regularly supports 21,406 individual waterfowl.<sup>15</sup></p>
Durham Coast SAC	UK0030140	393.63 ha	<p>Durham Coast SAC is the only example of vegetated sea cliffs on magnesian limestone exposures in the UK. These cliffs extend along the North Sea coast for over 20 km from South Shields southwards to Blackhall Rocks. Their vegetation is unique in the British Isles and consists of a complex mosaic of paramaritime, mesotrophic and calcicolous grasslands, tall-herb fen, seepage flushes and wind-pruned scrub. Within these habitats rare species of contrasting phytogeographic distributions often grow together forming unusual and species-rich communities of high scientific interest. The communities present on the sea cliffs are largely maintained by natural processes including exposure to sea spray, erosion and slippage of the soft magnesian limestone bedrock and overlying glacial drifts, as well as localised flushing by calcareous water.<sup>16</sup></p>
Northumbria Coast SPA	UK9006131	1107.98 ha	<p>The Northumbria Coast SPA includes much of the coastline between the Tweed and Tees Estuaries in north-east England. The site consists of mainly discrete sections of rocky shore with associated boulder and cobble beaches. The SPA also includes parts of three artificial pier structures and a small section of sandy beach. In summer, the site supports important numbers of breeding Little Tern <i>Sterna albifrons</i>, whilst in winter the mixture of rocky and sandy shore supports large number of Turnstone <i>Arenaria interpres</i> and Purple Sandpiper <i>Calidris maritime</i>.<sup>17</sup></p>

There are also several national designated sites including:

- Durham Coast SSSI and NNR
- Hartlepool Submerged Forest SSSI;
- Tees and Hartlepool Foreshore and Wetlands SSSI;
- Seaton Dunes and Common SSSI;
- Hart Bog SSSI;
- Seal Sands SSSI; and
- Cowpen Marsh SSSI.

Hartlepool also contains a number of local wildlife sites and local geological sites.

<sup>15</sup> <http://jncc.defra.gov.uk>

<sup>16</sup> <http://jncc.defra.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0030140>

<sup>17</sup> <http://jncc.defra.gov.uk/page-1997>

### B.3.2. Water

Hartlepool spans two coastal water bodies: Tyne and Wear in the northern part and Yorkshire North. There is one groundwater body in the Hartlepool area: the Wear Magnesian Limestone groundwater body. The current status and objectives for the potentially affected features are:

	Tyne and Wear	Yorkshire North
Water body ID	GB650301500002	GB650301500003
Current Overall Status	Good	Good
Status Objective (Overall)	Good by 2015	Good by 2015
Ecological Status Objective	Good by 2015	Good Ecological Potential by 2015
Chemical Status Objective	Good by 2015	Good by 2015
Ecological Status	Good	Good

Source: River Basin Management Plan: Northumbria River Basin District (Environment Agency, 2009)

Information	Wear Magnesian Limestone
Water body ID	GB40301G701700
Current Overall Status	Poor
Status Objective (Overall)	Good by 2027
Quantitative Status Objective	Good by 2027
Chemical Status Objective	Good by 2027
Justification for not reaching Good by 2015	Disproportionately expensive
Current Quantitative Status	Poor
Current Chemical Status	Poor
Saline Intrusion Current Status	Poor
Saline Intrusion Predicted Status	Poor by 2015
Justification for not reaching Good by 2015	Disproportionately expensive
Protected Area Designation	Drinking Water Protected Area, Nitrates Directive

Source: SPA Review data for the Teesmouth and Cleveland Coast SPA (2001)

Hartlepool is located in the Northumbria River Basin District (RBD). Within this RBD, only 27% of rivers (by length) meet the requirements for good ecological status (GES) or good ecological potential (GEP). 89% of groundwater bodies in the RBD meet the requirements for good status, while 50% of estuaries and transitional and coastal waters meet the requirements for GES or GEP<sup>18</sup>.

Groundwater in the Magnesian limestone from which Hartlepool Water obtains its supplies is contaminated by sulphate derived from the underlying Coal Measures. This is currently migrating from abandoned coal workings upstream of the Hartlepool Water wellfield, towards boreholes in the wellfield.

### B.3.3. Soil

Hartlepool is underlain by soil comprised of slowly permeable seasonally wet, slightly acid but base rich loamy and clayey soil. The sand dune soil begins as an outcrop from Hartlepool Bay southwards to Seaton Carew. Associated natural vegetation ranges from pioneer dune systems to low shrub<sup>19</sup>.

<sup>18</sup> Department for Energy and Climate Change (DECC): Appraisal of Sustainability: Site Report for Hartlepool 2010

<sup>19</sup> [www.landis.org.uk/soilsscapes](http://www.landis.org.uk/soilsscapes)



The Hartlepool area is underlain by carboniferous strata, sandstones and conglomerates, magnesian limestone and marls. Economic geological assets have been identified to include coal, rock salt, gypsum and anhydrite<sup>20</sup>.

There are a number of historic industrial land uses in the Hartlepool area, which may have given rise to historical contamination. These include nuclear power, chemical production and shipyards.

#### **B.3.4. Air**

In accordance with data mapping provided by DEFRA, Hartlepool currently has no Air Quality Management Areas (AQMA)<sup>21</sup>. In addition the area does not have a UK Automatic Urban and Rural Network (AURN) monitoring station for the most current air quality information, the closest stations are located in Billingham and Middlesbrough.

In 2006, Hartlepool Borough Council undertook a review and assessment of the air quality in the area and this concluded that road traffic was the major source of pollution with significant impact on nitrogen dioxide and particulate PM<sub>10</sub> concentrations at ground level. All thirteen current air quality objectives, covering seven pollutants, will be met within the Hartlepool Council area by their due dates and they concluded in 2006 there was no need to declare any Air Quality Management Areas, which is still the case for 2011.

The objectives of most concern were identified as the annual mean for nitrogen dioxide, and the 24 hour objective for particulate PM<sub>10</sub>. However it was alluded to that coastal sources such as salt particles could be a further source of PM<sub>10</sub> in addition to the traffic sources, and this required further investigation<sup>22</sup>.

#### **B.3.5. Climatic Factors**

The potential effects of climate change in the Hartlepool area, such as storm surges, coastal erosion, sea level rise and flooding, are explored in the sections on Flood Risk. The Hartlepool Partnership (formed of public, private, voluntary and community sectors) has committed itself to a 1.25% annual reduction target which will achieve a minimum of 8.75% reduction in CO<sub>2</sub>e (Carbon dioxide equivalent). For 2012 –2030 the long-term minimum target will be 27%.

Increased tidal levels and storminess could result in more extensive areas at risk of tidal flooding and erosion, reducing land available for sustainable development.

#### **B.3.6. Population and Human Health**

Hartlepool has a population of approximately 91,700<sup>23</sup>. The relative position for male and female life expectancy at birth for Hartlepool is relatively poor. Hartlepool males live on average 2.8 years less than English males and Hartlepool females live on average 2.4 years less than English females (2005)<sup>24</sup>. The 2010 Index of Multiple Deprivation ranks Hartlepool 24th most deprived out of the 354 British Local Authorities (LA).

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<sup>20</sup> A Brief Introduction to the Hartlepool Area: Alan Johnson, 2001 [www.geotrans-online.de](http://www.geotrans-online.de)

<sup>21</sup> [www.defra.gov.uk](http://www.defra.gov.uk)

<sup>22</sup> Hartlepool Borough Council - Review And Assessment of Air Quality 2006

<sup>23</sup> Hartlepool Fact file 2010

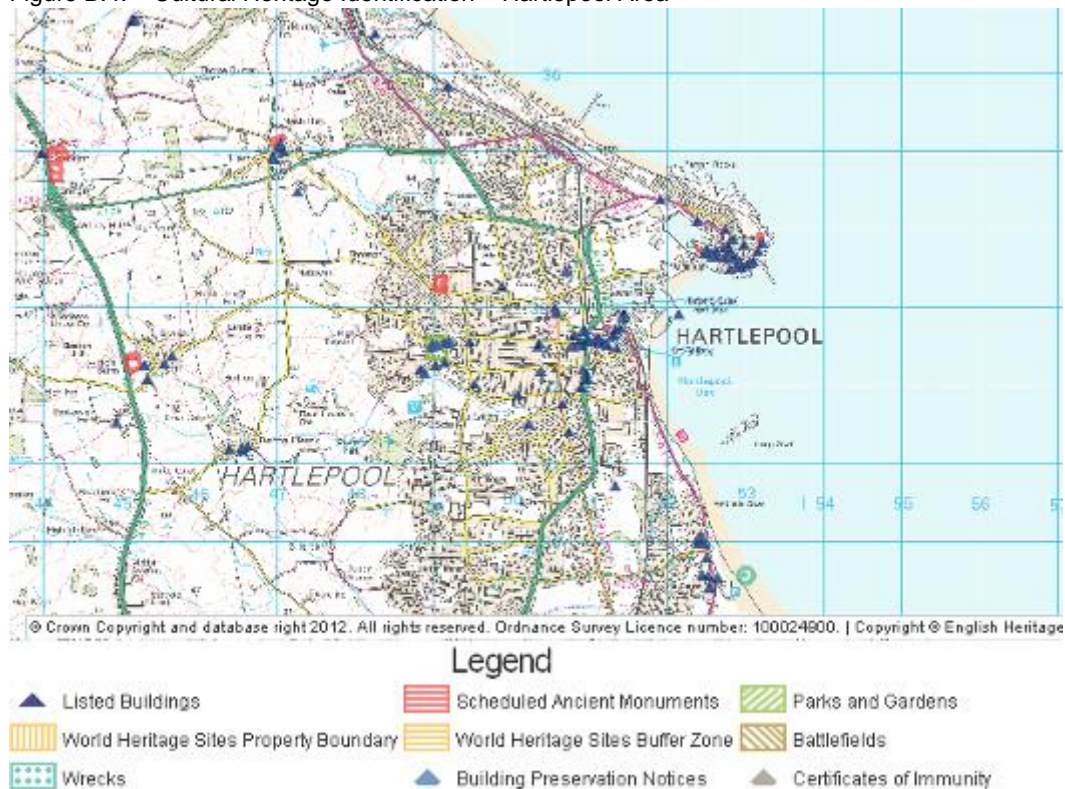
<sup>24</sup> North East Public Health Observatory: Life Expectancy in Hartlepool

### B.3.7. Cultural Heritage and Landscape

Hartlepool has a number of conservation areas and heritage assets including listed buildings/structures and scheduled monuments. There are 118 listed buildings in the Hartlepool area and eight conservation areas, six of the conservation areas lay in the main urban area of the town, and the two others in outlying villages<sup>25</sup>.

English Heritage has identified a number of heritage sites in the Hartlepool area, which can be seen in Figure B.4 below.

Figure B.4: Cultural Heritage Identification – Hartlepool Area



Source: English Heritage

<sup>25</sup> Hartlepool Borough Council – Hartlepool's Listed Buildings [online] 2012



## Appendix C. Scoping Report Consultation Comments

Table C.1: Scoping Report Consultation Responses

Consultee	Consultee Comments Reference	Comments	Anglian Water / Mott MacDonald Response
English Heritage	-	English Heritage has produced guidance on SEA/SA, which is currently being updated to reflect changes in planning and developing practice: <a href="http://www.helm.org.uk/upload/pdf/Strat-env-ass.pdf?1344331474">http://www.helm.org.uk/upload/pdf/Strat-env-ass.pdf?1344331474</a> . The assessment process should consider the potential effect on the significance of a heritage assets; the principles are set out in the NPPF (paragraphs 132 – 135) The setting of heritage assets of all types is an important consideration as well as possible direct and indirect impacts on the historic environment arising from the implementation of the management plan; these may be beneficial as well as potentially harmful effects. English Heritage published guidance on setting in 2011: <a href="http://www.english-heritage.org.uk/publications/setting-heritage-assets/">http://www.english-heritage.org.uk/publications/setting-heritage-assets/</a>	The English Heritage guidance was reviewed and considered in the preparation of the SEA.
	<b>3. Description and Context of Anglian Water's Water Resources Management Plan (WRMP)</b>	We suggest that this section could include some indication of the sorts of works that might be considered as options as part of the WRMP. As far as we are aware, these are likely to include: <ul style="list-style-type: none"> <li>• Demand management;</li> <li>• Groundwater and other abstractions;</li> <li>• Aquifer storage and recharge;</li> <li>• Reservoirs;</li> <li>• Winter storage</li> <li>• Water transfers;</li> <li>• Pipelines;</li> <li>• Catchment solutions, such as afforestation and,</li> <li>• Coastal desalination.</li> </ul> All of these have different types of impacts on the historic environment.	The Scoping Report was a consultation document and as such is not being updated. All the scoping comments received were addressed in the Environment Report. The Environmental Report detailed the scheme options.
	<b>4. Relationship with other Policies, Plans and Programmes</b>	Relevant sub-regional plans would include: <ul style="list-style-type: none"> <li>• Broads National Park Management Plan; and</li> <li>• AONB Management Plans (Lincolnshire Wolds; Norfolk Coast; Suffolk Coast and Heaths; Dedham Vale and Chilterns).</li> </ul>	These plans were reviewed and included in the plans and programmes review table.
	<b>4.2 Identification of Key Themes and Messages</b>	The 'Protection of landscape character and quality' includes historic landscapes, which includes 'designed landscapes', such as historic parks and gardens, as well as the wider historic character and specific features such as 'ridge and furrow'.	Noted and considered during assessment
	<b>5.2.7 Cultural Heritage and Landscape</b>	The footnote only seems to cover the East of England; does the data include the relevant parts of the East Midlands and N E Lincolnshire? As well as designated heritage assets, the National Planning Policy Framework highlights the importance of undesignated assets. This includes archaeology, which may be of national importance. The paragraph on landscapes makes no reference to landscape character studies. The East Midlands has a regional landscape character assessment ( <a href="http://www.naturalengland.org.uk/regions/east_midlands/ourwork/characterassessm ent.aspx">http://www.naturalengland.org.uk/regions/east_midlands/ourwork/characterassessm ent.aspx</a> ), as well as county and district level assessments. In addition, the relevant county	Scheme site specific baseline data on the historic environment and cultural heritage is presented in the Environmental Report Appendix D.

Consultee	Consultee Comments Reference	Comments	Anglian Water / Mott MacDonald Response
		Historic Landscape Characterisations are an important source of data. There are also historic characterisation studies of urban areas.	
	<b>Table 6.1 Key Issues, Opportunities and Scoping, Cultural Heritage, page 30</b>	As indicated above, the impacts of schemes on archaeology and historic landscapes should be taken into account. As well as avoiding harm or minimising adverse effects, opportunities should be sought to enhance the historic environment.	The opportunity to enhance the historic environment has been included in the key issues and opportunities table.
	<b>Table 7.1 SEA Framework</b>	It is recommended that the Cultural Heritage indicator (8) should be revised as follows: Protect and enhance the historic environment, heritage assets and their setting. The indicators could also include schemes where enhancement of the historic environment has been achieved.	The Cultural Heritage SEA objective has been amended and an additional indicator on schemes where enhancement of the historic environment has been achieved has been added to the SEA Framework.
<b>Natural England</b>	<b>General Comments</b>	We welcome the efforts made by Anglian Water in preparing the draft scoping report. We are satisfied at present that the SEA of the Water Resource Management Plan (WRMP) is proceeding in a proper, logical and comprehensive manner.	No action required.
	<b>Approach to the Strategic Environmental Assessment</b>	The scoping of the SEA is a critical stage which sets out the methodology and scope of tests against which the emerging WRMP will be assessed. It also sets out the most up-to-date wider policy context and identifies key environmental issues, characteristics and predicted problems. The scoping document clearly sets out the method that will be used in the SEA process and we are pleased that biodiversity, landscape, cultural history and climatic factors are recognised as important issues as well as water quality, water resources and flooding.	No action required.
		Natural England believes the SEA scoping document has outlined the relevant baseline information with regard to the environment but understands that at the scoping stage this is high level, however, we would expect a more detailed data collection around protected sites as the schemes and options become more defined.	More detail about protected sites and the effects of options on these sites has been included in the Environmental Report and HRA Report.
		Natural England is satisfied that the proposed SEA objectives are appropriate. Natural England believes that the objectives cover the key sustainability issues in the Anglian region and are relevant to the landscape and nature conservation issues associated with water resources. In terms of the assessment criteria for the biodiversity indicators it would be helpful to provide information on the area of both green and blue infrastructure that may be created.	An indicator on the area of both green and blue infrastructure creation has been added.
		At this stage we do not have any further comments on the SEA scoping document, but look forward to working closely with Anglian Water and the Environment Agency as the WRMP plan and the associated SEA progress through 2013 and we will be happy to provide further advice where necessary.	Noted. No action required.
<b>Environment Agency</b>	<b>Question 1: Are the aware of any additional plan or programmes that have been excluded from Appendix A,</b>	We suggest that the following plans and programmes are also reviewed: <ul style="list-style-type: none"> <li>Enjoying Water - Strategic Priorities for Water Related Recreation in East of England, August 2009. This can be found at: <a href="http://www.brighton.ac.uk/waterrecreation/strategic_priorities_east_england.htm">http://www.brighton.ac.uk/waterrecreation/strategic_priorities_east_england.htm</a></li> <li>Eel Management Plans for the United Kingdom - Anglian River Basin District, March 2010. This can be found at:</li> </ul>	The plans and programmes suggested have been reviewed and included in the plans and programmes review table.

Consultee	Consultee Comments Reference	Comments	Anglian Water / Mott MacDonald Response
	<b>which your organisation thinks is relevant to the Anglian Water WRMP SEA?</b>	<a href="http://archive.defra.gov.uk/foodfarm/fisheries/documents/fisheries/emp/anglian.pdf">http://archive.defra.gov.uk/foodfarm/fisheries/documents/fisheries/emp/anglian.pdf</a> Reference should also be made to in the European PPPs to Council Regulation (EC) No 1100/2007 establishing measures for the recovery of the stock of European eel. The relevant River Basin Management Plans for North East and Anglian Regions appear to have been referred to obtain baseline information presented in the Scoping Report however they do not appear in Appendix A.	
	<b>Question 2: Do you agree with the review of the current key sustainability issues in the Anglian Water region?</b>	In general we agree with the key issues identified in the Scoping Report. We suggest that reference should also be made to improvements identified in draft the National Environment Programme needed to secure improvements to and protect Habitats Regulation and SSSI designated sites. This should be noted in either the Water Resources or Biodiversity, Flora and Fauna SEA topics.	Reference to the draft National Environment Programme has been added to the Biodiversity, Flora and Fauna topics in the Environmental Report.
	<b>Question 3: Do you think that the environmental, social and economic baseline data collection for the Anglian Water region is appropriate and relevant?</b>	We note that the Scoping Report is a high level review of baseline conditions and believe that the data sources used are suitable for this high level assessment. We strongly support and welcome the commitment to undertake a review of site specific baseline conditions once feasible schemes / options have been selected. Review of Local Planning Authority Local Plans, including Core Strategy documents, will provide valuable information to help establish conflicts, synergies and opportunities for specific schemes with local environment and develop priorities. We recommend that Anglian Water engages directly with Local Authorities, including the Broads Authority, and with local conservation groups such as local wildlife Trusts, The Woodlands Trust, RSPB and other interested parties such as the NFU. This may reveal additional issues to be considered in the SEA and will help to ensure that the most up to date information is used to inform Environmental Report. We also recommend that the collection of data is not limited to the Anglian Region and the Hartlepool supply area where options involve the transfer of water in to or out from the Region. Anglian Water should liaise with neighbouring water companies and/or third parties to ensure that the environmental impact of these options is captured within the SEA.	No action required. Site specific baseline conditions and Local Planning Policy for scheme areas has been included in the Environmental Report. Anglian Water has already undertaken some consultation. The draft WRMP, draft Environmental Report and draft HRA Report will be issued for formal consultation in April/May 2013 and the responses will be used to inform the final WRMP, Environmental Report and HRA Report. Site specific baseline data will include baseline of transfers in and out of the region. Anglian Water are liaising with other water companies and third parties during the preparation of the WRMP, SEA and HRA.
	<b>Question 4: Is any environmental, social and economic baseline information currently missing?</b>	In general the baseline information is accurate and we welcome the identification of future trends for each of the main SEA topics. However, we have the following comments: <ul style="list-style-type: none"> <li>The Future Baseline should include the effect of existing legislation and Anglian Water's current WRMP on water resources, as well as water quality. The WFD requires that there should not be a deterioration in waterbody status, as well as the requirement to achieve Good Ecological Status / Potential (GES / GEP). It is important that where abstraction is forecast to rise within licensed limits that the impact on waterbody status and the implications for achieving GES / GEP are assessed.</li> </ul>	The impacts on waterbody status and the implications for achieving GES / GEP are assessed under SEA Objective 1.

Consultee	Consultee Comments Reference	Comments	Anglian Water / Mott MacDonald Response
		<ul style="list-style-type: none"> <li>As notes above, review of local PPPs should be undertaken to inform the Environmental Report. This may reveal additional environmental, social and economic issues that should be assessed and require the collection of additional baseline information.</li> </ul>	Local Planning Policy has been reviewed and included in the Environmental Report.
	<b>Question 5: Is there any inaccurate environmental, social and economic baseline data?</b>	The high level information presented in the Scoping Report appears to be accurate	No action required.
	<b>Question 6: Are the SEA objectives and associated assessment criteria and indicators suitable for Anglian Water WRMP?</b>	<p>In general the SEA objectives appear to be suitable for the WRMP and the Scoping Document sets out a clear and comprehensive set of assessment criteria and indicators by which to assess the relative impacts of potential options / schemes.</p> <p>We advise that some of the assessment criteria would benefit from the use of additional indicators to help quantify the impact of options. Specific suggestions include:</p> <ul style="list-style-type: none"> <li>Water and Biodiversity indicators - we suggest that it would be useful to quantify impacts in terms of hectares of habitat created / lost and km of river affected by habitat loss / gain, as well as the number of sites that have change in ecological status.</li> <li>Flood risk - we suggest that population and/or properties affected is also used to quantify impacts of options / schemes on flood risk.</li> <li>Landscape – we suggest that the area (in hectares) of landscape affected is used.</li> <li>Material Assets, Material Use and Waste – we suggest waste generated by schemes is quantified.</li> </ul>	The suggested indicators have been included in the SEA Framework.
	<b>Question 7: Does the wording of any existing objectives need to be changes, added or removed?</b>	In general the SEA objectives appear to be suitable for the WRMP	No action required.
	<b>Question 8: Do the draft SEA indicators provide a relevant measure for the objective? If not can you suggest appropriate alternatives?</b>	Please see our comments to Question 6 above	Please see response to Question 6 above.

Consultee	Consultee Comments Reference	Comments	Anglian Water / Mott MacDonald Response
	<b>Question 9: Do you have any further comments on the Scoping Report?</b>	<p>We welcome the useful information contained in the Scoping Report regarding how the SEA and WRMP process will interact. We have the following comments which we believe will aid the process:</p> <ul style="list-style-type: none"> <li>• The Scoping Report does not provide any criteria of what a 'significant' impact is. We believe that some definition for significance should be provided to ensure that the SEA process is clear and transparent;</li> <li>• There is no mention of how the SEA criteria has been used, or will be used to screen the unconstrained options list. The SEA criteria can be a useful tool to aid the transparent and consistent screening of options to generate the feasible/constrained list. Where options have been screened out due to environmental impacts these should be detailed to help justify why Anglian Water has not considered them further; and</li> <li>• We welcome the commitment to document the output of the SEA screening of the constrained options list and the assessment of cumulative, secondary and synergistic impacts. We would be pleased to comment on the results of the screening exercise prior to completion of the Environmental Report and to provide additional information to aid assessment at a scheme / site level.</li> </ul>	<p>Significance criteria have been added to the assessment methodology.</p> <p>Feasible options have been assessed in the SEA in accordance with the UKWIR guidance.</p> <p>Noted.</p>

# Appendix D. WRMP Scheme Options Baseline and Assessments

## D.1. Introduction

This Appendix provides the scheme options description, baseline and assessment. The scheme options have been presented according to the Resource Zone (RZ) it falls within. Information sources used to compile the baseline include:

- Anglian Water Scheme Reports;
- Anglian Water Scheme Maps/Drawings;
- MAGIC website;
- Local Authority Websites; and
- Environment Agency website.

The assessment has been undertaken based on the methodology, scoring and assumptions detailed in Sections 2.2.2 and 2.2.3 of the Environmental Report Volume I: Main Report. It should be noted that the baseline and assessments have been undertaken at a high plan level, and further environmental studies such as Environmental Impact Assessment (EIA) will be required for schemes taken forward.

The scheme descriptions and assessments were based on the scheme information and mapping provided by Anglian Water (dated April 2013 and updated November 2013).

Please note that for the purposes of public consultation all legally and commercially sensitive information (including written text and map figures) regarding Anglian Water existing and proposed infrastructure, assets and pipeline routes have been removed from this document.

## **D.2. West Suffolk RZ**

### **D.2.1. Scheme WS1: Newmarket RZ transfer**

#### **D.2.1.1. Scheme Background**

This option involves the transfer of water from Warren Hill Reservoir, Newmarket PZ to Little Saxham Reservoir, Bury St. Edmunds PZ.

The option requires the construction of a 200mm diameter pumping main from Warren Hill Reservoir to Little Saxham Reservoir across a total distance of approximately 14.2km.

#### **D.2.1.2. Scheme Baseline**

##### **Hydrology**

The proposed scheme crosses the River Kennet at Dalham. There are no extensive flood risk zones within the pipeline route.

##### **Groundwater Protection Zones (GPZs)**

The pipeline route is located within a GPZ 3.

##### **Ecological Designations**

The proposed scheme would not directly cross any statutory designated sites. It does pass through an area of ancient woodland.

##### **Heritage Assets**

Pipeline Route	Listed Buildings		Scheduled Monuments	Within 500m boundary of Scheduled Monument	Registered Parks & Gardens
	Grade I	Grade II			
Warren Hill – Little Saxham	Church of St Mary's Grade I	Dalham Hall: 4x Grade II listed buildings	N/A	Motte and Bailey at Denham Castle Moated site at Denham Hall	Within 500m of Ickworth House

##### **Landscape**

Newmarket is located within the East Anglian Chalk National Character Area. However, as the pipelines travel east to Bury St Edmunds, South East and South to Haverhill the National Character Area is South Suffolk and North Essex Clayland.

There are no Areas of Outstanding Natural Beauty (AONB) within the study area.

##### **Agricultural Landscape Classification**

The general Agricultural Landscape Classification of the area is generally a mix of Grade 2 and 3 otherwise known as very good and good to moderate agricultural land respectively (the best most versatile land).



### **Contaminated Land/Landfill**

The proposed scheme would not pass to any areas of consented or historic landfill.

### D.2.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Route would cross the River Kennet at Dalham.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipelines has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred from one PZ to another, avoiding further abstraction.	+	Minor	Medium	Not Significant
		Schemes concern supply, and therefore will not affect demand.	None.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> </ul>	The schemes do not involve managing flood	Burst pipeline can cause localised flooding.	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it involve loss or construction on the floodplain?</li> </ul>	<p>risk.</p> <p>Route does not pass through extensive areas of flood risk.</p>	<p>Construction works could have potential to cause temporary increased flooding, but this is considered unlikely given the routes do not pass through extensive areas at risk of flooding. Burst pipeline can cause localised flooding</p>	-	Negligible	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Predicted water deficits in the future for the area.	The proposals will help mitigate against the forecast water deficit by increasing supply into the Haverhill and Bury St. Edmunds Planning Zones from the Newmarket Planning Zone.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, although the scheme avoids large settlements.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Moderate	Low	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Route does not cross any statutory designated sites but does pass through an area of ancient woodland	Potential for direct loss of trees and habitat within ancient woodland.	-	Moderate	Medium	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Route would not cross any Areas of Outstanding Natural Beauty.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Low	Not Significant
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Route would pass close to numerous listed features, within 550m of a Scheduled Monument and within 500m of Ickworth House Registered Park and Garden.	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is negligible. No significant impact on ancient monuments, including setting, due to the distance from the proposed scheme. Route would have potential to impact on the Ickworth House RPG.	—	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to	Proposed schemes would build resilience to the effects of climate change through improved water supply security for the Haverhill and Bury St Edmunds Planning Zones, but by itself doesn't improve water supply for the wider East Anglia region as water is taken from another East Anglia Planning Zone.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		people, property and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 2.891 tCO <sub>2</sub> e. The operational carbon for this scheme is 212 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Schemes would require construction of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Route would primarily pass through areas of Grades 2 and 3 agricultural quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Minor	Low	Not Significant

## D.2.2. Scheme WS2: East Suffolk RZ Transfer

### D.2.2.1. Scheme Background

This option involves transfer of water from Wherstead Reservoir, East Suffolk RZ to Great Welnetham Reservoir and onto Rushbrooke WTW, Cambridgeshire and West Suffolk RZ.

The option requires construction of a 300mm diameter pumping main from Wherstead Reservoir to Great Welnetham Reservoir across approximately 36.8km. A 300mm diameter pipeline to Rushbrooke WTW which is approximately 3.3km is also required.

### D.2.2.2. Environmental Baseline

#### Ecological Designated Sites

A number of designated sites for nature have been identified below, including:

Pipeline Route	Designation	Name	Notes
Rushbrooke - Wherstead	Ancient Woodland	Link Wood	
	Ancient Woodland	Upper Waxhall Grove	
	Ancient Woodland	Mardlands Wood	
	Ancient Woodland	Pie Hatch Wood	
	SSSI	Elmsett Park Wood	Pipeline within 500m of SSSI
	SSSI, NNR	Bradfield Woods	Pipeline within 500m of SSSI

#### Heritage Assets

A number of scheduled monuments and listed buildings have been identified in close proximity to the pipeline, including:

Pipeline Route	Listed Building			Scheduled Monument	Within 500m Scheduled Monument
	Grade I	Grade II*	Grade II		
Rushbrooke - Wherstead	N/A	N/A	N/A	N/A	Remains of circular chapel E of church
	N/A	N/A	N/A	N/A	Moated site, formerly the site of Rushbrooke Hall, 400m south west of Poplar Meadow
	N/A	N/A	N/A	N/A	Great Bricett Moated Site
	N/A	N/A	Hill Farmhouse	N/A	N/A
	N/A	N/A	Redhouse Farmhouse	N/A	N/A

## Hydrology

Flood risk between Bury St Edmunds and Ipswich is generally restricted to the minor water courses such as those detailed in the table below. Areas most at risk from flooding are to the south of the pipeline routes within the catchment area of the River Stour and to the east within the catchment area of the River Gipping.

The table below provides baseline information of the watercourses crossed by each pipeline route. This is based on the Environment Agency online mapping – main river courses.

Hydrological information – river crossings and river ecological status.

Pipeline Route	River Crossing	River	Ecological/Quality Status	Notes
Rushbrooke - Wherstead	Rushbrooke WTW	River Lark	Poor	Rushbrooke WTW is located beside the River Lark – the proposed scheme would not cross it.
	592372 259577	Blackbourn	Moderate	Crossing at Maypole Green
	595300 257589	Rattlesden River	Poor	Crossing east of Falsham
	Several between Burstead & Bellstead Hell	Belstead Brook	Poor	Several crossing points on southern boundary of Ipswich leading into River Orwell

## Groundwater Source Protection

The proposed scheme would be located in areas of Groundwater Source Protection Zone 2 and 3.

## Socio Economics, Settlements and Infrastructure

The routes are located within a predominantly rural area between two major settlements of Bury St Edmunds to the north east of the pipeline routes and Ipswich to the south east.

### Major road crossings:

A14 and the A1214 west of Ipswich. Major roundabout at Delstead House.

### Major Rail crossings:

Ipswich Chord south west of Ipswich connecting Ipswich with Nuneaton. Approx. NGR 614573 240856.

### Airfield

Pipeline B – Disused airfield at Rattlesden Gliding Club west of Hightown Green.

## Landscape

Dedham Vale Area of Outstanding Natural Beauty (AONB). Wherstead WR is located within 500m west of Dedham Vale AONB.

Dedham Vale is located on the Suffolk-Essex border; this AONB protects an exceptional example of a lowland river valley of the River Stour. The designated area of the AONB stretches upstream from Manningtree to within one mile of Bures. However, the landscape quality of the remainder of the Stour Valley has resulted in its designation as a potential

AONB or Special Landscape Area and countryside management takes place within this wider framework.

#### Landscape Character Area

The pipeline route is located within South Suffolk and North Essex Claylands National Character Area.

#### **Agricultural Land Classification**

The pipeline route is located between Sudbury, Ipswich and Bury St Edmunds. According to Defra's MAGIC website, agricultural land is classified as a mixture of Grade 2 and Grade 3 land (Figure 2).

#### **Contaminated Land/Landfill**

Authorised landfill located approximately 800m from the Werstead WTW. The site is operated by Brooks and Wood Ltd under the Waste Management License number – 70689.



### D.2.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 3 main rivers with moderate to poor ecological status.	Where the pipeline crosses rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipeline has the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential to result in increased demand for abstraction.	Water would be transferred from one PZ to another, avoiding further abstraction.	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Flood risk between Bury St Edmunds and Ipswich is generally restricted to the minor water courses. Areas most at risk from flooding are to the south of the pipeline routes within the catchment area of	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		the River Stour and to the east within the catchment area of the River Gipping					
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable transfer of water between neighbouring PZs.	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Moderate	Medium	Significant
		Numerous receptors along the route, including properties on the outskirts of Bury St Edmunds and Ipswich	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be minimal as there are few receptors in this area.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed Pipeline do not cut through / run in close proximity to any designated sites for nature conservation. It does pass through or close to several areas of ancient woodland	Potential direct loss of trees and habitat from ancient woodland areas	-	Moderate	Medium	Significant
7. Protect and enhance	<ul style="list-style-type: none"> <li>Will it negatively affect landscape</li> </ul>	The proposed	Temporary visual effects due to	-	Minor	Low	Not

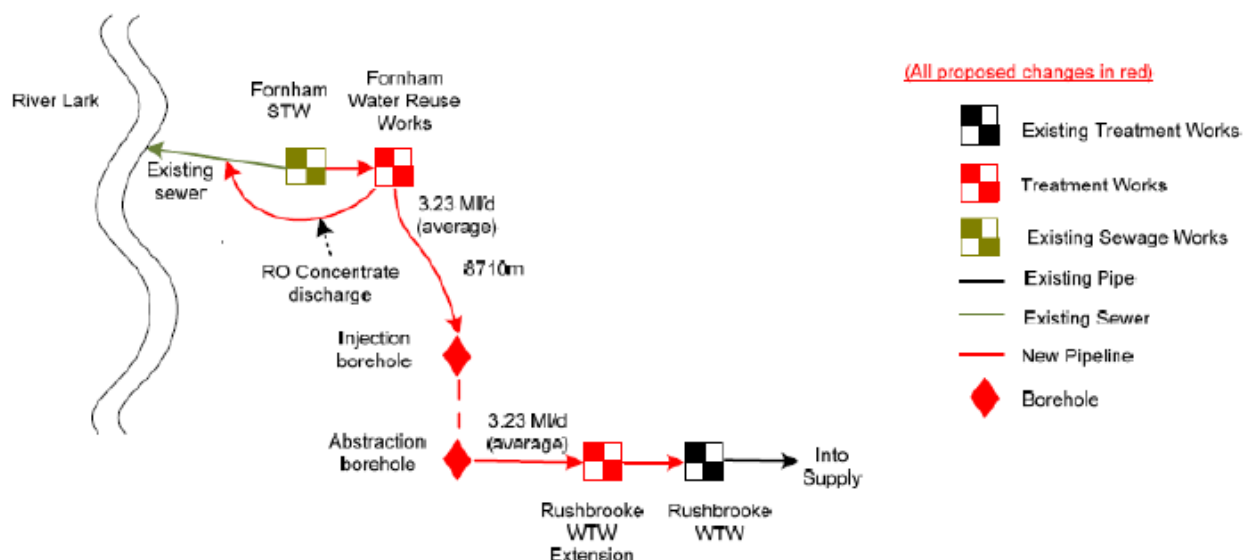
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
landscape quality and character across the region.	<ul style="list-style-type: none"> <li>quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	scheme would not run through or close to any areas of Outstanding Natural Beauty.	digging up ground to lay pipeline. No long-term impact envisaged				<b>Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	High concentration of listed buildings along the route. Pipeline does not run through any registered parks and gardens or SMS.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor given the distance from the proposed scheme.	–	Moderate	Low	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010</li> </ul>	N/A	The total embodied carbon for this scheme is 8,132 tCO <sub>2</sub> e. The operational carbon for this scheme is 656 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Resources and materials required for scheme. Scheme design and materials will follow Anglian Water sustainability policy.	–	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Agricultural land is classified as a mixture of Grade 2 and Grade 3 land.	Likely to include temporary effect on soils and agricultural land through laying of pipelines.	–	Moderate	Low	<b>Not Significant</b>

### D.2.3. Scheme WS3: Bury St Edmunds water reuse

#### D.2.3.1. Scheme Description

Scheme CWS5 Schematic



Source: Anglian water

This option proposes to treat 90% of the Dry Weather Flow (DWF) from Fornham STW through an advanced treatment process and to inject the treated water into the chalk aquifer either at Rushbrooke or Nowton as part of a Managed Aquifer Recharge Scheme (MAR)

The advanced treatment process will comprise ultrafiltration (UF) and Reverse Osmosis (RO). The final effluent ammonia consent is low with a 95 percentile value of 2mg/l. Consequently, there is no requirement to treat the effluent to remove ammonia through modification of the existing process. The RO process generates two streams – the product water which will be pumped to the injection borehole and the concentrate which will be discharged at the existing Fornham STW into the River Lark. The concentrate will have a salt concentration of 3000-5000 mg/l and will be diluted with the final effluent from the Fornham STW.

Ferric Sulphate will be dosed before the UF process to improve membrane performance and to precipitate iron phosphate which, in turn result in reduced calcium phosphate scaling and risk in the RO membranes. Phosphate will be rejected by the RO process and consequently, the phosphate concentration on the water to be injected into the aquifer will be very low.

The additional water could be abstracted from the aquifer at the Rushbrooke wellfield and treated at the Rushbrooke WTW. The water reuse plant capacity is based on 90% of the 2011 DWF and any flow above this will be discharge in the current manner.

### **D.2.3.2. Scheme Baseline**

#### **Hydrology**

The River Lark is a tributary of the River Great Ouse and flows north westerly through Bury St Edmunds. The course of the River Lark takes it north through Rushbrooke WW and approximately 1700m of Newton BH. The River Lark continues north maintaining a distance of no more than 500m from the proposed pipeline routes. The River Lark forms the western boundary of the Fornham Sewage works. The entire river corridor is at risk from flooding, particularly north of Fornham Sewage Works. However, Newton BH and Rushbrooke WW are not located within an area at risk from flooding.

According to EA mapping, the ecological quality of the River Lark is classified as Moderate between Fornham Sewage Works and St James Church of England Aided Middle School. The River Lark is joined by the River Linnet at this school site. South of the Middle School, the ecological quality of the River Lark is classified as Bad.

Newton BH, Rushbrooke WW and Fornham Sewage Works are all located within GPZ1. The majority of the pipeline route is located within GPZ2.

#### **Socio-economics**

The proposed pipeline route is located within the following administrative boundaries;

- Cambridgeshire and West Suffolk
- St Edmundsbury Borough Council
- Suffolk County Council

The proposed pipeline routes cross several road and rail networks:

- A134 Compiegne Way,.
- A14
- Peterborough – Ipswich rail line

The pipeline routes are located to the east of the main built environment of Bury St Edmunds and separate the main part of the city and residential areas .

#### **Ecological Designated Sites**

SSSIs approximately 4km from Fornham Sewage works include;

- Lackland Lakes SSSI
- Breckland Forest and Farmland.

The pipeline route between Rushbrooke WW and Fornham Sewage works will have a direct impact on The Glen Chalk Caves SSSI and Natterer's Wood which makes up 1 of 4 woods in the Moreton Hall Community Local Nature Reserves.

The Glen Chalk Caves SSSI consists of a series of tunnels excavated horizontally in chalk, and totalling about 200m in length. The tunnels radiate outwards from a pit which also contains a disused lime-kiln. Five species of bats regularly use the tunnels and the lime-kiln for hibernation between September and April. The bat population has been continuously monitored since 1947 and is the subject of continuing detailed scientific studies. Woodland Ways manages four woods within the Moreton Hall area of Bury St Edmunds:

Name	Area	Description
Natterer's Wood	7ha	An ex-arable field being planted into a woodland and will contain ponds, glades, wildflower meadow.
Woodland Ways Pond	0.5ha	Half is 1980s planted broadleaved woodland (oak, ash, maple) and half is long grassland with a pond, designed as a flood storage area. Common newts and frogs are common.
Home Covert	1ha	A 200 year old planted wood now with sycamore, hornbeam and ash. Dog's mercury and wood avens in the ground flora.
Pond Covert	1ha	A 200 year old planted wood now with sycamore, hornbeam and ash. Much box from Victorian pheasant cover. Dog's mercury and wood avens in the ground flora. A large pond is used for fishing and duck feeding.

## Historic Designations

There are several scheduled monuments which may be impacted by the proposed pipeline routes. There are two scheduled monuments 700m west and 600m from Fornham Sewage Works. Further information on these scheduled monuments is required from English Heritage.

The remains of Babwell Friary is a SM approximately 800m of the pipeline route at Tollgate Bridge.

Bury St Edmund's Abbey: including the monks' cemetery and outer precinct and vineyard walls is a scheduled monument located approximately 400 m from the pipeline route in the centre Bury St Edmund. The scheduling includes the precinct wall and all the open ground and upstanding remains of the Abbey of Bury St Edmunds within the Abbey precinct to the north and east of St James' Cathedral, as well as the area to the south-east of the abbey church containing St Andrew's Chapel and the monks' cemetery. It also includes part of an outer precinct to the north-east, south of Eastgate, the wall around the abbey vineyard to the east of the River Lark, and isolated sections of the precinct wall to the north and west, as well as two entrances, St James' Tower to the west and St Margaret's Gate to the south.

The Abbey is on the east side of the historic centre of Bury St Edmunds, with the town centre immediately outside its west precinct wall. The main precinct is to the west of the River Lark, which forms its east boundary, with the outer precincts, including the vineyard, to the east.

Given the legacy of Bury St Edmunds, it is unsurprising to find a high number of listed buildings on the English Heritage website. Two key areas where the pipeline route travels through have been identified. However, there are no Grade I listed buildings directly impacted by the pipeline routes:

- Eastgate Street
- Fornham St Martin

In both areas identified above, the pipeline route has the potential to directly impact on these listed buildings.

## Landscape

Bury St Edmunds is situated within South Suffolk and North Essex Landscape Character Areas. Fornham St Martin is located within the South Suffolk and High Suffolk Claylands.

## Agricultural Land Classification

Land immediately north of Bury St Edmund is classified as a mixture of Grade 3 – 7 under the Agricultural Land Classification. Land immediately south of the city is classified as either Grade 2 or 3.



### **Landfill Sites**

There are a number of historic landfill sites south of the city centre adjacent to Rougham Road and Rushbrooke Lane. The proposed pipeline will travel directly over the following historic landfill sites:

- Newton BH to Fornham Sewage Works – Haberden Landfill (Household waste).
- Fornham St Geneieve Landfill – located immediately north of sewage works. Fornham Park, Suffolk, IP28 6TT operated by Waste Recycling Group Ltd. No information available for landfill class. Permit ref - EAEPR\EA/EPR/FP3995NC/V002.

### D.2.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed scheme passes close to the River Lark and it would cross two tributaries of the river. It would also cross a series of water bodies associated with an industrial area to the east of Bury St. Edmunds.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	<b>Not Significant</b>
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has reasonably concluded that there will be no deterioration.	0	N/A	N/A	<b>No Effect</b>
		The treated water will be injected into the chalk aquifer, then abstracted	Potential for water quality effects from water injected into aquifer. However, if treated water complies with standards this shouldn't be an issue. The assessment has reasonably concluded that there will be no deterioration.	0	N/A	N/A	<b>No Effect</b>
		The concentrate from the RO plant will be discharged to the River Lark with the remainder of flow from Fornham STW.	Potential for water quality issues with discharge to River Lark. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has reasonably concluded that there will be no	0	N/A	N/A	<b>No Effect</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			deterioration.				
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential to result in increased demand for abstraction	Effluent would be treated and reused which forms a sustainable water resource.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Much of the proposed scheme would be constructed in an area of flood risk Zone 2.	Although the pipeline runs through a flood risk area there is unlikely to be effects. Burst pipeline can cause localised flooding. No new flood storage is involved in the project. However, storage of water in the aquifer could reduce the amount of storage available flood water.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable reuse of discharge water, ensuring increased supply of water without extracting more water out directly from the environment.	This proposal would allow increased security of water supplies without the need for abstraction which can deplete the natural environment's water systems. This would allow better use of water resources across a wider area.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline and modification of existing water works. This scheme would pass close to community receptors.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Modification works would take place within the existing sites. Construction effects on the local community will be reduced through avoidance of built-up areas. The operation of the pipeline is not	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would pass through the Glen Chalk Caves SSSI, designated due to scientific monitoring of bats. The scheme would also pass through the Moreton Hall Community Local Nature Reserve.	Construction of pipeline will directly affect designated sites. Although construction of the pipeline will be temporary it could cause loss of sensitive habitat and affect species.	-	Moderate	High	Highly Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would not run through areas designated as an AONB.	Temporary visual impact due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Medium	Not Significant
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would not run close to several Scheduled Monuments (400m at closest). It would not run near any Registered Parks and Gardens. The closest listed feature lies less than 50m from the proposal.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor given the distance from the proposed scheme and the potential for intervening vegetation and other features to obscure the view of the temporary visual intrusion.	—	Minor	Medium	Not Significant

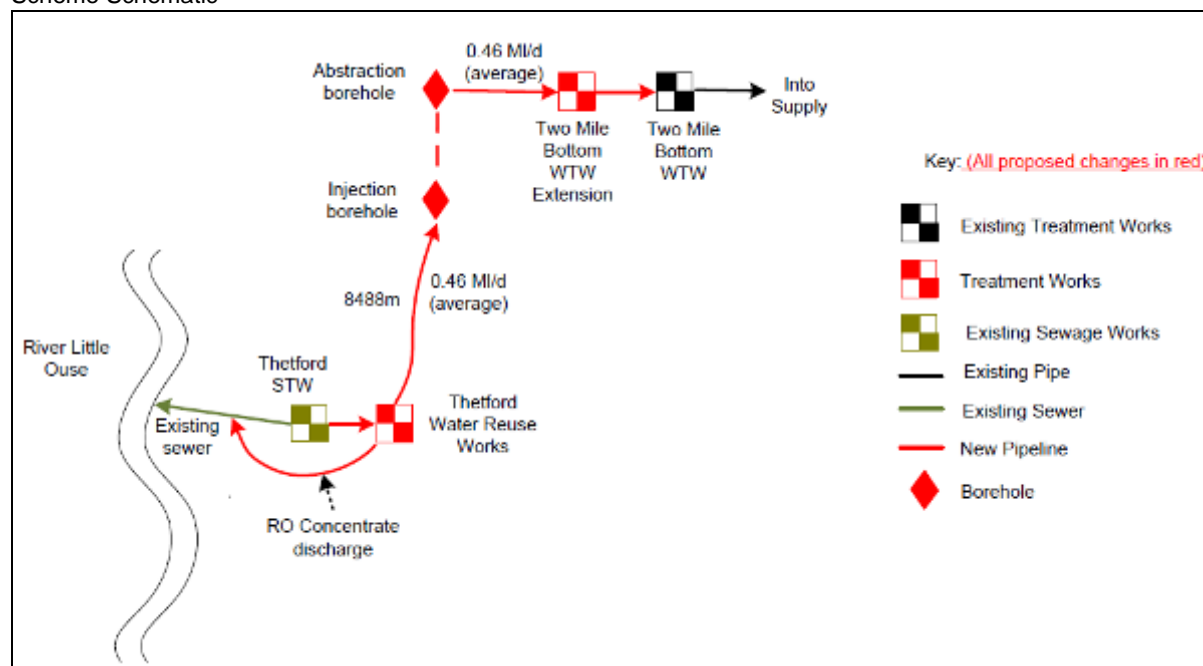
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 3,805 tCO <sub>2</sub> e. The operational carbon for this scheme is 1,734 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Existing Fornham STW and Rushbrooke WTW will be utilised. Scheme would require construction of new pipeline, new water reuse works at Fornham and extension to the Rushbrooke WTW.	Negative effects of resource use for construction materials, along with the construction materials required for the treatment works modifications. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through areas of Grades 2 and 3 agricultural land quality. The pipeline route goes through 2 historic landfill sites.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground. Potential for contamination pathways to be created from laying the pipeline through historic landfill sites.	–	Moderate	Medium	Significant

## D.2.4. Scheme WS4: Thetford water reuse

### D.2.4.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

This option proposes that the effluent from Thetford STW be treated and pumped to the chalk aquifer boreholes in the area of Warren Wood, Two Mile Bottom, Nunnery Lodge and Barnham Cross as part of a MAR scheme.

For this purpose, the Thetford STW will require a sidestream Microbiological Reactor (MBR) and RO. Depending on the requirements of the receiving aquifer, the product water will be oxygenated and the pH increased prior to pumping the water to the injection well. The RO process generated two streams – the product water which will be pumped to the injection boreholes and the concentrate which will be discharged at the existing Thetford STW into the River Little Ouse. The concentrate will have a salt concentration of 3000-5000mg/l and will be diluted with the final effluent from the Thetford STW.

The sidestream MBR should be designed as a Biological Nutrient Removal (BNR) plant to maximise biological phosphorous removal thereby reducing the ferric sulphate dosing requirements. Ferric sulphate will be dosed into the aeration tanks as a trim to reduce the phosphate concentration feeding the RO plant to minimise calcium phosphate scale formation in the RO membranes. A carbon dioxide stripper has been included to remove CO<sub>2</sub> in the RO permeate thereby reducing the sodium hydroxide dose required to achieve a neutral pH. However, the stripper could be removed and the sodium hydroxide dose increased to get the desired water quality standards for aquifer injection.

Water could be abstracted and treated at Barnham Cross WTW.



#### **D.2.4.2. Scheme Baseline**

##### **Hydrology**

The Little Ouse is a tributary of the River Great Ouse, it is approximately 37 miles in length and for much of its length, it defines the boundary between Norfolk and Suffolk. It rises east of Thelnetham and flows southwesterly through Thetford before it joins the Great Ouse north of Littleport in Cambridgeshire. In the centre of Thetford, the Little Ouse splits and forms the River Thet which flows eastwards. The Little Ouse flows southwards towards Bob Clarke Lake.

According to the Environment Agency the ecological quality of the Little Ouse is moderate, whereas the quality of the River Thet is Good. There is a general boundary of 200m on either side of the river banks which is at risk from flooding. The scheme would cross the river immediately south of Thetford STW..

The proposed pipeline routes transect through a number of GPZs. This proposed scheme would run through Source Protection Zones 1 and 2.

##### **Settlements, socio-economics and infrastructure**

Thetford is served by the following administrative bodies:

- Thetford Town Council
- Breckland District Council
- Norfolk County Council

Between 1958 and 1980, Thetford in Norfolk became a Greater London overspill town. Its population increased fourfold from 5,000 to 20,000.

The A11 Trunk Road runs from the M11 to Norwich; it is a major route presently carrying 25,000 vehicles per day. The proposed pipeline route will cross the A11. This may lead to potential impacts on PRow and issues with the Highways authorities.

The northern section of the pipeline route between Two Mile Bottom BH and Barnham Cross WW is located within the route of the Cambridge to Peterborough Network Rail line. Generally, there are two trains per hour eastbound to Norwich, while westbound there is an hourly service to Cambridge (Greater Anglia) and an hourly service to Liverpool via Peterborough and Nottingham (East Midlands Trains).

##### **Ecological – Designated Sites**

Thetford is located within Breckland, an important region of lowland heath in the UK with a high nature conservation value in Norfolk and Suffolk. As such, the area forms part of the UK National Biodiversity Action Plan both for the habitat and for specific species dependant on the heathland habitat.

The Breckland Heath immediately west and north west of Thetford is a SSSI, SAC, SPA and an Important Bird Area.

##### **SSSI**

Pipeline routes to Warren Wood BH and Two Bottom BH are located within Breckland Forest SSSI (encompasses Thetford Forest). The clear fell areas and young plantations within the Breckland Forest SSSI provide suitable breeding habitat for Annex I species woodlark and

nightjar, which occur in internationally important numbers in the region. Other key species within the SSSI include rare invertebrates, rare plants and red squirrels.

Thetford Golf Course & Marsh SSSI is located west of A11, along Brandon Road (B1107) and south of River Little Ouse. This site contains the only surviving area of a once extensive track of Breckland heath known as Thetford Warren. A wide range of heathland plant communities still occur in the occasionally mown "roughs" on the golf course and on other parts of the site. The SSSI is not directly impacted by the proposed pipeline routes north of Thetford STW however, the closest pipeline route between Thetford STW and Warren Wood BH is approximately 500m north of Thetford Golf Course SSSI.

## SPA

All pipeline routes west and north-west of the A11 travel through Breckland Special Protection Area (SPA) and Important Bird Area, which contains important breeding habitats for three species under the EC Wild Birds Directive Annex I: stone curlew (*Burhinus oedicanus*), woodlark (*Lullula arborea*) and nightjar (*Caprimulgus europaeus*).

## SAC

Breckland SAC is designated on the presence of rare and threatened habitats listed in Annex I of the Habitats Directive, including European dry heath.

LNR and SSSI - Barnham Cross Common:

Breckland grass heathland. Mixture of acid and chalk soils and vegetation including periglacial stripes. Rare plants include tower mustard and field wormwood. 60 species breeding birds have been recorded. There are many butterflies and other insects.

NNR – Thetford Heath:

Thetford Heath NNR has 94ha of open Breckland grass heath owned and managed by Norfolk Wildlife Trust and is ~ 1750m south west of Barnham Cross WW/BH. Thetford Heath was the first site where a periglacial 'patterned ground' of stone stripes and polygons formed by frost was identified in Britain. Thetford Heath consists open Breckland heath recognised for the following features:

- Botanical - As well as grass heath, the site has rare plants including breckland thyme, purple-stem cat's-tail, wall bedstraw, sickle medick, perennial knawel and breckland mugwort. There is also a notable lichen population, including several nationally scarce species.
- Ornithology - includes common curlew, green woodpecker, linnet, yellowhammer and skylark.

## Cultural Heritage

Thetford was founded c.870 AD and contains the remains of a Norman castle built on an earlier Iron Age fort. The town centre therefore contains a significant amount of cultural heritage assets. It was of great importance during the late Saxon/early Norman periods and was one of the largest towns recorded in Domesday Book. It was of industrial, military and ecclesiastical importance until the 12th century.

## Conservation Areas

The entire city centre of Thetford is a Conservation Area. The proposed scheme would pass through this Conservation Area.

## Listed Buildings

The proposed scheme would not impact upon Listed Features.

## Scheduled Monuments

Much like the impacts on listed buildings, impacts on Scheduled Monuments are restricted to the south of the Little Ouse and the Thet River. The proposed scheme would run approximately 500m west of the Red Castle Mediaeval ringwork, Church and Saxon settlement remains Scheduled Monument.

There are no Registered Parks and Gardens which would be affected by this scheme.

## Landscape

National Character Area – Brecklands:

Thetford lies within the Brecks (Breckland) National Character Area (NCA) in East Anglia, occupying much of south-western Norfolk and north-western Suffolk, together with a small part of north-eastern Cambridgeshire. The area has an ages-old identity, a very particular land use history and a richly distinctive wildlife, which sets it apart from all surrounding landscapes. Its underlying chalk geology has produced a low, gently undulating plateau, largely covered with sandy soils of glacial origin. The Brecks is sandwiched between the more fertile, and more wooded, clayland plateau to the north, east and south, and the level drained peat and silt fens to the west, which the main rivers, the Little Ouse, Wissey and Lark, drain into.

AONB

There are no AONBs within 20km of the pipeline route.

## Agricultural Land Classification

The entire urban boundary of Thetford is classified as Grade 7 'Urban'. Immediately west and north west of A11 route the land is classified as Grade 4 and Grade 6 as poor quality agricultural land and non-agricultural land respectively. This is mainly due to the location of Thetford Forest which borders the west and north west of Thetford.

## Contaminated Land and Landfill

There are two historic landfills within the immediate proposed pipelines:

- Land South East of Sewage Works – Historic landfill immediately south of Thetford STW. The pipeline route between Thetford STW and Barnham Cross BH will travel directly through this historic landfill. This landfill previously received 'inert' waste according to the EA website (closed in 1970).
- Thetford – Historic landfill located immediately north of Brandon Road which previously received 'inert' waste according to the EA website (closed in 1970). Two pipeline crossings:
  - Crossing at Canterbury way south east of Thetford WW. Approximate NGR 585989 283267.
  - Crossing at The Nunnery (British Trust for Ornithology). Approximate NGR 587507 28227

#### D.2.4.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposal would cross the River Thet (good ecological quality).	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	Not Significant
			The operation of the pipelines have potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has concluded that there is a low risk of deterioration and these risks will need to be resolved to obtain discharge consent.	-	Minor	Medium	Not Significant
		The treated water will be injected into the chalk aquifer, and then abstracted.	Potential for water quality effects from water injected into aquifer. However, if treated water complies with standards this shouldn't be an issue.	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would mitigate increased demand for abstraction through the reuse of water that would otherwise not be used for water supply.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			customer water consumption.				
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	A small section of the proposed schemes would be constructed in areas designated as Flood Zones 2 and 3 associated with crossing waterways.	Although the pipeline runs through a flood risk area there is unlikely to be effects. Burst pipeline can cause localised flooding. No new flood storage is involved in the project. However, storage of water in the aquifer could reduce the amount of storage available flood water.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Predicted water deficits in the future for the area.	Will help mitigate against the forecast water deficit by increasing supply of water in the Thetford Planning Zone.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, with the scheme proposed to pass through the settlement of Thetford.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic</li> </ul>	The proposed scheme would pass through the Breckland Forest SSSI. The proposed scheme would also near to the	Construction of pipeline will directly affect designated sites. Although construction of the pipeline will be temporary it could cause loss of sensitive habitat and affect species.	-	Major	High	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>biodiversity? Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Thetford Golf Course & Marsh SSSI. The proposed scheme would also pass through the Breckland Special Protection Area and Important Bird Area and Breckland SAC. The scheme also has potential to affect the Thetford Heath LNR.					
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposal would pass through the Breckland National Character Area. There are no Areas of Outstanding Natural Beauty located within 20km of the proposal.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged.	–	Minor	Low	<b>Not Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposed scheme would not pass close to listed features. It would pass within 500m of a Scheduled Monument. The proposed scheme would not run close to any Registered Park and Gardens.	Limited impact given the distance between the proposed scheme and cultural heritage features.	–	Minor	Low	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing	Proposed schemes would build resilience to the effects of climate change through improved water supply security for the Cambridgeshire and West Suffolk water resource zone.	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		coastal erosion risks to people, property and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 2,821 tCO <sub>2</sub> e. The operational carbon for this scheme is 903 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipelines and new water reuse works at Thetford.	Negative effects of resource use for construction materials. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed schemes would primarily pass through areas of Grades 4, 5 and 6 agricultural quality. This represents poor quality agricultural land associated with the Thetford Forest. Pipeline crosses historic landfill site,	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground. Potential for contamination pathways to be created from laying the pipeline through historic landfill sites.	—	Moderate	Medium	Significant

## **D.2.5. Scheme WS5: River Lark Flow Augmentation**

### **D.2.5.1. Scheme Description**

This option seeks to mitigate the effects of water abstractions at Rushbrooke WTW on the flow of the River Lark. The option focuses on the 8km stretch of the River Lark through Bury St. Edmunds.

### **D.2.5.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The proposed scheme would pass approximately 550m of the Moreton Hall Community Woods Local Nature Reserve, comprising meadows, woodland and a pond. This comprises the only ecological designation close to the proposed scheme.

<b>LNR</b>	<b>Distance</b>
Moreton Hall	550m

#### **Agricultural Land**

The majority of the proposed scheme would pass through urban areas and areas without agricultural classification. The section at the northern end of the scheme which lies outside the urban area is predominantly in an area of Grade 2 Agricultural Land Classification – this represents above average agricultural land quality.

#### **Water Resources**

The proposed scheme would cross the River Linnet in the south-west of Bury St Edmunds and the River Lark to the north of Bury St Edmunds.

#### **Flood Risk**

The proposed scheme would pass through two areas of flood risk associated with the waterway crossings outlined above. This would not constitute a significant length of the scheme.

#### **Source Protection Zones**

The proposed scheme would pass through areas of Groundwater Source Protection Zones 1 and 2.

#### **Historic Assets**

The scheme passes numerous historic features. These comprise Grade I, II\* and II features.

The proposal runs close to two Scheduled Monuments, and these are listed in the table below:

<b>Scheduled Monument</b>	<b>Distance</b>
Bury St Edmunds Abbey	300m from
Babwell Friary (remains of)	60m

The Bury St Edmunds Abbey Scheduled Monument also comprises an English Heritage site.

The proposal also runs close by to a Registered Park and Garden, as detailed in the table below:

Registered Parks and Gardens	Designation Type	Distance
Abbey Gardens and Precincts	Grade II	300m

Archaeological features along the proposed scheme's routing include a Neolithic hand axe, St Louis Convent School House Lodge, a three-storey maltings and cropmarks of a small settlement with enclosures. These features do not represent significant archaeological finds. The proposed scheme would primarily follow a route that is currently used as roadways, therefore representing land that has already been disturbed.

### Socio-Economics

The proposed scheme would pass through the following statistical wards: Eastgate, Abbeygate, Southgate, Risbygate, Northgate, and Fornham. These wards have a combined population of 19055 persons. The results from the 2011 census are yet to be published in full; therefore data from the 2001 census has been used. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The scheme lies within the County of Suffolk and within the Local Authority of St Edmundsbury.

The proposed scheme would run through a predominantly urban environment in Bury St Edmunds, with a small section of rural areas. Bury St Edmunds is a historic market town. The proposed scheme would cross the A14(T) dual carriageway and A134 primary roads, as well as the A1302 and A1101. It would also cross the Ipswich to Cambridge/Ely railway line, east of Bury St Edmunds railway station.

### Pollution

The proposal comes close to areas of historic landfill near Brundall and an area of authorised landfill near New Rackheath.

### D.2.5.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed scheme would cross the River Linnet and the River Lark.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	<b>Not Significant</b>
			Proposed scheme would draw off water from the River Lark, potential for reduced flows and water quality effects. The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has concluded that there is no risk of deterioration	0	N/A	N/A	<b>No Effect</b>
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of approximately 7km of pipeline.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	<b>Not Significant</b>
		Increased demand on water resources has the potential	Scheme would reduce potential demand for abstracted water as water would be recirculated from a	+	Minor	Medium	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		result in increased demand for abstraction.	wastewater resource. The wastewater would otherwise pass back into the water cycle unused.				
		Scheme concerns supply, and therefore will not affect demand.	None.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	A small section of the scheme would be constructed through areas at risk of flooding, associated with river crossings along the scheme route.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The East Anglian region is predicted to be in water deficit by 2040.	Will help mitigate against the forecast water deficit by increasing supply into the River Lark upstream of an abstraction intake. This will help increase supplies for this intake and result in more sustainable abstraction.	+	Moderate	Medium	Significant
		Scheme would require the construction of approximately 7km of new pipeline. This scheme would pass close to community receptors in Bury St Edmunds.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be felt in the urban areas of Bury St Edmunds. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
the local supply chain.	<ul style="list-style-type: none"> <li>Will local suppliers be used?</li> </ul>		should be used where possible.				
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme would pass 550m west of the Moreton Hall LNR.	This proposal is not likely to have an effect on this LNR due to the distance from the proposed scheme.	-	Low	Medium	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would not run through or close to any areas of Outstanding Natural Beauty.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged. No impacts on AONBs.	—	Minor	Low	Not Significant
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would run close to numerous listed features. The scheme would also run close to two Scheduled Monuments and one Registered Park and Garden. It would not cross sites that constitute significant archaeological sites.	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is negligible. No long-term impacts.	—	Low	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 2,187 tCO <sub>2</sub> e. The operational carbon for this scheme is 73 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require approximately 7km of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of no agricultural quality, with some areas of Grade 2.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Minor	Low	<b>Not Significant</b>



## **D.2.6. Scheme WS6: South Essex RZ Transfer**

### **D.2.6.1. Scheme Background**

This option involves transfer for water from Great Horkesley Reservoir, South Essex RZ to Great Welnetham Reservoir, and into Rushbrooke WTW.

This options involves the construction of a 400mm diameter pumping main from Great Horkesley Reservoir to Great Welnetham Reservoir across a total distance of approximately 34.9km. The second part of this option involves a new 400mm diameter pipeline to Rushbrooke WTW approximately 3.3km.

### **D.2.6.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The Great Horkesley WR lies approximately 750m away from the Slough Grove area of Ancient Woodland. North of here, the scheme also runs approximately 750m east of the Creak's Grove area of Ancient Woodland.

The scheme would pass approximately 750m from the Grange Wood area of Ancient Woodland, south-east of Leavenheath. The scheme comes within 50m of an unnamed area of Ancient Woodland, south-east of Assington.

To the east of Great Waldingfield, the proposed scheme would pass approximately 600m from the Edwardstone Woods SSSI, afforded protective status due to the high diversity of flora found within this ancient wood. This area also forms part of the High/Park Woods area of Ancient Woodland. Here, the scheme also runs approximately 250m from the Alstrop Wood area of Ancient Woodland.

South-west of Lavenham, the proposed scheme would run approximately 700m from the Lavenham Wood are of Ancient Woodland. North of here, the proposed scheme would come approximately 500m from the Lineage Wood and Railway Track, Long Melford SSSI. This site has been afforded protective status as it one of the largest remaining ancient woodland areas in west Suffolk, with grassy areas within the wood supporting a diverse range of flora. This site also comprises the Paradise Wood area of Ancient Woodland. At this point, the proposed scheme would briefly cross the Railway Walks Local Nature Reserve, which is a chalk grassland reserve, with chalk influence, scrub and a badger sett.

Further north along the proposed route, near Bradfield Combust, it would run approximately 800m away from the Sutton Hall Wood area of Ancient Woodland.

On the branch to Great Welnetham, the proposal would pass through part of the Link Wood area of replanted Ancient Woodland, to the west of Bradfield St. George. This is the location of the Great Welnetham WR.

The tables below outline the areas with environmental designations that the proposed scheme runs through or close to.

<b>SSSI</b>	<b>Distance</b>
Edwardstone Woods	600m
Lineage Wood and Railway Track, Long Melford	500m

Ancient Woodland	Distance
Link Wood	Proposed scheme would pass through
Slough Grove	750m
Creak's Grove	750m
Grange Wood	750m
High/Park Woods	600m
Alstrop Wood	250m
Lavenham Wood	700m
Paradise Wood	900m
Sutton Hall Wood	800m

LNR	Distance
Railway Walks	Proposed scheme would pass through

## Landscape

The proposed scheme would pass through the Dedham Vale Area of Outstanding Natural Beauty.

## Agricultural Land

The proposed pipeline would pass through land that is classified as Grades 2 and 3 Agricultural Land, with a small area of Grade 4. This land therefore represents average or above average grade agricultural quality.

## Water Resources

The proposed Option 1 scheme would cross the Belstead Brook (at three separate crossings) and a tributary of the River Brett (north of Wattisham Airfield).

The proposed Option 2 scheme would cross the River Stour, a tributary of the River Box and a tributary of the River Lark.

## Flood Risk

The proposed pipeline would pass through two areas of flood risk, associated with crossing waterways. As part of this, the scheme would pass through areas of both Flood Zone 2 and 3. This would not constitute a significant length of the scheme.

## Source Protection Zones

The majority of the proposed scheme would pass through an area of Source Protection Zone 2.

## Historic Assets

The table below shows the listed features that the proposed scheme would pass near to:

Listed Feature	Designation Type	Distance
Church of All Saints, Little Horkesley	I	. 150m
Lower Dairy Farmhouse, Little Horkesley	II	. 200m
Barn north of Lower Dairy Farmhouse, Little Horkesley	II	. 200m
Range Fronting Street, south of barn, Little Horkesley	II	. 200m
Farm building to north of Lower Dairy Farmhouse	II	. 200m
Heathcote, Leavenheath	II	50m
Acre Piece, Leavenheath	II	50m

Honey Hall, Leavenheath	II*	Less than 50m
Honey Tye Cottage and Cottage Adjoining	II	Less than 50m
Rosehill Farmhouse, Leavenheath	II	50m
Twelve listed features, Great Waldingfield	II	100 to 300m
Church of St. Lawrence, Great Waldingford	I	200m
Park Farmhouse, Lavenham	II	200m
Barn to west of Park Farmhouse, Lavenham	II	150m
Crutched Friars, Bradfield Combust	II	50m
Hunt Cottage, Bradfield Combust	II	200m

The proposal would run past several Scheduled Monuments, and these are listed in the table below. The proposal doesn't run past any Registered Parks and Gardens.

Scheduled Monument	Distance
Wissington ring ditch cluster	500m
Earthwork called Court Knoll	900m
Moated site 180m south of S Oldhall	800m
Moated site immediately west of Bradfield Hall	. 700m
Remains of circular Chapel, E of church	500m
Moated site, formerly site of Rushbrooke Hall, Rushbrooke	500m
Pumphouse in centre of village, Rushbrooke	900m

The proposed scheme would not pass close to areas of significant archaeological finds. Archaeological evidence close to the proposed route consists of church remains, Second World War pillboxes, moat remains, mounds, houses and barns, a late Neolithic arrowhead and a Bronze-age axe hammer.

### Socio-Economics

The proposed scheme would pass through nine statistical wards: Fordham and Stour, Nayland, Leavenheath, Bures St. Mary, Waldingford, Lavenham, North Cosford, Rougham and Horringer & Welnetham. The combined population from the 2001 censuses for these wards was 22,522 residents. The results from the 2011 census are yet to be published in full; therefore data from the 2001 census has been used. The scheme lies within the Counties of Essex and Suffolk and the Local Authorities of Colchester, Babergh and St. Edmundsbury. The proposed scheme would run through a predominantly rural area of agricultural activities. The proposal would not cross any significant infrastructure, however it would cross and run alongside the A134 around Leavenheath. It would also cross the A1071 north of Leavenheath and it would re-cross the A134 south of Bradfield Combust and on three occasions near Sicklesmere.

### Pollution

The proposal comes close to an area of authorised landfill near Nayland. The proposed scheme would cross an area of historic landfill near Bury St. Edmunds.

### D.2.6.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposal would cross the River Stour, a tributary of the River Box and a tributary of the River Lark.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipelines have potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipeline has the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred from one PZ to another, avoiding further abstraction.	+	Minor	Medium	Not Significant
		Schemes concern supply, and therefore will not affect demand.	None.	0	N/A	N/A	No Effect
3. Minimise the risk and	<ul style="list-style-type: none"> <li>Will it contribute to managing</li> </ul>	The scheme does	Burst pipeline can cause localised	-	Minor	Low	Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
reduce the impact of flooding	<ul style="list-style-type: none"> <li>flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	not involve managing flood risk.	flooding.				Significant
		A small section of the proposed scheme would be constructed in areas designated as Flood Zones 2 and 3.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Predicted water deficits in the future for the area.	Will help mitigate against the forecast water deficit by increasing supply into the Cambridgeshire and West Suffolk water resource area from South Essex.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, although the scheme avoids large settlements.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Moderate	Low	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory</li> </ul>	The proposed scheme would pass within 600m of two SSSIs, within 900m	Potential direct loss of habitat from ancient woodland and LNR and disturbance to species	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	habitats? • Will it affect aquatic biodiversity? • Will it affect habitats that rely on water e.g. wetlands?	of eight areas of Ancient Woodland, and it would pass through the Railway Walks Local Nature Reserve. Gt. Welnetham WR is within an area of ancient woodland					
7. Protect and enhance landscape quality and character across the region.	• Will it negatively affect landscape quality and character? • Will it enhance landscape quality and character?	The scheme would run through the Dedham Vale AONB.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged.	–	Minor	Medium	<b>Not Significant</b>
8. Protect historic assets and their landscapes.	• Will it affect the fabric of an historic asset? • Will it affect the setting of a historic asset?	The proposal would pass within 200m of 16 listed features, including two Grade I listings and one Grade II* listing. The closest listed feature would lie within 125m from the scheme. The proposal would also run within 1000m of seven scheduled monuments, with the closest being 500m from the proposed scheme.  Proposal would not pass near to any Registered Parks and Gardens	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is negligible. No impact on ancient monuments, including setting, due to the distance from the proposed scheme.	–	Minor	Medium	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed schemes would build resilience to the effects of climate change through improved water supply security for the Cambridgeshire and West Suffolk water resource zone, but by itself doesn't improve water supply for the wider East Anglia region as water will be taken from another East Anglian Planning Zone and this scheme in isolation doesn't examine water supply in that PZ.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 6,011 tCO <sub>2</sub> e. The operational carbon for this scheme is 517 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of Grades 2 and 3 agricultural quality, with some areas of Grade 4.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Minor	Low	<b>Not Significant</b>



## D.3. Ely RZ

### D.3.1. Scheme E1: Fenland RZ transfer

#### D.3.1.1. Scheme Description

This option involves the transfer of water from Stoke Ferry WTW to Isleham WTW. It will involve the construction of a pipeline between Stoke Ferry WTW and Isleham WTW.

#### D.3.1.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

The proposed pipeline route lies within 500m of Ecological Sites and areas with Environmental Designations.

The pipeline would pass through or close to the following SSSIs:

SSSI	Distance
Breckland Farmland	Passes through
Lakenheath Poors Fen	Passes through

The pipeline would pass through or close to the following SPA:

SPA	Distance
Breckland	Passes through

#### Historic Sites and Assets

The proposed pipeline route runs close to historic sites and assets (as identified in the table below).

##### Listed Buildings

Listed Buildings	Distance
79, The Causeway	400m
Remains of shrunken village E of Hockwold Hall	300m
Hockwold Hall	150m
Monument 3m South of Tower of Church of St Peter	150m
Church of St Peter	150m
THE RED HOUSE	200m
College Farmhouse	250m
Gainsborough House	500m
White House Farm	200m
Forget Me Not Cottage, also known as Thatched Cottage	0m
Church of St Nicholas	50m
Church of St Mary	300m
Barn 3m North of number 33 Methwold Hythe	300m

#### Water-bodies

The pipeline route crosses a number of significant waters bodies.

Main River	Ecological Status/Potential	Chemical Status/Potential
River Wissey	Moderate	N/A
Little Ouse River	Moderate	Good
River Lark	Moderate	Good

### **Landscape**

The pipeline route is not within or near an AONB, ancient woodland or parks.

### **Source Protection Zones**

The existing Isleham WR is within SPZ 1.

### **Flood Risk**

The pipeline route runs through large areas of significant flood risk in areas of low lying land and where it crosses main rivers.

### **Agricultural Land**

The majority of the area is Grade 1 and 2 agricultural land.

### **Contaminated Land/Landfill**

There is one historic landfill sites within 200m of the propose pipeline route:

- Chalk Pit, Whiteplot Road, Methwold Hythe, Thetford, Norfolk

### D.3.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 3 main rivers with moderate ecological status and good chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred between resources helping to reduce new abstraction	+	Minor	Low	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers and low lying land.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Numerous receptors, although in mostly rural areas.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	<b>Not Significant</b>
		Proposed scheme does not involve directly creating community assets.	No effects expected.	0	N/A	N/A	<b>No Effect</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through 2 SSSIs and a SPA.	There is a potential for direct loss of habitat or disruption within designated areas, including temporary construction disturbance from noise and dust etc.	-	Moderate	High	<b>Highly Significant</b>
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The pipeline route is not within or near an AONB, ancient woodland or parks.	Temporary visual effects from digging up ground to lay pipeline.	-	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The pipeline route runs adjacent or near 13 listed buildings.	Potential to disturb setting of listed buildings during construction. Potential effects from vibration during construction.	-	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 5,951 tCO <sub>2</sub> e. The operational carbon for this scheme is 591 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 1 and 2 agricultural land. Pipeline route is within 200m of one historic landfill site.	Likely to include temporary effects on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Negligible	Low	Not Significant

## **D.3.2. Scheme E2: Newmarket RZ transfer**

### **D.3.2.1. Scheme Description**

This option involves the transfer of water from Warren Hill reservoir to Isleham WTW. It will involve the construction of a pipeline between Warren Hill reservoir and Isleham WTW.

### **D.3.2.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The proposed pipeline route lies within 500m of Ecological Sites and areas with Environmental Designations.

The pipeline would pass through or close to the following SSSIs:

<b>SSSI</b>	<b>Distance</b>
Chippenham Fen & Snailwell Poor's Fen	Passes through
Newmarket Heath	Passes through

The pipeline would pass through or close to the following NNRs:

<b>NNR</b>	<b>Distance</b>
Chippenham Fen	200m

The pipeline would pass through or close to the following SAC:

<b>SAC</b>	<b>Distance</b>
Fenland	200m

#### **Historic Sites and Assets**

The proposed pipeline route runs close to a significant number of listed buildings in Chippenham, including the Grade II Listed Chippenham Hall.

#### **Water-bodies**

The pipeline route does not cross any main rivers but does cross drains etc.

#### **Landscape**

The pipeline route is not within or near an AONB. The pipeline route is not within or near (within 300m) of an ancient woodland. The pipeline route runs through the south of Chippenham Hall Park.

#### **Source Protection Zones**

The existing Isleham WR and Warren Hill WR are within SPZ 1. The majority of the pipeline route runs within SPZ2 and SPZ3.

#### **Flood Risk**

None of the pipeline route runs through areas of significant flood risk.

#### **Agricultural Land**

The majority of the area is Grade 2 and 3 agricultural land, although there are some areas of Grade 4.

#### **Contaminated Land/Landfill**

There is one historic landfill sites within 200m of the propose pipeline route:

- L O C Plant Hire, Station Road, Isleham, Cambs

### D.3.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses no main rivers.	Potential for groundwater pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect groundwater through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred between resources helping to reduce new abstraction	+	Minor	Low	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	None of the pipeline routes runs through areas of significant flood risk.	There is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Numerous receptors, especially within Newmarket.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	<b>Not Significant</b>
		Proposed scheme does not involve directly creating community assets.	No effects expected.	0	N/A	N/A	<b>No Effect</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through 2 SSSIs, and within 200m of a NNR and a SAC.	There is a potential for direct loss of habitat or disruption within SSSIs, including temporary construction disturbance from noise and dust etc.	-	Minor	High	<b>Significant</b>
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs close to Chippenham Hall Park.	Temporary visual effects from digging up ground to lay pipeline.	-	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs close to a number of listed buildings including Chippenham Hall.	Potential to disturb setting of listed buildings during construction. Potential effects from vibration during construction.	-	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 895 tCO <sub>2</sub> e. The operational carbon for this scheme is 0 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Scheme will involve use of materials and resources. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 2 and 3 agricultural land, although there are some areas of Grade 4. Pipeline route is within 200m of one historic landfill site	Likely to include temporary effects on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Negligible	Low	Not Significant

## **D.4. Newmarket RZ**

### **D.4.1. Scheme NWM1: Ely RZ transfer**

#### **D.4.1.1. Scheme Description**

This scheme is the same of scheme E2 'Newmarket RZ transfer' only reversed. Therefore, the baseline and assessment has not been repeated.

### **D.4.2. Scheme NWM2: West Suffolk RZ transfer**

#### **D.4.2.1. Scheme Description**

This scheme is the same as scheme WS1 'Newmarket PZ transfer' only reversed. Therefore, the baseline and assessment has not been repeated.

## D.5. Cheveley RZ

### D.5.1. Scheme CVY1: Newmarket RZ transfer

#### D.5.1.1. Scheme Description

This option involves the transfer of water between Newmarket RZ and Cheveley RZ. It will involve the construction of a pipeline between Warren Hill WR and Woodditton WT

#### D.5.1.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

The proposed pipeline route lies within 500m of Ecological Sites and areas with Environmental Designations.

This pipeline would pass through or close to the following SSSIs:

SSSI	Distance
Devils Dyke	Within 500m

#### Historic Sites and Assets

The proposed pipeline route runs close to historic sites and assets (as identified in the table below). In addition to this the proposed pipeline route runs close to a significant number of historic sites and assets in Ditton Green.

#### Listed Buildings

Listed Buildings	Distance
NORTH LODGE AND ATTACHED GATE PIERS (Grade II)	100m
CHURCH HALL FARM COTTAGES (Grade II)	50m
PARISH CHURCH OF ST MARY (Grade I)	50-100m

#### Water-bodies

The pipeline route does not cross any significant water bodies.

#### Landscape

The pipeline route is within or near (500m) Ancient Woodland (PICKMORE WOOD, COMBERS WOOD, LITTLE CHITLINGS WOOD, CHARCOALS WOOD). The pipeline route is not within or near (within 500m) an AONB or Country Park.

#### Source Protection Zones

The pipeline route runs within areas of SPZ1 and 3, although primarily SPZ 2.

#### Flood Risk

Some of the pipeline route runs through areas of minor flood risk where it crosses minor rivers.

#### Agricultural Land

The majority of the area is Grade 3 agricultural land and some Grade 2.

#### Contaminated Land/Landfill Site

There is one historic landfill site (Woodditton Pit) within 300m of the proposed pipeline route.

#### D.5.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline does not cross any significant water bodies.	Construction could cause pollution of groundwater	-	Minor	Low	Not significant
			The operation of the pipeline has the potential to affect water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Low	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred between resources helping to reduce new abstraction	+	Minor	Low	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Some of the pipeline route runs through areas of minor flood risk where it crosses minor water bodies.	Although the pipeline crosses minor flood risk areas, there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Numerous receptors, in a number of rural villages.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating community assets.	No effects expected.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The pipeline route runs near (within 500m) one SSSI.	There may be disturbance to species during construction	-	Minor	Medium	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs within 500m of 4 Ancient Woods.	Temporary visual effects from digging up ground to lay pipeline.	—	Minor	Medium	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through Woodditton, where there is a high concentration of listed buildings.	Potential to disturb setting of listed buildings during construction. Potential effects from vibration during construction.	-	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 239 tCO <sub>2</sub> e. The operational carbon for this scheme is 53 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	The scheme will use materials and resources. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 2 and 3 agricultural land.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Negligible	Low	Not Significant

## **D.5.2. Scheme CVY2: West Suffolk RZ transfer**

### **D.5.2.1. Scheme Description**

This option involves the transfer of water between West Suffolk RZ and Cheveley RZ. It will involve the construction of a pipeline between Hundon WR and Woodditton WR.

### **D.5.2.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

None

#### **Historic Sites and Assets**

The proposed pipeline route runs close to historic sites and assets (as identified in the table below). In addition to this the proposed pipeline route runs close to a significant number of historic sites and assets in Ditton Green.

##### *Listed Buildings*

Listed Building	Distance
PARK COTTAGE (Grade II)	250m
OAK FARMHOUSE (Grade II)	150m
THATCHED COTTAGE (Grade II)	150m
COTTAGE TO SOUTH EAST OF YEW TREE FARMHOUSE (Grade II)	200m
YEW TREE FARMHOUSE (Grade II)	200m
BATCHELORS HALL FARMHOUSE (Grade II)	200m
THE RED LION INN (Grade II)	300m
MALTING END COTTAGE (Grade II)	200m
THRIFT FARMHOUSE (Grade II)	500m
ROSALIE FARMHOUSE (Grade II)	300m
HAWBUSH COTTAGE (Grade II)	500m
BLUE DOORS FARMHOUSE (Grade II)	500m
HUNDON GREAT LODGE FARMHOUSE (Grade II)	100m

#### **Water-bodies**

The pipeline does not cross any significant water bodies.

#### **Landscape**

The pipeline route is within or near (300m) Ancient Woodland (DITTON PARK WOOD, NULL). The pipeline route is not within or near (within 300m) an AONB or Country Park.

#### **Source Protection Zones**

The pipeline route runs within areas of SPZ 2 and 3.

#### **Flood Risk**

There is no significant risk of flooding from rivers.

#### **Agricultural Land**

The majority of the area is Grade 2 and 3 agricultural lands.

#### **Contaminated Land/Landfill Sites**

There are no historic landfill sites within 300m of the proposed pipeline.

#### D.5.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline does not cross and significant water bodies.	Potential for groundwater pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Negligible	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred between resources helping to reduce new abstraction	+	Minor	Low	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	There is no significant risk of flooding from rivers.	Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Numerous receptors, in a number of rural villages.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating community assets.	No effects expected.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The pipeline route does not run near ecological sites or sites with environmental designations.	Although the scheme is not near any designated sites, there may still be disturbance to species during construction	-	Minor	Low	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs within 300m of 2 Ancient Woods.	Temporary visual effects from digging up ground to lay pipeline. Potential for trees to be lost for the scheme.	—	Minor	Medium	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through Ditton Green, where there is a higher concentration of listed buildings as well as a number of other listed buildings on other areas.	Potential to disturb setting of listed buildings during construction. Potential effects from vibration during construction.	—	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 713 tCO <sub>2</sub> e. The operational carbon for this scheme is 65 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	The scheme will use materials and resources. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 2 and 3 agricultural land. Pipeline route is not near (within 500m) any historic landfill sites.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Negligible	Low	<b>Not Significant</b>

## D.6. Central Essex RZ

### D.6.1. Scheme CE1: South Essex RZ transfer

#### D.6.1.1. Scheme Description

This option involves the transfer of water from Coggeshall reservoir to Lt Maplestead WR .

This option involves the construction of a 150mm diameter pipeline from Coggeshall WR to Parkfield WR, and from Parkfield WR to Lt Maplestead WR, across a total distance of 12.9km.

#### D.6.1.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

None

#### Historic Sites and Assets

The proposed pipeline route runs close to historic sites and assets (as identified in the table below). In addition to this the proposed pipeline route runs close to a significant number of historic sites and assets in Halstead.

##### Listed Buildings

Listed Buildings	Distance
HURRELLS FARM BARN	25m
BROOMHILL COTTAGE	50m
MOSSES FARM BARN	150m
MOSSES FARMHOUSE	175m
RED HOUSE	450m
HURRELLS FARM BARN	350m
HURRELLS FARMHOUSE	350m
SAXBYS	300m
CHURCH OF ST JOHN THE BAPTIST	450m
HALL CORNER COTTAGE	250m
IVY COTTAGE	150m
MOTTS GARDEN	100m
LEPPINGWELLS	100m
BRICKS FARM BARN	450m
BRICKS FARM CARTLODGE ADJOINING BARN	450m
BRICKS FARM COTTAGE	450m
HAMPERS FARMHOUSE	200m
DEANS COTTAGE	150m
OAK COTTAGE	50m
ASHFORD LODGE GATEHOUSE	100m
BENTALL'S FARMHOUSE BARN	150m
LETCHES FARMHOUSE	150m
GLADFEN HALL FARMHOUSE	300m
THE OLD VICARAGE	350m
PARISH CHURCH OF ST JAMES	350m
OLD SCHOOL AND SCHOOL HOUSE	350m
THE COTTAGE	150m
GREENSTEADHALL FARMHOUSE BARN	150m
RIVENSHALL	350m
HILL COTTAGE	250m
PERCES FARMHOUSE BARN	200m
PERCES FARMHOUSE GRANARY	200m
MARKS HALL BOUNDARY STONE	250m

MARKS HALL COTTAGES WALL OF WALLED IN GARDEN	50m
MARKS HALL COTTAGES	400m
MARKS HALL COTTAGES COACH HOUSE	400m
BULLOCKS CROSS FARMHOUSE BARN	100m
BULLOCKS CROSS FARMHOUSE GRANARY	100m
BULLOCKS CROSS FARMHOUSE	100m
BARN AT BOUCHIER'S GRANGE FARM	250m
71, COLNE ROAD	200m

### Water-bodies

The pipeline route crosses a number of significant waters bodies.

Main River	Ecological Status/Potential	Chemical Status/Potential
River Colne	Moderate	Fail
Bourne Brook	Moderate	N/A

### Landscape

The pipeline route is within or near (300m) Ancient Woodland (TYLERS WOOD, LITTLE MONKS WOODS, THRIFT WOOD and RAYNOR'S WOOD). The pipeline route is not within or near (within 300m) an AONB or Country Park.

### Source Protection Zones

The pipeline route runs within a SPZ2.

### Flood Risk

Some of the pipeline route runs through areas of significant flood risk where it crosses main rivers.

### Agricultural Land

The majority of the area is Grade 2 and 3 agricultural land.

### Contaminated Land/Landfill Site

There are no historic landfill sites within 200m of the propose pipeline route.

#### D.6.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 2 rivers with 'moderate' ecological status and on with 'fail' chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred between resources helping to reduce new abstraction	+	Minor	Low	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> </ul>	Increasing demand for water	The scheme would will help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Numerous receptors, especially within Halstead.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating community assets.	No effects expected.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The pipeline route does not run near ecological sites or sites with environmental designations	Although the scheme is not near any designated sites There may still be disturbance to species during construction	-	Minor	Low	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through or near 4 Ancient Woods.	Temporary visual effects from digging up ground to lay pipeline. Potential for trees to be lost for the scheme	-	Moderate	Medium	Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through Halstead where there is a high concentration of listed buildings	Potential to disturb setting of listed buildings during construction. Potential effects from vibration during construction.	-	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	<p>The total embodied carbon for this scheme is 1,133 tCO<sub>2</sub>e.</p> <p>The operational carbon for this scheme is 49 tCO<sub>2</sub>e per year.</p>	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Scheme will use materials and resources. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 2 and 3 agricultural land.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Negligible	Low	Not Significant



## **D.6.2. Scheme CE2: West Suffolk RZ transfer**

### **D.6.2.1. Scheme Description**

This option involves the transfer of water from Rushbrooke to Steeple Bumpstead via Little Saxham and Hundon. There are four legs of the pipeline: Rushbrooke to Lt Saxham; Lt Saxham to Hundon; Hundon to Great Wratting/Boyton Hall; Great Wratting/Boyton Hall to Steeple Bumpstead. The Hundon to Great Wratting leg is by substitution via existing infrastructure. The other legs will require the construction of a 300mm diameter pipeline.

### **D.6.2.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

None

#### **Historic Sites and Assets**

The proposed pipeline route runs close to historic sites and assets (as identified in the table below). In addition to this the proposed pipeline route runs close to a significant number of historic sites and assets in Horringer, Chevington, Wickham Street, Stradishall, Great Wratting, Calford Green and Sturmer. The proposed pipeline route runs through registered Parks and Gardens including: ICKWORTH HOUSE

#### *Listed Buildings*

<b>Listed Buildings</b>	<b>Distance</b>
NOWTON LODGE (Grade II)	150m
LITTLE HORSECROFT COTTAGE (Grade II)	400m
HORSECROFT HALL (Grade II)	150m
LODGE COTTAGE (Grade II)	200m
HOPLEYS LODGE (Grade II)	300m
ICKWORTH LODGE (Grade II)	150m
DAIRY COTTAGES (Grade II)	200m
THE GARDEN HOUSE GREAT SAXHAM HALL (Grade II)	100m
NEW POTASH COTTAGES (Grade II)	350m
HORSEPOOL FARMHOUSE (Grade II)	450m
THE GROVE (Grade II)	350m
THE OLD GROVE (Grade II)	300m
LITTLE KNOWLES GREEN COTTAGE (Grade II)	300m
TTLE KNOWLES GREEN FARMHOUSE (Grade II)	200m
ASHFIELD GREEN FARMHOUSE (Grade II)	400m
HOME FARMHOUSE (Grade II)	400m
BARN AT WATERLANE FARM (Grade II)	100m
EDMUNDS HILL HOUSE THE THATCHERS (Grade II)	300m
APPLE ACRE FARMHOUSE (Grade II)	300m
CHURCH OF ST MARY (Grade II)	100m
1-6 (Grade II)	300m
WOODLANDS COTTAGE (Grade II)	250m
GREAT WALTONS FARMHOUSE (Grade II)	350m
UPPER HOUSE FARMHOUSE (Grade II)	300m
YEW TREE FARMHOUSE BARN (Grade II)	250m
YEW TREE FARMHOUSE (Grade II)	250m
BROAD GREEN FARMHOUSE (Grade II)	100m
RYLANDS FARMHOUSE (Grade II)	400m
MOYNS PARK GATE PIERS (Grade II)	400m

MOYNS PARK (Grade I)	400m
BARN AND FARM COMPLEX OF OLD HALL FARM (Grade II)	150m
OLD HALL FARMHOUSE (Grade II)	100m
SOUTH LODGE OF MOYNS PARK (Grade II)	150m
COOTES FARMHOUSE (Grade II)	150m
WAKELANDS FARMHOUSE (Grade II)	400m
MARTIN'S FARMHOUSE BARN (Grade II)	150m
HIGH FOLLY (Grade II)	150m

### Water-bodies

The pipeline route crosses a number of significant waters bodies.

Main River	Ecological Status/Potential	Chemical Status/Potential
River Lark	Bad	N/A
River Linnet	Moderate	Good
Tributary (River Lark)	Poor	N/A
River Glem	Good	N/A
Tributary (River Stour)	Moderate	N/A
Tributary (River Stour)	Poor	N/A

### Landscape

The pipeline route is within or near (300m) Ancient Woodland (TWIST WOOD, DAIRY WOOD, PARK WOOD, JENNISONS PLANTATION, EASTER WOOD, OLDHALL WOOD).  
The pipeline route is not within or near (within 300m) an AONB or Country Park.

### Source Protection Zones

The pipeline route runs within AREAS OF SPZ 1, 2 and 3.

### Flood Risk

Some of the pipeline route runs through areas of significant flood risk where it crosses main rivers.

### Agricultural Land

The majority of the area is Grade 2 and 3 agricultural land.

### Contaminated Land/Landfill Sites

There are two historic landfill sites (Paddock and Rowley Hill) within 200m of the proposed pipeline route.

### D.6.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 6 rivers with 'bad' to 'moderate' ecological status and one with 'good' chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred between resources helping to reduce new abstraction	+	Minor	Low	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Numerous receptors, in a number of rural villages.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating community assets.	No effects expected.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The pipeline route does not run near ecological sites or sites with environmental designations	Although the scheme is not near any designated sites There may still be disturbance to species during construction	-	Minor	Low	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through or near 6 Ancient Woods.	Temporary visual effects from digging up ground to lay pipeline. Potential for trees to be lost for the scheme	—	Moderate	Medium	Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through Ickworth House Park; and Horringer, Chevington, Wickham Street, Stradishall, Great Wratting, Calford Green and Sturmer where there is a higher concentration of listed buildings.	Temporary effects to Registered Parks and Gardens from lying of the pipeline. Potential to disturb archaeological remains in these areas. Potential to disturb setting of listed buildings during construction. Potential effects from vibration during construction.	—	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 1,864 tCO <sub>2</sub> e. The operational carbon for this scheme is 199 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	The scheme will use materials and resources. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant

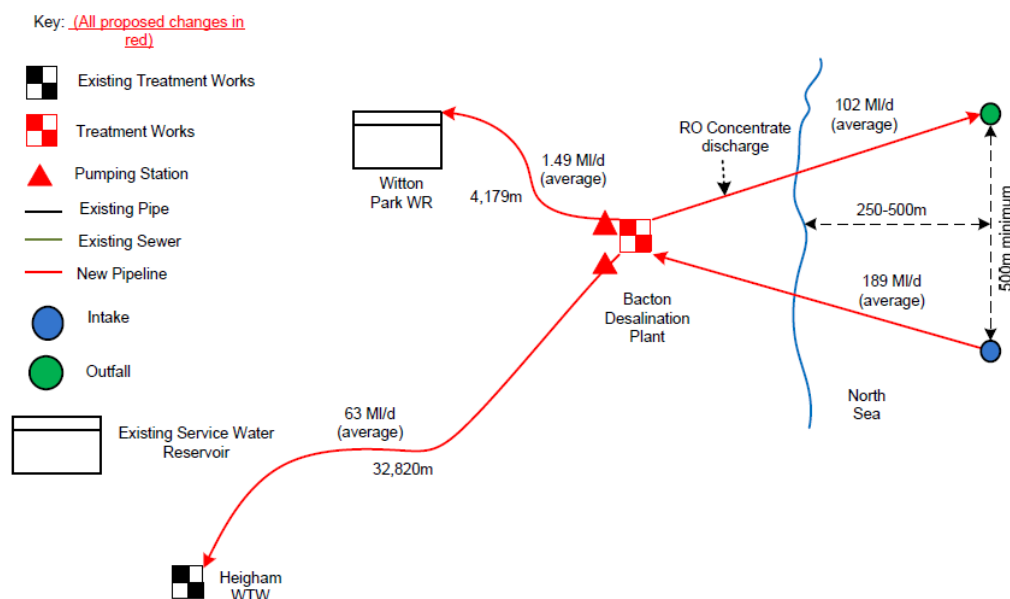
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 2 and 3 agricultural land. Pipeline route is within 200m of two historic landfill sites.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Negligible	Low	<b>Not Significant</b>

## D.7. Norwich and The Broads RZ

### D.7.1. Scheme NB1 / NB12: Bacton Desalination

#### D.7.1.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

The proposed desalination site is located at Bacton, on the Norfolk Coast (near the gas terminal). The actual location will be confirmed if the option were to be progressed. The sea water intake will be located offshore beyond the surf zone to ensure reasonable intake water quality. The brine may be discharged 500m from the intake location with the current taking the brine away from the intake.

The proposed pre-treatment comprises Dissolved Air Flotation (DAF) and Ultrafiltration (UF). The sludge from the DAF and chemical backwash waste from the UF will be discharges to the sewerage network for safe disposal. The UF backwash waste will be discharged with the brine. The output from the UF plant will be collected and pumped to the desalination plant. A two-pass system with a partial second pass is proposed subject to receipt of a full seawater analysis.

Scheme NB12 Bacton Desalination is the same as the description of scheme NB1 Bacton Desalination above except that the capacity will be smaller for NB12 as it will be sized for nominal 10 MI/d.

#### D.7.1.2. Scheme Baseline

##### Ecological Sites and Environmental Designations

Pipeline route runs along a road which is next to western boundary of designated site – The Broads SAC, Broadland SPA and Ramsar, and Crostwick Marshes SSSI.

Designated Site	Distance
The Broads SAC, Broadland SPAS and Ramsar and Crostwick SSSI	Pipeline runs along road adjacent to western boundary of site
River Wensum SSSI and SAC	800m
Sweetbriar Road Meadows SSSI and Wensum Valley (Mile Cross March & Sycamore Crescent) LNR	Pipeline goes through the site on the boundary of the SSSI and LNR, and through part of the LNR

### Historic Sites and Assets

The pipeline runs adjacent to several listed buildings in particular 3 no. listed buildings near Bacton, several listed buildings in the Coltishall area, and 80m east from listed building at Meeting House Hill.

Heritage Designation	Distance
Broomholm Priory Scheduled Monument (split into 2 section)	80m / 60m
Honing Hall Grade II* Registered Park and Garden	700m
WWII Fighter Pen, Cold War blast walls and associated remains at the airfield formerly known as RAF Coltishall Scheduled Monument	240m
Roman Camp and settlement site west of Horstead Scheduled Monument	300m
Catton Hall Grade II* Registered Park and Garden	550m
Mile Cross Gardens Grade II Registered Park and Garden	200m
Wayside Cross at the junction of Boundary Road and Drayton High Road Scheduled Monument	40m

### Landscape

The pipeline runs along a road that splits an area of ancient woodland into 2 separate areas. The woodland is Staininghall Wood (ancient replanted woodland). The pipeline route also follows a road which is adjacent to The Broads National Park. The pipeline route is not within or near an AONB.

### Source Protection Zones

The pipeline runs within areas of SPZ 2 and 3. Norwich WTW is located within SPZ3.

### Flood Risk

Pipeline crosses some areas of significant flood risk where it crosses the River Bure, North Walsham Canal and River Wensum DS Norwich.

### Contaminated Land/Landfill

The proposed scheme would not pass through areas of historic or consented landfill.

### Agricultural Land

The pipeline route goes through mainly Grade 3 agricultural land but it does also go through areas of Grade 1 and Grade 2.

### Water-bodies

The pipeline routes cross several inland waters. Main rivers crossed by the pipeline include:



Main River	Ecological Status/Potential	Chemical Status/Potential
River Bure	Moderate	Fail
North Walsham Canal	Moderate	Does not require assessment
River Wensum DS Norwich	Poor	Fail
Spixworth Beck	Moderate	Does not require assessment

The intake and discharge points are within the Norfolk East coastal waters which have an ecological status of moderate.

### D.7.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Brine would be discharged into the North Sea 500m from the intake location with the current taking the brine away from the intake. The brine will be dispersed within 50-200m of the discharge points.	Potential for discharged brine to cause negative effects in the water system where it is discharged. However, due to the fact that it is being discharged straight into the sea and will have a lower salt concentration than the receiving water it is unlikely to have significant effects. The WFD assessment has reasonably concluded that there will be no deterioration but further assessment is required to increase certainty in this conclusion.	0	N/A	N/A	No Effect
		Pipeline will cross the following main rivers: River Bure (E = moderate, C = fail), North Walsham Canal (E = moderate), River Wensum (E = poor, C = fail), Spixworth Beck (E = moderate). Intake and discharge points within Norfolk East coastal waters with an ecological status of moderate	Where the pipeline crosses rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD assessment has reasonably concluded that there will be no deterioration but further assessment is required to increase certainty in this conclusion.	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme	Leakages from pipeline are common. However, modern construction techniques and	-	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	concerns construction of 18.2km of pipeline.	pipes have a lower propensity for leakage.				
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be taken from the sea, which forms a sustainable water resource.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The pipeline crosses several areas of flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		The nearest receptors to the site of the proposed Bacton desalination plant are properties on Church Road	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of the pipelines. In particular, the Bacton pipeline will involve 16.6km of pipeline through fields, 1.6km of A roads reinstated, 16.6km of B roads and minor roads reinstated and a total 76 no. direct drill crossings of rivers, roads and railways. Bacton (Happisburgh (Witton Park)) pipeline will involve 17.9km of pipeline through fields, 46m of A roads reinstated, 858m of B roads and minor roads reinstated, a total of 32 no. direct drill crossings of rivers and roads.	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			There will also be temporary construction nuisance for receptors close to the Bacton desalination plant.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline runs along a road which is next to western boundary SAC, SPA, Ramsar, and SSSI. Pipeline runs through SSSI/LNR split site.	No direct loss of habitat from SAC, SPA, Ramsar, SSSI site. However, construction of the pipeline will cause disturbance for species and may affect them returning to the area or their breeding. Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the SSSI/LNR site and will directly affect species during construction.	–	Moderate	High	Highly Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline runs along a road that splits an area of ancient woodland into 2 separate areas. Pipeline route also follows a road which is adjacent to The Broads National Park. New desalination plant within area of fields.	Temporary visual effects from laying the pipeline. As long as no trees are lost within the ancient woodland area there should be no permanent effects on the area (potential effects on bats and birds in the woodland). The new desalination plant is to be located in an area of fields which will change the landscape character.	–	Moderate	Medium	Significant
8. Protect and enhance the historic environment, heritage assets and their	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a</li> </ul>	The pipeline runs adjacent to several listed buildings.	Pipeline is unlikely to affect the 3 Registered Parks and Gardens because of there	–	Minor	High	Significant

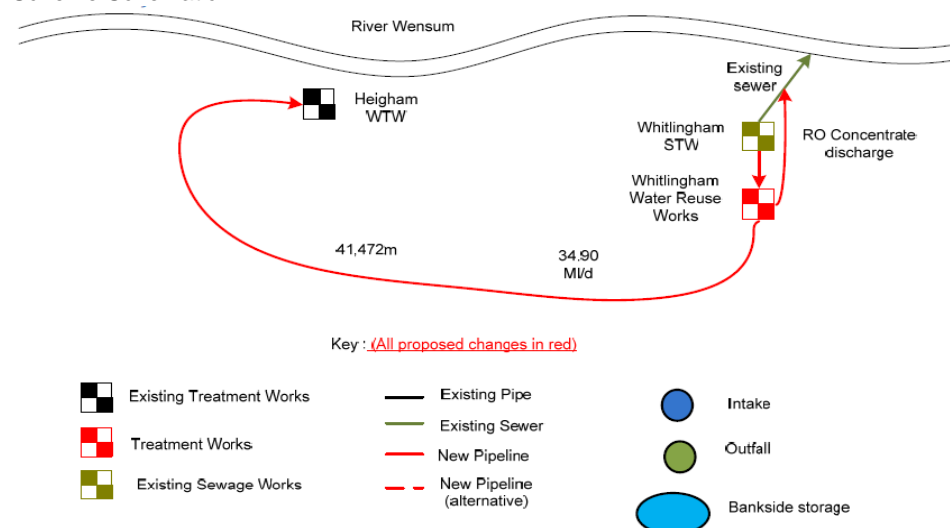
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
setting	historic asset?	Pipeline runs 200-700m from 3 Registered Parks and Gardens. Pipeline runs 40-240m from 4 Scheduled Monuments (2 of which are 40 and 80m away).	distance. Lying of the pipeline has the potential to affect Scheduled monuments through vibration and construction activities. Their setting may also be temporarily affected during construction of the pipeline. It is assumed that no listed buildings will be altered, but works to lay the pipeline may cause vibration effects.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	<p>NB1 = The total embodied carbon for this scheme is 43,468 tCO<sub>2</sub>e. The operational carbon for this scheme is 63,163 tCO<sub>2</sub>e per year.</p> <p>NB12 = The total embodied carbon for this scheme is 12,214 tCO<sub>2</sub>e. The operational carbon for this scheme is 13,359 tCO<sub>2</sub>e per year.</p>	-	N/A	N/A	Highly Significant
11. Ensure that a	Will the scheme use	N/A	Existing Witton WR and Norwich	—	Moderate	Low	Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>		WTW will be used. A new Desalination plant at Bacton and 36.9km of new pipeline will be required. Scheme design and materials will follow Anglian Water corporate sustainability policy.				Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Pipeline route goes through mainly Grade 3 agricultural land but it does also go through areas of Grade 1 and Grade 2. Pipeline route is adjacent to historic landfill site.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Discharge will be within EA standards so should not pollute the ground. The proposed site location for the new desalination plant is at Bacton near the gas terminal, although the exact location is still to be confirmed. There is potential for landtake of high quality agricultural land for the plant. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	–	Moderate	Medium	Significant

## D.7.2. Scheme NB2 / NB11: Norwich Water Reuse

### D.7.2.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

This option involves the treatment of Whitlingham STW effluent and discharge into the River Wensum 1.5-2km upstream of the Norwich WTW intake.

The effluent from Whitlingham STW would require UF and a RO stage will be included to achieve drinking water standards. The concentrate from the RO plant will be discharged with the current Whitlingham discharge. The RO product will be treated with peroxide and UV.

Scheme NB11 Norwich Water Reuse (growth scheme) is the same as the description of scheme NB2 Norwich Water Reuse (SR) above except that the capacity will be smaller for NB11 as it will be sized for nominal 10 MI/d and including a 10 MI/d extension of Norwich WTW.

### D.7.2.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

The proposed pipeline route lies within 500m of the River Wensum SAC and SSSI.

The pipeline would pass through or close to the following SSSIs:

SSSI	Distance
Caistor St. Edmund Chalk Pit	160m
River Wensum	At 2 points: 150m and 50m south
Sweetbriar Road Meadows	Within 50m across the River Wensum

Whitlingham March LNR is across the road (A47) from the Whitlingham STW and proposed pipeline route. The proposed pipeline route also runs through the Wensum Valley (Mile Cross Marsh and Sycamore Crescent) LNR.

#### Historic Sites and Assets

The proposed pipeline route runs close to historic sites and assets (as identified in the table below). The proposed route runs through the centre of Norwich where there is a high concentration of listed buildings.

*Pipeline Route 1 – Scheduled Monuments*

Scheduled Monument	Distance
Arminghall, sites discovered by air photographs	Through site
Sites discovered by air photography at Markshall	With 150m
Sites discovered air photography at Markshall on A47	Within 50m
Two Tumuli in Big Wood	Within 350m
Norwich Castle	Within 150m
Dominican Friary	Within 150m
Gate of Bridewell, part of No. 6 St. Andrew's Hill	Within 100m
Bedford Street Medieval Undercroft	Within 100m
St. Lawrence's Well, Lower Westick Street	Within 100m
City Walls and Tower	Adjacent to SM at Benedict Street/A1074
Cross in St. Mary's Churchyard	Within 200m

The proposed pipeline route will run through Crown Point Grade II Registered Park and Garden; is within 50m south-west of The Rosary Cemetery Grade II\* Registered Park and Garden; adjacent to Norwich City (Earlham Road) Cemetery Grade II Registered Park and Garden; and within 30m north-west of Intwood Hall Grade II\* Registered Park and Garden.

## Water-bodies

The pipeline route crosses several inland waters including a larger water body at Whitlingham Country Park. The pipeline crosses the following main rivers:

Main River	Ecological Status/Potential	Chemical Status/Potential
Yare	Moderate / Poor	Does not require assessment
Wensum DS Norwich	Poor	Fail
Wensum US Norwich	Bad	Fail
Tas	Moderate	Does not require assessment
Intwood Stream	Moderate	Does not require assessment
Tud	Moderate	Does not require assessment

## Landscape

The pipeline route is not within or near an AONB. The pipeline route is not within or near (within 300m) of an ancient woodland. The pipeline route runs through the south-western part of Whitlingham Country Park.

## Source Protection Zones

The existing Whitlingham STW is within SPZ 2. The existing Norwich WTW is within SPZ 3. The discharge and abstraction points are within SPZ 1. The majority of the pipeline route runs within SPZ3 with areas within SPZs 1 and 2.

## Flood Risk

Some pipeline route runs through some areas of significant flood risk where it crosses main rivers.

## Agricultural Land



The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 and Grade 4.

### **Contaminated Land/Landfill**

There are 2 historic landfill sites within 200m of the propose pipeline route:

- Sandhill Quarries historic landfill site (inert and industrial waste); and
- Between Yarmouth Road and the River Yare historic landfill site (inert, liquids/sludge).

The pipeline passes through/adjacent to a historic landfill site and an authorised landfill site:

- Costessey authorised landfill site; and
- Longwater Pits historic landfill site (inert, industrial, commercial, household, special).

### D.7.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 6 main rivers with moderate to bad ecological status and fail chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The WFD assessment has concluded that there is a low risk of deterioration.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme reuses effluent reducing the need for abstraction sources.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> </ul>	Pipeline routes go through some areas of significant flood	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it involve loss or construction on the floodplain?</li> </ul>	risk where it crosses main rivers.	be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.				
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially within the centre of Norwich.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. The new water reuse works at Whitlingham will be within the existing site of the STW which is within an area of countryside surrounded by fields, woods and the A47. Construction effects on the local community will be minimal as there are few receptors in this area.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Abstraction and discharge point downstream of River Wensum SAC/SSSI. Pipeline route runs near to SSSIs and a LNR. Upstream of	Potential to disturb species in nearby SSSIs and LNR. Potential for loss of flow downstream of Whitlingham STW and upstream of the designated site which may affect qualifying species..	-	Minor	High	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Broads SAC, and Broadland SPA/Ramsar					
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through the south-western part of Whitlingham Country Park.	Temporary visual effects from digging up ground to lay pipeline, especially within the Country Park. New water reuse works will be next to existing STW on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through the centre of Norwich where there is a high concentration of listed buildings. Pipeline route runs through or near 4 Registered Parks and Gardens and 10 Scheduled Monuments.	Temporary affects to Registered Parks and Gardens from lying of the pipeline. Potential to disturb archaeological remains in these areas. Pipeline running through scheduled monuments may cause damage to the fabric of the structure.	–	Major	High	<b>Highly Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>

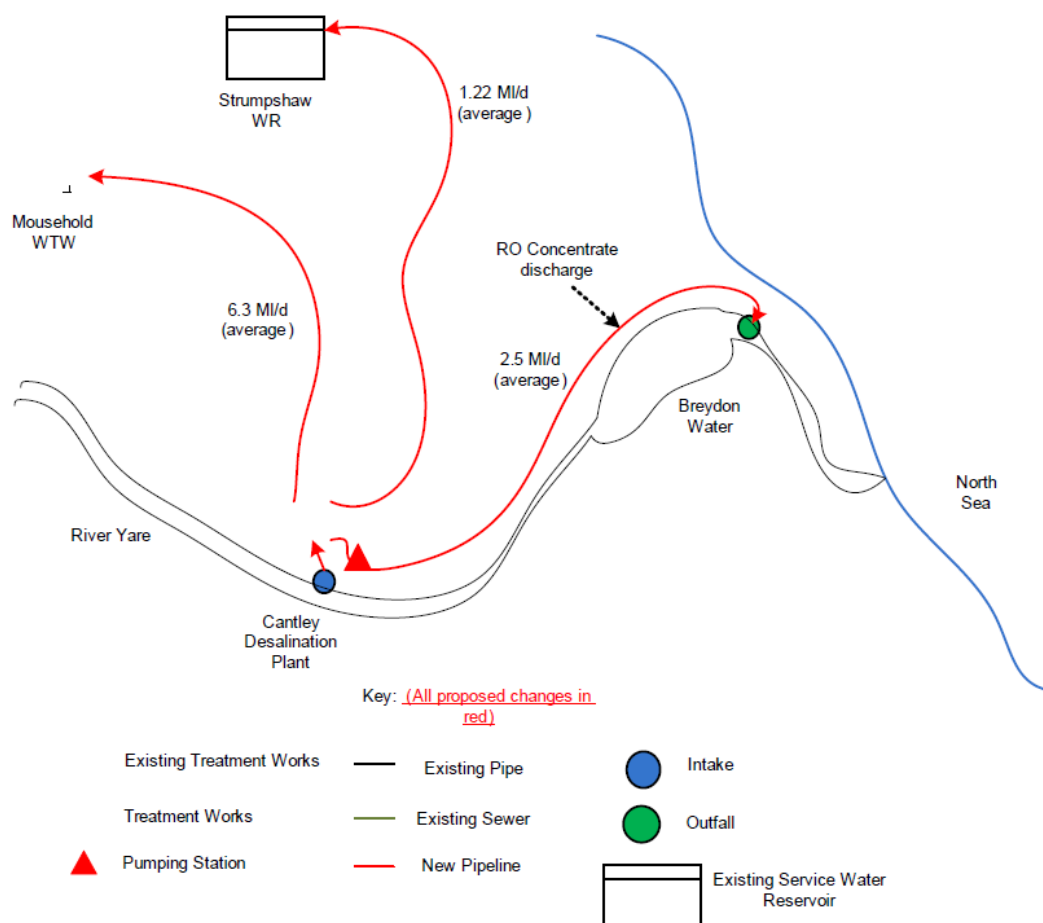
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 11,918 tCO <sub>2</sub> e. The operational carbon for this scheme is 4,461 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Existing Whitlingham STW and Norwich WTW will be utilised. A new Whitlingham Water Reuse Works and new pipeline will be required. Possible expansion of Norwich WTW required. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 and Grade 4. Pipeline route is within 200m of 4 historic and authorised landfill sites (adjacent to 2 of these sites)	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Discharge will be within EA standards so should not pollute the ground. The new water reuse works will be located next to the existing Whitlingham STW on Anglian Water land. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Negligible	Low	Not Significant



### D.7.3. Scheme NB3: Cantley Desalination

#### D.7.3.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

The Cantley plant will supply 1.22MI/d to Strumpshaw to satisfy Brundall and 6.3MI/d to Mousehold to satisfy Norwich. The proposed site location is at Cantley on the River Yare. The water is brackish and the salinity will vary with the tide. It is proposed that the brine or concentrate may be discharged at the outlet of Breydon Water as the river flows through Great Yarmouth. The concentrate or brine will have a salt concentration of 3,000 – 5,000mg/l, whereas seawater salinity is 35,000mg/l.

### D.7.3.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

European Designated Sites (SAC, SPA, Ramsar):

- The pipeline route runs through sections of the Broadland SPA and Ramsar site and The Broads SAC at 3 points;
- The discharge point is on the boundary of the Breydon Water SPA and Ramsar site; and
- The existing Cantley STW is within the Broadland SPA and Ramsar site and The Broads SAC.

National and local designated sites (SSSI, NNR, LNR):

- The discharge point is on the boundary of the Breydon Water SSSI and LNR;
- The pipeline route runs through Halvergate Marshes SSSI;
- The pipeline route runs through Cantley Marshes SSSI at 2 points and is close to the Yare Boards and Marshes SSSI;
- The pipeline route runs through Lion Wood LNR, which is adjacent to the existing treatment works at Mousehold; and
- The existing Cantley treatment works and a section of the pipeline route run through the Mid-Yare NNR.

#### Historic Sites and Assets

Scheduled Monument	Distance
Remains of St. Leonard's Priory	300m
Claxton Castle (remains)	500m
Langley Abbey	450m

Historic Park and Garden	Grade	Distance
Crown Point	II	Within 10m
The Rosary Cemetery	II*	170m of the existing treatment works at Mousehold

There are several listed buildings close to the route, especially within the centre of Norwich.

#### Water-bodies

The pipeline routes cross many inland waters, especially within the Broadland and Breydon Water areas. It crosses a larger water body at Whitlingham Country Park. The pipeline crosses the following main rivers and estuarine waters:

Main River/ Estuarine Water	Ecological Status/Potential	Chemical Status/Potential
Bure & Waveney & Yare & Lothing (Breydon Water) (Estuarine)	Moderate	Good
The Fleet	Moderate	Does not require assessment
River Yare (tidal). Pipeline crosses this river at 2 points	Moderate	Fail
Hellington Beck	Poor	Does not require assessment
Unknown	Good	Does not require assessment

#### Landscape

There pipeline routes are not within or near an AONB. The pipeline routes runs through Lion Wood, which is an areas of ancient and semi-natural woodland. The pipeline route also runs through Buckenham Wood (split into ancient replanted woodland, and ancient and semi-



natural woodland). The pipeline runs through Whitlingham Country Park. A large section of the pipeline runs through the Broads National Park.

### **Source Protection Zones**

The existing mousehold treatment works is within SPZ1. Sections of the pipeline route runs through all 3 SPZs.

### **Flood Risk**

The majority of the pipeline route is within an area of significant flood risk

### **Agricultural Land**

The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 and Grade 4.

### **Contaminated Land/Landfill**

Pipeline route close to South of Mill House, Claxton historic landfill site and through, or close to historic landfill site between Yarmouth Road and the River Yare (at Thorpe St Andrew).

### D.7.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Brine would be discharged at the outlet of Breydon Water.	Potential for discharged brine to cause negative effects at Breydon Water. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Moderate	Medium	Significant
		Pipeline will cross 5 main rivers/estuarine waters ranging from good to poor ecological status and good to fail chemical status.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of new pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be abstracted from the River Yare (tidal). Abstraction would be within licence limits.	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The majority of the pipeline route and the proposed Cantley desalination plant is within an area of significant flood risk	The proposed new Cantley desalination plant is next to the River Yare and in an area at significant risk of flooding which could cause operational issues. Although the majority of the pipeline is within a flood risk area there be no effects as it will be secure underground. No new flood storage is involved in the project but the existing service water reservoir at Mousehold will be utilised.	-	Minor	Medium	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		The nearest receptors to the site of the proposed Cantley desalination plant are the Reedcutter Pub & Restaurant (formerly the Red Inn) and the Cantley Sugar Factory.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of the pipelines. Cantley to Mousehold pipeline will involve 26km pipeline through fields, 44m of A roads reinstated, 3.4km B and minor roads reinstated, and a total of 89 no. direct drill crossings of rivers, roads and railways. There will also be temporary construction nuisance for receptors close to the Cantley desalination plant.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline runs through sections of the Broadland SPA, Ramsar site, Broads SAC, 2 SSSIs and a LNR. The discharge point is on the boundary of Breydon water SPA, Ramsar site, SSSI and LNR. The Cantley site and part of the pipeline is within a NNR. Pipeline route runs through Lion Wood (ancient and semi-natural woodland), and Buckenham Wood (ancient replanted woodland, ancient and semi-natural woodland).	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated sites and will directly affect species during construction which may affect them returning to the area or their breeding. Effects may be significant in the woodland areas if trees are lost to lay the pipeline (also affects bats and birds in woodland).	-	Major	High	Highly Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The pipeline runs through Whitlingham Country Park. A large section of the pipeline runs through the Broads National Park.	Temporary visual effects from digging up ground to lay pipeline, especially within the National Park and Country Park. The new Cantley desalination plant will be located next to the River Yare in an area of predominately fields, affecting the landscape character. Visual intrusion effects may be reduced due to the fact that the Cantley Sugar Factory is located nearby.	—	Moderate	Medium	Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs within 300-500m of 3 Scheduled Monuments, and is on	Temporary affects to Registered Park and Garden from lying of the pipeline. Potential to disturb archaeological remains in this area. It is assumed that	—	Minor	Medium	Not Significant

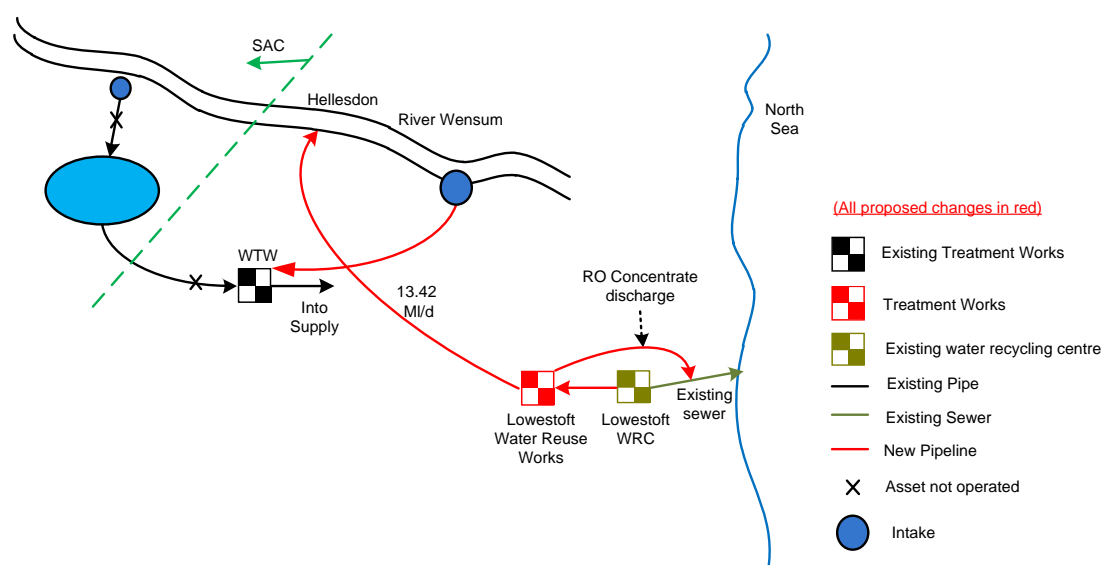
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		the boundary of a Registered Park and Garden. The existing Mousehold WTW is approx. 170m from a Registered Park and Garden (cemetery). There are several listed buildings near to the pipeline route.	pipelines will not run directly under listed buildings. However, lying of pipeline near to listed buildings may cause vibration effects. Scheduled Monuments should not be directly affected as the nearest one is 300m away. The setting of these historic assets may be temporarily affected from laying the pipeline but land will be restored.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions</li> </ul>	N/A	<p>Although the plant will treat brackish water which uses considerably less power than seawater desalination, the plant will require large amounts of power and a new electrical supply will be required.</p> <p>The total embodied carbon for this scheme is 42,962 tCO<sub>2</sub>e. The operational carbon for this scheme is 13,451 tCO<sub>2</sub>e per year.</p>	-	N/A	N/A	<b>Highly Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	from transport?						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	The existing treatment works at Mousehold will be utilised. A new desalination plant and new pipeline will be required. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 and Grade 4. The pipeline is likely to run through a historic landfill site next to the Whitlingham Country Park.	Likely to include temporary effect on soils and agricultural land through laying of pipelines, approx. 42.9km of pipeline will run through fields (although not all of these will be agricultural). Discharge will be within EA standards so should not pollute the ground. The new desalination plant at Cantley will be next to the existing Cantley sewage treatment works on Anglian Water land. Potential for contamination pathways to be created from laying the pipeline near the historic landfill sites.	—	Minor	Low	<b>Not Significant</b>

## D.7.4. Scheme NB4: Lowestoft Water Reuse

### D.7.4.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

There is a significant predicted deficit in the Norwich Planning Zone in both 2015 and 2040 due to reduced abstraction from the River Wensum. The existing river abstraction point at Norwich Pits is due to be closed for environmental reasons and the abstraction point at Norwich WTW will be developed and a new treatment works would be constructed.

The deficit is predicted to reach 64.7ML/d in 2040 and the new treatment plant at Norwich will provide 45 ML/d with a peak flow of 63ML/d (including the Bland Road supply).

A number of options are being considered to provide the necessary feed water to Norwich WTW and this option proposes the treatment of the Lowestoft effluent to discharge into the River Wensum at Hellesden upstream of the Norwich WTW intake but downstream of the Special Area of Conservation. The Lowestoft WTW is an advanced treatment plant incorporating a MBR.

### D.7.4.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

The proposed scheme starting point at Lowestoft is approximately 870m from the Corton Cliffs SSSI, afforded protection due to the important geology at the site, which is describes as

a “nationally important Pleistocene site”. Following the proposed scheme westwards from Lowestoft, it passes approximately 450m away from an unnamed area of Ancient Woodland, to the north of Blundeston.

As the scheme passes Fritton, it crosses into an area of Grazing Marshland. It then comes within 900m of the Breydon Water Ramsar Site and the Halvergate Marshes SSSI, afforded protection due to the area forming the largest expanse of traditionally managed grazing/grass marshes in Broadland. They support a wide variety of aquatic ditch communities, including nationally scarce populations of plants and invertebrate animals, as well as internationally important wildfowl and wading bird populations, both breeding and wintering. This site is also designated as the Broadland Special Protection Area and much of it forms part of the Breydon Water RSPB reserve.

North of Limpenhoe, the scheme passes approximately 500m away from the Broadland Ramsar and Limpenhoe Meadows SSSI, afforded protection due to being a fine example of unimproved fen grassland with dykes, with an exceptional level of diversity, particularly for plant species, but also invertebrates.

The scheme comes within 550m of the Mid-Yare National Nature Reserve, afforded protection due to rare breeding reedbed species such as swallowtail butterfly, Norfolk hawker dragonfly and marsh harrier. The lowland grasslands in the reserve support wintering wildfowl populations and breeding wading birds such as lapwing and snipe. This area supports a number of ecological designations. Here, the scheme also comes within 500m of the Cantley Marshes SSSI, afforded protection due to nationally rare or scarce plant populations, and rare breeding dragonfly populations. The site also has internationally important wintering numbers of wigeon and national important numbers of wintering bean goose (the majority of the British population).

The scheme also comes within approximately 700m of the associated Broadland Grazing Marsh area. Much of the land here is managed by the RSPB. At this point, the scheme also comes within 3km south-west of the Decoy Carr, Acle SSSI, Broadland SPA and Broadland Ramsar site. This wet woodland and fenland site has protective status due to fenland and wet woodland plant diversity.

South of Lingwood, the scheme passes the east of the Buckenham Wood area of Ancient Woodland and within 500m of the Strumpshaw Wood area of Ancient Woodland.

Around the top of Norwich, the scheme passes through and along by the River Wensum Grazing Marsh area and SSSI, given protective status as it is of interest as one of a national series of rivers as an example of an enriched, calcareous lowland river. The river supports an abundance of diverse riverine invertebrate fauna, with the associated terrestrial habitats supporting a range of diverse flora species.

At the point of the River Wensum discharge, the scheme crosses the Blackhill Wood Ancient Woodland. From the point of the River Wensum intake, the proposed scheme would then pass through and follow an adjacent path to the previously outlined River Wensum Grazing Marsh area and SSSI, before passing through these sites to access the Hellesdon discharge point.

The tables below outline the areas with environmental designations that the proposed scheme runs through or close to.



SSSI	Distance
Corton Cliffs	870m
Halvergate Marshes	900m
Limpenhoe Meadows	500m
Cantley Marshes	500m
Decoy Carr, Acle	3km
River Wensum	Scheme passes through and runs alongside

Ramsar	Distance
Breydon Water	900
Broadland	500m

Ancient Woodland	Distance
Unnamed, near Blundeston	450m
Buckenham Wood	75m
Strumpshaw Wood	500m
Blackhill Wood	Scheme passes through

SPA	Distance
Broadland	700m

### Agricultural Land

The proposed scheme will primarily pass through areas of land that have an agricultural classification of grade 3, with some areas with agricultural classification grades 1, 2 or 4, and a small area of non-agricultural and urban land. These are detailed in the map below.

### Flood Risk and Source Protection Zones

The proposed scheme passes through a substantial area of Flood Zone 3 in the Broadland area between Lowestoft and Norwich, as well as an area of Flood Zone 3 associated with the River Wensum, north-west of Norwich.

The scheme passes through a large area of groundwater source protection catchment zone 3, and some small areas of catchment zones 1 and 2 in the vicinity of the village of Brundall. The proposed scheme passes through an area of source protection zone 2 across the top of Norwich.

### Historic Sites and Assets

The scheme passes numerous historic features. The table below shows the Grade I, II\* and II listed features the proposed scheme would pass near to:

Listed Feature	Designation Type	Distance
Church of Bartholomew, north of Corton	Grade II*	250m
Lound Hall, Lound	Grade II	200m
Lodging Farmhouse, north of Lound	Grade II	320m
Fritton Old Hall, Fritton	Grade II*	250m
Church of St. Edmund	Grade II*	250m
Toft Monk's (detached) Windpump, west of Fritton	Grade II	300m
Holy Farm House, Reedham	Grade II	150m
Witton Green Farmhouse, Reedham	Grade II	120m
The Top House Public House, Reedham	Grade II	500m
Church of St. Botolph, Limpenhoe	Grade II*	350m
Tombstone, Church of St. Botolph, Limpenhoe	Grade II	350m
Remains of Church of St. Edmund, north of Cantley	Grade II*	500m

Listed Feature	Designation Type	Distance
Oaklands Farmhouse, Strumpshaw	Grade II	200m
Church of St. Peter, Strumpshaw	Grade I	450m
Church of St. Michael, south of Blofield	Grade I	50m
Church of St. Andrew and St. Peter, Blofield	Grade I	530m
Church of St. Gervase and Protase, Great Plumstead	Grade II*	600m
The Old Lodge, Great Plumstead	Grade II	250m
South Lodge Cottage, Great Plumstead	Grade II	400m
Church of St. Mary and St. Margaret, Sprowston	Grade I	500m
Walls, gates and gate-piers, Sprowston	Grade II	500m
Drayton Lodge, Drayton	Grade II*	500m
St. Edmund's Church, Costessey	Grade I	300m
Beehive Lodge, Costessey	Grade II	50m
The Marlpit Public House, Hellesdon	Grade II	350m
Barn at Hill House Farm, Hellesdon	Grade II	400m
Hellesdon House, Hellesdon	Grade II	450m
Old Stables to Hellesdon House, Hellesdon	Grade II	500m

The proposal runs past several Scheduled Monuments, and these are listed in the table below:

Scheduled Monument	Distance
Lound water works and engine house, Lound	600m
St. Edmund's Church	550m
Drayton Lodge, Drayton	500m
Village Cross 160m south of St. Margaret's Church	850m

The proposal also runs close by to two Registered Parks and Gardens, as detailed in the table below:

Registered Parks and Gardens	Designation Type	Distance
Catton Hall, Old Catton	Grade II*	550m
Norwich City (Earlham Road) Cemetery	Grade II	800m

The proposed scheme would pass several sites with archaeological evidence, primarily associated with the Second World War, Neolithic flint axes, Roman cropmarks and nineteenth Century brickworks. These do not constitute major archaeological sites.

### Socio-Economics

The proposed scheme would pass through 17 Statistical Wards, with a combined resident population of 86,863, taken from the 2001 census. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The scheme lies within the County of Norfolk and passes through the Local Authorities of Waveney, Great Yarmouth, Broadland, Norwich and South Norfolk.

The start of the pipeline, at Corton, is designated as a strategic gap. The scheme passes through two areas of Great Landscape Value in within the Broadland Local Authority, both near Brundall and near Drayton.

The proposed scheme would run through a mix of rural and urban environments, including the city of Norwich. The scheme runs through an area predominantly of tourism, leisure and agricultural industries, but it also runs through Norwich Airport and the various forms of employment associated with Norwich.

## Contaminated Land/Landfill

The scheme is close to a number of historic and authorised landfill sites:

- The Lowestoft STW is approx. 90m away from the Disused railway cutting off Stirrups Lane, Corton historic landfill last (open for receiving waste from 1981 to 1983, inert, household and industrial);
- Route approx. 300m north-east of Buckenham Woods, Strumpshaw historic landfill site (household waste);
- Route approx. 350m from Thorpe St Andrew historic landfill site (open to receive waste from 1930 to 1991, inert, commercial, liquids/sludge waste);
- Route approx. 500m south of Rackheath authorised landfill site; and
- Route approx. within 100m of Sandhill Quarries historic landfill site (inert and industrial).

## Water Bodies

The pipeline route crosses several inland waters, particularly around the Broadlands area (not within any designated areas but near to them). Main rivers crossed by the pipeline include:

Main River	Ecological Status/Potential	Chemical Status/Potential
Wensum DS Norwich	Poor	Fail
Wensum US Norwich	Bad	Fail
Tud	Moderate	Does not require assessment
Witton Run	Moderate	Does not require assessment
Fritton Lake	Moderate	Does not require assessment

#### D.7.4.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposal would cross the Fritton Decoy lake, numerous waterways associated with the Broads forming ditches across the marshland (a protected landscape, with designations including Ramsar and SSSI), the Burgh Castle and Berney Arms Reaches, a tributary located just north of Brundall and the River Wensum, north-east of Norwich.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Moderate	Medium	Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Minor	Medium	Not Significant
		Reused water could be piped from Lowestoft into the River Wensum.	Potential for water quality issues however water will be treated within WQ standards. The WFD assessment is incomplete	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			as the scheme was rejected at option stage.				
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of approximately 45km of pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Minor	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme reuses effluent reducing need for abstraction sources.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	A considerable section of the proposed scheme will be constructed in areas designated as Flood Zone 2, associated with the Norfolk Broads.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Scheme would require the construction of approximately 45km of new pipeline. This scheme would pass close to community receptors,	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. In particular the pipeline will involve 23m of A roads reinstated, 3.9km	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		particularly near Norwich.	B and minor roads reinstates, total 93 no. direct drill crossings of rivers, roads and railways. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas near Norwich, and smaller settlements and farms along the route. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme will pass through the River Wensum SSSI and the Blackhill Wood Ancient Woodland. The scheme also passes within 1km of a further 4 SSSIs, 2 Ramsar sites, 3 Ancient Woodlands and an SPA.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the SSSI site and will directly affect species during construction. This disturbance may impact on species returning to the area in the future or their breeding. Works to lay the pipeline within the ancient woodland may involve loss	-	Major	High	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			of tress and affects on bats and birds and other animals using this habitat. The route crosses many inland waters associated with the Broadland SPA and Breydon Water and there is potential for contamination during construction to affect designated sites further away.				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would not run through or close to any areas of Outstanding Natural Beauty.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged assuming new Lowestoft reuse works and Norwich WTW expansion are within existing Anglian Water land next to existing works.	—	Minor	Medium	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would run within 1250m of 73 listed features. The closest receptors are the Grade I Church of St. Michael, south of Blofield, and the Beehive Lodge, Costessey, both approximately 50m from the scheme. The proposed scheme would pass within 1250m of 7 Scheduled Monuments, coming with 500m of the closest one (Drayton Lodge). The scheme comes	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is reduced.	—	Minor	Medium	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		within 1800m of 6 Registered Parks and Gardens, the closest being 500m away (Catton Hall).					
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 12,498 tCO <sub>2</sub> e. The operational carbon for this scheme is 6,597 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building</li> </ul>	Scheme would require approximately 45km of new	Resources and materials required for scheme. Scheme design and materials will follow	-	Moderate	Low	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	pipeline. New Lowestoft water reuse works.	Anglian Water sustainability policy.				
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of Grade 3 agricultural quality, with some areas of Grades 1, 2 and 4. The works and pipeline routes are within 90-500m of 6 historic or authorised landfill sites.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground. Potential for contamination pathways to be created from laying the pipeline nears historic/authorised landfill sites.	—	Moderate	Low	<b>Not Significant</b>

## **D.7.5. Scheme NB5: Norwich storage option**

### **D.7.5.1. Scheme Description**

This option requires a large raw water storage reservoir to be constructed outside of Norwich. The reservoir would be filled from the existing intake at Norwich WTW and would require a twin pipeline between Norwich and the new reservoir.

This option has been developed to mitigate the scenario that a new 'hands off flow' (HoF) licence condition is imposed at Norwich WTW and additional storage would be required to allow for the periods when the river flows are below the HoF. The 'Costessey Surface Water Licence Sustainability Reduction Project, 2012' estimates that the storage requirements would be for approximately 100 days.

### **D.7.5.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

Starting from the Great Plumstead end of the proposed scheme, the route would run 850m of the Bulmer Coppice area of Ancient Woodland. The proposed scheme would pass through the Racecourse plantation area of replanted Ancient Woodland.

The proposed scheme would pass through the Mousehold Wood Local Nature Reserve (LNR), afforded protection as it is an area of urban heathland. Here it would also run approximately 850m from the St. James' Pit SSSI, afforded protective status due to fossil remains found at the site, and the potential for further study of Upper Cretaceous mosasaurs.

The proposed scheme would run approximately 650m from the Catton Grove Chalk Pit SSSI, afforded protection for its Upper Chalk Catton Sponge Bed.

At the Norwich WTW end of the proposed scheme, the route would run approximately 200m from the Sweet Briar Road Meadows SSSI. This site has been designated as a protected site due to its wet meadow habitat and associated flora.

Here, the scheme would also pass through the Wensum Valley LNR. This site lies adjacent to the Sweet Briar Road Meadows SSSI and contains similar habitats and species, as well some wooded areas.

The tables below lay out the areas with environmental designations the proposed pipeline runs close to.

<b>SSSI</b>	<b>Distance</b>
St. James' Pit	850m
Sweet Briar Road Meadows	200m
Catton Grove Chalk Pit	650m

<b>Ancient Woodland</b>	<b>Distance</b>
Bulmer Coppice	850m
Racecourse plantation	Proposed scheme would pass through

<b>LNR</b>	<b>Distance</b>
Mousehold Wood	Proposed scheme would pass through
Wensum Valley	Proposed scheme would pass through

## Agricultural Land

The proposed scheme would pass through land which is classified as either Grade 2 or 3 agricultural quality, or land which is urban. The agricultural land represents quality which is above average to average.

## Water Resources

The proposed scheme would cross some drainage ditches, north of Thorpe St. Andrew in the east of Norwich. It would also cross the River Wensum north-east of Norwich city centre, with the Norwich WTW site lying next to the River Wensum.

## Flood Risk

The proposed scheme would pass through areas of Flood Zone 3 associated with the Fenland area as well as crossing water bodies.

## Source Protection Zones

The proposed scheme would pass through areas of Source Protection Zones 1, 2 and 3.

## Historic Assets

The proposed scheme would run close and adjacent to numerous listed features in Norwich. This would comprise five Grade II listed features and a Grade II\* listed feature.

The following table shows the Scheduled Monuments within 500m of the proposed scheme.

*Scheduled Monuments*

Scheduled Monument	Distance
Site of William's Chapel	Proposed scheme would run adjacent
Remains of Church of St Bartholomew	Proposed scheme would run adjacent

The proposed scheme would run approximately 50m from the Grade II Waterloo Park Registered Park and Garden (RPG). It would also run less than 50m from the Grade II Wensum Park RPG. The end point of the proposed scheme would be located approximately 450m from the Grade II Norwich City (Earlham Road) Cemetery.

## Socio-Economics

The proposed scheme would run through the following statistical wards: Plumstead, Thorpe St Andrew South East, Thorpe St Andrew North West, Crome, Sprowston East, Catton Grove, Sewell, Mile Cross, Mancroft, and Wensum. The results from the 2011 census are yet to be published in full; therefore data from the 2001 census has been used. The 2001 census shows that the combined population for the wards was 80,740. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply in the area. The proposed scheme would be located in the Local Authorities of Broadland and Norwich. It would be located in the County of Norfolk.

The proposed scheme would cross the A1042, A1151, A140, A1067 and A1042. It would cross the Norwich – Cromer railway line to the east of Norwich. Much of the scheme would be located in built-up areas of Norwich. Parts of the scheme would be located in rural areas with agricultural industries. The predominant industries of Norwich are service-sector based.

### **Contaminated Land/Landfill**

The proposed scheme would not pass through or close to any areas of historic or authorised landfill.

#### D.7.5.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline would cross drainage ditches in rural areas, and the River Wensum.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect this water body through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Increased demand on water resources has the potential to result in increased demand for abstraction.	Water will be stored allowing for use when needed.	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on flood risk.	0	N/A	N/A	No Effect
		Part of the proposed scheme will be constructed in areas liable to flooding (both Flood Zones 2 and 3).	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable increased storage of water.	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline and modification of existing water works. This scheme would pass close to some community receptors – particularly in Norwich.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Modification works would take place within the existing sites. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas in	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			Norwich. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme would pass through an area of Ancient Woodland and two Local Nature Reserves. The proposal would also pass within 200m of another SSSI.	Effects considered to be limited to the construction period. Potential for pollution events or disturbance of woodland habitat, particularly if work is undertaken during breeding season.	-	Moderate	Medium	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would not run through an area designated as an AONB.	Temporary visual due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposal would run adjacent to two Scheduled Monuments. The scheme would come close to five Grade II listed features and one	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are not considered to be significant given the temporary nature of the	—	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Grade II* listed features.	works and the potential for intervening vegetation and other features to obscure the view of the temporary visual intrusion.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 18,733 tCO <sub>2</sub> e. The operational carbon for this scheme is 2,167 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing</li> </ul>	Scheme would require construction of new pipeline and	Negative effects of resource use for construction materials,	-	Moderate	Low	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	modification to existing water works	along with the construction materials required for the treatment works modifications.				
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through an area of Grades 2 and 3 agricultural quality. This represents average / above average quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	<b>Not Significant</b>

## **D.7.6. Scheme NB6: Norwich intake with pre-treatment**

### **D.7.6.1. Scheme Description**

**D.7.6.2. This option uses the existing intake at Norwich WTW and installing a new pre-treatment plant upfront of the existing works eliminating the need for bankside storage. The water will be abstracted from the River Wensum and receive pre treatment before joining the existing treatment stream. Scheme Baseline**

### **Ecological Sites and Environmental Designations**

The intake of the proposed scheme lies approximately 120m from the Sweet Briar Road Meadows SSSI. It has been afforded protective status as it forms the best remaining example of a type of wetland habitat which previously occurred more widely in the East Norfolk river valleys, but which has been largely lost. The site also forms the Wensum Valley (Mile Cross Marsh and Sycamore Crescent) Local Nature Reserve and an area designated as grazing marsh.

The tables below lay out the areas with environmental designations the proposed pipelines runs close to.

<b>SSSI</b>	<b>Distance</b>
Sweet Briar Road Meadows	120m

<b>Local Nature Reserve</b>	<b>Distance</b>
Sweet Briar Road Meadows	100m

The proposed scheme passes through an area without agricultural classification as it is classified as 'urban' instead.

### **Flood Risk and Groundwater**

The proposed pipeline would pass through an area of Flood Zones 2 and 3.

The scheme is located in groundwater protection zone 3.

### **Historic Assets**

<b>Scheduled Monument</b>	<b>Distance</b>
St. Bartholomew's Church	200m

<b>Registered Parks and Gardens</b>	<b>Distance</b>
St. Bartholomew's Church	600m

The proposed scheme comes within 200m of the Scheduled Monument of St. Bartholomew's Church, Heigham. It also comes within 600m of the Norwich City (Earlham Road) Cemetery Registered Park and Garden.

The scheme comes within 0m-550m of four no. Grade II listed features comprising the Gibraltar Café, Gibraltar Gardens Public House, Gate Pieces and Forecourt Walls to number 256 and the remains of St. Bartholomew Church. The proposed scheme also comes within 550m of the Grade II\* listed Dolphin Inn.

### **Socio-Economics**

The proposed scheme would be located in the statistical ward of Wensum. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. The 2001 census shows that the population of the Wensum ward was 10,509 persons. The route lies within Norfolk County Council and in the Local Authority of Norwich. It lies exclusively within an existing water management site, and therefore its impacts on the wider area in terms of socio-economics are limited.

### **Contaminated Land/Landfill**

The scheme intake is within 50m of a historic landfill site called "Off Waterworks Road".

#### D.7.6.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposal would be located within existing Water Works, alongside the River Wensum. Abstraction would be from the River Wensum	The construction process has the potential to cause pollution to the River Wensum, such as through disturbing contaminated land and spillage of construction materials. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect this water body through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. Operational abstraction from the River Wensum could affect water flows.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of approximately 350m of pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains	-	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts				
		Increased demand on water resources has the potential to result in increased demand for abstraction	Scheme would enable increased flexibility of water resources, enabling reduced pressure on abstraction	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on flood risk management or storage.	0	N/A	N/A	No Effect
		The scheme would be constructed within Flood Zones 2 and 3.	Construction works could have potential to cause temporary increased flooding. Pipelines can burst causing localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Norwich Planning Zone deficit is forecast to reach 64.7ml/d by 2040 due to reduced abstraction from the River Wensum.	Will help mitigate against the forecast water deficit.	+	Moderate	Medium	Significant
		Scheme would require the construction of approximately 350m of new pipeline. This scheme would pass close to community receptors, particularly near	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for nearby residents from construction of pipeline. Construction effects on the local community will	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Norwich.	be minimised through maintaining scheme within existing site works boundaries. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme will pass close to the Sweet Briar Meadows SSSI and LNR. Abstraction will be from the River Wensum.	Effects of the Sweet Briar Meadows SSSI and LNR land would be limited to the construction phase or maintenance work. Construction methods have potential for negative impacts on these sites. Direct effects would be limited, however, as the scheme would not pass directly through. The volume of water to be abstracted from the Wensum is not known and changes in flows could affect migratory species from the Wensum SAC, and designated sites downstream	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would not run through or close to any areas of Outstanding Natural Beauty. It will be within an existing water works facility and located adjacent to an urban area.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged. No impacts on AONBs.	—	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would run within 200m of the St. Bartholomew's Church, Heigham Scheduled Monument., and within 550 of four Grade II listed features.	Potential for temporary impacts on setting for listed features associated with the pipeline construction. These are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is minor.	—	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 16,337 tCO <sub>2</sub> e. The operational carbon for this scheme is 3,285 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require approximately 350m of new pipeline.	Negative effects of resource use for construction materials. Short length of pipeline means these are not considered to be significant.	-	Minor	Medium	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through an area without agricultural classification as it is considered an urban area.	Likely to include temporary effect on soils through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Minor	Low	Not Significant



### **D.7.7. Scheme NB7: Norwich intake with lining existing bankside storage**

#### **D.7.7.1. Scheme Description**

Anglian Water is conducting a study to assess the potential hydraulic continuity between Norwich Pits and the River Wensum. The investigation was initiated as there was concern that drawing down the pits could impact the Wensum SAC. This option involves the lining of both the existing and newly acquired pits to prevent connectivity to the river. A new pipeline from Norwich WTW is required.

A HDPE liner covered with 1m of bed material is the preferred method. A temporary sheet-pile cut-off wall around the pits and pumping would be required to de-water the pits for the installation of the liner.

As part of the Wensum sustainability reduction there is a risk that the Norwich boreholes will not be available to support the pits during periods of high turbidity in the river. Therefore, a coarse 'roughing' filter upfront of the existing Norwich WTW is required.

#### **D.7.7.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

The proposed scheme would pass through the Wensum Valley (Mile Cross Marsh and Sycamore Crescent) LNR in Norwich as it travels north from its origin point. This site has been afforded protective status due to urban wetland and wet meadow habitats found in the site. The proposed scheme would also pass through the adjoining Sweet Briar Road Meadows SSSI. This site has been afforded protective status due to the wet meadow habitat found on the site, which is particularly important given the site's urban setting. The site contains a wide variety of wet meadow plant species and associated fauna.

The outlet to the proposed scheme near Taverham will lie in/adjacent to the River Wensum SSSI and SAC. This area has been designated as it is one of a national series of rivers as an example of an enriched, calcareous lowland river. The river supports an abundance of diverse riverine invertebrate fauna, with the associated terrestrial habitats supporting a range of diverse flora species

The tables below outline the areas with environmental designations that the proposed scheme runs through or close to.

<b>SSSI</b>	<b>Distance</b>
Sweet Briar Road Meadows	Proposed scheme would pass through
River Wensum	Proposed scheme would pass through/lie adjacent

<b>LNR</b>	<b>Distance</b>
Wensum Valley (Mile Cross Marsh and Sycamore Crescent)	Proposed scheme would pass through

<b>SAC</b>	<b>Distance</b>
River Wensum	Proposed scheme would pass through/lie adjacent

##### **Source Protection Zones**

The proposed scheme passes through an area of source protection zone 3, as well as a small area of zone 1.

### **Agricultural Classification**

The proposed scheme will primarily pass through areas of land that have an agricultural classification of grade 3, with some areas with agricultural classification grades 1, 2 or 4, and a small area of non-agricultural and urban land.

### **Flood Risk**

The proposed scheme would pass through flood zones 2 and 3 associated with passing close to the River Wensum. It would also pass through other areas of flood risk.

### **Historic Assets**

The proposed scheme would pass close to three Grade II listed features in Drayton.

In Drayton it would also run past the Scheduled Monument of the Village Cross 160m south of St. Margaret's Church. It would also pass approximately 180m north-east from the Drayton Lodge Scheduled Monument. These are listed in the table below.

The proposed scheme would not pass close to any Registered Park and Gardens.

Scheduled Monument	Distance
Village Cross 160m south of St. Margaret's Church, Drayton	Proposed scheme would run adjacent to (less than 20m away)
Drayton Lodge	160m

### **Socio-Economics**

The proposed scheme would pass through the following six Statistical Wards: Wensum, Mile Cross, Hellesdon South-East, Hellesdon North-West, Drayton South, and Taverham South. The combined population for these wards in the 2001 census was 38,594. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The scheme lies within the County of Norfolk and passes through the Local Authorities of Broadland and Norwich.

The proposed scheme would run through a mix of rural and urban environments, including part of the city of Norwich. The scheme runs through an area predominantly of tourism, leisure and agricultural industries, but also the service-focussed economy of Norwich.

### **Contaminated Land/Landfill**

The proposed scheme would not run close to any areas of authorised or historic landfill.

### D.7.7.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed pipeline route would cross the River Wensum SAC & SSSI at Norwich Pits. Abstraction would be from the River Wensum.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect water bodies through the leakage of water from the pipeline. The abstraction has the potential to affect flows in the River Wensum.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts	-	Negligible	Low	Not Significant
		Increased demand	Scheme would enable	+	Minor	Medium	Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		on water resources has the potential result in increased demand for abstraction.	increased flexibility of water resources, enabling reduced pressure on abstraction.				Significant
		Scheme concerns supply, and therefore will not affect demand.	None.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on flood risk.	0	N/A	N/A	No Effect
		Small sections of the proposed scheme would be constructed in areas of higher flood risk associated with the River Wensum.	Construction works could have potential to cause temporary increased flooding. Burst pipes can cause localised flooding.	-	Negligible	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Norwich Planning Zone deficit is forecast to reach 64.7ml/d by 2040 due to reduced abstraction from the River Wensum.	The proposed scheme would help improve water supply through water storage facilities.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, particularly near Norwich.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			areas near Norwich. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme will pass through the Sweet Briar Road Meadows SSSI and the Wensum Valley LNR. It will also cross the River Wensum SAC & SSSI at Norwich Pits	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding. The abstraction has the potential to affect flows and could affect habitat and species downstream (including the Broads SAC and Broadland SPA and Ramsar site).	-	Moderate	High	Highly Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would not run through or close to any areas of Outstanding Natural Beauty.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged. No impacts on AONBs.	—	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a</li> </ul>	Proposal would have potential to directly affect three	Potential for temporary impacts on setting for listed features associated	—	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
setting	historic asset?	listed features, though impacts would be limited to setting. Proposed scheme would pass by a Village Cross Scheduled Monument, and approximately 160m away from another at Drayton Lodge.	with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is minor.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from</li> </ul>	N/A	The total embodied carbon of the scheme is 15,911 tCO <sub>2</sub> e The operational carbon is 4,605 tCO <sub>2</sub> e per year	-	N/A	N/A	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	transport?						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of Grade 3 agricultural quality, as well as areas classified as 'urban'.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Minor	Low	<b>Not Significant</b>

## **D.7.8. Scheme NB8: Norwich intake with new bankside storage**

### **D.7.8.1. Scheme Description**

This option is an alternative to NB7: lining the existing bankside storage. The construction of new bankside storage to replace Norwich pits removes the need to line the pits due to hydraulic continuity (see Scheme NB7).

The option would still require a coarse 'roughing' filter upfront of the existing Norwich WTW if the Norwich boreholes are not available to support the pits during periods of high turbidity in the river.

### **D.7.8.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The proposed scheme would pass approximately 500m of the Bawthorpe Marsh Local Nature Reserve (LNR). This site has been afforded protective status as it is an unimproved area of grassland adjacent to the River Wensum, supporting aquatic flora species.

The proposed scheme would run approximately 150m of the Earlham Park Woods LNR, afforded protection as it contains a diverse range of habitats, including a range of woodland flora and regenerating elm trees.

At the Norwich WTW end of the proposed scheme, the route would run approximately 200m of the Sweet Briar Road Meadows SSSI. This site has been designated as a protected site due to its wet meadow habitat and associated flora.

Here, the scheme would also pass through the Wensum Valley LNR. This site lies adjacent to the Sweet Briar Road Meadows SSSI and contains similar habitats and species, as well some wooded areas.

The tables below lay out the areas with environmental designations the proposed pipeline runs close to.

<b>SSSI</b>	<b>Distance</b>
Sweet Briar Road Meadows	200m

<b>LNR</b>	<b>Distance</b>
Bawthorpe Marsh	500m
Earlham Park Woods	150m
Wensum Valley	Proposed scheme would pass through

#### **Agricultural Land**

The proposed scheme would pass through land which is classified as either Grade 3 or urban agricultural quality. The Grade 3 land represents average agricultural quality.

#### **Water Resources**

The proposed scheme would cross the River Yare north of Cringleford. The Norwich WTW site lies on the banks of the River Wensum.

#### **Flood Risk**



The proposed scheme would pass through areas of Flood Risk 2 and 3 associated with crossing the River Yare and running close to the River Wensum.

### **Source Protection Zones**

The proposed scheme would pass through areas of Source Protection Zones 1, 2 and 3.

### **Historic Assets**

The proposed scheme would pass close by two Grade II listed features and the Grade I listed Church of St. Mary, all near Earlham. The closest Scheduled Monument the scheme would pass close to would be the Remains of the Church of St. Bartholomew; approximately 700m.

The proposed scheme would run adjacent to the Grade II Norwich City (Earlham Road) Cemetery Registered Park and Garden.

### **Socio-Economics**

The proposed scheme would run through three statistical wards comprising Cringleford, University and Wensum. The results from the 2011 census are yet to be published in full; therefore data from the 2001 census has been used. The 2001 census shows that the combined population of the wards was 23,484 persons. It is envisaged that the wider area will undergo population growth with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The proposed scheme would be located in the Local Authorities of South Norfolk and Norwich, lying within the County of Norfolk.

The proposed scheme would cross the A47 dual carriageway to the west of Norwich. The proposed scheme would also cross the A1074 and the A140 in Norwich. The proposed scheme would be located within both rural and urban areas. The rural areas have industries centred upon agriculture, with Norwich having an economy largely based upon the service

### **Contaminated Land/Landfill**

The proposed scheme would not pass through any areas associated with historic or authorised landfill.

### D.7.8.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline would cross the River Yare and run close to the River Wensum.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect this water body through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would enable increased flexibility of water resources, enabling reduced pressure on abstraction.	+	Minor	Medium	Not Significant
3. Minimise the risk and	Will it contribute to managing	The scheme does	The scheme would not	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
reduce the impact of flooding	flood risk e.g. involve flood storage? • Will it involve loss or construction on the floodplain?	not involve managing flood risk.	have effects on flood risk.				
		Part of the proposed scheme will be constructed in areas liable to flooding (both Flood Zones 2 and 3).	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	<b>Not Significant</b>
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	• Will it help secure water supplies for customers? • Will it cause nuisance for local communities? • Will it create community assets e.g. reservoir nature trail?	The scheme would enable increased storage of water.	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Moderate	Medium	<b>Significant</b>
		Scheme would require the construction of new pipeline and modification of existing water works. This scheme would pass close to some community receptors – particularly in Norwich.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Modification works would take place within the existing sites. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas in Norwich. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	<b>Not Significant</b>
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	<b>No Effect</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would pass through an LNR. The proposal would also pass within 500m of another two LNRs and within 200m of a SSSI	Effects considered to be limited to the construction period. Potential for pollution events or disturbance of woodland habitat, particularly if work is undertaken during breeding season.	-	Moderate	Medium	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would not run through an area designated as an AONB.	Temporary visual due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposal would pass close to two Grade II listed features and a Grade I listed feature. The closest Scheduled Monument lies 700m from the scheme and it would run adjacent to two RPGs.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are not considered to be significant given the temporary nature of the works and the potential for intervening vegetation and other features to obscure the view of the temporary visual intrusion.	—	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 21,771 tCO <sub>2</sub> e. The operational carbon for this scheme is 6,336 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline and modification to existing water works	Negative effects of resource use for construction materials, along with the construction materials required for the treatment works modifications.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through an area of Grade 3 agricultural quality. This represents average quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	Not Significant

## **D.7.9. Scheme NB10: Norwich intake to existing bankside storage**

### **D.7.9.1. Scheme Description**

This option utilises the existing Norwich intake and storage at Norwich Pits by providing a new pipeline from Norwich WTW to the pits. Water is then conveyed from the pits back to Norwich WTW via the existing pipelines.

### **D.7.9.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The proposed scheme would pass through the Wensum Valley (Mile Cross Marsh and Sycamore Crescent) LNR in Norwich as it travels north from its origin point. This site has been afforded protective status due to urban wetland and wet meadow habitats found in the site. The proposed scheme would also pass through the adjoining Sweet Briar Road Meadows SSSI. This site has been afforded protective status due to the wet meadow habitat found on the site, which is particularly important given the site's urban setting. The site contains a wide variety of wet meadow plant species and associated fauna.

The outlet to the proposed scheme near Taverham will lie in/adjacent to the River Wensum SSSI and SAC. This area has been designated as it is one of a national series of rivers as an example of an enriched, calcareous lowland river. The river supports an abundance of diverse riverine invertebrate fauna, with the associated terrestrial habitats supporting a range of diverse flora species

The tables below outline the areas with environmental designations that the proposed scheme runs through or close to.

<b>SSSI</b>	<b>Distance</b>
Sweet Briar Road Meadows	Proposed scheme would pass through
River Wensum	Proposed scheme would cross the SSSI at Norwich Pits

<b>LNR</b>	<b>Distance</b>
Wensum Valley (Mile Cross Marsh and Sycamore Crescent)	Proposed scheme would pass through

<b>SAC</b>	<b>Distance</b>
River Wensum	Proposed scheme would cross the SAC at Norwich Pits

#### **Source Protection Zones**

The proposed scheme passes through an area of source protection zone 3, as well as a small area of zone 1.

#### **Agricultural Classification**

The proposed scheme will primarily pass through areas of land that have an agricultural classification of grade 3, with some areas with agricultural classification grades 1, 2 or 4, and a small area of non-agricultural and urban land.

## Flood Risk

The proposed scheme would pass through flood zones 2 and 3 associated with passing close to the River Wensum. It would also pass through other areas of flood risk.

## Historic Assets

The proposed scheme would pass close to three Grade II listed features in Drayton.

In Drayton it would also run past the Scheduled Monument of the Village Cross 160m of St. Margaret's Church. It would also pass approximately 180m from the Drayton Lodge Scheduled Monument. These are listed in the table below.

The proposed scheme would not pass close to any Registered Park and Gardens.

Scheduled Monument	Distance
Village Cross 160m south of St. Margaret's Church, Drayton	Proposed scheme would run adjacent to (less than 20m away)
Drayton Lodge	160m

## Socio-Economics

The proposed scheme would pass through the following six Statistical Wards: Wensum, Mile Cross, Hellesdon South-East, Hellesdon North-West, Drayton South, and Taverham South. The combined population for these wards in the 2001 census was 38,594. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The scheme lies within the County of Norfolk and passes through the Local Authorities of Broadland and Norwich.

The proposed scheme would run through a mix of rural and urban environments, including part of the city of Norwich. The scheme runs through an area predominantly of tourism, leisure and agricultural industries, but also the service-focussed economy of Norwich.

## Contaminated Land/Landfill

The proposed scheme would not run close to any areas of authorised or historic landfill.

### D.7.9.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed pipeline route would cross the River Wensum SAC & SSSI at Norwich Pits. Abstraction from the River Wensum.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	<b>Not Significant</b>
			The operation of the pipeline has potential to affect water bodies through the leakage of water from the pipeline. The abstraction has the potential to change flows in the River Wensum. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has concluded that there will be no risk of deterioration.	0	N/A	N/A	<b>No Effect</b>
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of	-	Negligible	Low	<b>Not Significant</b>



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			water lost through leakage can increase rapidly and may even result in significant losses through bursts				
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would enable increased flexibility of water resources, enabling reduced pressure on abstraction.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on flood risk.	0	N/A	N/A	No Effect
		Small sections of the proposed scheme would be constructed in areas of higher flood risk associated with the River Wensum.	Construction works could have potential to cause temporary increased flooding. Burst pipes can cause localised flooding.	-	Negligible	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Norwich Planning Zone deficit is forecast to reach 64.7ml/d by 2040 due to reduced abstraction from the River Wensum.	The proposed scheme would help improve water supply through increased flexibility in water provision.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, particularly near	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Norwich.	community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas near Norwich. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme will pass through the Sweet Briar Road Meadows SSSI and the Wensum Valley LNR..	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated sites and will directly affect species during construction which may affect them returning to the area or their breeding.	-	Moderate	Medium	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would not run through or close to any areas of Outstanding Natural Beauty.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged. No impacts on AONBs.	—	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would have potential to directly affect three listed features,	Potential for temporary impacts on setting for listed features associated with the pipeline	—	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		though impacts would be limited to setting. Proposed scheme would pass by a Village Cross Scheduled Monument, and approximately 160m away from another at Drayton Lodge.	construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is minor.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from</li> </ul>	N/A	The total embodied carbon of the scheme is 3,725 tCO <sub>2</sub> e The operational carbon is 1,267 tCO <sub>2</sub> e per year	-	N/A	N/A	<b>Not Significant</b>

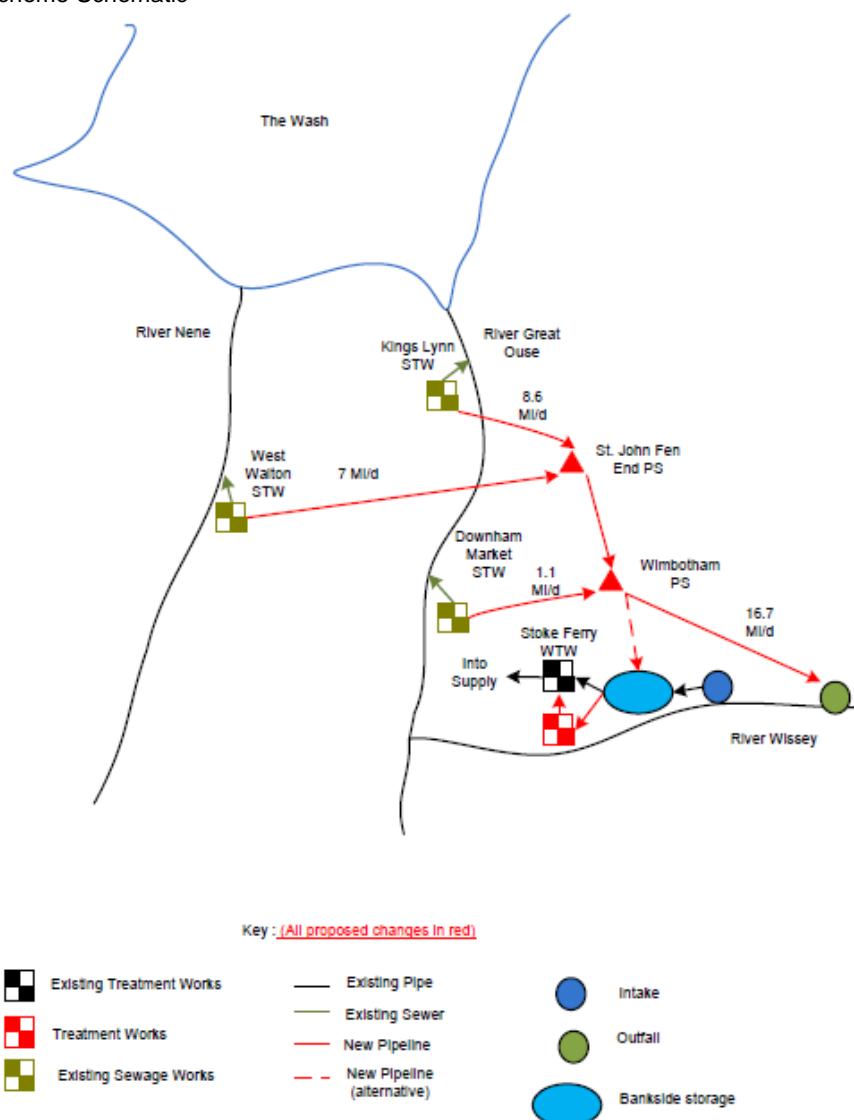
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	transport?						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of Grade 3 agricultural quality, as well as areas classified as 'urban'.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Minor	Low	<b>Not Significant</b>

## D.8. Fenland RZ

### D.8.1. Scheme F1: Kings Lynn and Wisbech Water Reuse

#### D.8.1.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

Treated effluent from King's Lynn STW is proposed to be combined with the effluent from West Walton STW and pumped into the River Wissey 2km upstream from the existing Stoke Ferry WTW abstraction point.

King's Lynn STW will require modification to incorporate a sidestream membrane bioreactor and RO. The RO product water will be dosed with hydrogen peroxide or ozone and treated with UV radiation to provide additional virus inactivation and to breakdown any remaining

organic species such as pesticides. The product water will be oxygenated and the pH will be increased prior to pumping water to the River Wissey.

The RO concentrate will be discharged at the existing King's Lynn STW into the tidal stretch of the River Great Ouse. The concentrate will have a salt concentration of significantly lower than ambient sea water.

At West Walton STW, the final effluent ammonia concentration is low therefore additional ammonia treatment is not required. RO will be required to reduce the salt concentration. The concentrate from the RO plant will be discharged with the current West Walton discharge. An advanced oxidation process such as hydrogen peroxide and UV radiation will be required to achieve additional virus inactivation and destruction of oestrogen based chemicals.

#### D.8.1.2. Scheme Baseline

##### Scheduled Monuments Sites

The pipeline runs close to the three Scheduled Monuments as shown in the table below.

Monument	Distance	Reason for Designation
Cross in St Margaret's churchyard (Top of map)	Within 500m	The monument includes the remains of a standing stone cross located within St Margaret's churchyard, approximately 8m to the south west of the south porch of the church. The cross, which is Listed Grade II, is 14th century in date and includes the socket stone and the lower part of the original shaft.
Moated site 140m north east of Crimplesham Hall (Bottom left of map)	Within 50m	The monument includes a moated site situated at the western end of Crimplesham village and to the south of Downham Road, which at this point formerly ran to the south of the present line and within 30m of the north west corner of the moat. The moated site is at the south west corner of a field which is named on a map of 1839 as Talbots, and it is probable that it is the site of the medieval manor house of that name.
Remains of monastic grange with moated site at Grange Farm (Bottom right of map)	Within 200m	The monument includes remains of a monastic grange with a small moated site and associated earthworks, located to the east of the road between King's Lynn and Wereham and about 2.5km to the north east of the site of West Dereham Abbey, to which the grange belonged. It also includes the buried remains of an early 17th century house to the north west of the moated site.

In addition, there are a number of listed buildings in close proximity to the route, which have been listed below. A radius of approximately 200m was used.

Listed Building	Grade	Distance
Crimplesham hall	II	50m
Folly 70 Metres South West of Crimplesham Hall	II	100m
Ardmore House Fairview Cottage Ruby Cottage	II	50m
Church of St Mary	II*	50m
Mannor Farmhouse	II	100m
Complex of Farm Buildings Immediately West of Manor Farmhouse	II	100m
The Mannor House	II	50m
The Limes	II	100m
The George And Dragon	II	100m
The White House	II	100m
The Cottage	II	100m
Post Office Vine House	II	100m

Pitt Farmhouse	II	100m
Church Of St Margaret	II*	100m
Old Vicarage House	II	100m

## Ecological Sites

The Pipeline route runs near to three SSSIs (shown in the table below).

SSSI	Distance
Islington Heronry	500m
Wretton Deposits	1km
Boughton Fen	1km

The pipeline lies close to the Islington Heronry SSSI. Extent of mature woodland cover has been maintained. The farm manager reports sightings this year of between 17 and 31 individual herons on adjacent arable fields prior to nesting. Egg shells found confirm continued breeding.

The pipeline lies close to the River Wissey at Wretton. At Wretton a complex series of late Pleistocene (Ipswichian–Devensian) terrace deposits of the River Wissey have been exposed in the sides of a cut-off channel. The Devensian deposits are of unique interest because they record the most complete sequence of Early Devensian deposits containing stratigraphically useful pollen, molluscs, beetles and vertebrates, collectively making this a key stratigraphic locality. Fluvial deposits here contain abundant fossil mammal remains. This assemblage includes wolf, arctic fox, bear, reindeer, bison and woolly rhinoceros making Wretton Britain's richest vertebrate locality of early Devensian age.

The pipeline lies close to Boughton Fen SSSI situated on shallow fen peats in the valley of a tributary of the River Wissey. A tall fen community covers much of the site and several interesting plants are present. Scrub is well represented and is used by breeding birds. The site is of entomological interest. Reed *Phragmites australis* forms an almost pure stand where the water-table is highest at the southern end of the site. The remainder of the site is of variable wetness and a more diverse fen community has developed. Reed is again dominant, but Meadowseet *Filipendula ulmaria* and Great Willowherb *Epilobium hirsutum* are abundant. Other species present include Common Valerian *Valeriana officinalis*, Hemp Agrimony *Eupatorium cannabinum*, Angelica *Angelica sylvestris*, Purple Small-Reed *Calamagrostis canescens* and Reed Sweet-Grass *Glyceria maxima*. On the highest ground, woodland has developed and is dominated by Ash *Fraxinus excelsior* and Alder *Alnus glutinosa* with some Willow *Salix sp.* The ground flora consists of Meadowseet, Nettle *Urtica dioica* and Hogweed *Heracleum sphondylium*. Several areas of dense Blackthorn *Prunus spinosa* scrub are present on the drier parts of the site. Many uncommon species of moth have been recorded from the site, including the rare *Perizoma sagittaria*. Sedge, reed and grasshopper warblers all breed on the fen and otters are regular visitors.

## Agricultural Land

Agricultural land classification ranges from Grade 1 on the western section of the pipeline, to Grade 3 on the eastern side.

## Flood Risk

The pipeline is located within flood risk zone 1. Zone 1 is a low probability risk, i.e. land with less than 1 in 1000 annual probability of river or sea flooding in any year.

## Water Bodies

The pipeline will cross The River Great Ouse approximately 2km north of Downham Market.

### **Source Protection Zones**

The pipeline is not located within a groundwater source protection zone, i.e. the Environment Agency's policy and approach to controlling the risk to groundwater supplies from potentially polluting activities and accidental releases of pollutants

### **Socio Economics**

Kings Lynn and West Norfolk population is approximately 143,330 and approximately 67.4% of people live in rural areas. In rural King's Lynn and West Norfolk 36.5% of people aged 16 to 74 are economically inactive. 55.5% of those people are retired, 5.8% are students and 18.3% are looking after the home or family. In comparison, 33% of people aged 16 to 74 are economically inactive in urban King's Lynn and West Norfolk and 31% are economically inactive in rural parts of the Government Office Region.



### D.8.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The River Great Ouse approximately 2km north of Downham Market.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. Potential to reduce flows in the River Rene and River Great Ouse. This could lead to sediment transport and water quality issues. The WFD screening has demonstrated the need for a full WFD assessment. Due to absence of data, further assessment considering the impact on flow is recommended prior to this option being progressed.	?	N/A	N/A	Effect Unknown
2. Maintain and improve sustainable water resources and	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over</li> </ul>	Pipelines have the potential for leakages to occur. This scheme	Leakages from pipeline are common. However, modern construction techniques and	-	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
encourage the sustainable use of water	<ul style="list-style-type: none"> <li>abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	concerns construction of approximately 5km of pipeline.	pipes have a lower propensity for leakage.				
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would reduce potential demand for abstracted water as water would be taken from a wastewater resource. The wastewater would otherwise pass back into the water cycle.	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Part of the scheme will be constructed in areas liable to flooding.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	N/A	Will help mitigate against the forecast water deficit through increased supply but without the need for increased abstraction rates.	+	Moderate	Medium	Significant
		Scheme would require the construction of 24km of new pipeline. This scheme would pass close to community receptors.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve	No effects predicted.	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		directly creating of community assets.					
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would not pass through designated sites.	No direct loss of habitat or disruption within designated areas. However, potential for temporary construction disturbance from noise and dust etc. Potential effect on the Wash from reduced river flows and sediment transportation.	-	Minor	High	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Does not pass through an AONB or any landscape-designated area.	Temporary visual due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The pipeline comes within approximately 200m of a SM and within approximately 50m of a number of listed buildings.	Potential for the scheme to compromise the historic setting of the structures identified, due to the construction of the pipeline. Temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor.	—	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and	Proposed scheme build resilience to the effects of climate change through improved water supply security. Felixstowe part of the scheme could be at risk from increasing sea levels.	+	Moderate	Medium	Significant

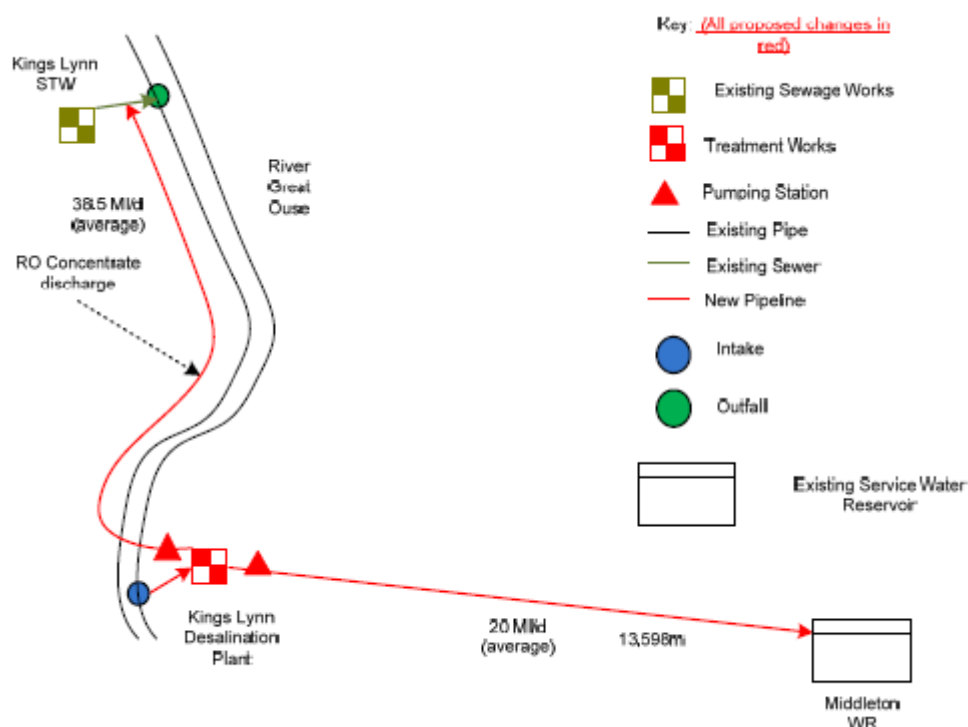
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 19,208 tCO <sub>2</sub> e. The operational carbon for this scheme is 13,170 tCO <sub>2</sub> e per year.	-	N/A	N/A	Highly Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require 24km of new pipeline	Negative effects of resource use for construction materials, along with the construction materials required for the desalination plant and pipeline. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The area ranges from Grade 1 to 3 agricultural land. No landfill sites in close proximity.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	Not Significant



## D.8.2. Scheme F2: Kings Lynn desalination

### D.8.2.1. Scheme Description

Scheme Schematic



Source: Anglian Water

This option involves development of a desalination plant located south of King's Lynn on the River Great Ouse. The river intake would be located on the river bank and the intake must be protected to prevent damage by ships. The salinity of the river water will vary with the tides and the RO feed pumps will be controlled by Variable Frequency Drivers (VFDs) to optimise energy use. The brine will be discharged at the existing Kings Lynn STW to minimise the increase in salinity during incoming tides when the brine will be drawn up the river towards the intake.

The proposed pre-treatment process comprises DAF and UF. The sludge from the DAF and chemical backwash waste from the UF will be discharged to the sewer network. The UF backwash will be discharged with the brine. The UF product will be collected and pumped to the desalination plant. A two-pass system with partial second pass is proposed subject to receipt of a full seawater analysis.

### D.8.2.2. Scheme Baseline

#### Ecological Sites

The pipeline is not located near any international sites of ecological importance (Ramsar, SAC, and SPA).

The pipeline route does, however, run through the River Nar SSSI. The River Nar originates as a spring-fed stream, west of Mileham in Norfolk and flows for 42 km before joining the River Great Ouse at Kings Lynn, where a sluice prevents the penetration of seawater at high tide. The River combines the characteristics of a southern chalk stream and an East Anglian fen river. Together with the adjacent terrestrial habitats, the Nar is an outstanding river system of its type.

The upper Nar has a wide range of natural physical features incorporating riffles, pools, gravel beds and meanders, whilst the lower reaches below Narborough are embanked and steep sided with water flowing sluggishly through a predominantly arable flood plain. The variation in physical features and the influence of the underlying chalk give rise to a rich and diverse flora. Amongst the 78 species of riverine and bankside plants are many eutrophic and mesotrophic species, including 5 pondweeds and 8 bryophytes.

The Nar is well-known locally for its brown trout, *Salmo trutta*. Since 1985, trout numbers have increased steadily; pike, *Esox lucius*, numbers have remained fairly stable whilst roach, *Rutilus rutilus*, and eel, *Anguilla anguilla*, have continued to be the dominant species in the river. A further 11 species have been recorded in the Nar although they contribute only a small amount to the total fish biomass.

#### Scheduled Monuments Sites

The pipeline runs close to a Scheduled Monument as detailed in the table below.

Monument	Distance	Reason for Designation
Middleton Mount mote and bailey castle	Approximately 500m north	The monument includes the earthwork and buried remains of a motte and bailey castle which is located about 480m NNW of St Mary's Church and the centre of the village of Middleton, on the edge of a rise commanding a view of the lower ground to the west, north and south west. Underlying the castle there are buried remains relating to earlier occupation of the site, probably during the Late Saxon period.

In addition, there are a number of listed buildings in close proximity to the route, which have been listed below. A radius of approximately 200m was used.

Listed Building	Grade	Distance
Old Dairy Farmhouse At Tf 6282 1636	II	50m (Northern section of West Winch)
Crown Public House	II	50m )
Church of St Mary	II*	50m
Row Of 4 Memorials Circa 1-5m South Of South East Angle Of South Aisle of Church Of St Mary	II	50m
Row Memorials To Edmonds Family Circa 10-15 Metres South Of Chancel Of Church Of St Mary	II	50m

Listed Building	Grade	Distance
Memorial Circa 5 Metres South East Of Porch Of Church Of St Mary	II	50m
The Old Lodge	II	50m
Churchyard Cross Circa 11 Metres North Of Church Of St Mary	II	50m
Memorial Circa 2 Metres South West Of South West Angle Of Church Of St Mary	II	50m
Orangery Circa 130 Metres To North East Of Middleton Hall	II	100m
Middleton Hall	II	100m
Pergola Circa 60 Metres North East Of Middleton Hall	II	100m

## Water Bodies

The pipeline will cross The River Great Ouse at Saddlebow.

## Flood Risk

The pipeline is located within flood risk zone 1. Zone 1 is a low probability risk, i.e. land with less than 1 in 1000 annual probability of river or sea flooding in any year.

## Source Protection Zones

The pipeline is not located within a groundwater source protection zone, i.e. the Environment Agency's policy and approach to controlling the risk to groundwater supplies from potentially polluting activities and accidental releases of pollutants.

## Agricultural Land

Agricultural land classification ranges from Grade 1 on the western section of the pipeline, to Grade 3 on the eastern side.

## Socio Economics

Kings Lynn and West Norfolk population is approximately 143,330 and approximately 67.4% of people live in rural areas. In rural King's Lynn and West Norfolk 36.5% of people aged 16 to 74 are economically inactive. 55.5% of those people are retired, 5.8% are students and 18.3% are looking after the home or family. In comparison, 33% of people aged 16 to 74 are economically inactive in urban King's Lynn and West Norfolk and 31% are economically inactive in rural parts of the Government Office Region.

## Contaminated Land/Landfill

The pipeline will not pass through a landfill site.



#### D.8.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Brine would be discharged at the existing Kings Lynn STW	Potential for discharged brine to cause negative effects in the water system where it is discharged. The WFD assessment has concluded that there is high risk of deterioration.	-	Moderate	Medium	Highly Significant
		The pipeline expects to cross The River Great Ouse at Saddlebow	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD assessment has concluded that there is a high risk of deterioration.	-	Moderate	Medium	Highly Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 11km of pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has	Scheme would reduce potential demand for abstracted water as	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		the potential result in increased demand for abstraction.	water would be taken from the sea.				
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Part of the scheme will be constructed in areas liable to flooding.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	N/A	Will help mitigate against the forecast water deficit through increased supply	+	Moderate	Medium	Significant
		Scheme would require the construction of 11km of new pipeline (and a desalination plant). This scheme would pass close to community receptors.	<p>There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. In particular •11km of DI pipeline through fields.</p> <ul style="list-style-type: none"> <li>•522m of A roads reinstated.</li> <li>•1.6km of B &amp; minor roads reinstated.</li> <li>•Total 41 no direct drill crossings of rivers, roads and railways varying between 29 and 117m width including draw pits.</li> </ul> <p>Pipeline route option 1 does run through a SSSI</p> <p>Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas. The operation of the</p>	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed Pipeline 1 runs through a SSSI. Upstream of the Wash SPA/Ramsar.	Direct loss of habitat and disruption within designated area, and potential for temporary construction disturbance from noise and dust etc. Potential reduced flows in the Great Ouse river and into The Wash which could affect habitats that support qualifying species in designated sites.	-	Moderate	Medium	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Does not pass through any landscape-designated area.	Temporary visual due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	There are a number of listed buildings in close proximity to the route. No SMs will be affected	Potential for the scheme to compromise the historic setting of a number of listed buildings. Temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor.	—	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water</li> </ul>	Projections for future climate change include hotter, drier	Proposed scheme would build resilience to the effects of climate change through	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
change.	<ul style="list-style-type: none"> <li>resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	improved water supply security. Felixstowe part of the scheme could be at risk from increasing sea levels.				
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 7,795 tCO <sub>2</sub> e. The operational carbon for this scheme is 15,773 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require 11km of new pipeline (and the construction of a new desalination plant).	Negative effects of resource use for construction materials, along with the construction materials required for the desalination plant and pipeline. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage</li> </ul>	Agricultural land classification ranges from Grade 1 on the	Likely to include temporary effect on soils and agricultural land through the laying of	—	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	to soils and agricultural land?	western section of the pipeline, to Grade 3 on the eastern side. There are no historic landfill sites within 410m of the in close proximity to the proposed pipeline.	pipelines. Discharge will be within EA standards so should not pollute the ground. The desalination plant is proposed for land which is classified as Urban/Non-agricultural.				

### **D.8.3. Scheme F4: Ruthamford North RZ Transfer (12 MI/d)**

#### **D.8.3.1. Scheme Description**

This option proposed to transfer water from the Ruthamford North RZ from Whittlesey to Wisbech.

This option involves the construction of a 500mm diameter pumping main from King's Delph Reservoir to Friday Bridge Reservoir (approximately 27km) and pumped onto Emnneth Hungate Reservoir (approximately 6.4km).

#### **D.8.3.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

###### Internationally Designated Sites

The Nene Washes are located, at its nearest point, approximately 1km north of the proposed pipeline. They extend for around 21 kilometres (13 mi) east of the City of Peterborough and cover more than 15 square kilometres (3,700 acres). They are an internationally designated site for nature conservation and have been afforded Ramsar, Special Area of Conservation (SAC) and Special Protection Area (SPA) status.

Moreton's Leam, a large drainage channel running along the eastern flank of the Nene Washes, contains the highest recorded density of spined loach *Cobitis taenia* in the UK. There may also be thriving populations in the smaller ditches of the Washes. The site represents spined loach populations in the Nene catchment. In addition, the washes are significant for their over-wintering populations of Bewick's swan (*Cygnus columbianus bewickii*) and Pintail (*Anas acuta*).

###### Nationally Designated Sites

The Nene Washes are also designated as a Site of Special Scientific interest. The site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. The site is additionally notable for the diversity of plant and associated animal life within its network of dykes.

###### Local Nature Reserve

The pipeline will run directly through Lattersey Field a local nature reserve.

##### **Historic Sites and Assets**

###### Scheduled Monuments

There are a number of Scheduled monuments surrounding the pipeline; however, none of them fall within 1km of the pipeline.

### Listed Buildings

There are a number of listed buildings at Friday Bridge, approximately 5km south of Wisbech, which could be affected by the pipeline. The listed buildings have been identified below:

Listed Building	Grade	Distance
Church Of St Mark	II	200m
The Chequers Inn	II	Within 50m)
Clock Tower And War Memorial	II	Within 50m
Water Tower At Approximately Grid Reference 465 047	II	Within 50m )
Rookery Farmhouse	II	100m

### **Water Bodies**

The River Nene is located approximately 1km from the pipeline. In addition, the pipeline intersects the Twenty Foot in two locations, approximately 3km east of Whittlesey and 3km north of March.

### **Flood Risk**

Pipeline is located within Zone 1 - Low Probability: land with less than 1 in 1000 annual probability of river or sea flooding in any year.

### **Source Protection Zones**

Not within a groundwater SPZ.

### **Agricultural Land**

Agricultural quality is Grade 1 and 2.

### **Socio-Economics**

The pipeline runs from the east of Peterborough to approximately 5km south of Wisbech.

Peterborough had an estimated population of 184,500 in June 2007. Situated 75 miles (121 km) north of London, the city stands on the River Nene which flows into the North Sea approximately 30 miles (48 km) to the north-east.

Wisbech is a market town, inland port and civil parish with a population of 20,200 in the Fens of Cambridgeshire. The tidal River Nene runs through the centre of the town

### **Contaminated Land/Landfill**

Pipeline will not come in to contact with any historic landfill sites

#### D.8.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The River Nene is located approximately 1km north of the pipeline. Twenty Foot River is intersected at two points along the route.	Potential for pollution during construction. However, good site practices will minimise this risk. The WFD screening has demonstrated the need for a full WFD assessment.	-	Minor	Medium	<b>Not Significant</b>
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment concluded that there is a low risk of deterioration.	-	Minor	Medium	<b>Not Significant</b>
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	<b>Not Significant</b>
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would reduce potential demand for abstracted water as water would be transferred between PZ	+	Minor	Medium	<b>Not Significant</b>
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline runs across flood risk zone 1 – low probability.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	<b>Not Significant</b>
4. Ensure security of water supplies for	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> </ul>	Construction of pipelines to from	There may be temporary construction nuisance (noise,	-	Minor	Medium	<b>Not Significant</b>



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Kings Delph to Emneth Hungate	dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas.				
		N/A	Will help mitigate against the forecast water deficit through increased supply but without the need for increased abstraction rates.	+	Moderate	Medium	Significant
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would not have any impact on any internationally or nationally designated sites for nature conservation. However, the pipeline will run directly through Lattersey Field a local nature reserve.	Potential direct loss of habitat / disruption within designated areas (LNR). Potential for temporary construction disturbance from noise and dust etc.	-	Moderate	Medium	Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Does not affect any landscape-designated area.	Temporary negative visual effects associated with laying the pipeline	—	Negligible	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The pipeline has the potential to affect a number of listed buildings in Friday	There could be temporary impacts on setting for listed features associated with the construction phase, although	—	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Bridge. There will be no impacts on any registered parks or gardens or Scheduled Monuments	these are considered to be minor.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. Felixstowe part of the scheme could be at	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 4,989 tCO <sub>2</sub> e. The operational carbon for this scheme is 827 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate</li> </ul>	N/A	Potential negative effects of resource use for construction materials, along with the construction materials required for the proposed pipeline. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	waste/is it a zero waste scheme? • Will waste generated by the scheme be halved to landfill?						
12. Protect best quality soil and agricultural land	• Will it help maintain water supplies for irrigation? • Will it cause loss or damage to soils and agricultural land?	The majority of the area is Grade 1 - 2 agricultural land. No historic landfill sites are near to the route	Could include temporary effect on soils and agricultural land through the installation of the pipelines. There will be no effects of ground contamination.	–	Negligible	Low	<b>Not Significant</b>

#### **D.8.4. Scheme F5: Ruthamford North RZ Transfer (25 MI/d)**

This option requires the same pipeline route as Option F4, however it requires a 700mm pumping main. The baseline and assessment will be the same as scheme F4 and has, therefore, not been repeated.

## **D.9. Hunstanton RZ**

### **D.9.1. Scheme H1: Fenland RZ transfer**

#### **D.9.1.1. Scheme Description**

This option proposes to transfer water from New Fring WTW, south of Fring in the Fenland RZ, to Ringstead Reservoir.

This option involves the construction of a 150mm diameter pumping main from New Fring WTW to Ringstead Reservoir across approximately 6.1km.

#### **D.9.1.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

There are no designated sites for nature conservation in close proximity to the pipeline.

##### **Historic Sites and Assets**

###### Scheduled Monuments

There are no scheduled monuments within 500m of the pipeline.

###### Listed Buildings

Listed Building	Grade	Distance
High House	II	200m
Magazine Cottage	II	200m
East Hall Farmhouse	II	15m

##### **Water Bodies**

The Heacham River runs approximately 200m from the pipeline.

##### **Flood Risk**

The scheme is not within a flood risk zone.

##### **Groundwater**

The proposed pipeline falls within groundwater SPZ's 1-3.

##### **Landscape**

The northern section of the pipeline, at Sedgeford, is located within the Norfolk Coast AONB.

##### **Socio-Economics**

Sedgeford is a civil parish in the English county of Norfolk, about 6km south of the North Sea and 5km east of the Wash. It covers an area of 17.06 km<sup>2</sup> and had a population of 540 in 224 households as of the 2001 census.

### **Contaminated Land/Landfill**

Pipeline will not come in to contact with any historic landfill sites.

### D.9.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The Heacham River runs approximately 200m west of the pipeline.	Limited potential for pollution during construction. Good site practices will minimise this risk.	-	Minor	Low	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The WFD assessment has concluded that there are some water bodies (GB105033053480, GB40501G400400) related to this scheme that are at medium risk of deterioration. Other water bodies (GB40501G400200, GB105033047620, GB105033047680) associated with this scheme are not expected to be at risk from deterioration.	-	Moderate	Medium	Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme transfers water from one PZ to another reducing demand for abstraction.	+	Minor	Medium	Not Significant
		Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Not within a flood risk zone.	Burst pipes can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable increased transfer of water.	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Moderate	Medium	Significant
		Construction of pipelines from Fring to north Sedgford	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> </ul>	Proposed scheme would not have any impact on any internationally or nationally designated sites for nature conservation.	No impact on designated sites. Potential for temporary construction disturbance from noise and dust etc.	-	Negligible	High	Not Significant

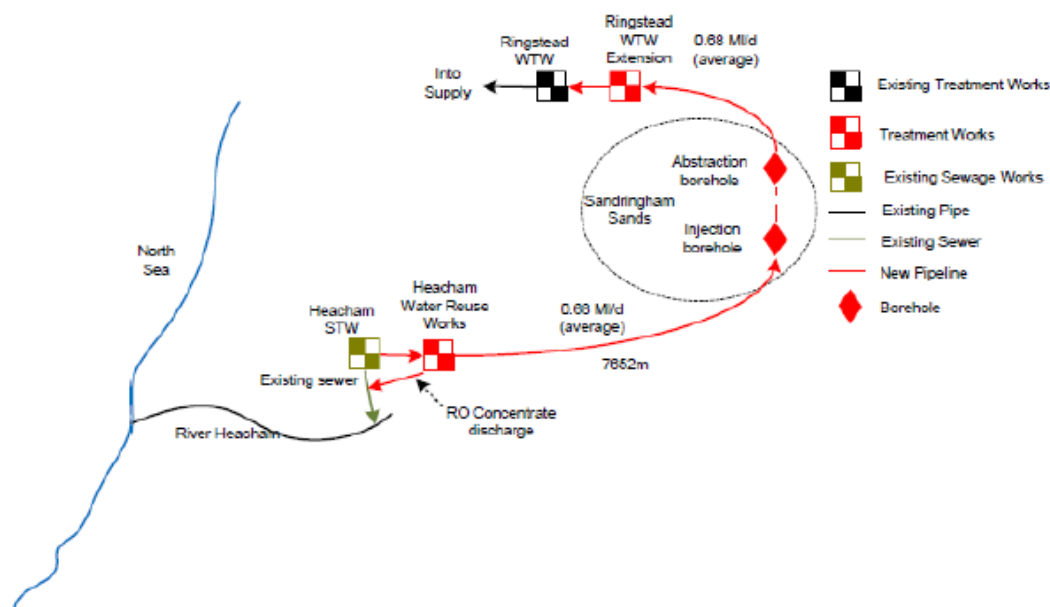


Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>						
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through the Norfolk Coast AONB	Temporary visual effects from digging up ground to lay pipeline, especially within the AONB.	–	Negligible	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline within 150-200m of three Grade II listed buildings.	There could be temporary impacts on setting for listed features associated with the construction phase, although these are considered to be minor.	–	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. Felixstowe part of the scheme could be at risk from increasing sea levels.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> </ul>	N/A	Total embodied carbon is 353 tCO <sub>2</sub> e Operational carbon is 33 tCO <sub>2</sub> e	-	N/A	N/A	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Potential negative effects of resource use for construction materials, along with the construction materials required for the proposed pipeline. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Agricultural land classification unknown. No historic landfill sites in close proximity	Could include temporary effect on soils and agricultural land through the installation of the pipelines. There will be no effects of ground contamination.	—	Negligible	Low	<b>Not Significant</b>

#### D.9.2.1. Scheme Description

## Scheme H2 Schematic



Source: Anglian Water

This option proposes that the effluent from Heacham STW will be treated and pumped to the Sedgeford Boreholes where the treated effluent will be injected into the Sandringham Sands from where it will be abstracted and treated at Ringstead.

The Heacham STW will require a sidestream MBR and RO to reduce salt and soluble organics concentrations to drinking water standards. Depending on the requirements of the receiving aquifer, the product water will be oxygenated and the pH increased prior to injection. The RO concentrate will have a salt concentration significantly lower than ambient sea water.

The water will be injected into the upper layer of the aquifer which has a high nitrate concentration. As the total oxidised nitrogen of the treated effluent is less than 1mg/l, then this should reduce the nitrate concentration of the abstracted water. Ringstead WTW has a nitrate removal ion exchange plant and an extension to the plant maybe required for an additional output. The water reuse plant capacity is based on 90% of the 2011 DWF. Any flow above this will be discharged in the current manner.

#### D.9.2.2. Scheme Baseline

## Ecological Sites and Environmental Designations

The pipeline proposal originates approximately 670m away from an area of coastal grazing marsh. It is also approximately 800m from The Wash SSSI, afforded protective status due to exceptional biological interest. The area represents one of Britain's most important wintering grounds for wildfowl and wading birds, as well as a breeding area for common seals. The Ringstead end of the route lies approximately 500m from the Catlane Wood area of Ancient Woodland.

The proposed pipeline would pass through the Heacham Brick Pitt SSSI, just south of Heacham. It has been afforded protective status due to it being the only opportunity to examine the Lower Cretaceous

Snettisham Clay. It has yielded distinctive Lower Barremian ammonite faunas. It is described as a key site in the assessment of regional stratigraphy and in correlations of Lower Cretaceous strata showing a facies rarely exposed and of limited aerial extent. The proposed pipeline also passes through the Norfolk Coast Area of Outstanding Natural Beauty (AONB). This area has been afforded AONB status due to characteristics that Natural England describes as incorporating “the finest, remotest and wildest of Norfolk’s renowned marsh coastlands.”

The tables below lay out the areas with environmental designations the proposed pipelines runs close to.

SSSI	Distance
The Wash	670m
Heacham Brick	Passes through

Ancient Woodland	Distance
Catlane Wood	500m

AONB	Distance
Norfolk Coast	Passes through

### Agricultural Land

The proposed pipeline would pass through land that is classified as Grade 3 Agricultural land.

### Flood Risk and Source Protection Zones

The proposed pipeline would pass through an area of Flood Zone 2 where it crosses the Heacham River. This is for approximately 100m. There are no other areas where the route passes through areas of Flood Zones 2 or 3. The Ringstead end of the scheme is located in an area of groundwater source protection zone 1.

### Historic Sites and Assets

Scheduled Monument	Distance
Roman Villa north-east of Eaton	900m

The pipeline passes approximately 900m from the Roman Villa north-east of Eaton. There are no Registered Parks and Gardens in proximity to the proposal. There are no listed features within 100m of the proposed pipeline. The closest listed receptor is the Grade II listed Caley Mill, approximately 375m from the proposed pipeline.

### Socio-Economics

The proposed pipeline would run through two statistical wards: Snettisham and Heacham. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. The 2001 census shows that the combined population of the wards was 8,458 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The route lies within Norfolk County Council and is within the Kings Lynn and West Norfolk Local Authority boundary. It crosses the A149, but does not pass near to any trunk routes. The pipeline would run through rural areas, running to the south of the village of Heacham, and north of the village of Sedgeford. The area’s industries primarily concern agriculture and tourism.

### Contaminated Land/Landfill

The route passes approximately 300m north of a historic landfill site.

## Water Bodies

Main River	Ecological Status/Potential	Chemical Status/Potential
Heacham River	Moderate	Does not require assessment

The scheme is within a Principle aquifer (Bedrock) (including the Sandringham Sands) aquifer). This aquifer is likely to provide water storage, and support water supply / river base flows on a strategic scale.

### D.9.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline would cross the Heacham River.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect this water body through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has reasonably concluded that there would be no deterioration but water quality impacts require further investigation to confirm this conclusion.	0	N/A	N/A	No Effect
		Reused water would be piped from Heacham into the Sedgeford Boreholes where the treated effluent would be injected into Sandringham Sands, and abstracted and treated at Ringstead WTW.	Potential for water quality issues, however, water/effluent will be treated in accordance with WQ standards so effects are unlikely. Water abstraction from the aquifer has the potential to affect river flows. Keeping within abstraction licence conditions should prevent over abstraction from the aquifer. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has reasonably concluded that there would be no deterioration but water quality impacts require further investigation to	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			confirm this conclusion.				
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 5.8km of pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme reuses effluent reducing need for abstraction sources. Abstraction of treated effluent from aquifer will be within licence limits to minimise over abstraction.	+	Minor	Medium	Not Significant
		N/A.	Scheme unlikely to affect/influence customer water consumption.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	A small section of the proposed scheme will be constructed in areas liable to flooding (both Flood Zones 2 and 3). Some of this benefits from flood protection schemes.	Pipeline unlikely to affect flooding. Storage of treated effluent in aquifer could result in less storage for rainwater increasing flood risk.	-	Moderate	Medium	Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Hunstanton Planning Zone's deficit is forecast to be 1.62 ml/d by 2040. The scheme would have an available output of 2.71 ml/d.	Will help enable the predicted Hunstanton PZ deficit to be reduced and thus ensure a continued supply of water for customers.	+	Moderate	Medium	Significant
		Scheme would require the construction of 5.8km of new pipeline, a new water reuse works at Heacham and extension of the existing Ringstead WTW. This scheme would pass close to community receptors.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. In particular the pipeline will involve 5.8km of pipeline through fields, 25m of a roads reinstated, 1.8km of B and minor roads reinstated, a total of 8 no. direct drill crossings of rivers, roads and railways. It is assumed that the new Heacham reuse works would be within Anglian Water land at the existing Heacham STW site and that	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			the Ringstead extension would also be within Anglian Water land on the site. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas near Heacham. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/AS	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would pass close by or through the Heacham Brick Pitt SSSI. This SSSI has been designated due to opportunities to examine the geology. The Heacham end of the scheme is located within 500m of ancient woodland, and protection designations associated with The Wash (SSSI, coastal grazing, Ramsar and SPA).	Given that the reason for the SSSI designation is geology, constructing a pipeline through or close by to the site presents some risks to the conservation of this site as it will directly affect it. Potential temporary construction effects (noise, dust) for bats and birds in the ancient woodland area. Potential effects on the Wash designated sites from discharge into the River Heacham which is hydrologically connected to the designated site.	-	Major	High	Highly Significant
7. Protect and enhance landscape quality and character across the	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> </ul>	Pipeline would run through the Norfolk Coast Area of	Temporary visual effects in the AONB due to digging up ground to lay pipeline. No long-term impact	-	Minor	Low	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
region.	<ul style="list-style-type: none"> <li>Will it enhance landscape quality and character?</li> </ul>	Outstanding Natural Beauty (AONB) for the majority of its length. The Heacham end of the scheme is located within 500m of ancient woodland,	envisaged. Scheme will not cause loss of trees from the ancient woodland due to its distance from the pipeline route.				
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would not run close to historic assets. Closest listed feature lies 375m from the proposal, closest Scheduled Monument lies 900m away.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor given the distance from the proposed scheme.	–	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be</li> </ul>	N/A	The total embodied carbon for this scheme is 2,443 tCO <sub>2</sub> e. The operational carbon for this scheme is 531 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<p>designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</p> <ul style="list-style-type: none"> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require 5.8km of new pipeline, new Heacham reuse works and extension to the existing Ringstead WTW.	Resources and materials required for scheme. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through an area of Grade 3 agricultural quality. The pipeline route is 300m from a historic landfill site.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Approx. 5.8km of pipeline will run through fields (although not all of these will be agricultural). Discharge will be within EA standards so should not pollute the ground. Unlikely to be affect from the landfill site.	—	Negligible	Low	<b>Not Significant</b>

### D.9.3.1. Scheme Description

North Sea

500m minimum

250-500m

RO Concentrate discharge

5.5 Mld (average)

8.8 Mld (average)

Hunstanton Desalination Plant

5.335m

3 Mld (average)

Ringstead WTW

Key: (All proposed changes in red)

- Existing Treatment Works
- Treatment Works
- Pumping Station
- Existing Pipe
- Existing Sewer
- New Pipeline
- Intake
- Outfall

This option is for a desalination plant close to Hunstanton. The seawater intake will be offshore beyond the surf zone to ensure reasonable quality of intake water. The brine may be discharged 500m away from the intake with the currents taking the brine away from the intake.

The proposed pre-treatment process comprises of DAF and UF. The sludge from the DAF and chemical backwash waste from the UF will be discharged to the sewer. The UF backwash waste will be discharged with the brine. A two-pass system with partial second pass is proposed subject to receipt of a full sea water analysis.

#### D.9.3.2. Scheme Baseline

The Hunstanton desalination plant, along with associated pipelines connecting it to the North Sea intake, is located approximately 220m from the Wash SSSI and Ramsar site, afforded protective status due to exceptional biological interest. The area represents one of Britain's most important wintering grounds for wildfowl and wading birds, as well as a breeding area for common seals.

The proposed pipeline passes through the Norfolk Coast Area of Outstanding Natural Beauty (AONB). This area has been afforded AONB status due to characteristics that Natural England describes as incorporating “the finest, remotest and wildest of Norfolk’s renowned marsh coastlands.” It also comes within approximately 580m from the Long Wood Ancient Woodland, and within 80m of the Catlane Wood area of Ancient Woodland.

The tables below lay out the areas with environmental designations the proposed scheme runs close to.

SSSI	Distance
The Wash	220m

Ramsar	Distance
The Wash	220m

AONB	Distance
Norfolk Coast Area	Scheme passes through

Ancient Woodland	Distance
Long Wood	580m
Catlane Wood	80m

### Agricultural Land

The proposed pipeline would pass through land that is mostly classified as Grade 3 Agricultural land, with some Grade 4 close to the North Sea. This land is therefore not of the highest agricultural quality.

### Flood Risk and Source Protection Zones

The proposed scheme would originate in an area of Flood Zone 3, to the south of Hunstanton, with part of the scheme benefitting from flood protection. As the pipeline heads east from the desalination plant, it leaves the area of Flood Zone 3, before briefly entering an area of Flood Zone 2 and then Flood Zone 3 as it crosses a tributary of the Heacham River. After this area of Flood Zone 3, it doesn't pass through any other area of high flood risk. At the Ringstead end of the scheme, the pipeline and scheme end point are located within an area of groundwater source protection zone 1.

### Historic Assets

Scheduled Monument	Distance
St. Peter's Church Tower	1.6km
Hunstanton Chapel	770m

Registered Parks and Gardens	Distance
Hunstanton Hall	1km

There are two scheduled monuments near to the proposed scheme, and the Grade II Hunstanton Hall Registered Park and Garden.

The closest listed feature the scheme comes close to is the Grade II Listed Manor Farm House, approximately 600m of the proposed scheme. The proposed route does not run through any conservation areas.

The proposed scheme runs close to an area of archaeological evidence, south of Ringwood Downs, approximately 50m from the scheme (Monument Number: TF 63 NE 67). The site has remains of Neolithic flint scatters. This, however, does not constitute a significant archaeological find.

### Socio-Economics

The proposed scheme passes through the Hunstanton, Heacham and Snettisham statistical wards. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. The 2001 census shows that the combined population of the

wards was 14,153 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The route lies within Norfolk County Council and is within the Kings Lynn and West Norfolk Local Authority boundary.

The pipelines would run through mainly rural areas, but close to the peripheries of the settlements of Hunstanton and Heacham. It crosses the A149, but does not pass near to any trunk routes. The area's industries primarily concern agriculture and tourism.

#### **Contaminated Land / Landfill**

There are no areas of historic landfill in the area surrounding the proposed pipeline. The nearest one is to the east of Ringstead, as shown on the map below. The route does not directly cross any of these areas of historic landfill.

### D.9.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Brine would be discharged from the desalination plant 50m-100m offshore.	Potential for discharged brine to cause negative effects in the water system where it is discharged. It is considered that this will be unlikely. The WFD assessment has concluded that there is a medium risk of deterioration and should be mitigated through design if option is taken forward.	-	Moderate	Medium	Significant
		Pipeline would cross tributaries of the Heacham River. Water would be abstracted from the sea at The Wash	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect tributaries of the Heacham River through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			due to its chemical status being of high quality The WFD assessment has concluded that there is a medium risk of deterioration and should be mitigated through design if option is taken forward.				
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 5.3km of pipeline.	The scheme uses pipelines which can leak, and does not specifically target reduced leakage. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would reduce potential demand for onshore abstracted water as water would be taken from the sea which forms a sustainable water resource.	+	Minor	Medium	Not Significant
		Scheme concerns supply, and therefore will not affect demand.	None.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on flood risk.	0	N/A	N/A	No Effect
		Sections of the proposed scheme would be constructed in areas liable to flooding (both Flood Zones 2 and 3). Some of this benefits from flood protection	Construction works could have potential to cause temporary increased flooding. Pipelines can burst causing localised flooding	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		schemes.					
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Hunstanton Planning Zone's deficit is forecast to be 1.62 ml/d by 2040.	Will help enable the predicted Hunstanton PZ deficit to be mitigated against and thus ensure a continued supply of water for customers.	+	Moderate	Medium	Significant
		Scheme would require the construction of 5.3km of new pipeline and a desalination plant. This scheme would pass close to community receptors.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas near Hunstanton. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> </ul>	Proposed scheme would pass close approximately 200m from The Wash SSSI. It	Potential for construction effects to disturb the SSSI. No long term effects envisaged from this. Intake and discharge	-	Major	High	Highly Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	would also come within 80m of the Catlane Wood area of Ancient Woodland. Water intakes and discharges are likely to be located within this SSSI as well as The Wash SPA and Ramsar.	are permanent features and have potential to cause disturbance to the water within this SSSI, SPA and Ramsar.				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would run through the Norfolk Coast Area of Outstanding Natural Beauty (AONB) for the majority of its length.	Temporary visual effects in the AONB due to digging up ground to lay pipeline. No long-term impact envisaged.	–	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would not run close to historic assets. Closest listed feature lies 600m from the proposal, closest Scheduled Monument lies 770m away. Closest Registered Park and Garden would be approximately 1km from the scheme.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor given the distance from the proposed scheme.	–	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 2,836 tCO <sub>2</sub> e. The operational carbon for this scheme is 978 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require 5.3km of new pipeline and construction of a desalination plant.	Negative effects of resource use for construction materials, along with the construction materials required for the Desalination Plant modification works.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through predominantly Grade 3 agricultural quality, but also some areas of Grade 4.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	Not Significant

## **D.9.4. Scheme H4: Hunstanton RZ Groundwater Development**

### **D.9.4.1. Scheme Description**

This option utilises two disused licensed boreholes at the Sedgeford Station and Ringstead Reservoir. The option also requires construction of a further three boreholes, sites have been acquired by Anglian water for these. New treatment is required to remove iron and manganese..

### **D.9.4.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The proposed scheme would come within 500m of the Catlane Wood area of Ancient Woodland. The proposed scheme would not come close to any other ecologically designated sites.

The tables below lay out the areas with environmental designations the proposed pipelines runs close to.

<b>Ancient Woodland</b>	<b>Distance</b>
Catlane Wood	500m

#### **Landscape**

The proposed scheme would run along a section of the boundary of the Norfolk Coast Area of Outstanding Natural Beauty.

#### **Agricultural Land**

The proposed pipeline would pass through land that is classified as Grade 3 Agricultural Land. This land therefore represents land of average agricultural quality.

#### **Water Resources**

The proposed scheme would not cross any overland water resources.

#### **Flood Risk**

The proposed scheme would not pass through any areas classed as flood zones.

#### **Groundwater**

The Ringstead groundwater source would lie close to an area of Source Protection Zone 2. No other part of the scheme would either come close to pass through any other areas of source protection.

#### **Historic Assets**

The proposed scheme would not come close to any listed features. The closest being the Grade II listed Wethered Manor in Sedgeford, approximately 820m of the proposed scheme.

The proposed scheme would not pass near any Registered Parks and Gardens.

The closest Scheduled Monument would be the Roman Villa north-east of Eaton which would be approximately 1.4km of the proposed scheme.

*Scheduled Monuments*

Scheduled Monument	Distance
Roman Villa NE of Eaton	1.4km

The proposed scheme would not pass through an area of archaeological interest.

**Socio-Economics**

The proposed pipeline would run through the Statistical Ward of Snettisham. The results from the 2011 census are yet to be published in full; therefore data from the 2001 census has been used. The 2001 census shows that the population of the ward was 3,846 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The proposed scheme would run within the County of Norfolk and the Local Authority of King's Lynn and West Norfolk.

The proposed scheme does not pass near to any trunk road routes or other infrastructure. The pipeline would run through rural areas.

**Contaminated Land/Landfill**

The route does not pass close to areas of historic landfill.

#### D.9.4.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed scheme would not cross any surface water bodies. Existing disused boreholes will be re-commissioned	Re-commissioning the discussed boreholes will adhere to license limits to avoid over abstraction. The WFD assessment has concluded that there is a medium risk of deterioration for the River Heacham and North West Norfolk Sandringham waterbodies. This is due to site specific information from the Environment Agency which suggests that the upper reaches may be at risk of deterioration as a consequence of the proposed option.	-	Moderate	Medium	Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The proposed scheme would be constructed in an area of low flood risk.	Burst pipeline can cause localised flooding. No flood storage involved in scheme.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable use of new water resources.	This proposal would help with the meeting of predicted water deficits for the East Anglia region through use of currently unused water resources.	+	Minor	Medium	Not Significant
		Scheme would require the	There may be temporary construction nuisance	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		construction of new pipeline and re-commissioning of disused boreholes.	(noise, dust, visual, road/pedestrian diversions) from construction of pipeline, but due to a lack of residents near to the pipeline, this isn't considered significant here. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Closest ecological receptor is at Catlane Wood, 500m west of the scheme. Proposed scheme would not pass close by to any other ecologically designated sites.	No direct impacts are envisaged, indirect impacts limited to potential for pollution from construction activities, but these are not considered to be likely.	-	Minor	Medium	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would run through an area designated as an AONB.	Temporary visual impact due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Medium	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would not run close to Scheduled Monuments (1.4km at closest) and	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although	—	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		would not run near any Registered Parks and Gardens. Closest listed feature lies 820m from the proposal.	these are considered to be minor given the distance from the proposed scheme and the potential for intervening vegetation and other features to obscure the view of the temporary visual intrusion.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 629 tCO <sub>2</sub> e. The operational carbon for this scheme is 188 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> </ul>	Scheme would require construction	Negative effects of resource use for	-	Moderate	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	of new pipeline.	construction materials. Scheme design and material will follow Anglian Water sustainability policy.				
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through an area of Grade 3 agricultural land quality, representing average quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Not close to any landfill sites.	—	Minor	Low	<b>Not Significant</b>



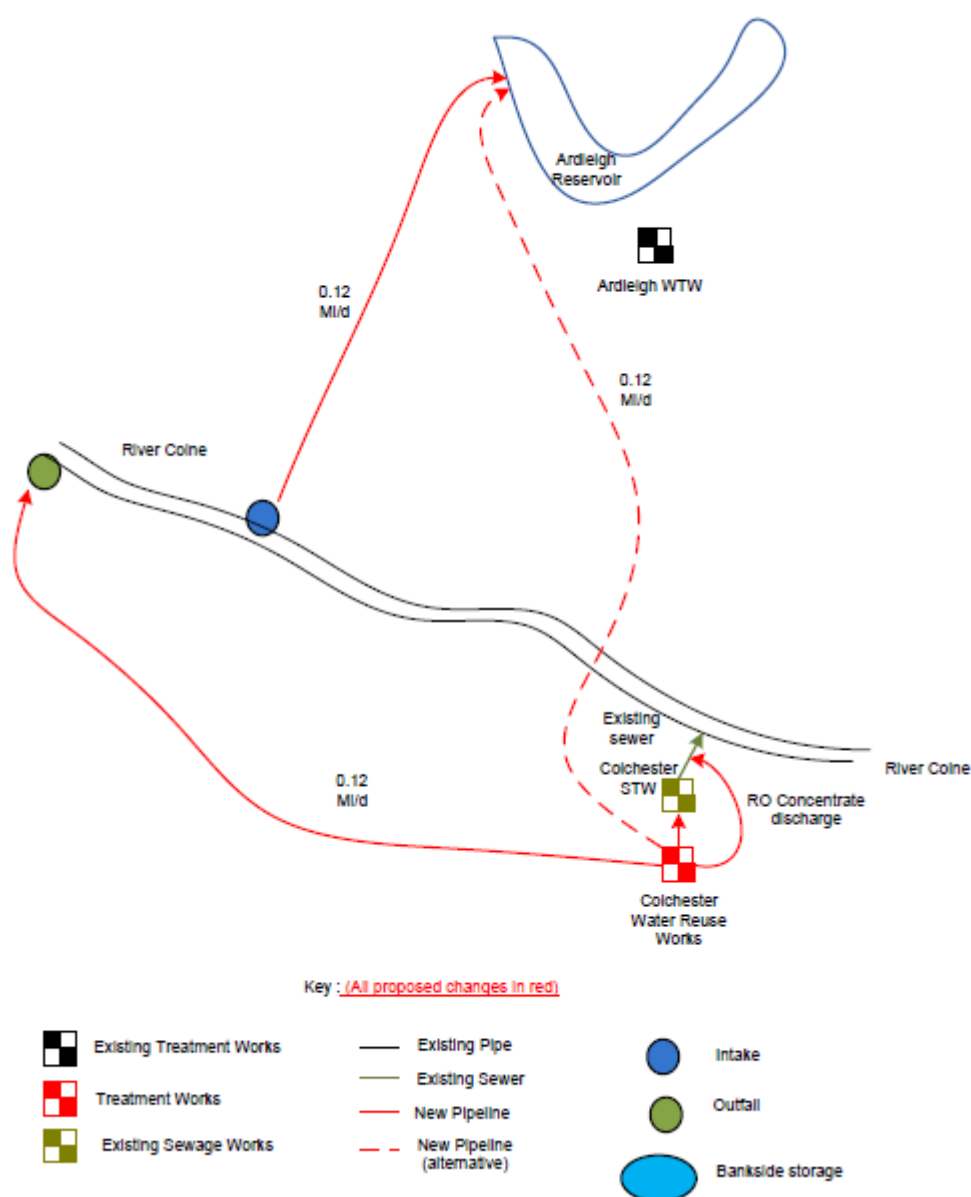
## D.10. South Essex RZ

### D.10.1. Scheme SE1: Colchester Water Reuse

#### D.10.1.1. Scheme Description

The scheme would provide the necessary feed water to the Ardleigh Reservoir which feeds Colchester and the surrounding area. The scheme proposes that the treatment of the Colchester effluent to discharge into the River Colne, 2km upstream of the Ardleigh intake at East Mills.

Scheme Schematic



Source: Anglian Water 2013

#### **D.10.1.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

The Colchester water reuse work is approximately 400m from the Upper Colne Marshes SSSI:

- This site is predominantly salt marsh;
- Grazing marsh is confined to a relatively small area at the western end;
- Of the species in the notified vascular plant assemblage (VPA), *Bupleurum tenuissimum* is occasional on the grazing marsh and there is scattered *Lepidium latifolium*, mainly on the north side of the Roman River;
- Both the grazing marsh and salt marsh remain suitable for other VPA species; and
- The unit is relatively undisturbed and holds a good variety of wintering, passage and breeding water birds.

##### Local Nature Reserves

Salary Brook LNR is located approximately 10m from the pipeline, and Welsh Wood LNR is located approximately 600m from the west of the pipeline.

##### **Historic Sites and Assets**

##### Scheduled Monuments

The pipeline is not within 500m of a Scheduled Monument.

##### Registered Parks and Gardens

The pipeline is within 50m of Wivenhoe Park Registered Park and Garden:

- Wivenhoe Park lies on the north side of Wivenhoe, in an increasingly developed area just to the south-east of Colchester. It covers c 34ha, bounded to the north by Elmstead Road, to the north-east by Colchester Road, to the south-west by the main University campus and to the south by Boundary Road; and
- It is an old deer park, improved in 1776-80 by Richard Woods to form a landscaped park of 34ha round a country house.

##### Listed Buildings

The pipeline runs close to the following Listed Buildings:

- Moze Hall (less than 50m away from the scheme);
- Cartlodge, Cow Byre and Haylodge, Barn and Linked Cow Byre and Stable / Cartlodge (100m – 150m of the scheme); and
- West Lodge (50-100m from the scheme).

##### **Water**

Surface Water Ecological Status in the Colchester area is Moderate, and Chemical Status is good.

##### **Flood Risk**

The southern section of the pipeline is within a flood risk zone; however, it does benefit from flood defences. North of the A120 has been classed as a significant risk (zone 3) which is land with a 1 in 100 or greater probability of river flooding in any year. South of the A120 the risk is only likely to flood in extreme conditions (zone 1) - land with less than 1 in 1000 annual probability of river or sea flooding in any year.

### Source Protection Zones

Not within a groundwater SPZ.

### Agricultural Land

Land use in the Colne catchment is predominantly agricultural. Colchester is the largest urban area

DEFRA's agricultural land classification system grades land from 1 (excellent) to 5 (very poor). Grades 1-3a are defined as the "best and most versatile land". The Colne catchment is Grade 2, while Colchester is classed as 1.

### Ancient Woodland

The pipeline is located close to a number of ancient woodlands. Ancient woodland is defined as land that has been continually wooded since at least 1600AD. They are some of the richest sites for wildlife and are full of cultural heritage.

The pipeline runs to the west of Walls Wood, runs through the western section of Churn wood and is approximately 100m from Home Wood.

### Socio-Economics

The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. The 2001 census shows that the combined population of the wards was 155,800 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area.

Population	
All People 2001 Census	155,800
All People mid-2006	170,800
- 0-14 years	28,900
- 15-64 years	117,200
- 65 years +	24,800

### Contaminated Land/Landfill

The pipeline is within 200m of two historic landfill sites, identified by the Environment Agency.

Types of waste found in these identified landfill sites include:

- **Inert:** Waste which remains largely unaltered once buried such as glass, concrete, bricks, tiles, soil and stones; and
- **Industrial:** Waste from a factory or industrial process. It excludes waste from mines, quarries and agricultural wastes.

#### D.10.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed pipeline would abstract from the River Colne	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. Potential issues with discharge abstraction and discharge to the River Colne. The WFD assessment has concluded that there would not be a risk of deterioration.	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of approximately 4.5km of pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be abstracted from and recharged to the River Colne.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			affect/influence customer water consumption				
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Part of the scheme will be constructed in areas liable to flooding.	Burst pipeline can cause localised flooding. No new flood storage involved in scheme.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The deficit in the Colchester Planning Zone is predicted to reach 3.23Ml/d in 2040.	Options are being considered to provide the necessary feed water to the Ardleigh Reservoir which feeds Colchester and the surrounding area.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage</li> </ul>	Proposed scheme runs adjacent to Salary Brook LNR,	There is a potential for direct loss of habitat or disruption within LNR and areas of Ancient	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
region.	<ul style="list-style-type: none"> <li>to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	and through an area of ancient woodland. Colne Estuary SPA/Ramsar located 3km downstream of Colchester WTW.	woodland, including temporary construction disturbance from noise and dust etc. Potential effects on qualifying features of designated site from reduced river flows and water quality				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Does not pass through an AONB or any landscape-designated area.	Temporary visual due to digging up ground to lay pipeline. No long-term impact envisaged.	—	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline would run within approximately 50-100m of a number of listed buildings.	Temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor.	—	Minor	Low	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. Felixstowe part of the scheme could be at risk from increasing sea levels.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015</li> </ul>	N/A	The total embodied carbon for this scheme is 7,970 tCO <sub>2</sub> e. The operational carbon for this scheme is 7,550 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require approximately 4.5km of new pipeline	Negative effects of resource use for construction materials, along with the construction materials required for the desalination plant and pipeline. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 1 and 2 agricultural land. No landfill sites in close proximity.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	<b>Not Significant</b>

## **D.10.2. Scheme SE2 / SE8: East Suffolk RZ transfer**

### **D.10.2.1. Scheme Description**

This option involves transfer of water from Wherstead Reservoir, in East Suffolk RZ to Horkesley Reservoir in South Essex.

This option involves the construction of a 400mm diameter pumping main from Horkesley Reservoir to Wherstead Reservoir across a total distance of approximately 21.7km.

Scheme SE8 East Suffolk RZ transfer is the same as the description of scheme SE2 East Suffolk RZ transfer above except that the capacity will be smaller for SE8 (2 MI/d).

### **D.10.2.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

##### International

There are no internationally designates sites for nature located within 1km of the pipeline.

##### National

There are no nationally designated sites for nature within 1km of the pipeline.

#### **Historic Sites and Assets**

##### Scheduled Monuments

There are no SM's located within 500m of the pipeline.

##### Listed Buildings

There are a number of listed buildings along the route. The closest listed buildings to the pipeline are listed below. Distances are an approximation. No listed buildings have been considered beyond 50m.

Listed Building	Grade	Distance
East View Whitethorn	II	50m
Grove Cottages	II	50m
Barn To East Of Coveneys	II	50m
Coveneys	II	50m
Stable Range To South East Of Barn East Of Coveneys	II	50m
Ridgnall	II	50m
Barn North Of Barn To East Of Ridgnalls	II	50m
Ridgnalls Lodge	II	50m
Barn To East Of Ridgnall	II	50m
Potters Farmhouse	II	50m
Barn To East Of Potters Farmhouse	II	50m
Brook Farmhouse	II	50m
Potash Cottage	II	50m
Broomhouse To North Of The Hall	II	50m
Higham Hall	II	50m
Church Of St Mary	II*	50m
The Old Vicarage	II	50m
Laburnam House	II	50m
Lampitts	II	50m
Church Of St Mary	II*	50m
Pannington Hall	II	50m

##### Parks and Gardens



There are no registered parks or gardens within 500m of the pipeline

### **Water-bodies**

The pipeline crosses the Stour and Orwell's estuaries in a number of places

### **Landscape**

The pipeline runs through the Stour and Orwell AONB, and through three areas of ancient woodland.

### **Source Protection Zones**

The pipeline passes through groundwater source protection zones 1 and 2.

### **Flood Risk**

The pipeline is located in flood risk zone 3, which has a high probability of flooding; i.e. land with a 1 in 100 or greater probability of river flooding or a 1 in 200 or greater annual probability of flooding from the sea in any year.

### **Agricultural Land**

The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2.

### **Contaminated Land/Landfill**

The Pipeline does not pass through any historic landfill sites.

#### D.10.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses the Stour and Orwell estuary in a number of places	Where the pipeline crosses the rivers there is potential for pollution during construction. However, good site practices will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of approximately 20km of pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme reuses effluent reducing the need for abstraction sources.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. Burst pipeline can cause localised flooding. No new flood storage is involved in the project.	-	Minor	Low	Not Significant
4. Ensure security of	<ul style="list-style-type: none"> <li>Will it help secure water supplies</li> </ul>	The scheme would	This proposal would allow	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	enable transfer of water between neighbouring PZs.	more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.				
		Numerous receptors along the route.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	<b>Not Significant</b>
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	<b>No Effect</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Site not close to any international or national sites for nature. Runs through or adjacent to 5 areas of ancient woodland.	Potential for direct loss of trees and habitat and disturbance to protected species in ancient woodland areas.	-	Moderate	Medium	<b>Significant</b>
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through the Stour and Orwell AONB, ancient woodlands and coastal grazing marshes.	Temporary visual effects from digging up ground to lay pipeline in AONB.	—	Minor	Medium	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	High concentration of listed buildings along the route. No registered parks or gardens or SM's.	Temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor.	—	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to</li> </ul>	Projections for future climate change include hotter, drier	Proposed scheme would build resilience to the effects of climate change through improved water supply	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	climate change effects on water resources?	summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	security. The scheme is unlikely to educate people about the impacts of climate change on water resources.				
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	<p>SE2 = Total embodied carbon is 2,925 tCO<sub>2</sub>e Operational carbon 533 tCO<sub>2</sub>e per year</p> <p>SE8 = Total embodied carbon is 1,489 tCO<sub>2</sub>e Operational carbon 98 tCO<sub>2</sub>e per year</p>	-	N/A	N/A	Not significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grades 1-3 agricultural land. Pipeline route is not near any historic	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be	—	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		and authorised landfill sites.	created from laying the pipeline near the historic landfill site.				

### **D.10.3. Scheme SE4: Amendment to Ardleigh Agreement**

#### **D.10.3.1. Scheme Description**

This option involves Anglian Water increasing its proportion of Ardleigh WTW output. The current arrangement with Affinity Water proportions the output from Ardleigh WTW as 70:30 to Anglian Water. This option increases Anglian Water's proportion to 80:20. There are no works or pipeline routes associated with this option. Therefore, no baseline has been collected.

#### D.10.3.2. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	N/A	The WFD screening has demonstrated the need for a full WFD assessment. Based on the method developed by the Environment Agency, there is a low risk of the proposal resulting in the deterioration of waterbody GB105037041330. No other risks were identified	-	Minor	Medium	<b>Not Significant</b>
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme will increase amount of water in network without the need for further abstraction to get this additional water.	+	Minor	Medium	<b>Not Significant</b>
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	N/A	None identified	0	N/A	N/A	<b>No Effect</b>
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	N/A	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Minor	Medium	<b>Not Significant</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on</li> </ul>	N/A	None identified	0	N/A	N/A	<b>No Effect</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	water e.g. wetlands?						
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon is 0 tCO <sub>2</sub> e The operational carbon is 236 tCO <sub>2</sub> e per year	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing</li> </ul>	N/A	No infrastructure will be needed.	+	Moderate	Medium	Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
resource infrastructure and that existing infrastructure is utilised/expanded where possible	infrastructure rather than building new infrastructure? • Is the scheme designed to be low maintenance? • Will the scheme generate waste/is it a zero waste scheme? • Will waste generated by the scheme be halved to landfill?						
12. Protect best quality soil and agricultural land	• Will it help maintain water supplies for irrigation? • Will it cause loss or damage to soils and agricultural land?	N/A	None identified	0	N/A	N/A	No Effect

#### **D.10.4. Scheme SE6: South Essex RZ Groundwater Development**

##### **D.10.4.1. Scheme Description**

The scheme involves re-commissioning an existing disused groundwater source at the existing Great Horkesley treatment works in Great Horkesley, near Colchester. No construction of pipeline is included with the proposals.

##### **D.10.4.2. Scheme Baseline**

There are very few features or designated areas in or around the site.

##### **Environmental Designations**

Slough Grove Ancient and Semi-Natural Woodland is located approximately 600m from the site. There are no other ecological designations within 1km.

##### **Historic Assets**

There are no Scheduled Monuments, Registered Parks and Gardens, or Registered Battlefields within 1km of the site.

##### **Landscape**

The site is not within or near an AONB, and there are no National Parks and Country Parks within 1km of the site.

##### **Flood Risk**

The site and surrounding area is not within a flood risk zone.

##### **Contaminated Land/Landfill**

There are no landfill sites (historic or authorised) within 1km of the site.

##### **Water and Geology**

The site is not within a Ground Source Protection Zone. The site is not within a Bedrock aquifer but it is within a Secondary A Superficial (drift) deposits aquifer. A superficial deposits aquifer is an aquifer with permeable unconsolidated (loose) deposits, e.g. sands and gravels. A Secondary A aquifer has permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases form an important source of base flow to rivers.

The nearest river is over 2km from the site. This is the River Stour DS Lamarsh. It has an ecological status of Moderate Potential, and a chemical status of Good.

#### D.10.4.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Proposed scheme would not come into contact with surface water bodies.	There are not deemed to be potential effects as there are no water bodies close to the site. Potential for groundwater issues. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has indicated that there is a low risk of deterioration.	-	Minor	Low	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	N/A	Scheme is unlikely to have an effect on leakages or customer water consumption. As long as abstraction from the borehole is within licence limits there should be no significant effects.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on managing flood risk.	0	N/A	N/A	No Effect
		The proposed scheme is outside an area of flood risk.	It is not considered that this scheme will have an impact on flood risk.	0	N/A	N/A	No Effect
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable the use of a water supply that is currently unused.	This proposal would allow increased water supply for the area which is currently unused.	+	Moderate	Medium	Significant
		Few receptors because located within a rural setting	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of the	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			scheme.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would not be located close to a protected site – the nearest environmental designated site is an area of ancient woodland 600m away.	Potential for temporary construction effects on local wildlife.	-	Minor	Low	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Scheme not within a designated landscape area.	Temporary visual impact due to re-commissioning the borehole	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposal is not located close to any Scheduled Monuments of Registered Parks and Gardens.	Unlikely to be any effects on historic assets.	0	N/A	N/A	No Effect
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise,	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		increasing coastal erosion risks to people, property and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 526 tCO <sub>2</sub> e. The operational carbon for this scheme is 69 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would concern re-using a previous borehole. .	Re-use of an existing borehole will reduce the negative effects of construction works, although there will be some need for construction work and use of new materials on site.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Scheme located on existing Anglian Water land	No landtake required	0	N/A	N/A	No Effect

### **D.10.5. Scheme SE7: Ardleigh Reservoir Extension**

#### **D.10.5.1. Scheme Description**

Extension of Ardleigh Reservoir, involving conversion of a gravel pit next to the existing reservoir into an extension of the reservoir. To treat the additional water the existing Ardleigh WTW will be extended. Ardleigh Reservoir is located on the outskirts of Colchester. The scope includes:

- Land purchase (120 acres);
- 630mm diameter transfer pipeline;
- Pumping station;
- Spillway;
- Draw-off works including 800mm conduit;
- Aeration structure; and
- 3 MI/d WTW extension.

#### **D.10.5.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

There are no environmental designations located within the site. The nearest designation is Bullock Wood SSSI which is located approximately 1 mile of the proposed reservoir extension area. Ardleigh Gravel Pits SSSI is over 2 miles from the site, and Birch Wood Ancient and Semi-natural woodland is over 1 mile from the site.

#### **Agricultural Land**

The proposed reservoir extension is on land classified as Grade 2 agricultural quality. This represents high quality agricultural land.

#### **Water Resources**

The existing Ardleigh Reservoir is classified as having poor ecological quality (under the River Basin Management Plan). Salary Brook runs through the existing reservoir but is not located within the proposed extension area. The brook has moderate ecological potential.

#### **Flood Risk**

There is an area classed by the EA as at significant risk of flooding around the existing reservoir and Salary Brook.

#### **Source Protection Zones**

There are no ground source protection zones within or surrounding the site.

#### **Historic Assets**

There are several Listed Buildings surrounding the boundary of the site, but not within the site itself. These are listed in the table below.

#### *Listed Buildings*

Listed Buildings	Distance from reservoir extension works
Forge Cottage Grade II	250m
Gatehouse Farmhouse Grade II	200m
Hillhouse Farmhouse Grade II	50m
Two attached barns approx. 30m west of Hillhouse Farmhouse Grade II	80m
Chilvers Cottages Grade II	250m
Wick Farmhouse Grade II	350m
Barn adjacent to road at Wick Farm Grade II	350m

The Crop Mark Site south of Ardleigh is over 2 miles from the site.

#### **Socio-Economics**

There are several farms close to the boundary of the site that could be affected by nuisance and visual intrusion from the works. The nearest large town is Colchester.

#### **Contaminated Land/Landfill**

There is a historic landfill site associated with the WTW at Ardleigh reservoir. This is located on the opposite site of the existing reservoir to the proposed extension site

#### D.10.5.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The existing Ardleigh Reservoir is classified as having poor ecological quality (under the River Basin Management Plan). Salary Brook runs through the existing reservoir but is not located within the proposed extension area. The brook has moderate ecological potential.	The construction process has the potential to cause pollution to the existing reservoir and Salary Brook through disturbing contaminated land and spillage of construction materials. into the water bodies. Risk will be minimised through adherence to best practice guidance.	-	Minor	Medium	Not Significant
			There are unlikely to be operational effects on water quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has concluded that there is a low risk of deterioration due to potential physical disturbances.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	A short section of pipeline will be associated with the scheme. Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential to result in increased demand for abstraction.	Water will be stored allowing for use when needed.	+	Minor	Medium	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not directly involve managing flood risk, although the extension will be able to hold more water.	The scheme may have benefits for flood risk through water storage.	+	Minor	Low	Not Significant
		There is an area of significant flood risk around the reservoir and Salary Brook	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable increased storage of water.	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across the area.	+	Moderate	Medium	Significant
		Scheme would require the construction of a reservoir extension, new short section of pipeline and modification to existing water works. There are several farms close to the boundary of the site	There may be temporary construction nuisance (noise, dust, visual) for farms close to the site. The views for residents of the nearby farms will be permanently changed.	-	Minor	Medium	Not Significant
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> </ul>	There are no environmental designations located within the site. The nearest	There is hydrological connectivity between the scheme and the designated site; potential changes in water flows from the reservoir during construction has	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	<p>designation is Bullock Wood SSSI which is located approximately 1 mile south-west of the proposed reservoir extension area. Ardleigh Gravel Pits SSSI is over 2 miles from the site, and Birch Wood Ancient and Semi-natural woodland is over 1 mile from the site. There is hydrological connectivity between the scheme and the Colne Estuary SPA/Ramsar</p>	<p>the potential to effect supporting processes on which qualifying natural habitats and species rely.</p>				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	<p>Pipeline would not run through an area designated as an AONB.</p>	<p>Visual impacts during construction and permanent change to landscape from the reservoir extension.</p>	—	Moderate	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	<p>There are several Listed Buildings surrounding the boundary of the site, but not within the site itself. These range from 50m to 350m from the site. There is a Scheduled monument just over 2 miles from the site.</p>	<p>Potential for temporary affects during construction for listed buildings close to the site from dust and vibration. No long-term impacts envisaged.</p>	—	Minor	Medium	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought.	Proposed scheme would build resilience to the effects of climate change through improved water supply security and storage.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 7,601 tCO <sub>2</sub> e. The operational carbon for this scheme is 596 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of a reservoir extension, new short section of pipeline and modification to existing water works	Negative effects from resource use and construction materials.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed reservoir extension is on land classified as Grade 2 agricultural quality.	Agricultural land will be permanently lost for the reservoir extension.	—	Low	Moderate	Not Significant

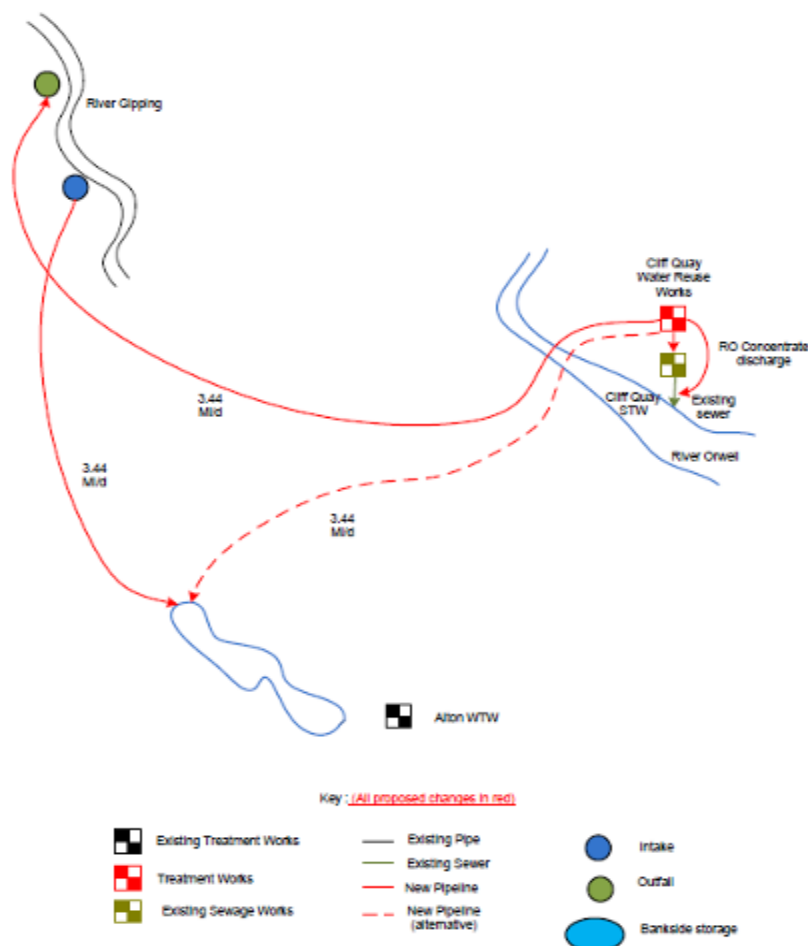
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		This represents high quality agricultural land.					

## D.11. East Suffolk RZ

### D.11.1. Scheme ES3: Ipswich Water Reuse

#### D.11.1.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

This option proposes additional treatment of the discharge from Cliff Quay STW and discharged into the River Gipping, 2km upstream of the Alton water intake at Spoughton.

Cliff Quay STW would require a sidestream MBR and RO. The product water will be oxygenated and the pH increased prior to pumping to the River Gipping. RO generates two streams – the product water which will be pumped into the River Gipping and the concentrate which will be discharged at the existing Cliff Quay STW into the tidal stretch of the River Gipping.

### D.11.1.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

##### Route 1:

From the Cliff Quay STW, the proposed scheme would cross the Orwell Estuary, passing through the Stour and Orwell Estuaries SPA and Ramsar site, afforded protective status due to the large numbers of birds that use the mudflats of the estuary, and it supports important numbers of breeding avocet (*Recurvirostra avosetta*).

The scheme would run through the Holbrook Park area of Ancient Woodland. It would also run adjacent to the northern boundary of the Cutlers Wood area of Ancient Woodland.

SPA	Distance
Stour and Orwell Estuaries	Proposed scheme passes through
Ramsar site	Distance
Stour and Orwell Estuaries	Proposed scheme passes through
Ancient Woodland	Distance
Cutlers Wood	Proposed scheme would run adjacent
Holbrook Park	Proposed scheme would run through

##### Route 2:

From the Cliff Quay STW, the proposed scheme would cross the Orwell Estuary. Here it would be crossing the Stour and Orwell Estuaries SPA and Ramsar site, afforded protective status due to the large numbers of birds that use the mudflats of the estuary and it supports important numbers of breeding avocet (*Recurvirostra avosetta*).

South of Ipswich, the proposed scheme would pass adjacent to the Spring Wood and Millennium Wood, Belstead LNR. This site has been protected due to ancient and coppiced woodland with a range of associated plants. This site also forms the Spring Wood area of Ancient Woodland. Here the scheme would also pass 430m of the Bobbits Lane LNR (designated for its wet woodland and rough grassland), 840m of the Bourne Lane Reedbeds LNR (protected due to reed bed and scrub habitat) and 930m of the Stoke Park Wood LNR (forming an area of mixed woodland). Here it would also pass within 600m of the Bobbitshole, Belstead LNR, afforded protective status due to geology as it is a nationally important Pleistocene reference site.

The discharge point into the River Gipping would be located approximately 140m (on the opposite side of the river) of the Hazel Wood area of Ancient Woodland. Here it would also be approximately 420m from the Bramford Meadows LNR, afforded protective status due to its grassland and scrub habitat and associated fauna, such as great green bush crickets and brown argus butterflies.

The section of the scheme runs from the River Gipping to Alton. On this section of the scheme, the proposal would pass approximately 540m from the Spinney/Wherstead Woods area of Ancient Woodland.

SPA	Distance
Stour and Orwell Estuaries	Proposed scheme passes through
Ramsar site	Distance
Stour and Orwell Estuaries	Proposed scheme passes through

LNR	Distance
Spring Wood and Millennium Wood, Belstead	Proposed scheme would run adjacent
Bobbitts Lane	430m away
Bourne Lane Reedbeds	840m away
Stoke Park Wood	930m away

SSSI	Distance
Bobbittshole, Belstead	600m away

Ancient Woodland	Distance
Spring Wood	Proposed scheme would run adjacent
Hazel Wood	140m away
Spinney/Wherstead Woods	540m -away

### Landscape designations

Both the proposed routes would pass through the Suffolk Coast and Heaths Area of Outstanding Natural beauty (AONB).

### Agricultural Land

The proposed routes would run through areas of Grade 2 or 3 agricultural quality, representing average or above average quality. Much of the route 2 would run through areas which are not classified as they are urban areas.

### Water Resources

Route 1: The proposed scheme would cross the Orwell estuary south of Ipswich.

Route 2: The proposed scheme would cross the Orwell estuary, south of Ipswich, and the Belstead Brook at two locations west of Ipswich. The proposal would also cross a headwater of Alton Water at two locations, north of Tattingstone White Horse. The proposed scheme would also have discharge and abstraction points on the River Gipping.

### Flood Risk

The proposed scheme would pass through areas of flood risk associated with the waterways of the Orwell Estuary, River Gipping and Belstead brook where the scheme would either cross them or have a discharge or abstraction point at them. This only constitutes a small length of the proposed scheme.

### Source Protection Zones

The proposed scheme would have sections of pipeline that run through source protection zone 2.

### Historic Assets

Route 1:

The proposed scheme would pass close to the Grade II listed Wherstead Hall, east of Wherstead, and the Grade II listed Valley Farmhouse, west of Freston.

Route 2:

The proposed scheme would pass close to nine Grade II listed features in Wherstead, as well as the Grade II\* listed Church of St Mary.

In Washbrook, the proposed scheme would pass close to the Grade II listed features of Mill House and Copdock Hall.

In Soughton the proposed scheme would pass close to six Grade II listed features.

In south-west Ipswich the proposed scheme would pass close to Grade II listed features near Springvale comprising the Red House and a barn associated with the Red House.

South of Ipswich, the proposed scheme would run close to the Grade II listed Pannington Hall and the Grade II listed Bluegates Farmhouse.

The proposed scheme would not pass close to any Scheduled Monuments.

#### *Scheduled Monuments*

Scheduled Monument	Distance
Interrupted ditch system at Potash Farm	890m

Route 2 would pass approximately 600m from the Grade II Chantry Park Registered Park and Garden. The proposed scheme would not pass close to any other Registered Park and Garden.

#### *Registered Park and Gardens*

Registered Park and Garden	Distance
Chantry Park	600m

## **Socio-Economics**

Route 1: The proposed scheme would run through the following statistical wards: Gainsborough, Brook, and Alton. The results from the 2011 census are yet to be published in full, therefore data from the 2001 census has been used. The 2001 census shows that the combined population of the wards was 16,051 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply in the area. The proposed scheme would be located in the Local Authorities of Ipswich, Mid-Suffolk and Babergh, and within the county of Suffolk. The proposed scheme would cross the A14(T) at the Orwell Estuary, following the same path as the road for the river crossing.

Route 2: The proposed scheme would run through the following statistical wards: Gainsborough, Brook, Bramford & Blakenham, Pinewood, Sprites, Berners, and Alton. The results from the 2011 census are yet to be published in full, therefore data from the 2001 census has been used. The 2001 census shows that the combined population of the wards was 34,789 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply in the area. The proposed scheme would be located in the Local Authorities of Ipswich, Mid-Suffolk and Babergh, and within the county of Suffolk. The proposed scheme would cross the A14(T) at two locations and the A12 at another, both of which constitute major dual carriageway roads. It would also cross the A1214 and A1071. The proposed scheme would also cross the Ipswich to London railway line at two locations.

The proposed schemes would pass through urban areas associated with the town of Ipswich, and rural areas of Suffolk. The economy of the area has a large agricultural component, as well as the service sector and transport.

## **Contaminated Land/Landfill**

The proposed scheme would start at an area of historic landfill at Cliff Quay. Route 2 would also pass close to an area of historic landfill near Sroughton.



#### D.11.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline would cross the Orwell Estuary, headwaters of Alton Water and the Belstead Brook. Abstraction and discharge from River Gipping.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	<b>Not Significant</b>
			The operation of the pipeline has potential to affect this water body through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. Potential for water quality issues in River Gipping. The WFD screening has demonstrated the need for a full WFD assessment. It is assumed that there will be no reduction of freshwater flow to the estuary but further assessment is needed to confirm that there will be no deterioration.	0	N/A	N/A	<b>No Effect</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential to result in increased demand for abstraction.	Scheme will reuse effluent helping to decrease amount needed for abstraction	+	Minor	Medium	Not Significant
		Scheme concerns supply, and therefore will not affect demand.	None.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on managing flood risk.	0	N/A	N/A	No Effect
		Where the proposal crosses waterways it passes through areas of flood risk. These only constitute very small sections of the proposed scheme.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable the reuse of waste water.	This proposal would allow increased water supply for the area through the re-use of water that would otherwise not be utilised as it is wastewater.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline and modification of	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		existing water works. The scheme avoids built up areas, minimising impacts on community receptors.	from construction of pipeline. Modification works would take place within the existing sites. Short-term construction effects on the local community will have potential to be felt. The proposed scheme would however be constructed in rural areas where impacts on community receptors would be considerably lower.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would pass through the Stour and Orwell Estuaries SPA and Ramsar site, and the Holbrook Park area of Ancient Woodland. The scheme would also run adjacent to the Cutlers Wood area of Ancient Woodland. The scheme would also run adjacent to	Potential effects on designated site during the construction period. Potential for pollution events or disturbance of woodland habitat, particularly if work is undertaken during breeding season.	-	Moderate	High	Highly Significant

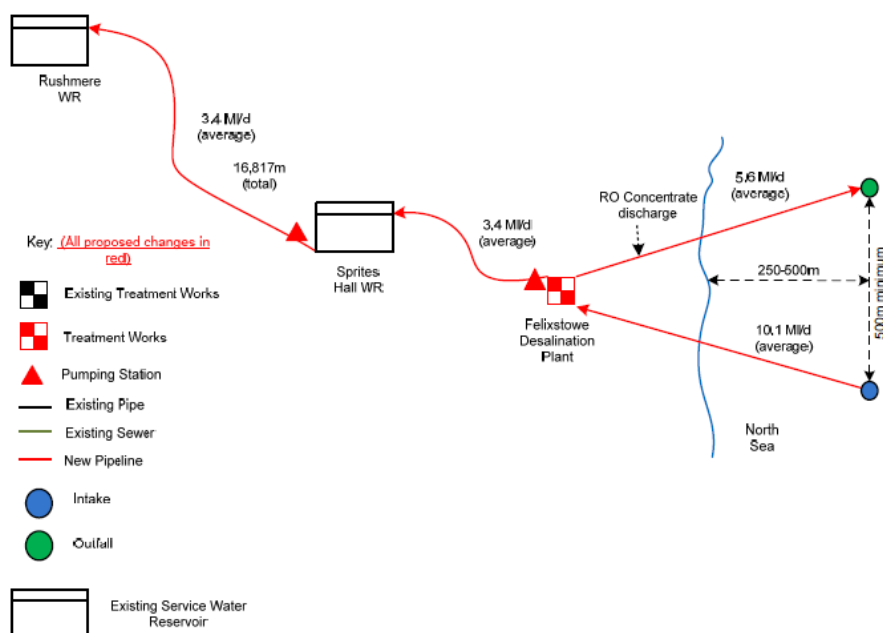
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		the Spring Wood and Millennium Wood, Belstead LNR and the Spring Wood area of Ancient Woodland.					
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would run through the Suffolk Coast and Heaths Area of Outstanding Natural Beauty.	Temporary visual impact due to digging up ground to lay pipeline. No long-term impact envisaged.	–	Minor	Low	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Proposal would not run close to Scheduled Monuments. The proposed scheme would run approximately 600m away from the nearest Registered Park and Garden at Chantry Park. The proposal would run close to several Grade II and II* listed features.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are not considered to be significant given the temporary nature of the impact. It will not directly impact the historical value of these features and impacts on setting would be limited to the construction period.	–	Negligible	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 10,273 tCO <sub>2</sub> e. The operational carbon for this scheme is 7,082 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through an area of Grades 2 and 3 agricultural quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	Not Significant

## D.11.2. Scheme ES4: Felixstowe Desalination

### D.11.2.1. Scheme Description

Scheme ES4 Schematic



Source: Anglian Water

The proposed location for the desalination plant is approximately 1km from the Port of Felixstowe, with the actual location awaiting confirmation. The location for the seawater intake would be located approximately 250m-500m offshore. This stretch of water is a heavily used shipping area which increases the likelihood of ship collision and poor water quality due to the stirring up of the sea bed and the resulting increased turbidity of water. Brine would be discharged and dispersed with 50-100m of the discharge points.

A pipeline will be constructed to connect the proposed facility to the existing Sprites Hall reservoir, which is then connected to Rushmere via an existing pipeline. The flow between Sprites Hall and Rushmere is limited to 7-8 Ml/d, and therefore a new main will be required if the flow rate is to be increased. The pipelines would run through mainly countryside areas, but with some built up areas affected in Felixstowe, Trimley St. Mary and Ipswich, with the proposal running close to the villages of Kirton, Heath Cross and Bucklesham.

### D.11.2.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

**Felixstowe to Sprites Hall:** The pipeline proposal originates at a location that is at most as close as 100m north-west of the Languard Common SSSI (afforded protection due to its supralittoral sediment habitat and associated plants) and is therefore within a 500m buffer for this SSSI. Because this is the proposed location for the desalination plant, there is no alternative for the pipeline than to pass through this buffer, although it does not pass through the SSSI itself. The proposed pipeline route passes approximately 600m from the east of the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) and 1,850m to the

east of the Stour and Orwell Estuaries Ramsar and Special Protection Area site. This site has been given protection due to breeding avocet populations and large numbers of wintering wildfowl.

Spites Hall to Rushmere: This section of pipeline passes through the Suffolk River Valley Environmentally Sensitive Area. Rushmere is located within a Source Protection Zone 1 area, and the pipeline also has to pass through a Source Protection Zone 2 area to access Rushmere. Here it passes approximately less than 100m from the Mill Stream Local Nature Reserve (contains wet carr woodland, ponds and wood/scrub, with water voles present along with First World War firing butts). The route comes as close as approximately 1300m from an area allocated as Coastal Grazing Marsh.

The tables below lay out the areas with environmental designations the proposed pipelines runs close to.

SSSI	Distance
Langard Common	100m

Ramsar	Distance
Stour and Orwell Estuaries	1850m

AONB	Distance
Suffolk Coast and Heaths	600m

Environmentally Sensitive Area	Distance
Suffolk River Valley	Pipeline passes through

Local Nature Reserve	Distance
Mill Stream	100m

### Agricultural Land

The proposed pipeline between Felixstowe and Sprites Hall would pass through land that is generally classified as non-agricultural/urban, or is considered to be grade 2 quality. The pipeline route between Sprites Hall and Rushmere passes through agricultural land that is of grades 3 to 5.

### Flood Risk

The proposed pipeline would pass through an area of Flood Zone 2 in Felixstowe, and a small area of Flood Zone 3 associated with the pipeline crossing the small Mill River.

### Historic Sites and Assets

Scheduled Monument	Distance
Landguard Fort and associated field works	100m

There are no Registered Parks and Gardens in proximity to the proposal. The pipeline is proposed to run within 100m of approximately 25 listed features. There are three which are located in close proximity to the route of the proposed pipeline and are detailed below:

- Grade II listed Kirton Hall, approximately 500m of Kirton. It is a 19<sup>th</sup> Century Farmhouse;
- Grade II\* listed Church of St. Mary in Bucklesham. It is a Mediaeval Church with extensive 19<sup>th</sup> Century re-build; and
- Grade II The Old Rectory in Bucklesham. It is a house, formerly rectory with an 18<sup>th</sup>/19<sup>th</sup> Century core.

The proposed pipeline runs close by two locations in Trimley St. Mary with previous archaeological evidence, though neither of these sites is considered to be of archaeological importance:

- Fidells Cross - Mediaeval boundary cross found at the junction of Spriteshall Lane with High Street; and
- Discovery of Roman coins and a pot near the High Street.

### Socio-Economics

The proposed pipeline would run through six statistical wards: Felixstowe South, Felixstowe West, Trimleys with Kirton, Nacton and Rushmere St. Andrew. The results from the 2011 census are yet to be published in full; therefore, data from the 2001 census has been used. The 2001 census shows that the combined population of the six wards was 28,246 persons. It is envisaged that the area will undergo continued population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The route lies within Suffolk County Council and is within the Suffolk Coastal Local Authority boundary. The location for the Felixstowe desalination plant is zoned for employment by Suffolk Coastal District Council.

The pipelines would run through mainly countryside areas, but with some built up areas affected in Felixstowe, Trimley St. Mary and Ipswich, with the proposal running close to the villages of Kirton, Heath Cross and Bucklesham. It runs close to the A14 and the A12 main dual carriageway roads. The Felixstowe desalination plant lies adjacent to the busy Felixstowe Port, primarily used for container traffic and is a significant employer for the area.

### Contaminated Land/Landfill

There are several areas of historic landfill in the area surrounding the proposed pipeline. These are shown on the map below. The route does not directly cross any of these areas of historic landfill:

- Church Land historic landfill site approx. 160m of the pipeline (inert waste);
- Capel Hall Farm historic landfill site approx. 410m of the pipeline (inert waste); and
- Bucklesham Road historic landfill sites approx. 300m of the pipeline (inert waste).

### Water Bodies

Main River	Ecological Status/Potential	Chemical Status/Potential
Bucklesham Mill River	Moderate	Good

The pipeline would also cross King's Fleet, a water body north-west of Kirton. The scheme is located within a Principal aquifer for the majority of the area. Around the Port of Felixstowe this is a Secondary A aquifer (Bedrock).



#### D.11.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Brine would be discharged from the desalination plant 50m-100m offshore.	Potential for discharged brine to cause negative effects in the water system where it is discharged. However, due to the fact that it is being discharged straight into the sea and will have a lower salt concentration than the receiving water it is unlikely to have significant effects. The WFD assessment carried out has reasonably concluded that there will be no deterioration. Further assessment is required to increase the certainty of the conclusion.	0	N/A	N/A	No Effect
		Pipeline would cross King's Fleet, a water body north-west of Kirton, and Bucklesham Mill River (ecological status = moderate, chemical status = good). The scheme runs through a Secondary A aquifer around the Port of Felixstowe area and a Principal aquifer for the majority of the rest of the area.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD assessment carried out has reasonably	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			concluded that there will be no deterioration. Further assessment is required to increase the certainty of the conclusion.				
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 13.3km of pipeline.	Leakages from pipeline are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be taken from the sea, which forms a sustainable water resource.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Part of the scheme will be constructed in areas liable to flooding.	Pipeline unlikely to affect flooding. No new flood storage involved in scheme but existing service water reservoirs at Sprites Hall and Rushmere will be utilised. Burst pipes can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Ipswich and Woodbridge Planning Zones deficit is forecast to be 18.95 ml/d by 2040. The scheme would have an average capacity of 25 ml/d.	Will help enable the predicted Ipswich and Woodbridge PZs deficit to be reduced and thus ensure a continued supply of water for customers.	+	Moderate	Medium	Significant
		Scheme would require the construction of 13.3km of new pipeline and a desalination plant. This scheme would pass close to	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. In particular the pipeline will involve 718km of A roads reinstated, 2.5km B and minor roads	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		community receptors.	reinstated, total of 22 no. direct drill crossings of rivers, roads and railways. The new desalination plant at Felixstowe will be within an industrial area that comprises the Port of Felixstowe, though it would be located close to a SSSI and Scheduled Monument site at Languard Common. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would not pass through designated sites. However, the pipeline route is within 100m of a SSSI and LNR	No direct loss of habitat or disruption within designated areas. However, potential for temporary construction disturbance from noise and dust etc.	-	Negligible	High	Not Significant
7. Protect and enhance landscape quality and character across the	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> </ul>	Pipeline would run 600m from Suffolk Coasts and Heaths	Potential temporary visual effects from the AONB due to digging up ground to lay	—	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
region.	<ul style="list-style-type: none"> <li>Will it enhance landscape quality and character?</li> </ul>	AONB. Does not pass through any landscape-designated area.	pipeline, although unlikely due to distance from AONB.				
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Desalination plant in Felixstowe is located approximately 100m away from the Languard Common Scheduled Monument. Scheme would also come within 500m of three listed features.	Potential for the scheme to compromise the historic setting of Languard Common with construction of the desalination plant. Temporary impacts on setting for listed features associated with the pipeline construction, although these are considered to be minor.	–	Moderate	High	Highly Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. Felixstowe part of the scheme could be at risk from increasing sea levels.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions</li> </ul>	N/A	Total embodied carbon is 8,388 tCO <sub>2</sub> e Operational carbon is 14,421 tCO <sub>2</sub> e per year	-	N/A	N/A	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	from transport?						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require 13.3km of new pipeline and the construction of a new desalination plant. The scheme would see an upgrade of existing capacity between Sprites Hall and Rushmere.	Upgrading of existing capacity between Sprites Hall and Rushmere would enable modernisation of infrastructure. However, this would also require the negative effects of resource use for construction materials, along with the construction materials required for the desalination plant and pipeline. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 2 and 3 agricultural land, although there are some areas of Grades 4 and 5. There are 3 historic landfill sites within 410m of the pipeline route (the nearest is approx. 160m)	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground. The desalination plant is proposed for land which is classified as Urban/Non-agricultural. Potential for contamination pathways to be created from laying the pipeline near historic landfill sites. Effects reduced due to distance from sites.	—	Negligible	Low	<b>Not Significant</b>

### **D.11.3. Scheme ES6: East Suffolk RZ Groundwater Development**

#### **D.11.3.1. Scheme Description**

The proposed scheme would entail the reuse of the disused Claydon groundwater source. No construction of pipeline is included with the proposals.

#### **D.11.3.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

The closest ecological designation to the proposed site is the Sandy Lane Pit, Barnham SSSI, located approximately north of the site. There are no other sites with an ecological designation within a 1km radius of the site.

SSSIs

SSSI	Distance
Sandy Lane Pit, Barnham	950m

##### **Landscape designations**

The proposed scheme would not pass through an area of Outstanding Natural Beauty

##### **Agricultural Land**

The proposed scheme is not proposed for an area of agricultural land and is located in an urban area.

##### **Water Resources**

The proposed scheme would not come into contact with any surface water systems.

##### **Flood Risk**

The proposed scheme would not be located in an area of flood risk.

##### **Source Protection Zones**

The proposal would be located in an area bordering Groundwater Source Protection Zones 1 and 2.

The bedrock below the proposed site is designated as a principal aquifer by the Environment Agency.

The proposed scheme would be located above a Groundwater Vulnerability Zone classified as major aquifer intermediate.

The proposed site lies outside an area of superficial deposits aquifer designation.

##### **Historic Assets**

The closest listed feature to the proposal would be the Grade II listed Henry VIII farmhouse, located approximately 220m of the proposed site. It is not considered that this proposal would have a detrimental impact on this feature.

The closest Scheduled Monument to the proposed scheme would be the Baylham Roman Site, which would be approximately 2.75km from the proposed scheme. This is considered to be too far for the proposal to have an impact upon it.

The closest Registered Park and Garden to the proposal would be the Grade I Shrubland Hall, approximately 1.3km from the proposed scheme. This is considered to be too far for the proposal to have an impact upon it.

### **Socio-Economics**

The proposed scheme would be situated in the statistical ward of Claydon & Barham. The results from the 2011 census are yet to be published in full, therefore data from the 2001 census has been used. The 2001 census shows that the population of the Claydon & Barham ward was 4,200 persons. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply in the area. The proposed scheme would be located in the Local Authority of Mid-Suffolk and the county of Suffolk.

The proposal would be located in the village of Claydon which is a predominantly residential area, with the wider area being dominated by agricultural land.

### **Contaminated Land/Landfill**

The proposed scheme would be located at a site with both authorised and historical landfill sites in the surrounding area, but the site is not close to these sites itself.

### D.11.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Proposed scheme would not come into contact with surface water bodies.	There are not deemed to be potential effects as there are no water bodies close to the site. Potential for groundwater issues. The WFD screening has demonstrated the need for a full WFD assessment. The WFD assessment predicted that there would be a low risk of deterioration.	-	Minor	Low	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	N/A	Scheme is unlikely to have an effect on leakages or customer water consumption. As long as abstraction from the borehole is within licence limits there should be no significant effects.	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on managing flood risk.	0	N/A	N/A	No Effect
		The proposed scheme is outside an area of flood risk.	It is not considered that this scheme will have an impact on flood risk.	0	N/A	N/A	No Effect
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable the use of a water supply that is currently unused.	This proposal would allow increased water supply for the area which is currently unused.	+	Moderate	Medium	Significant
		Scheme location if within a rural village setting	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of the	-	Minor	Medium	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			scheme.				
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would not be located close to a protected site – the nearest is a SSSI 950m away.	Potential for temporary construction effects on local wildlife.	-	Minor	Low	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Scheme not within a designated landscape area.	Temporary visual impact due to re-commissioning the borehole	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposal is not located close to any Scheduled Monuments of Registered Parks and Gardens. The closest listed feature is located approximately 220m away.	Potential for impact on setting of listed features. However, intervening development and vegetation mean this is considered to be unlikely at this site.	–	Minor	Low	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events,	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.					
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 878 tCO <sub>2</sub> e. The operational carbon for this scheme is 159 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would concern re-using a previous borehole.	Re-use of an existing borehole will reduce the negative effects of construction works, although there will be some need for construction work and use of new materials on site.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Scheme located on existing Anglian Water land	No landtake required	0	N/A	N/A	<b>No Effect</b>

#### **D.11.4. Scheme ES10: South Essex RZ transfer**

Scheme ES10 is the reverse of scheme SE2 and will have the same baseline and assessment, therefore, it has not been repeated.

## D.12. North Ruthamford RZ

### D.12.1. Scheme RHFA2: Peterborough Water Reuse

#### D.12.1.1. Scheme Description

The scheme involves transferring treated effluent from Flag Fen STW to a point upstream on the River Nene for water supply. The discharge location will be at least 2km upstream of any raw water intake.

#### D.12.1.2. Scheme Baseline

##### Ecological Sites and Environmental Designations

The site, water reservoir and pipeline routes are near two SPAs, 11 SSSI, and one LNR (shown in the tables below).

SPA	Distance
Nene Washes	300m
Rutland Water	300m

SSSI	Distance
Nene Washes	300m
Castor Highlands	Through site
Rutland Water	300m
Shacklewell Hollow	Through site
Empingham Marshy Meadows	750m
Ketton Quarries	600m
Collyweston Quarries	200m
Bonesmill Hollow	Through site
Bedford Purlieus	Adjacent to site
West Abbots and Lound Woods	500m
Old Sulehay Forest	200m

LNR	Distance
Grimeshaw Wood	300m

##### Historic Sites and Assets

The site, water reservoir and pipeline routes are near several Schedule Monuments (shown in the table below).

Scheduled Monument	Distance
Peterborough Cathedral Precincts	650m
Bronze Age Post Alignment and Timber Platform	800m
Shrunken Village at Upton	900m
Sutton Heath	650m
Wothorpe House	500m
Austin Friars Priory/Tower of City Wall	700m
Moated Site with fishponds and enclosures	200m
Wansford Roman Site	700m
Fort and Roman Walled Town of Durobrivae	On site
Roman site in Normangate field/Roman Villa SW of Castor Station/Site of Roman Villa	400m
Castor flood meadows	200m
Orton Pit	Adjacent to site
Settlement areas south of Orton Longue Ville	Adjacent to site
Site of Manor House Gardens/Collyweston Sundial	500m

## **Water bodies**

There are several water bodies that lie near the proposed pipeline route:

- Rutland water;
- River Nene;
- Willow Brooke;
- River Wellend; and
- River Gwash.

## **Landscape**

The site, water reservoir and pipeline route does not lie immediately adjacent or near any AONBs.

## **Flood Risk**

There are several rivers, water reservoirs and canals along this pipeline route therefore there is always risk of flooding.

## **Agricultural Land**

The majority of the area that the reservoir is in is Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

## **Contaminated Land/Landfill**

The pipeline route passes through or close to the following landfill sites:

- Within 200m of Ketton Landfill and Ketton Quarry authorised landfill site;
- Within 200m of Grange Bottom Quarry, Ketton historic landfill site;
- Through Thornhaugh Landfill Quarry and Thornhaugh authorised landfill site;
- Through Stamford historic landfill site;
- Runs along a road which is adjacent to a number of historic landfill sites including:
  - London Road Stages 2 and 3 landfill site;
  - Woodstow landfill site;
  - Stanground landfill site; and
  - Land Off Potters Way landfill site.

### D.12.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Several water bodies lie near the proposed route including : Rutland water; River Nene; Willow Brooke; River Wellend; River Gwash	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme reuses effluent reducing the pressure on clean water abstraction sources.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood</li> </ul>	Pipeline routes go through some areas	Although the pipeline crosses flood risk areas there is	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
flooding	<ul style="list-style-type: none"> <li>storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	of significant flood risk where it crosses main rivers.	unlikely to be effects as it the pipeline will be buried underground. Burst pipes can cause localised flooding. This project will not increase of install new flood storage.				
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads on the outskirts of Peterborough.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Scheme is within 300m of Nene Washes SPA and Rutland Water SPA, and goes through 3 SSSIs, and is within 500m of 6 more SSSIs.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding.	-	Moderate	High	Highly Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Scheme does not pass through any AONBs.	Temporary visual effects from digging up ground to lay pipeline.	-	Minor	Low	Not Significant
8. Protect and enhance the historic environment,	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> </ul>	The scheme is adjacent to 3	Potential for damage to adjacent scheduled	-	Major	High	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the setting of a historic asset?</li> </ul>	Scheduled Monuments, and within 500m of 5 more.	monuments from laying pipeline.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	Total embodied carbon is 15,422 tCO <sub>2</sub> e Operational carbon is 17,951 tCO <sub>2</sub> e per year	-	N/A	N/A	Highly Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate</li> </ul>	N/A	The pipeline and water treatment works will require use of resources and materials for construction.	—	Medium	Low	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	waste/is it a zero waste scheme? • Will waste generated by the scheme be halved to landfill?						
12. Protect best quality soil and agricultural land	• Will it help maintain water supplies for irrigation? • Will it cause loss or damage to soils and agricultural land?	The majority of the land is Grade 3 agricultural land. The scheme will run through an authorised landfill site and a historic landfill.	Potential for contamination pathways to be opened up during construction of pipeline from landfill sites.	—	Medium	Moderate	Significant

## D.12.2. Scheme RHFA3: Rutland Dam Raising

### D.12.2.1. Scheme Description

A 10% increase in the storage contained within Rutland Water would remain with the licence for refill and for abstraction from the reservoir. This 10% increase in volume at this reservoir would result in a 20 MI/d rise in hydrological yield.

The proposed scheme of increasing the reservoir volume by 10% will require the dam to be raised by 1m with a 3m high retaining wall. This will require a length of crest of approximately 1,200m. The area of fill required is approximately 69.3m<sup>2</sup> giving a total volume of fill of 83,160m<sup>3</sup>.

For this proposal a 1,000m x 5m access road and a reinstatement of 1,200m edge protection to the crest on both sides will be required.

There are no pipelines associated with this scheme.

### D.12.2.2. Scheme Baseline

#### Ecological Sites and Environmental Designations

The reservoir does not lie immediately adjacent or near any SACs.

The reservoir itself is an SPA.

SPA	Distance
Rutland Water	On site

The reservoir is near two SSSIs (shown in the table below).

SSSI	Distance
Burley & Rushpit Woods	Adjacent to North of site
Rutland Water	On Site

The reservoir does not lie immediately adjacent or near any LNRs.

#### Historic Sites and Assets

The reservoir has a scheduled monument on site and one nearby.

Scheduled Monument	Distance
Moated Site With Fishponds And Enclosures At Empingham	590m
Barnhill Moated Site At Hambleton	On site

#### Water bodies

The reservoir itself is a water body.

#### Landscape

The reservoir is not within or near an AONB.

#### Source Protection Zones

The reservoir is not within or near a SPZ.

#### Flood Risk

The reservoir is a water body therefore there is always risk of flooding from the reservoir.

### **Agricultural Land**

The majority of the area that the reservoir is in is Grade 3 agricultural land; there are some small areas of Grade 2 and Grade 4 agricultural land.

### **Contaminated Land/Landfill**

The reservoir has industrial pollution sites nearby as shown in the table below.

Pollution	Distance
Radioactive substance sites (Oakham Veterinary Hospital)	1700m

### D.12.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Raising the dam will increase the surface area of the water body.	Increasing the area of the water body which is a designated SSSI and SPA potentially will improve the ecological status of the Rutland Water. However the WFD assessment carried out has identified that there is a potential high risk of deterioration of a water body (GB30536479) associated with this scheme. Further investigation into the possible impacts raised water levels are likely to have on the biological elements are required. A review of the water quality impacts will be required. Other water bodies associated with this scheme are at low risk or no risk of deterioration.	-	Moderate	High	Highly Significant
			Construction works will likely require the water levels to be dropped prior to starting work and this may have a temporary negative impact on the water body. There is also potential for pollution to be caused during the construction phase, best practice guidelines for working near water should be followed. The WFD screening has demonstrated that a full WFD assessment is not required.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> </ul>	Increased demand on water resources has the potential	The volume of water available will increase this will allow more water to be abstracted	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	result in increased demand for raw water abstraction. N/A	whilst at the same time reducing the pressure of over abstraction on this water body Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Risk of flooding from reservoir	Increasing the volume of the reservoir will result in water that may have contributed to flooding being stored but could also cause reservoir flooding.	-	Minor	Medium	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water During the construction there may be a temporary impact on local residents from construction traffic and noise. There may also be some permanent loss of local land with the rise in water level.	The scheme would help ensure a secure and continued supply of water for customers. There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from the construction works to raise the dam.	+	Moderate	Medium	Significant
		Proposed scheme will increase the surface water area of the existing water body.	Slight positive to be gained from increasing the surface water area of the existing water body.	+	Minor	Low	Not Significant
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to</li> </ul>	Rutland Water SPA and SSSI are part	Construction on the existing dam within the designated site	-	Moderate	High	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
diversity across the region.	<ul style="list-style-type: none"> <li>statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	of the site. Burley & Rushpit Woods SSSI is located to the north of the site.	is likely to result in the disturbance of qualifying features and act in-combination with existing recreational pressure for which the site is vulnerable. An increase in reservoir water height is likely to result in the loss of habitat supporting qualifying features if this has not been accounted for in the recent habitat creation project.				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Existing dam will be raised.	Temporary visual effects from construction work to raise dam level, Permanent change in landscape will higher dam height.	–	Minor	Medium	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Bamhill moated site is surrounded by the water body and the Epingham moated site within fishponds is located 590m east.	The scheme has potential to impact on the Bamhill moated site depending on the increased height in water levels.	-	Moderate	Medium	Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 66,109 tCO <sub>2</sub> e. The operational carbon for this scheme is 1,449 tCO <sub>2</sub> e per year.	-	N/A	N/A	Highly Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The scheme is increasing the capacity of an existing asset rather than creating a new reservoir.	Existing Rutland Water capacity will be increased by raising the height of the dam. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Locally the majority of the area is Grade 3 agricultural land, although there are some small areas of Grade 2 and Grade 4.	Raising the dam is unlikely to have a significant impact on the local agricultural land.	0	N/A	N/A	No Effect

### **D.12.3. Scheme RHFA4: Trade with STW**

#### **D.12.3.1. Scheme Description**

This scheme involves reducing the amount of water Anglian Water export to STW. There will be no new infrastructure involved in this scheme. Therefore, no baseline has been gathered.



#### D.12.3.2. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	N/A	None identified.	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme will increase amount of water in network without the need for further abstraction to get this additional water	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	N/A	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Minor	Medium	Not Significant
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
7. Protect and enhance landscape quality and character across the	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
region.	and character?						
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	Carbon modelling results to be determined	?	N/A	N/A	?
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> </ul>	N/A	No infrastructure will be needed.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
possible	<ul style="list-style-type: none"> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>						
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect

#### **D.12.4. Scheme RHFA5: Pitsford Dam Raising**

##### **D.12.4.1. Scheme Description**

The proposed Pitsford Dam Raising scheme contributes to supplying the Ruthamford North RZ deficit and will provide 13.8 MI/d capacity for the RZ. A 50% increase in the reservoir volume within Pitsford would remain with the licence for refill and for abstraction from the reservoir. Pitsford's yield would benefit from an increase in storage, with 13.8 MI/d gained from 50% greater reservoir volume.

The proposed scheme of increasing the reservoir volume by 50% will require the dam to be raised asymmetrically by an estimated 3m (further would be required to determine the exact height to produce the increase in volume required). This will require a length of crest of approximately 518m. The area of fill required is approximately 141.8m<sup>2</sup> giving a total volume of fill of 73,452m<sup>3</sup>. For this proposal a 1,000m x 5m access road and a reinstatement of 518m edge protection to the crest on both sides will be required.

The additional water that will be available from the raising of Pitsford dam will be treated at Pitsford WTW before being transferred to Ling Water Reservoir via a 7km pipeline.

##### **D.12.4.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

##### *Reservoir*

The reservoir does not lie immediately adjacent or near any SACs.

The reservoir does not lie immediately adjacent or near any SPAs.

The reservoir itself is a SSSI.

SSSI	Distance
Pitsford Reservoir	Site

The reservoir does not lie immediately adjacent or near any LNRs.

##### *Pipeline*

The pipeline does not pass through or close to any SACs.

The pipeline does not pass through or close to any SPAs.

The pipeline does not pass through or close to any SSSIs.

The pipeline passes immediately next to Crowfields Common Local Nature Reserve.

#### **Historic Sites and Assets**

##### *Reservoir*

The reservoir does not lie immediately adjacent or near any Scheduled Monuments.

##### *Pipeline*

The pipeline does not pass through or immediately adjacent or near any Scheduled Monuments.

### **Water bodies**

The Pitsford Water reservoir is a water body.

The pipeline crosses one waterbody the Malton Arm of the Brampton Branch upstream of where the waterbody has been classified by the Environment Agency.

### **Landscape**

The reservoir is not within or near an AONB.

### **Source Protection Zones**

The reservoir is not located within a source protection zone.

### **Flood Risk**

The reservoir is a water body therefore there is always risk of flooding from the reservoir.

### **Agricultural Land**

The majority of the area that the reservoir is in is Grade 3 agricultural land; there are some small areas of Grade 2 agricultural land.

### **Contaminated Land/Landfill**

There are no known pollution spots near the reservoir.

#### D.12.4.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Increasing the level of the dam will increase the surface area of the existing water body	<p>Construction activities that are undertaken near water have the potential to cause pollution.</p> <p>Construction methods should follow best practice guidelines to avoid, contain or minimise any pollution incidents.</p> <p>The WFD assessment has concluded that there is a potential high risk of deterioration of a water body (GB30538199) associated with this scheme. Further investigation into the possible impacts raised water levels are likely to have on the biological elements are required. A review of the water quality impacts will be required. Other water bodies associated with this scheme are at low or no risk of deterioration.</p>	-	Moderate	High	Highly Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	<p>Pipelines have the potential for leakages to occur. This scheme concerns construction of a new pipeline</p> <p>Increased demand on water resources has the potential result in increased demand for raw</p>	<p>Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.</p>	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		water abstraction.	The yield of the existing water body will be increased.				
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The volume of water that the reservoir can contain will increase.	The reservoir will store more water therefore potential risk from pluvial or fluvial flooding should be reduced.	+	Minor	Medium	Not Significant
			With an increase in water volume stored there is an increased risk from flooding if the dam breaches.	-	Minor	Medium	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads on the outskirts of Peterborough.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The area and volume of the water body will be increased.	The area of water habitat will increase.	+	Minor	Medium	Not Significant
		The construction works have potential to create potential for	Best practice guidelines for working in or near water will be followed.	-	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		pollution to enter the water body.					
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Existing dam will be raised.	Temporary visual effects from construction work to raise dam level, Permanent change in landscape will higher dam height.	-	Minor	Medium	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	<p>There are no historical assets close to the existing reservoir.</p> <p>The pipeline passes close to several listed buildings but no scheduled ancient monuments.</p>	The proposed laying of the pipeline has the potential to have an effect on the listed building or disturb previously unrecorded historical assets but this is unlikely.	-	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to</li> </ul>	N/A	The total embodied carbon for this scheme is 24,678 tCO <sub>2</sub> e. The operational carbon for this scheme is 1,417 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Significant</b>



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The scheme is increasing the capacity of an existing asset rather than creating a new reservoir. Materials will be required for the new pipeline.	Existing Pitsford Reservoir capacity will be increased by raising the height of the dam. Raising the dam and laying of the pipeline scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Locally the majority of the area is Grade 3 agricultural land, although there are some small areas of Grade 2 and Grade 4.	Raising the dam is unlikely to have a significant impact on the local agricultural land.	0	N/A	N/A	<b>No Effect</b>

## D.12.5. RHFA6: Canal Transfer

### D.12.5.1. Scheme Description

This option involves transfer of water from Severn Trent Water's Minworth STW to Ling Reservoir via Duston Mills. This proposed scheme seeks to utilise the existing network of Grand Union Canal.

This option involves the construction of a 626mm diameter pumping main from Minworth STW near Birmingham to the canal/river system, approximately 6.4km. Water would then be abstracted and pumped at Duston Mills near Northampton. The second leg of this proposed scheme involves a 900mm diameter pumping main from Duston Mill to Ling Reservoir across a distance of 9.2km.

### D.12.5.2. Scheme Environmental Baseline

#### Ecological Sites and Environmental Designations

The pipeline and water resources do not lie immediately adjacent or near any SACs.

The pipeline and water resources do not lie immediately adjacent or near any SPAs.

The pipeline and water resources are near three SSSIs (shown in the table below).

SSSI	Distance
Alvecote Pools	Adjacent to site
Boon's Quarry, Woodland's Quarry and Illing's Trenches	200m
Griff Hill Quarry	Through site

The pipeline and water resources are near twelve LNRs (shown in the table below).

LNR	Distance
Tameside	700m
Kettle Brook	Through site
Warwickshire Moor	200m
Dosthill Park	500m
Hodge Lane	Adjacent to site
Wyken Slough	250m
Newbold Quarry Park	Through site
Ashlawn Cutting	Adjacent to site
Storton's Pits	500m
Kingsthorpe	700m
Hills and Holes	100m
Lings Wood	On site

#### Historic Sites and Assets

The pipeline and water resources are near twenty five schedule monuments (shown in the table below).

Scheduled Monument	Distance
Causewayed Enclosure	100m
Settlement Sites and Enclosures	700m
Wynchnor deserted medieval village	200m
Circular enclosures	600m
Pit alignments running and centring Wynchnor Bridge	700m
Moated site and plunge bath at Manor House	200m
Tamworth Castle and Medieval Deanery	500m
Polsworth Abbey Remains and Polesworth Bridge	150m
Merevale Abbey	500m

Scheduled Monument	Distance
Manduesedum Roman Villa	400m
Oldbury camp	1km
Hartshill Castle	700m
Benefictine Priory and Precinct of St Mary, Nuneaton	300m
Ensor's Pool	1km
Site of deserted village of Hopsford	720m
Cistercian, Grange of Upper Smite	520m
Mottle and Bailey Castle	400m
Deserted village at Onley Grounds	500m
Braunstonbury deserted Medieval Village	Adjacent to site
Site of Bannaventa	Adjacent to site
Muscott deserted Medieval Village	Within 300m
The Berry Ringwork	Within 700m
Multivallate Hillfort at Hunsbury Hill	Within 900m
Deserted Medieval Village	Within 700m
Saxton Palace Complex	Adjacent to site

### Water bodies

The River Trent is a water bodies. The pipeline runs near several rivers such as the River Trent and River Tame. The pipeline runs alongside the Coventry Canal.

### Landscape

The pipeline and water resources do not lie immediately adjacent or near any AONBs.

### Source Protection Zones

The pipeline does not pass through any source protection zones.

### Flood Risk

There are several rivers and canals along this pipeline route and therefore the route runs through areas at risk from flooding.

### Agricultural Land

The majority of the area that the pipeline passes through is Grade 3 agricultural land with some areas of Grade 4 and Grade 2 agricultural land.

### Contaminated Land/Landfill

The pipeline route runs close to a number of landfill sites.

#### D.12.5.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The River Trent and Lings water reservoir are water bodies. The pipeline runs near several rivers such as the River Trent and River Tame. The pipeline runs alongside the Coventry Canal before reaching Lings water reservoir where the River Nene runs south of this pipeline.	Where the pipeline runs close to or crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 135km of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme uses water from a canal reducing the pressure on clean water abstraction sources.  <b>*Although not shown on the drawings it is assumed that</b>	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			<b>the water will be treated before entering the water distribution network.</b>				
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	<b>No Effect</b>
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. Burst pipes can cause localised flooding. This project will not increase of install new flood storage.	-	Minor	Low	<b>Not Significant</b>
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	<b>Significant</b>
		Numerous receptors, especially where the pipeline follows major roads on the outskirts the major settlements including Tamworth, Nuneaton, Coventry and Northampton.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	<b>Not Significant</b>
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	<b>No Effect</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance	<ul style="list-style-type: none"> <li>Will it encourage habitat</li> </ul>	Pipeline runs	Although construction of the	-	Moderate	High	<b>Highly</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	through a SSSI and 3 LNR, and runs adjacent to a second SSSI, and another LNR.	pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding.				Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route does not go through any AONBs	Temporary visual effects across an extensive area from digging up ground to lay pipeline.	–	Minor	Medium	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs adjacent to 3 SM and within 1km of 22 further Scheduled Monuments.	Temporary affects to Scheduled Monuments from laying of the pipeline. Potential to disturb both recorded and previously unrecorded archaeological remains in these areas. Pipeline running adjacent to scheduled monuments may cause damage to the fabric of the structure.	–	Moderate	High	Highly Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 9,570 tCO <sub>2</sub> e. The operational carbon for this scheme is 5,323 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	135 km of new pipe and associated fittings and materials will be required	135 km of new pipeline will be required. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 and Grade 4. Pipeline passes close to several waste sites along the majority of the route.	<p>Likely to include temporary effect on soils and agricultural land through laying of pipelines. Pipeline length is 135km so extensive area of ground would require excavation and work compound areas.</p> <p>Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.</p>	—	Moderate	Medium	Significant

#### **D.12.6. Scheme RHFA15: Saltersford reduction**

##### **D.12.6.1. Scheme Description**

This is an opex only solution. It involves reducing raw water export to the Central Lincolnshire RZ. The source (by substitution) would be Hall WTW. There are no works or pipeline routes associated with this option. Therefore, no baseline has been collected.



#### D.12.6.2. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme will increase amount of water in network without the need for further abstraction to get this additional water	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	N/A	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Minor	Medium	Not Significant
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
8. Protect and enhance	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>						
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 0 tCO <sub>2</sub> e. The operational carbon for this scheme is 623 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	No infrastructure will be needed.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect

## D.13. South Ruthamford RZ

### D.13.1. Scheme RHFA1: Ruthamford North RZ Transfer 1

#### D.13.1.1. Scheme Description

This option involves utilising the surplus in Ruthamford North RZ available at average. It requires an increased transfer of water from Hannington Reservoir to Salcey Reservoir .

This option involves the construction of a 900mm diameter pumping main approximately 20.6km.

#### D.13.1.2. Scheme Environmental Baseline

##### Ecological Sites and Environmental Designations

The WR, PS and pipeline does not lie immediately adjacent or near any SACs.

The Ecton PS lies near a SPA.

SPA	Distance
Upper Nene Valley Gravel Pits	800m

The WR, PS and pipeline lies near three SSSIs. The pipeline runs through ancient woodland which includes Hardwick Wood and Sywell Wood.

SSSI	Distance
Withmale Park Wood/Bush Walk	220m
Hardwick Lodge	630m
Salcey Forest	Adjacent to Salcey WR

The WR, PS and pipeline does not lie immediately adjacent or near any LNRs.

##### Historic Sites and Assets

The pipeline to Salcey WR lies near two schedule monuments.

Schedule Monument	Distance
Clifford Hill Motte Castle	600m
Romano-British Settlement & Pottery Kiln W of Ecton North Lodge	700m

The WR, PS and pipeline does not lie immediately adjacent or near any NPs.

##### Water bodies

The water body near the Hannington WR is Pitsford Water. The pipeline passes through the Sywell reservoir and through the River Nene to Salcey WR.

##### Landscape

The WR, PS and pipeline does not lie immediately adjacent or near any AONB.

##### Source Protection Zones

The proposed new pipeline does not run through any source protection zones.

### **Flood Risk**

The pipeline cuts through the River Nene which has the potential for flooding.

### **Agricultural Land**

The majority of the area that the WR, PS and that the pipeline passes through is located in Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

### **Contaminated Land/Landfill**

There are no known potential sources of pollution along the proposed new pipeline route.

### D.13.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 3 main water bodies including the River Nene with moderate to poor ecological status which fail chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 19.5km of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme uses surplus water from existing source and WTW so reduces the pressure on new clean water abstraction sources.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and	Will it contribute to managing	Pipeline routes go	Although the pipeline crosses	-	Minor	Low	Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
reduce the impact of flooding	<ul style="list-style-type: none"> <li>flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	through some areas of significant flood risk where it crosses main rivers.	flood risk areas there is unlikely to be effects as it the pipeline will be buried underground and micro sited around the reservoirs This project will not increase the amount of available existing or install new flood storage. Burst pipes can cause localised flooding.				Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads on the outskirts of Northampton	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route crosses the River Nene and passes close to designated sites (adjacent to a SSSI).	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding.	-	Moderate	High	Significant
7. Protect and enhance	<ul style="list-style-type: none"> <li>Will it negatively affect landscape</li> </ul>	Pipeline route does	Temporary visual effects from	—	Minor	Low	Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
landscape quality and character across the region.	<ul style="list-style-type: none"> <li>quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	not run through any sites designated for landscape value.	digging up ground to lay pipeline the scheme uses existing WTW and WR so visual effects will not be significant.				Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs within 600m of historical assets.	Pipeline does not run through any scheduled monuments so is unlikely to cause damage to the fabric of the structure. There is still potential for the excavation for the laying of the pipeline to have an effect on previously unrecorded assets	–	Minor	Low	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010</li> </ul>	N/A	The total embodied carbon for this scheme is 8,627 tCO <sub>2</sub> e. The operational carbon for this scheme is 1,389 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Pipeline will be constructed using new materials.	Existing Hannington WR, Ecton PS and Salcey WR will be utilised. 19.5km of new pipeline will be required. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2.	Likely to include temporary effect on soils and agricultural land through laying of pipelines.	—	Negligible	Low	<b>Not Significant</b>

## **D.13.2. Scheme RHFA7: Grafham Dam Raising**

### **D.13.2.1. Scheme Description**

The proposed scheme of increasing the reservoir volume by 50% will require the dam to be raised asymmetrically by 3m or more. This will require a length of crest of approximately 1,300m. The area of fill required is approximately 169m<sup>2</sup> giving a total volume of fill of 219,700m<sup>3</sup>.

A 50% increase in the reservoir volume within Grafham Water would remain with the licence for refill and for abstraction from the reservoir. Grafham's yield would benefit from an increase in storage, with 50 MI/d gained from 50% greater reservoir volume.

For this proposal a 1,000m x 5m access road and a reinstatement of 1,300m edge protection to the crest on both sides will be required.

### **D.13.2.2. Scheme Environmental Baseline**

#### **Ecological Sites and Environmental Designations**

The reservoir does not lie immediately adjacent or near any SACs.

The reservoir does not lie immediately adjacent or near any SPAs.

The reservoir is near three SSSIs (shown in the table below).

<b>SSSI</b>	<b>Distance</b>
Grafham Water	On site
Perry Woods	570m
Brampton Woods	1,500m

The reservoir does not lie immediately adjacent or near any LNRs.

#### **Historic Sites and Assets**

The reservoir has a scheduled monument nearby.

<b>Scheduled Monument</b>	<b>Distance</b>
Moated Site 700m East North East of Village Farm	1,000m

#### **Water bodies**

The reservoir is a water body.

#### **Landscape**

The reservoir is not within or near an AONB.

#### **Flood Risk**

The reservoir is a water body therefore there is always risk of flooding from the reservoir.

#### **Agricultural Land**

The majority of the area that the reservoir is in is Grade 3 agricultural land; there are some small areas of Grade 2 agricultural land.

### Contaminated Land/Landfill

The reservoir has industrial pollution sites nearby as shown in the table and map below.

Pollution	Distance
Air and Waste Transfer (disposal in/on land, recovery land-treatment, recovery of fuel/organic substances)	320m
Air and waste (sewage)	100m

#### D.13.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Raising the dam will increase the surface area of the water body.	<p>Increasing the area of the water body which is a designated SSSI potentially will improve the ecological status of the Grafham Water.</p> <p>However the WFD assessment has identified that there is potentially a high risk of deterioration of a water body (GB30538310) associated with this scheme. Further investigation into the possible impacts raised water levels are likely to have on the biological elements are required. A review of the water quality impacts will be required.</p> <p>Other water bodies associated with the scheme are at low or no risk of deterioration.</p>	-	Moderate	High	Highly Significant
			<p>Construction works will likely require the water levels to be dropped prior to starting work and this may have a temporary negative impact on the water body. There is also potential for pollution to be caused during the construction phase, best practice guidelines for working near water should be followed. The WFD screening assessment has demonstrated that a full WFD assessment is not required.</p>				Not Significant
2. Maintain and improve sustainable water	<ul style="list-style-type: none"> <li>Will it reduce water lost through</li> </ul>	N/A	N/A	0	N/A	N/A	No Effect
		Increased demand	The volume of water available				Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	on water resources has the potential result in increased demand for raw water abstraction.	will increase this will allow more water to be abstracted whilst at the same time reducing the pressure of over abstraction on this water body	+	Minor	Medium	Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Increasing the volume of the reservoir will result in water that may have contributed to flooding being stored.	Increase in water stored and increase in potential risk from reservoir flooding.	-	Minor	Medium	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		During the construction there may be a temporary impact on local residents from construction traffic and noise. There may also be some permanent loss of local land with the rise in water level.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from the construction works to raise the dam.	-	Minor	Medium	Not Significant
		Proposed scheme will increase the surface water area of the existing water body.	Slight positive to be gained from increasing the surface water area of the existing water body.	+	Minor	Low	Not Significant
5. Deliver WRMP schemes together with the local community and work with the local	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
supply chain.			where possible.				
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	<p>The area and volume of the water body will be increased.</p> <p>The construction works have potential to create potential for pollution to enter the water body.</p>	<p>The area of water habitat will increase.</p> <p>Best practice guidelines for working in or near water will be followed.</p>	<p>+</p> <p>-</p>	<p>Minor</p> <p>Minor</p>	<p>Medium</p> <p>Medium</p>	<p><b>Not Significant</b></p> <p><b>Not Significant</b></p>
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Existing dam will be raised.	Temporary visual effects from construction work to raise dam level, Permanent change in landscape will higher dam height.	-	Minor	Medium	<b>Not Significant</b>
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Moated site lies 700m from the reservoir.	It is unlikely that the scheme will impact on historic assets.	0	N/A	N/A	<b>No Effect</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have</li> </ul>	N/A	Total embodied carbon is 100,407 tCO <sub>2</sub> e Operational carbon is 2,781 tCO <sub>2</sub> e per year	-	N/A	N/A	<b>Highly Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The scheme is increasing the capacity of an existing asset rather than creating a new reservoir.	Existing Grafham Reservoir capacity will be increased by raising the height of the dam. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Medium	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	Locally the majority of the area is Grade 3 agricultural land, although there are some small areas of Grade 2.	Raising the dam is unlikely to have a significant impact on the local agricultural land.	0	N/A	N/A	<b>No Effect</b>

### D.13.3. Scheme RHFA8: New Ruthamford South Reservoir

#### D.13.3.1. Scheme Description

The proposed scheme is to create a new abstraction resulting in a new reservoir near to Grafham Water. The deployable output would be 39 MI/d average demand and 49 MI/d peak demand.

There are three proposed pipeline routes:

- **Route 1** – New abstraction at Grafham Intake and transfer of water to existing Grafham WTW and new treated water pipeline to Staughton WR;
- **Route 2** - New abstraction at Grafham Intake and transfer of water to existing Grafham WTW and new treated water pipeline to Abbotsley WR; and
- **Route 3** - New abstraction at Grafham Intake and transfer of water to existing Grafham WTW and new treated water pipeline to Gallowbrook WR.

#### D.13.3.2. Scheme Baseline

##### Ecological Sites and Environmental Designations

The reservoir does not lie immediately adjacent or near any SACs.

The reservoir does not lie immediately adjacent or near any SPAs.

The reservoir is near three SSSIs (shown in the table below).

SSSI	Distance
Grafham Water	On site
Perry Woods	570m
Brampton Woods	1,500m

The reservoir does not lie immediately adjacent or near any LNRs.

Pipeline route 1 passes close to SSSIs.

SSSI	Distance
Grafham Water	1000m
Perry Woods	Through site and within 200m

Pipeline route 2 passes close to SSSIs.

SSSI	Distance
Grafham Water	500m
Little Paxton Pits	500m
Little Paxton Wood	500m

Pipeline route 2 passes immediately adjacent to Little Paxton Pits LNR.

Pipeline route 3 passes close to SSSIs.

SSSI	Distance
Grafham Water	500m
Little Paxton Pits	500m
Little Paxton Wood	500m

##### Historic Sites and Assets



The reservoir has a scheduled monument nearby.

Scheduled Monument	Distance
Moated Site 700m East North East of Village Farm	1,000m

### Water bodies

The reservoir itself is a water body.

Pipeline route 2 passes over the River Ouse which is a heavily modified waterbody of moderate ecological potential and good chemical quality.

### Landscape

Neither the reservoir or pipeline routes are within or near any AONBs or within land that is designated for its landscape value.

### Source Protection Zones

Pipeline route 2 passes through 1 source protection zone.

### Flood Risk

The reservoir is a water body therefore there is always risk of flooding from the reservoir. All three pipeline routes run through and close to land which is at risk of flooding from both rivers and Grafham reservoir.

### Agricultural Land

The majority of the area that the reservoir and the land that the pipeline routes pass through is in Grade 3 agricultural land; there are some small areas of Grade 2 agricultural land.

### Contaminated Land/Landfill

The reservoir and pipeline routes 1 and 2 have industrial pollution sites nearby as shown in the below.

Pollution	Distance
Air and Waste Transfer (disposal in/on land, recovery land-treatment, recovery of fuel/organic substances)	320m
Air and waste (sewage)	100m

Pipeline route option 3 passes close to Eaton Tractors pit farm that holds a waste management licence.

### D.13.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 1 main river with moderate to moderate ecological status and good chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has concluded that there is a low risk of deterioration.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of one new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased	Scheme introduced a new abstraction source effluent increasing the pressure on clean water abstraction	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		demand for raw water abstraction.	sources.				
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipes can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows main roads.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Runs through a SSSI and is adjacent to a LNR.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding.	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Does not run through an AONB	Temporary visual effects from digging up ground to lay pipeline route.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Does not run close to any historic assets	Potential to disturb previously unrecorded archaeological remains in these areas.	–	Minor	Low	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	<p>Proposed scheme would build resilience to the effects of climate change through improved water supply security.</p> <p>The scheme is unlikely to educate people about the impacts of climate change on water resources.</p>	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	Total embodied carbon is 90,485 tCO <sub>2</sub> e Operational carbon is 30,276 tCO <sub>2</sub> e per year	-	N/A	N/A	Highly Significant
11. Ensure that a sustainable approach is adopted for new water	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing</li> </ul>	New materials will be required for the new abstraction	Existing Grafham STW will be utilised. However, a new pipeline will be required.	–	Moderate	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	point and the pipeline	Scheme design and materials will follow Anglian Water corporate sustainability policy.				
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 there is potential for the pipeline to pass close to potential sources of pollution depending on which pipeline route is taken forward.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic waste sites.	–	Moderate	Low	<b>Not Significant</b>

#### **D.13.4. Scheme RHFA 9: Grafham Intake Refurbishment**

##### **D.13.4.1. Scheme Description**

This scheme involves refurbishing the pumps to allow increased capacity. No pipelines will be developed as part of this scheme. Therefore, no baseline has been gathered.

#### D.13.4.2. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	N/A	None identified. The WFD screening demonstrated that a full WFD assessment is not required.	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme will increase amount of water in network without the need for further abstraction to get this additional water	+	Minor	Medium	Not Significant
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	N/A	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Minor	Medium	Not Significant
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon is 3,329 tCO <sub>2</sub> e The operational carbon is 77 tCO <sub>2</sub> e per year	-	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> </ul>	N/A	No infrastructure will be needed.	+	Moderate	Medium	Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>						
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	N/A	None identified	0	N/A	N/A	No Effect

## **D.13.5. Scheme RHFA10: Re-commission Pulloxhill WTW**

### **D.13.5.1. Description of overall site scheme**

This scheme involves the re-commission of the previously operated Pulloxhill WTW, abstracting from Woburn Sands groundwater source. Borehole installations, associated infrastructure and an existing abstraction licence are already in place for this scheme.

### **D.13.5.2. Scheme Environmental Baseline**

#### **Ecological Sites and Assets**

The infrastructure from Pulloxhill WTW to Ampthill WR does not lie immediately adjacent or near any SACs or SPAs.

The infrastructure from Pulloxhill WTW to Ampthill WR lies near four SSSIs (shown in the table below).

<b>SSSI</b>	<b>Distance</b>
King's Wood & Glebe Meadows, Houghton Conquest	650m
Maulden Church Meadow	1,300m
Flitwick Moor	270m
Pulloxhill Marsh	Adjacent to Pulloxhill WTW

The infrastructure from Pulloxhill WTW to Ampthill WR lies near two LNRs (shown in the table below).

<b>LNR</b>	<b>Distance</b>
King's Wood & Glebe Meadows, Houghton Conquest	650m
Flitton Moor	150m

The infrastructure from Pulloxhill WTW to Ampthill WR does not lie immediately adjacent or near any National Parks.

#### **Historic Sites and Assets**

The infrastructure from Pulloxhill WTW to Ampthill WR lies near two scheduled monuments.

<b>Scheduled Monument</b>	<b>Distance</b>
Houghton House	500m
Moated Site at Ruxox Farm	500m

#### **Water bodies**

The infrastructure from Pulloxhill WTW to Ampthill WR crosses the Ivel Navigation and the Running Waters-Steppingly that comprise the River Flit both of which are of moderate ecological quality.

Ampthill WR is a water body.

#### **Landscape**

The infrastructure from Pulloxhill WTW to Ampthill WR is not within or near an AONB.

### **Source Protection Zones**

The proposed pipeline does not run through any source protection zones.

### **Flood Risk**

The infrastructure from Pulloxhill WTW to Ampthill WR crosses the River Flit and the pipeline route runs near several small reservoirs therefore there is always risk of flooding from the river.

### **Agricultural Land**

The majority of the area that the infrastructure from Pulloxhill WTW to Ampthill WR lies in is Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

### **Pollution**

The infrastructure from Pulloxhill WTW to Ampthill WR is not adjacent or near any known areas of potential pollution e.g. landfill sites, waster transfer stations.

### D.13.5.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The pipeline crosses the River Flit with moderate to poor ecological status and fair chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme will be abstracting from an previously used borehole, the abstraction volume will be within the existing licence.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipeline can cause localised flooding.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>		for customers.				
		Numerous receptors, along the route of the pipe however the density of population in this area is relatively low.	There may be temporary construction nuisance (noise, dust, visual,) for residents from construction of pipeline.	-	Moderate	Low	<b>Not Significant</b>
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	<b>No Effect</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Abstraction and discharge point are not close to SAC, SPA or SSSI. The nearest is 270m west of pipeline and unlikely to be affected. Pulloxhill WTW adjacent to SSSI and pipeline route within 150m of a LNR.	Although construction of the pipeline will be temporary it could possibly disturb wildlife from the local designated areas depending on the timing of the works.	-	Moderate	Medium	<b>Significant</b>
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route is not within an area of great landscape quality.	<p>Temporary visual effects from digging up ground to lay pipeline</p> <p>Proposed scheme uses existing WTW on Anglian Water land so visual effects will be reduced because of the existing works.</p>	-	Minor	Low	<b>Not Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Scheme is within 500m of 2 Scheduled Monuments	Temporary affects and potential to disturb archaeological remains in these areas.	-	Negligible	High	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 3,329 tCO <sub>2</sub> e. The operational carbon for this scheme is 77 tCO <sub>2</sub> e per year	N/A	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Existing Pulloxhill WTW will be utilised. New pipeline will be required. Scheme design and materials will follow Anglian Water corporate sustainability policy.	–	Medium	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> </ul>	The pipeline route runs through an the	Likely to include temporary effect on soils and agricultural land through	–	Negligible	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	area of Grade 3 agricultural land, although there are some areas of Grade 2	laying of pipelines. Discharge will be within EA standards so should not pollute the ground.				

### **D.13.6. Scheme RHFA11: Re-commission Ruthamford South RZ reservoir**

#### **D.13.6.1. Description of overall site scheme**

This potential scheme involves the construction of a new 12 Ml/d water treatment works (WTW) at the existing Foxcote reservoir site. The new WTW would treat water obtained from utilising the existing abstraction licences from the reservoir and the River Ouse. This WTW at Foxcote would supply treated water to 10 Ml/d average demand and up to 12Ml/d during peak demand periods.

#### **D.13.6.2. Scheme Environmental Baseline**

##### **Ecological Sites and Environmental Designations**

The infrastructure from Foxcote WR to Deanshanger WR does not lie immediately adjacent or near any SACs.

The infrastructure from Foxcote WR to Deanshanger WR does not lie immediately adjacent or near any SPAs.

The infrastructure from Foxcote WR to Deanshanger WR lies near two SSSIs (shown in the table below).

SSSI	Distance
Whittlewood Forest	Adjacent to Deanshanger WR
Foxcote Reservoir & Wood	360m

The infrastructure from Foxcote WR to Deanshanger WR does not lie immediately adjacent or near any LNRs.

##### **Historic Sites and Assets**

The infrastructure from Foxcote WR to Deanshanger WR does not lie immediately adjacent or near any scheduled monuments.

The infrastructure from Foxcote WR to Deanshanger WR does not lie immediately adjacent or near any NPs.

##### **Water bodies**

Foxcote WR and Deanshanger WR are both open reservoirs and are therefore both water bodies.

##### **Landscape**

The infrastructure from Foxcote WR to Deanshanger WR is not within or near an AONB.

##### **Source Protection Zones**

The pipeline from Foxcote WTW to Deanshanger Water Reservoir does not pass through any source protection zones.



### **Flood Risk**

Foxcote WR to Deanshanger WR are both water bodies therefore there is always risk of flooding from the river.

### **Agricultural Land**

The majority of the area that the infrastructure from Foxcote WR to Deanshanger WR lies in is Grade 3 and Grade 4 agricultural land with some small areas of Grade 2 agricultural land.

### **Pollution**

The infrastructure from Foxcote WR to Deanshanger WR is not adjacent or near any polluting sites.

### D.13.6.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 1 main rivers with moderate to poor ecological status and fail chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 20.6km of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme reuses effluent reducing the pressure on clean water abstraction sources.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> </ul>	Pipeline routes go through some areas of significant flood	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will it involve loss or construction on the floodplain?</li> </ul>	risk where it crosses main rivers.	pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipelines can cause localised flooding.				
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows main roads.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Moderate	Low	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The Deanshanger WR lies near to a SSSI	Works will not directly affect the SSSI in terms of habitat loss but there could still be disturbance to protected species from noise and dust during construction.	-	Minor	Medium	Not Significant
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route does not run through any areas designated for landscape.	Temporary visual effects from digging up ground to lay pipeline	—	Minor	Low	Not Significant
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route does not run through any SAM or listed buildings.	Potential to disturb previously unrecorded archaeological remains in these areas. Pipeline running through scheduled monuments may cause damage to the fabric of	—	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	the structure. Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 3,664 tCO <sub>2</sub> e. The operational carbon for this scheme is 1,646 tCO <sub>2</sub> e per year.	N/A	N/A	N/A	Not Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	N/A	Existing Foxcote site will be utilised. New pipeline will be required. Scheme design and materials will follow Anglian Water corporate sustainability policy.	–	Medium	Low	Not Significant
12. Protect best quality	<ul style="list-style-type: none"> <li>Will it help maintain water</li> </ul>	The majority of the	Likely to include temporary	–	Negligible	Low	Not

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
soil and agricultural land	<ul style="list-style-type: none"> <li>supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	area is Grade 3 agricultural land, although there are some areas of Grade 2 and Grade 4.	effect on soils and agricultural land through laying of pipelines. Discharge will be within EA standards so should not pollute the ground. The new water reuse works will be located next to the existing Foxcote WTW site on Anglian Water land.				Significant

## **D.13.7. Scheme RHFA13: Ruthamford North RZ Transfer 2**

### **D.13.7.1. Scheme Description**

The scheme involves water transfer from North Ruthamford to South Ruthamford. The scheme would transfer water from Hannington WR to Salcey WR, and would also involve transfer between Deanshanger and Woburn WR. The projected treated water capacity that will be available from the implementation of this option is 24 MI/d under average demand conditions and 39 MI/d under peak demand conditions.

The estimated pipeline route length of Hannington WR to Salcey WR is 19.5km.

The estimated pipeline route length of Deanshanger WR to Woburn WR is 20km.

The uprating of the pumps should only cause minor impacts due to the refurbishment of an existing pump.

### **D.13.7.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The WR, PS and pipeline does not lie immediately adjacent or near any SACs.

The Ecton PS lies near a SPA (see table below).

<b>SPA</b>	<b>Distance</b>
Upper Nene Valley Gravel Pits	800m

The WR, PS and pipeline lies near three SSSIs. The pipeline runs through ancient woodland which includes Hardwick Wood and Sywell Wood.

<b>SSSI</b>	<b>Distance</b>
Withmale Park Wood/Bush Walk	220m
Hardwick Lodge	630m
Salcey Forest	Adjacent to Salcey WR

The WR, PS and both pipelines are not located immediately adjacent or near any LNRs.

#### **Historic Sites and Assets**

The pipeline from Ecton PS to Salcey WR lies near two schedule monuments.

<b>Schedule Monument</b>	<b>Distance</b>
Clifford Hill Motte Castle	600m
Romano-British Settlement & Pottery Kiln W of Ecton North Lodge	700m

The pipeline for Deanshanger WR to Woburn WR lies near nine scheduled monuments.

Schedule Monument	Distance
Remains of the church and churchyard of St Mary Magdalene	Through site
Medieval manorial complex comprising a twin moated site, fishpond and associated earthworks 750m west of St. Mary's church	700m
The toot: a motte and bailey castle and later manorial complex 450m south west of St. Mary's church	700m
Moated site with associated earthworks, 770m south of St. Mary's church, south of the junction of childs way and fulmer street	700m
Moated site, fishpond and associated earthworks 150m	500m
Medieval manor of Simpson	800m
Shrunken medieval village at Caldecotte	400m
Danesborough camp: a slight Univallate hillfort 420m north of the knoll	500m

### Water bodies

The water body near the Hannington WR is Pitsford Water. The pipeline passes through the Sywell reservoir and through the River Nene to Salcey WR.

The Deanshanger WR to Woburn WR pipeline route passes over three waterbodies:

- The River Ouse which is classed as a heavily modified water body with moderate potential ecological potential and good chemical quality.
- The Ouzel US and Caldecote Mill which is classed as a heavily modified water body with moderate potential ecological potential and good chemical quality.
- Newton Longville Brook which is classified as heavily modified water body with moderate potential ecological potential and good chemical quality.

### Landscape

The WR, PS and pipeline does not lie immediately adjacent or near any AONB.

### Source Protection Zones

Neither pipeline passes through any source protection zones. However, Woburn WR is located within 500m of a SPZ.

### Flood Risk

The Hannington WR to Salcey WR pipeline cuts through the River Nene which poses a flood risk.

### Agricultural Land

The majority of the area that the WR, PS and pipeline is in is Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

### Contaminated Land/Landfill

The Deanshanger WR to Woburn WR pipeline route passes close to four historic landfill site at Tavistock Road, Elfield Park and at Little Brickhill.

#### D.13.7.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	This option includes the requirement to cross 4 main rivers with moderate to moderate ecological status and good chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk. construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. construction will minimise this risk.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 39km of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to	0	N/A	N/A	No Effect



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			affect/influence customer water consumption				
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipes can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads through Milton Keynes	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through or near to three SSSIs.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through a mixture of rural and urban areas.	breeding. Temporary visual effects from digging up ground to lay pipeline. Both parts of the proposed options include the use of existing WR on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through the centre of Milton Keynes where there is a high concentration of listed buildings and Scheduled Ancient Monuments. The route goes through a SM site.	Potential to disturb archaeological remains in these areas. Pipeline running through scheduled monuments may cause damage to the fabric of the structure.	–	Moderate	High	Highly Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 18,926 tCO <sub>2</sub> e. The operational carbon for this scheme is 2,713 tCO <sub>2</sub> e per year.	-	N/A	N/A	Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The new pipelines will require new materials to be used.	Existing Hannington WR, Ecton PS, Slacey WR, Deanshanger WR and Woburn WR will be utilised. New pipelines require to transfer water from areas of surplus to where there is a projected deficit. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Minor	Medium	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2. Pipeline route is within 200m of 4 historic and authorised landfill sites.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Minor	Medium	Not Significant

## **D.13.8. Scheme RHFA14: Huntingdon Water Reuse**

### **D.13.8.1. Scheme Description**

The proposed scheme is to reuse the water from Huntingdon STW transferring it via a pipeline to Grafham Water reservoir. The deployable output would be 5.40 MI/d average demand and 5.44 MI/d peak demand.

### **D.13.8.2. Scheme Baseline**

#### **Ecological Sites and Designations**

The pipeline does pass through or immediately adjacent or near any SACs or SPAs. The reservoir is near three SSSIs (shown in the table below).

<b>SSSI</b>	<b>Distance</b>
Grafham Water	On site
Brampton Woods	Through site
Portholme	250m
Godmanchester Eastside Common	500m

Neither the reservoir nor the pipeline lie immediately adjacent or near to any LNRs.

#### **Historic Sites and Assets**

The reservoir has a scheduled monument nearby and the pipeline passes close to this and one other scheduled monument.

<b>Scheduled Monument</b>	<b>Distance</b>
Moated Site 700m East North East of Village Farm	1,000m
Moated Site 170m East Of St Mary's Church	600m

#### **Water bodies**

The reservoir itself is a water body.

The pipeline crosses the River Ouse which is classed as heavily modified and is moderate potential ecological status and good chemical quality.

#### **Landscape**

The pipeline route is not located within or near any AONBs or within land that is designated for its landscape value.

#### **Source Protection Zones**

Pipeline passes immediately adjacent to 1 source protection zone.

#### **Flood Risk**

The reservoir is a water body therefore there is always risk of flooding from the reservoir. The pipeline route runs through and close to land which is at risk of flooding for both rivers and Grafham reservoir.

### Agricultural Land

The majority of the area that the reservoir and the land that the pipeline route options pass through is in Grade 3 agricultural land; there are some small areas of Grade 2 agricultural land.

### Contaminated Land/Landfill

The reservoir and pipeline route options 1 and 2 have industrial pollution sites nearby as shown in the table below.

Pollution	Distance
Air and Waste Transfer (disposal in/on land, recovery land-treatment, recovery of fuel/organic substances)	320m
Air and waste (sewage)	100m

### D.13.8.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline crosses 1 main river with moderate to moderate ecological status and good chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk. construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. construction will minimise this risk. The WFD screening has demonstrated the need for a full WFD assessment. The assessment has concluded that there is unlikely to be a risk of deterioration.	0	N/A	N/A	No Effect
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of one new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential	Scheme introduced a new abstraction source effluent increasing the pressure on	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		result in increased demand for raw water abstraction.	clean water abstraction sources.				
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipes can cause localised flooding	-	Minor	Low	Not significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows main roads.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Runs through and is adjacent to SSSI. Upstream of Portholme SAC.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within SSSI and will directly affect species during construction which may affect them returning to the area or their breeding. Construction of the pipeline crossing likely to	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			result in a change in river water quality which at a time of flood could affect the extent and distribution of qualifying natural habitats of Portholme designated site.				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Does not run through an AONB	Temporary visual effects from digging up ground to lay pipeline.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route largely runs through open countryside close to 2 scheduled ancient monuments.	Potential to disturb scheduled monuments and to disturb previously unrecorded archaeological remains in these areas.	–	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	<p>Proposed scheme would build resilience to the effects of climate change through improved water supply security.</p> <p>The scheme is unlikely to educate people about the impacts of climate change on water resources.</p>	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010</li> </ul>	N/A	Total embodied carbon is 5,093 tCO <sub>2</sub> e Operational carbon is 2,958 tCO <sub>2</sub> e per year	-	N/A	N/A	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	New materials will be required for the new pipeline and discharge to Grafham water	A new pipeline will be required and outfall structure to discharge to Grafham water. Scheme design and materials will follow Anglian Water corporate sustainability policy.	–	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2 there is potential for the pipeline to pass close to potential sources of pollution depending on which pipeline route is taken forward.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic waste sites.	–	Moderate	Low	<b>Not Significant</b>

### **D.13.9. Scheme RHFP1: Ruthamford North RZ Transfer 3**

#### **D.13.9.1. Overall Scheme Description**

This option has been developed to meet the peak deficit in Ruthamford South RZ using the surplus available in Ruthamford North RZ. It involves increasing the transfer of water from Hannington Reservoir via a Pumping Station to Salcey Reservoir. It also requires a transfer from Deanshanger Reservoir to Woburn Reservoir.

A 900mm diameter pumping main is required between Hannington and Salcey Reservoir with a total distance of approximately 20.6km. A 750mm diameter pumping main is required from Deanshanger Reservoir to Woburn Reservoir via Old Stratford WB across a distance of 19.7km.

#### **D.13.9.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

The WR, PS and pipeline does not lie immediately adjacent or near any SACs. The Ecton PS lies near a SPA.

<b>SPA</b>	<b>Distance</b>
Upper Nene Valley Gravel Pits	800m

The WR, PS and pipeline lies near three SSSIs. The pipeline runs through ancient woodland which includes Hardwick Wood and Sywell Wood.

<b>SSSI</b>	<b>Distance</b>
Withmale Park Wood/Bush Walk	220m
Hardwick Lodge	630m
Salcey Forest	Adjacent to Salcey WR

The WR, PS and pipeline does not lie immediately adjacent or near any LNRs.

##### **Historic Sites and Assets**

The pipeline lies near two schedule monuments.

<b>Scheduled Monument</b>	<b>Distance</b>
Clifford Hill Motte Castle	600m
Romano-British Settlement & Pottery Kiln W of Ecton North Lodge	700m

The pipeline for Deanshanger WR to Woburn WR lies near nine scheduled monuments.

<b>Schedule Monument</b>	<b>Distance</b>
Remains of the church and churchyard of St Mary Magdalene	Through site
Medieval manorial complex comprising a twin moated site, fishpond and associated earthworks 750m west of St. Mary's church	700m
The toot: a motte and bailey castle and later manorial complex 450m south west of St. Mary's church	700m
Moated site with associated earthworks, 770m south of St. Mary's church, south of the junction of child's way and fulmer street	700m
Moated site, fishpond and associated earthworks 150m	500m
Medieval manor of Simpson	800m

Schedule Monument	Distance
Shrunken medieval village at Caldecotte	400m
Danesborough camp: a slight Univallate hillfort 420m north of the knoll	500m

### Water bodies

The water body near the Hannington WR is Pitsford Water. The pipeline passes through the Sywell reservoir and through the River Nene to Salcey WR.

### Landscape

The WR, PS and pipeline does not lie immediately adjacent or near any AONB.

### Source Protection Zones

Neither pipeline runs through any source protection zones.

### Flood Risk

The pipeline crosses the River Nene which poses a flood risk.

### Agricultural Land

The majority of the area that the WR, PS and pipeline is in is Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

### Contaminated Land/Landfill

The Deanshanger WR to Woburn WR pipeline route passes close to four historic landfill site at Tavistock Road, Elfield Park and at Little Brickhill.

### D.13.9.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	This option includes the requirement to cross 1 river with moderate to poor ecological status and fail chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. construction will minimise this risk.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme uses surplus water from other RZ so does not increase pressure on water resources.	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipes can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads through Milton Keynes	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through or near to three SSSIs. Pipeline crosses the River Nene between Upper Nene Valley Gravel Pits SPA and Ramsar sites.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the SSSI and will directly affect species during construction which may affect them returning to the area or their breeding. Pipeline in close proximity to	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			habitat likely to support qualifying features of designated site. Pipeline crosses River Nene between designated sites and has potential to cause effects				
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through a mixture of rural and urban areas.	Temporary visual effects from digging up ground to lay pipeline. Both parts of the proposed options include the use of existing WR on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through the centre of Milton Keynes where there is a high concentration of listed buildings and Scheduled Ancient Monuments and runs through a SM.	Potential to disturb archaeological remains in these areas. Pipeline running through scheduled monuments may cause damage to the fabric of the structure.	–	Moderate	High	Highly Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	Total embodied carbon is 38,873 tCO <sub>2</sub> e Operational carbon is 630 tCO <sub>2</sub> e	-	N/A	N/A	Highly Significant
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The new pipelines will require new materials to be used.	Existing Hannington WR, Ecton PS, Slacey WR, Deanshanger WR, Old Stratford WB and Woburn WR will be utilised. New pipelines require to transfer water from areas of surplus to where there is a projected deficit. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Minor	Medium	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2. Pipeline route is within 200m of 4 historic and authorised landfill sites.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Minor	Medium	Not Significant

#### **D.13.10. Scheme RHFP2: Ruthamford North RZ Transfer 4**

##### **D.13.10.1. Scheme Description**

This option utilises the surplus from both Wing WTW and Grafham WTW at peak . It requires increasing the existing transfers between:

- Hannington and Salcey service reservoirs via the Ecton booster;
- Deanshanger to Woburn service reservoirs via the Old Stratford Booster; and
- Grafham WTW to Ampthill service reservoir.

The transfers require:

- A 750mm diameter pumping main from Hannington to Salcey approximately 20.6km.
- A 300mm diameter pumping main from Deanshanger to Woburn a distance of 19.7km.
- A 600mm diameter pumping main from Grafham WTW to Ampthill approximately 32.6km.

##### **D.13.10.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The WR, PS and pipeline does not lie immediately adjacent or near any SACs. The Ecton PS lies near a SPA.

SPA	Distance
Upper Nene Valley Gravel Pits	800m

The Hannington WR to Ecton PS to Salcey WR pipeline lies near three SSSIs. The pipeline runs through ancient woodland which includes Hardwick Wood and Sywell Wood.

The start of the Grafham WTW to Ampthill WR pipeline is located within the Grafham Water SSSI. The pipeline then passes close to Perry Woods

SSSI	Distance
Grafham Water	Within site
Perry Woods	570m
Little Paxton Wood	1000m
King's Wood & Glebe Meadows	Through site
Cooper's Hill	Through site
Withmale Park Wood/Bush Walk	220m
Hardwick Lodge	630m
Salcey Forest	Adjacent to Salcey WR

The WR, PS and both pipelines are not located immediately adjacent or near any LNRs.

#### **Historic Sites and Assets**

The pipeline from Ecton PS to Salcey WR lies near two schedule monuments.

Scheduled Monument	Distance
Clifford Hill Motte Castle	600m
Romano-British Settlement & Pottery Kiln W of Ecton North Lodge	700m



The pipeline for Deanshanger WR to Woburn WR lies near nine scheduled monuments.

Scheduled Monument	Distance
Remains of the church and churchyard of St Mary Magdalene	Through site
Medieval manorial complex comprising a twin moated site, fishpond and associated earthworks 750m west of St Mary's church	700m
The toot: a motte and bailey castle and later manorial complex 450m south west of St Mary's church	700m
Moated site with associated earthworks, 770m south of St Mary's church, south of the junction of Child's way and Fulmer street	700m
Moated site, fishpond and associated earthworks 150m	500m
Medieval manor of Simpson	800m
Shrunken medieval village at Caldecotte	400m
Danesborough camp: a slight Univallate hillfort 420m north of the knoll	500m

### Water bodies

The water body near the Hannington WR is Pitsford Water. The pipeline leading down to Ecton PS passes through the Sywell reservoir and through the River Nene to Salcey WR.

The Deanshanger WR to Woburn WR pipeline route passes over three waterbodies:

- The River Ouse which is classed as a heavily modified water body with moderate potential ecological potential and good chemical quality;
- The Ouzel US and Caldecote Mill which is classed as a heavily modified water body with moderate potential ecological potential and good chemical quality; and
- Newton Longville Brook which is classified as heavily modified water body with moderate potential ecological potential and good chemical quality.

### Landscape

The WR, PS and pipeline does not lie immediately adjacent or near any AONB.

### Source Protection Zones

Neither pipeline passes through any source protection zones. However, Woburn WR is located within 500m of a SPZ.

### Flood Risk

The Hannington WR to Salcey WR pipeline cuts through the River Nene which poses a flood risk.

### Agricultural Land

The majority of the area that the WR, PS and pipeline is in is Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

### Contaminated Land/Landfill

The Deanshanger WR to Woburn WR pipeline route passes close to four historic landfill site at Tavistock Road, Elfield Park and at Little Brickhill.

### D.13.10.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	This option includes the requirement to cross 4 main rivers with moderate to moderate ecological status and good chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. construction will minimise this risk.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 39km of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme uses surplus water from other RZ so does not increase pressure on water resources.	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. This project will not increase of install new flood storage. Burst pipes can cause localised flooding	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads through Milton Keynes	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through or near to three SSSIs and through areas of ancient woodland.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding.	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through a mixture of rural and urban areas.	Temporary visual effects from digging up ground to lay pipeline. Both parts of the proposed options include the use of existing WR on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through the centre of Milton Keynes where there is a high concentration of listed buildings and Scheduled Ancient Monuments and runs through a SM.	Potential to disturb archaeological remains in these areas. Pipeline running through scheduled monuments may cause damage to the fabric of the structure.	–	Moderate	High	Highly Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> </ul>	N/A	Total embodied carbon is 39,342 tCO <sub>2</sub> e Operational carbon is 1,111 tCO <sub>2</sub> e	-	N/A	N/A	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The new pipelines will require new materials to be used.	Existing Hannington WR, Ecton PS, Slacey WR, Deanshanger WR and Woburn WR will be utilised. New pipelines require to transfer water from areas of surplus to where there is a projected deficit. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Minor	Medium	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2. Pipeline route is within 200m of 4 historic and authorised landfill sites.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Minor	Medium	<b>Not Significant</b>

### **D.13.11. Scheme RHFP3: Ruthamford North RZ Transfer 5**

#### **D.13.11.1. Scheme Description**

This option utilises the surplus from both Wing WTW and Grafham WTW at peak . It requires increasing the existing transfers between:

- Hannington and Lings service reservoirs ; and
- Grafham WTW to Ampthill service reservoir.

These transfers require:

- A 1200mm diameter pumping main from Hannington Reservoir to Lings across a total distance of approximately 16.4km; and
- A 750mm diameter pumping main from Grafham WTW to Ampthill Reservoir across a distance of approximately 32.6km.

#### **D.13.11.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

The WR, sites and pipelines do not lie immediately adjacent or near any SACs.

The WR, sites and pipelines do not lie immediately adjacent or near any SPA.

The scheme passes through or close to the following SSSIs.

<b>SSSI</b>	<b>Distance</b>
Grafham Water	Adjacent
Perry Woods	570m
Little Paxton Wood	1000m
King's Wood & Glebe Meadows	Through site
Cooper's Hill	Adjacent
Withmale Park Wood/Bush Walk	220m
Hardwick Lodge	630m

The Hannington WR pipeline runs through ancient woodland which includes Hardwick Wood and Sywell Wood.

The WR, sites and pipelines do not lie immediately adjacent or near any LNRs.

The WR, sites and pipelines do not lie immediately adjacent or near any NPs.

##### **Historic Sites and Assets**

The WR, sites and pipelines do not lie immediately adjacent or near any scheduled monuments.

##### **Water bodies**

Hannington WR is located near to Pitsford Water. The pipeline leading down to Ling Offtake is close to the River Nene.

## **Landscape**

The WR, sites and pipelines do not lie immediately adjacent or near any AONB.

## **Source Protection Zones**

Neither pipeline passes through any source protection zones.

## **Flood Risk**

The pipeline runs near the River Nene this area of land is at risk of flooding.

## **Agricultural Land**

The majority of the area that the WR, sites and pipelines is in is Grade 3 agricultural land with some small areas of Grade 2 agricultural land.

## **Contaminated Land/Landfill**

The reservoir has industrial pollution sites nearby as shown in the table below.

<b>Pollution</b>	<b>Distance</b>
Grafham WTW (waste)	Adjacent to Grafham WR
Water pollution	Adjacent to Ampthill WR

### D.13.11.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	This option includes the crosses 1 main river with moderate to moderate ecological status and good chemical status.	Where the pipeline crosses rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. construction will minimise this risk.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of 46km of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw water abstraction.	Scheme uses surplus water from other RZ so does not increase pressure on water resources.	+	Minor	Medium	Not Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. Burst pipes can cause localised flooding. This project will not increase of install new flood storage.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads through Wellingborough and on the outskirts of Northampton.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Low	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through or near to seven SSSIs and through two areas of ancient woodland.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through a mixture of rural and urban areas.	breeding. Temporary visual effects from digging up ground to lay pipeline. Both parts of the proposed options include the use of existing WR on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through the centre of Milton Keynes where there is a high concentration of listed buildings and Scheduled Ancient Monuments.	Potential to disturb archaeological remains in these areas. Pipeline running through scheduled monuments may cause damage to the fabric of the structure.	–	Minor	Medium	Not Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> </ul>	N/A	The total embodied carbon for the scheme is 13,687 tCO <sub>2</sub> e The operational carbon for the scheme is 1,140 tCO <sub>2</sub> e per year	-	N/A	N/A	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The new pipelines will require new materials to be used.	Existing Hannington WR, to Lings and Grafham WTW and Ampthill WR will be utilised. New pipelines require transferring water from areas of surplus to where there is a projected deficit. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Minor	Medium	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2. Pipeline route is within 200m of 4 historic and authorised landfill sites.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Minor	Medium	<b>Not Significant</b>

## **D.13.12. Scheme RHFP4: Clapham WTW**

### **D.13.12.1. Scheme Description**

This option utilises existing spare peak licence capacity at Clapham WTW. The scheme includes the following components:

- A pipeline to supply water from Grafham to Ampthill WR; and
- A pipeline to supply water from Ampthill to Milton Keynes.

### **D.13.12.2. Scheme Baseline**

#### **Ecological Sites and Environmental Designations**

The WRs and pipeline does not lie immediately adjacent or near any SACs.

The WRs and pipeline does not lie immediately adjacent or near any SPAs.

The WRs and pipeline is near two SSSIs (shown in the table below).

<b>SSSI</b>	<b>Distance</b>
Grafham Water	On site
Kings Wood and Glebe meadows	250m
Perry Woods	500m

The WRs and pipeline is near one LNR which is also a SSSI (shown in the table below).

<b>LNR</b>	<b>Distance</b>
Kings Wood and Glebe meadows	250m

The proposed pipeline runs through Kings Wood and Glebe meadows area of ancient woodland.

#### **Historic Sites and Assets**

The WRs and pipeline is near seven schedule monuments (shown in the table below).

<b>Scheduled Monument</b>	<b>Distance</b>
Bassmead Manor Farm	490m
Palaceyard Wood	500m
Manor Farm	200m
Long Barrow	450m
Moated site and two fishponds at the rectory	480m
Ampthill Castle	750m
Houghton House	100m

The WRs and pipeline does not lie immediately adjacent or near any NPs. Its runs through a Registered Park and Garden

#### **Water bodies**

The water reservoirs at Grafham and Ampthill are water bodies. The pipeline lies near and through the River Great Ouse.

#### **Landscape**

The WRs and pipeline does not lie immediately adjacent or near any AONBs.

### **Source Protection Zones**

The scheme does not pass over any source protection zones.

### **Flood Risk**

There is always risk of flooding from the reservoirs and the River Great Ouse.

### **Agricultural Land**

The majority of the area that the reservoir is in is Grade 2 agricultural land; there is some surrounding Grade 3 agricultural land with small areas of Grade 1 agricultural land.

### **Contaminated Land/Landfill**

Grafham Water reservoir has industrial pollution sites nearby as shown in the table below.

<b>Pollution</b>	<b>Distance</b>
Grafham WTW (waste)	Adjacent to Grafham WR
Water pollution	Adjacent to Ampthill WR

### D.13.12.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	This option includes the requirement for working near water bodies.	Where the pipeline is located close to a water body or crosses minor rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk. construction will minimise this risk.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. construction will minimise this risk.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for raw	Scheme uses surplus water from other RZ so does not increase pressure on water resources.	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		water abstraction. N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. Burst pipes can cause localised flooding. This project will not increase of install new flood storage.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Low	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through or near to three SSSIs and goes through an area of ancient woodland.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their breeding.	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through a mixture of rural and urban areas.	Temporary visual effects from digging up ground to lay pipeline. Both parts of the proposed options include the use of existing WR on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through open countryside and small rural villages and larger towns and the Ampthill to Milton Keynes pipeline runs close to 2 Scheduled Monuments and through a Registered Park and Garden	Potential to disturb archaeological remains in these areas.	–	Minor	High	Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of</li> </ul>	N/A	The total embodied carbon of the scheme is 8,833 tCO <sub>2</sub> e The operational carbon is 3,738 tCO <sub>2</sub> e per year	-	N/A	N/A	Significant



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
management operations	<ul style="list-style-type: none"> <li>the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The new pipelines will require new materials to be used.	Existing Grafham WR, Ampthill WR, Ampthill WR and Woburn WR will be utilised. New pipelines require to transfer water from areas of surplus to where there is a projected deficit. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2. Pipeline route is within 50m of 2 pollution sites.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Moderate	Low	<b>Not Significant</b>

### **D.13.13. Scheme RHFP5: Ruthamford North RZ Transfer**

#### **D.13.13.1. Scheme Description**

This scheme includes:

- New pipeline between Grafham to Ampthill WR; and
- To uprate Ampthill to Woburn WR.

#### **D.13.13.2. Scheme Baseline**

##### **Ecological Sites and Environmental Designations**

The WRs and pipeline does not lie immediately adjacent or near any SACs.

The WRs and pipeline does not lie immediately adjacent or near any SPAs.

The WRs and pipeline is near two SSSIs (shown in the table below).

<b>SSSI</b>	<b>Distance</b>
Grafham Water	On site
Perry Woods	500m
Kings Wood and Glebe meadows	250m

The WRs and pipeline is near one LNR which is also a SSSI (shown in the table below).

<b>LNR</b>	<b>Distance</b>
Kings Wood and Glebe meadows	250m

The proposed pipeline runs through Kings Wood and Glebe meadows area of ancient woodland.

##### **Historic Sites and Assets**

The WRs and pipeline is near seven schedule monuments (shown in the table below).

<b>Scheduled Monument</b>	<b>Distance</b>
Bassmead Manor Farm	490m
Palaceyard Wood	500m
Manor Farm	200m
Long Barrow	450m
Moated site and two fishponds at the rectory	480m
Houghton House	100m
Ampthill Castle	750m

The WRs and pipeline does not lie immediately adjacent or near any NPs. It runs through a Registered Park and Garden.

##### **Water bodies**

The water reservoirs at Grafham and Ampthill are water bodies. The pipeline lies near and through the River Great Ouse.

## **Landscape**

The WRs and pipeline does not lie immediately adjacent or near any AONBs.

## **Source Protection Zones**

The pipeline does not pass over any areas that are designated as source protection zones.

## **Flood Risk**

There is always risk of flooding from the reservoirs and the River Great Ouse. The scheme will pass through areas of flood risk.

## **Agricultural Land**

The majority of the area that the reservoir is in is Grade 2 agricultural land; there is some surrounding Grade 3 agricultural land with small areas of Grade 1 agricultural land.

## **Contaminated Land/Landfill**

The reservoir has industrial pollution sites nearby as shown in the table below.

<b>Pollution</b>	<b>Distance</b>
Grafham WTW (waste)	Adjacent to Grafham WR
Water pollution	Adjacent to Ampthill WR

### D.13.13.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	This option includes the requirement for working near water bodies.	Where the pipeline is located close to a water body or crosses minor rivers there is potential for pollution during construction. Following best practice guidelines during construction will minimise this risk. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality. The WFD assessment is incomplete as the scheme was rejected at option stage.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur. This scheme concerns construction of new pipeline.	Pipeline leakage is common even in newly laid water mains. The volumes of leakage from newly laid water mains are relatively low however as the condition of the water mains deteriorates with age and external influences the volume of water lost through leakage can increase rapidly and may even result in significant losses through bursts.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential	Scheme uses surplus water from other RZ so does not increase pressure on water	+	Minor	Medium	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		result in increased demand for raw water abstraction.	resources.				
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	Pipeline routes go through some areas of significant flood risk where it crosses main rivers.	Although the pipeline crosses flood risk areas there is unlikely to be effects as it the pipeline will be buried underground. Burst pipes can cause localised flooding. This project will not increase of install new flood storage.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Increasing demand for water	The scheme would help ensure a secure and continued supply of water for customers.	+	Moderate	Medium	Significant
		Numerous receptors, especially where the pipeline follows major roads.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline.	-	Minor	Low	Not Significant
		Proposed scheme does not involve direct creation of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory to non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline route runs through or near to SSSIs and through an area of ancient woodland.	Although construction of the pipeline will be temporary it could cause loss of sensitive habitat within the designated site and will directly affect species during construction which may affect them returning to the area or their	-	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline route runs through a mixture of rural and urban areas.	breeding. Temporary visual effects from digging up ground to lay pipeline. Both parts of the proposed options include the use of existing WR on Anglian Water land so visual effects will be reduced because of the existing works.	–	Minor	Low	Not Significant
8. Protect and enhance the historic environment, heritage assets and their setting	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	Pipeline route runs through open countryside and small rural villages and larger towns and the Ampthill to Milton Keynes pipeline runs close to 9 Scheduled Monuments and through a Registered Park and Garden	Potential to disturb archaeological remains in these areas and vibration of digging up earth could affect nearby SMs.	–	Moderate	High	Highly Significant
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise increasing coastal erosion risks to people, property and the environment.	Proposed scheme would build resilience to the effects of climate change through improved water supply security. The scheme is unlikely to educate people about the impacts of climate change on water resources.	+	Moderate	Medium	Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	Carbon modelling results to be determined.	?	N/A	N/A	?
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	The new pipelines will require new materials to be used.	Existing Grafham WR, Ampthill WR, Ampthill WR and Woburn WR will be utilised. New pipelines require to transfer water from areas of surplus to where there is a projected deficit. Scheme design and materials will follow Anglian Water corporate sustainability policy.	—	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The majority of the area is Grade 3 agricultural land, although there are some areas of Grade 2. Pipeline route is within immediately adjacent to 2 pollution sites and within 50m of 2 pollution sites.	Likely to include temporary effect on soils and agricultural land through laying of pipelines. Potential for contamination pathways to be created from laying the pipeline near the historic landfill site.	—	Moderate	Low	Not Significant

## **D.14. Cambridge and West Suffolk (Old RZ)**

### **D.14.1. Scheme CWS1: Thetford PZ transfer**

#### **D.14.1.1. Scheme Description**

This option involves the transfer of water from Barnham Cross WTW near Thetford to Rushbrooke WTW near Bury St. Edmunds.

The construction of a 200mm diameter pumping main from Barnham Cross WTW to Stanton Reservoir across a total distance of approximately 14.5km is required. A 200mm diameter pipeline is needed from Stanton Reservoir to Rushbrooke WTW across a distance of 10.1km.

#### **D.14.1.2. Scheme Baseline**

##### **Hydrology**

The pipeline between Rushbrooke WW and Stanton Reservoir will cross the Black Bourne at Mickie Mere, south west of Ixworth. The river corridor, generally 50m either side of the river, is a flood zone area. Mickie Mere is also a ground source protection zone 1. The north westerly route between Stanton and Barnham Cross travels through the River Black Bourne at Bangrove Wood. The route then enters GPZ1 again at Barnham Cross WTW.

##### **Socio-Economics**

The pipeline route between Rushbrooke WW to Stanton Reservoir crosses the following major network:

- A14
- A1088 Stow Lane
- River Black Bourne
- Peterborough to Doncaster rail line.

The pipeline route between Stanton Reservoir and Barnham Cross crosses the following major networks:

- A143 Stanton Road
- A1088 Thetford Rd
- Honington Airfield
- Little Ouse River

##### **Ecological Designated Sites**

Pakenham Meadow SSSI lies 1 mile to the north east of the village of Pakenham, and is bounded along its western side by the Pakenham Stream. The meadow is unusually species rich, unimproved and poorly drained, and forms one of the best examples of its kind in the county.

Bangrove Wood SSSI is a good example of ancient woodland on clay soil. It is mostly former coppice-with-standards, supporting a wealth of characteristic woodland floor herbs. It is located North-west of Stanton Reservoir and is located within the pipeline corridor. The final 4200m of pipeline to Barnham Cross WTW passes through the Brecklands SSSI, SAC, SPA, and Barnham Cross LNR.



## Heritage Assets

Pipeline Route	Listed Buildings		Scheduled Monuments	Within 500m boundary of Scheduled Monument	Registered Parks & Gardens
	Grade I	Grade II			
Rushbrooke WW and Stanton Reservoir		Shrub End, Pakenham Lodge and The Lodge	Two scheduled monuments located immediately south of Ixworth		

## Landscape

The proposed pipeline travels through the following National Character Areas:

- South Suffolk and North Essex
- South Norfolk and High Suffolk Claylands
- Brecklands

## Agricultural Land Classification

Beginning at Rushbrooke WW, the pipeline passes through land classified as Grade 2 and 3 towards Stanton Reservoir. The land then changes to land classified as Grade 3 and 4 as it passes through the Brecklands.

#### D.14.1.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed scheme would cross the Black Bourne river.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors and good site practices.	-	Minor	Medium	Not Significant
			The operation of the pipelines has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Water would be transferred from one PZ to another, avoiding further abstraction.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence customer water consumption	0	N/A	N/A	No Effect
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The proposed scheme would pass through an area at higher risk from flooding, associated	Although the pipeline crosses flood risk areas there is unlikely to be effects as it will be secure underground. No new flood storage is involved in the project	-	Minor	Low	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		with the Black Bourne.	but the existing service water reservoir at Stanton will be utilised. Potential for localised flooding from pipeline leakages.				
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Predicted water deficits in the future for the area.	Will help mitigate against the forecast water deficit by increasing supply into the Bury St Edmunds Planning Zone.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, although the scheme avoids large settlements.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Moderate	Low	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme has potential to affect the Pakenham Meadow, Bangrove Wood and Brecklands SSSI. The Brecklands is also designated as a Special Area of Conservation and Special Protection Area. It would also pass through the	Construction methods have potential for negative impacts on these sites through ground excavation works and vegetation clearance. Construction activities may disturb species and affect them returning to the area.	-	Moderate	High	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Barnham Cross Local Nature Reserve.					
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would pass through the South Suffolk & North Essex, South Norfolk & High Suffolk Claylands and Breckland areas classified as National Character Areas.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged.	–	Minor	Low	<b>Not Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposed scheme would have the potential for direct impacts upon three Grade II listed features. The proposed scheme would also come within 500m of two Scheduled Monuments.	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is negligible. No impact on ancient monuments beyond temporary setting impacts, including setting, due to the distance from the proposed scheme.	–	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed schemes would build resilience to the effects of climate change through improved water supply security for the Bury St Edmunds Planning Zone, but by itself doesn't improve water supply for the wider East Anglia region as water will be taken from another East Anglian Planning Zone and this scheme in isolation doesn't examine water supply in that PZ.	+	Moderate	Medium	<b>Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 1,341 tCO <sub>2</sub> e. The operational carbon for this scheme is 41 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline. Existing resources at Rushbrooke WW, Stanton Reservoir and Barnham Cross WW will be utilised.	Negative effects of resource use for construction materials. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed schemes would primarily pass through areas of Grades 2 and 3 agricultural quality, with some areas of Grade 4.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Minor	Low	<b>Not Significant</b>

## **D.14.2. Scheme CWS3: Sudbury PZ transfer**

### **D.14.2.1. Scheme Background**

This option involves the transfer of water from Long Melford Reservoir, Sudbury PZ to Great Welnetham Reservoir, Bury St. Edmunds PZ.

The option requires the construction of a 150mm diameter pumping main from Long Melford Reservoir to Great Welnetham Reservoir across a total distance of approximately 13.2km.

### **D.14.2.2. Scheme Baseline**

#### **Socio Economics, Settlements and Infrastructure**

The pipeline routes fall within the following administrative boundaries:

- Suffolk County Council
- Babergh District Council
- St Edmundsbury District Council

The proposed pipeline would cross the A134 north of Bradfield Combust.

#### **Hydrology**

The proposed scheme would cross Chad Brook twice and a tributary of Chad Brook.

There are no major flood risk areas across the study area. Standard areas at risk from flooding apply around main water courses within the study area.

#### **Ecological Designated Sites**

The proposed pipeline routes would directly impact on ancient woodland at Rushbrooke Wood .

#### **Heritage Assets**

Pipeline Route	Listed Buildings		Scheduled Monuments	Within 500m boundary of Scheduled Monument	Registered Parks & Gardens
	Grade I	Grade II			
Long Melford - Great Welnetham		Wash Farmhouse at Bridge Street			All pipeline routes flow into Long Melford WR located within the Kentwell Hall Registered Parks and Garden (Grade II*)

#### **Landscape**

There are no AONBS within the study area.

#### **Agricultural Land Classification**

The majority of land within the study area is either Grade 2 or 3. Land is classified as either very good to moderate quality.

#### **Contaminated land/Landfill**

According to the Environment Agency website, the proposed pipeline would travel directly through a historical landfill known as Railway Cutting east of Manor Farm. During operation the site received commercial and household waste between 1970 and 1978.

#### D.14.2.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposed scheme would cross Chad Brook twice and a tributary of Chad Brook.	The operation of the pipelines has potential to affect these water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	<b>Not Significant</b>
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipeline have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	<b>Not Significant</b>
		Increased demand on water resources has the potential result in increased demand for abstraction.	Schemes would mitigate increased demand for abstraction through supply of water from a neighbouring PZ.	+	Negligible	Low	<b>Not Significant</b>
		Scheme concern supply, and therefore will not affect demand.	None.	0	N/A	N/A	<b>No Effect</b>
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The schemes would not have an effect on flood risk.	0	N/A	N/A	<b>No Effect</b>
		The proposed scheme does not pass through areas at flood risk.	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding	-	Minor	Low	<b>Not Significant</b>
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	Predicted water deficits in the future for the area.	Will help mitigate against the forecast water deficit by increasing supply into the Haverhill and Bury St Edmunds Planning Zones from the Sudbury PZ.	+	Moderate	Medium	<b>Significant</b>



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors, although the scheme avoids large settlements.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Moderate	Low	<b>Not Significant</b>
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	<b>No Effect</b>
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	<b>Not Significant</b>
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Pipeline would pass through an area of Ancient Woodland.	Potential direct loss of trees and habitat from ancient woodland	-	Moderate	Medium	<b>Significant</b>
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	The proposed scheme would not pass through any Areas of Outstanding Natural Beauty.	Temporary visual effects due to digging up ground to lay pipeline. No long-term impact envisaged.	-	Minor	Low	<b>Not Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposed scheme could have potential to have impact upon listed features.	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings	-	Minor	Medium	<b>Not Significant</b>

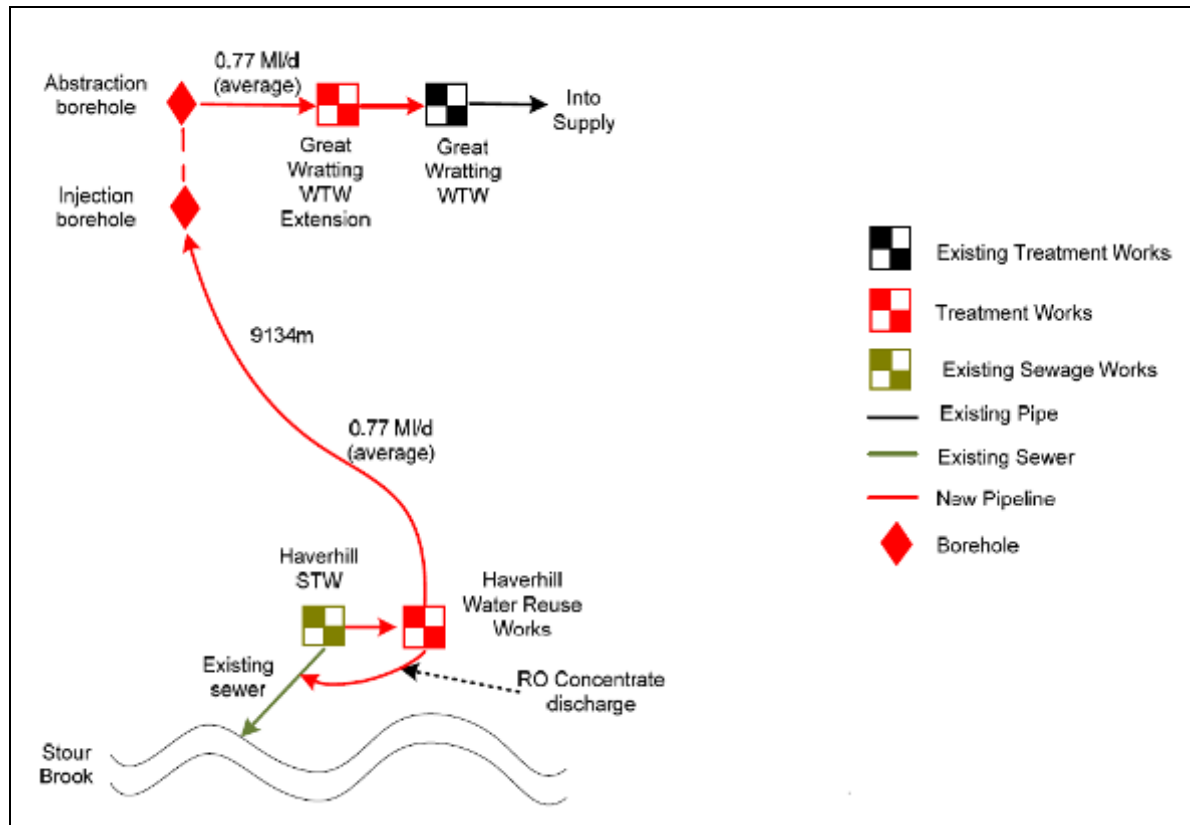
Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		The proposed route would pass along the boundary of the Grade II* Kentwell Hall Registered park and Garden.	and vegetation acting to screen the construction works, and the distance would mean any impact is negligible. No impact on ancient monuments, including setting, due to the distance from the proposed scheme. Potential for there to be temporary effects on the Kentwell Hall Registered park and Garden from the construction of the pipeline.				
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed schemes would build resilience to the effects of climate change through improved water supply security for the Haverhill and Bury St Edmunds Planning Zones, but by itself doesn't improve water supply for the wider East Anglia region as water will be taken from another East Anglian Planning Zone and this scheme in isolation doesn't examine water supply in that PZ.	+	Moderate	Medium	Significant
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>	N/A	The total embodied carbon for this scheme is 515 tCO <sub>2</sub> e. The operational carbon for this scheme is 4 tCO <sub>2</sub> e per year.	-	N/A	N/A	Not Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline.	Negative effects of resource use for construction materials.	-	Moderate	Low	Not Significant
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of Grades 2 and 3 agricultural quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines.	—	Minor	Low	Not Significant

### D.14.3. Scheme CWS6: Haverhill water reuse

#### D.14.3.1. Scheme Description

Scheme Schematic



Source: Anglian Water, 2013

This option proposes to treat 90% of the DWF from Haverhill STW through an advanced treatment process and inject the treated water into the chalk aquifer at either Wixoe or Gt Wrating as part of a MAR scheme.

The advanced treatment process will comprise UF and RO. The final effluent ammonia consent is low with a 95 percentile value of 2mg/l. Consequently, there is no requirement to treat the effluent to remove ammonia through modification of the existing process. The RO process generated two streams – the product water which will be pumped to the injection boreholes and the concentrate which will be discharged at the existing Haverhill STW into the River Lark. The concentrate will have a salt concentration of 3000-5000mg/l and will be diluted with the final effluent from the Haverhill STW.

Ferric Sulphate will be dosed before the UF process to improve membrane performance and to precipitate iron phosphate which, in turn result in calcium phosphate scaling risk in the RO membrane. Phosphate will be rejected by the RO process and consequently, the phosphate concentration in the water to be injected into the aquifer will be very low.

The additional water could be abstracted from the aquifer at the Wixoe or Great Wrating and treated at the Great Wrating WTW. The water reuse plant capacity is based on 90% of the 2011 DWF and any flow above this will be discharged in the current manner.

#### **D.14.3.2. Environmental Baseline**

##### **Hydrology**

Stour Brook flows from west of Haverhill in an easterly direction to connect with the River Stour at Water Hall Farm. The proposed scheme would run near it at Great Wrating BH, but would not cross it, or any other water body.

The area is not located within a Flood Zone.  
The pipeline routes transect through various Groundwater Source Protection Zones (GPZ). The proposed scheme would run through areas of GPZ 1 and 2.

##### **Settlements, socio-economics and infrastructure**

The proposed pipeline route is located within the following administrative boundaries:

- St Edmundsbury Borough Council
- Suffolk County Council

The proposed scheme would run through Haverhill, Little Wrating and Great Wrating Parishes.

The route is located between the following settlements; Haverhill, Kedington and Great Wrating. Major roads include the A1017 and the A143.

##### **Ecological – Designated Sites**

The route travels through the Haverhill Railway Walks Local Nature Reserve (LNR) at Coupals Farm and Spring Gardens south east of Haverhill centre. There are no other ecological designated sites within 5km of the route.

##### **Cultural Heritage**

The Moated Site at Great Wilsey Farm lies approximately 500m away from the pipeline. This is a scheduled monument.

The Church of St Mary's (Grade II\*) at Little Wrating is the closest listed building to the proposed scheme.

There are no Parks and Registered Gardens within 5km of the Pipeline Route.

##### **Landscape**

The site is located within the East Anglian Plain (Natural Area).  
The site is located within the South Suffolk and North Essex Claylands National Character Area.  
There are no Areas of Outstanding Natural Beauty (AONB) within 20km of the site.

### **Agricultural Land Classification**

According to Defra's MAGIC interactive mapping, the site is located in two categories of land classification. Land immediately east of Haverhill village is classified as Grade 2 whereas land within Haverhill villages itself is Grade 3/7 (urban).

### **Contaminated Land and Landfill Sites**

Millfields Way in Haverhill is a former household waste landfill and is located directly north of Haverhill sewerage works. The pipeline route transects through this former landfill area. There are no details of when this site received waste.

#### D.14.3.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	The proposal would come close to the River Stour, but it would not cross a water body.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	Not Significant
			The operation of the pipeline has potential to affect water bodies through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	Not Significant
		The treated water will be injected into the chalk aquifer, then abstracted	Potential for water quality effects from water injected into aquifer. However, if treated water complies with standards this shouldn't be an issue.	0	N/A	N/A	No Effect
		The concentrate from the RO plant will be discharged to the Stour Brook with the remainder of the flow from Haverhill STW.	Potential for water quality issues with discharge to Stour Brook.	-	Minor	Medium	Not Significant
2. Maintain and improve sustainable water resources and encourage the sustainable use of water.	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	Not Significant
		Increased demand on water resources has the potential result in increased demand for abstraction.	Scheme would reduce potential demand for abstracted water as water would be taken from a wastewater resource. The wastewater would otherwise pass back into the water cycle.	+	Minor	Medium	Not Significant
		N/A	Scheme unlikely to affect/influence	0	N/A	N/A	No Effect

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
			customer water consumption				
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The proposed scheme does not run through areas of Flood Zones 2 or 3.	Burst pipelines can cause localised flooding. No new flood storage is involved in the project. However, storage of water in the aquifer could reduce the amount of storage available flood water.	-	Minor	Low	Not Significant
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The Haverhill water deficit is forecast to reach 0.6ml/d by	Will help mitigate against the forecast water deficit through increased supply but without the need for increased abstraction rates.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline. This scheme would pass close to community receptors around the east side of Haverhill.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas near Haverhill. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	The proposed scheme will pass through the Haverhill Railway Walks LNR.	Construction of pipeline will directly affect the LNR. Although construction of the pipeline will be temporary it could cause loss of sensitive habitat and affect species.	-	Moderate	Medium	Significant
7. Protect and enhance	<ul style="list-style-type: none"> <li>Will it negatively affect</li> </ul>	The proposed	Temporary visual effects due to digging	—	Minor	Low	Not



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
landscape quality and character across the region.	<ul style="list-style-type: none"> <li>landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	scheme would not run through or close to any areas of Outstanding Natural Beauty.	up ground to lay pipeline. No long-term impact envisaged.				<b>Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposal would run close to listed features. The proposed scheme would pass within 500m of a Scheduled Monument. The does not pass within 5km of any Registered Parks and Gardens).	Potential for temporary impacts on setting for listed features associated with the pipeline construction. For most listed features these are considered minor due to intervening buildings and vegetation acting to screen the construction works, and the distance would mean any impact is negligible.	–	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> </ul>	N/A	The total embodied carbon for this scheme is 4,821 tCO <sub>2</sub> e. The operational carbon for this scheme is 476 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>Will schemes be designed to contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Existing Great Wratting WTW and Haverhill STW will be utilised. Scheme would require approximately 9km of new pipeline, extension to Great Wratting WTW and a new water reuse works at Haverhill.	Negative effects of resource use for construction materials. Scheme design and materials will follow Anglian Water sustainability policy.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would primarily pass through areas of Grade 2 agricultural quality, with some areas of Grades 3.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Moderate	Low	<b>Not Significant</b>

#### **D.14.4. Scheme CWS11: Fenland RZ transfer**

##### **D.14.4.1. Scheme Description**

This option involves transfer of water from Stoke Ferry WTW, Fenland RZ to Rushbrooke WTW.

This option involves the construction of a 500mm diameter pumping main from Stoke Ferry WTW to Rushbrooke WTW, approximately 44.2km.

##### **D.14.4.2. Scheme Baseline**

###### **Ecological Sites and Environmental Designations**

The Stoke Ferry WTW is located approximately 600m from the Wretton SSSI, afforded protective status due to its geology as it is considered to be a key stratigraphic location.

As the scheme progresses south, it passes through the Breckland Forest SSSI in two sections north and south of the town of Brandon. This area has been designated as a SSSI as it supports internationally important numbers of breeding woodlark and nightjar, is home to five vascular plants listed on Schedule 8 of the Wildlife and Countryside Act and an important assemblage of nationally rare and nationally scarce vascular plants. The site also supports an exceptionally rich invertebrate fauna and the only extant population of red squirrels in East Anglia. The site also contains three sites containing important geological features. The majority of this site also forms the Breckland SPA and Ramsar site.

The proposed scheme would pass through an area of grazing marsh to the west of the town of Brandon,

South-west of Thetford, the proposed scheme would re-enter the Breckland SPA and Ramsar site, with this area also constituting the Thetford Heath SSSI. This site has been designated due to its grassland and heathland habitats and associated species including rare plants and birds.

The section of the proposed scheme that would pass up to Barnham Cross WTW would pass through an area of grazing marsh.

The Barnham Cross WTW lies adjacent to the Barnham Cross Common LNR, afforded protection due to rare plants found on the site and the diversity of breeding bird species found there.

The proposed scheme would pass approximately 150m from an un-named area of ancient woodland near to Honington.

The proposed scheme would pass approximately 900m from an area of un-named ancient woodland near to Timworth Green.

The proposed scheme would pass approximately 350m from an area of un-named ancient woodland near to Fornham St. Martin.

The proposed scheme would pass approximately 600m away from the Glen Chalk Caves, Bury SSSI. This site has been afforded protection as the caves are home to five species of bat which have been continuously monitored since 1947.

Here the site also passes approximately 100m at the closest point to the six sites that form the Moreton Hall Community Woods LNR.

The tables below lay out the areas with environmental designations the proposed pipeline runs close to.

SSSI	Distance
Wretton	600m
Breckland Forest	Proposed scheme would pass through
Thetford Heath	Proposed scheme would pass through
Glen Chalk Caves, Bury	600m

Ancient Woodland	Distance
Un-named, near Honington	150m
Un-named, near Timworth Green	900m
Un-named near Fornham St. Martin	350m

Ramsar	Distance
Breckland	Proposed scheme would pass through

LNR	Distance
Barnham Cross Common	Proposed scheme would lie adjacent to the LNR
Moreton Hall Community Woods	100m

### Agricultural Land

The proposed pipeline would pass through land that is predominantly classified as Grades 2, and 3 agricultural land. This land therefore represents average or below average grade agricultural quality.

### Water Resources

South of Stoke Ferry WTW, the scheme crosses numerous waterways associated with the Fens. As it leaves the Fenland area, it crosses a cut-off channel.

The proposed scheme would also cross the Little Ouse River west of Brandon. The section of the proposal up to Barnham Cross WTW would cross the Little Ouse River twice, south of Thetford. North of Timworth Green the proposal would cross Ampton Water, as well as twice crossing the waterway connecting Ampton Water with the River Lark.

### Flood Risk

The proposed scheme would pass through areas of Flood Zone 3 associated with the Fenland area as well as crossing water bodies.

### Source Protection Zones

The proposed scheme would pass through two areas of Source Protection Zone 3

### Historic Assets

The proposed scheme would pass close to a Grade II listed barn in Methwold Hythe. As the schemes passes Elvedon, it would pass close to two listed Grade II cottages, but also three Grade II\* listed features comprising Elveden Hall, the Water Tower 200m south-west of Elveden Hall, and the Church of St. Patrick and St. Andrew.

The proposed scheme would pass close by to 18 listed features in Barnham, south of Thetford. It would also pass close by the Grade II listed Seven Hills House, along the A134

between Barnham and Ampton. Nearby, it would also pass close by the Grade II listed features of Barn at Heath Farm and Heath Farmhouse.

In Ampton, the proposed scheme would pass close to the Grade II listed Ampton Hall. In Bury St. Edmunds the proposed scheme would pass close to the Grade II listed Lodge to Moreton Hall School.

In total, the scheme would therefore run close to 26 Grade II listed features and 3 Grade II\* listed features.

The following table shows the Scheduled Monuments within 1km of the proposed scheme.

*Scheduled Monuments*

Scheduled Monument	Distance
Village Cross, north-east of St. James' Church	500m
Remains of Shrunk Village, E of Hockwold Hall	1km
Earth Works in Little Ouse Valley	100m
Leylands Farm, Romano-British site, Hockwold	250m
Bowl barrow known as John Mann's clump	900m
Bowl barrow and ring ditch nr Neville House Farm	450m
Bury St. Edmunds Abbey	1km

The proposed scheme would pass approximately 1km away from the Grade II\* Euston Park Registered Park and Garden (RPG). This constitutes the nearest RPG to the scheme, with no other RPGS within 1km of the route.

### Socio-Economics

The proposed scheme would run through the following statistical wards: Denton, Barton West, Barton East, Thetford Saxon, Bardwell, Harling & Heathlands, Risby, Pakenham, Farnham, Great Barton, and Moreton Hall. The results from the 2011 census are yet to be published in full; therefore data from the 2001 census has been used. The 2001 census shows that the combined population of the wards was 45,677. It is envisaged that the wider area will undergo population growth, with Anglian Water seeing this as part of the reason to examine proposals to increase water supply for the area. The proposed scheme would be located in the Local Authorities of King's Lynn & West Norfolk, Forest Heath, St. Edmundsbury and Breckland. It would be located in the Counties of Norfolk and Suffolk.

The proposed scheme would cross the A1065, A11(T), A134, A143 and A14(T) – with the A14 comprising a dual carriageway road. The proposed scheme would also cross the Ely – Cambridge and Ipswich – Cambridge rail lines. The scheme largely avoids built-up areas, although would pass through parts of Bury St. Edmunds.

### Pollution

The proposed scheme would run either close or through an area of historic landfill north of Ampton. The proposed scheme would not pass through or adjacent any other areas of landfill.

#### D.14.4.3. Scheme Assessment

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	<ul style="list-style-type: none"> <li>Will it affect the ecological status/potential of water bodies?</li> <li>Will it affect the chemical status/potential of water bodies?</li> <li>Will it affect overall water quality of water bodies?</li> </ul>	Pipeline would cross numerous waterways associated with the Fens, including a cut-off channel. It would also cross the Little Ouse River, Ampton Water and the waterway connecting Ampton Water with the River Lark.	The construction process has the potential to cause pollution to the water bodies, such as through disturbing contaminated land and spillage of construction materials into the water bodies. This therefore has the potential to affect water quality and water chemical status. Risk will be minimised through adherence to guidance on construction near sensitive water receptors.	-	Minor	Medium	<b>Not Significant</b>
			The operation of the pipeline has potential to affect this water body through the leakage of water from the pipeline. However, the water carried through the pipeline is unlikely to cause a negative impact due to its chemical status being of high quality.	-	Minor	Medium	<b>Not Significant</b>
2. Maintain and improve sustainable water resources and encourage the sustainable use of water	<ul style="list-style-type: none"> <li>Will it reduce water lost through leakages?</li> <li>Will it reduce over abstraction?</li> <li>Will it reduce customer water consumption?</li> </ul>	Pipelines have the potential for leakages to occur.	Leakages from pipelines are common. However, modern construction techniques and pipes have a lower propensity for leakage.	-	Negligible	Low	<b>Not Significant</b>
		Increased demand on water resources has the potential to result in increased demand for abstraction.	Water would be transferred from one PZ to another, avoiding further abstraction.	+	Minor	Medium	<b>Not Significant</b>
3. Minimise the risk and reduce the impact of flooding	<ul style="list-style-type: none"> <li>Will it contribute to managing flood risk e.g. involve flood storage?</li> <li>Will it involve loss or construction on the floodplain?</li> </ul>	The scheme does not involve managing flood risk.	The scheme would not have effects on flood risk.	0	N/A	N/A	<b>No Effect</b>
		Part of the proposed scheme will be constructed in areas liable to	Construction works could have potential to cause temporary increased flooding. Burst pipeline can cause localised flooding.	-	Minor	Low	<b>Not Significant</b>

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		flooding (both Flood Zones 2 and 3).					
4. Ensure security of water supplies for customers whilst ensuring operations/schemes do not negatively affect local communities.	<ul style="list-style-type: none"> <li>Will it help secure water supplies for customers?</li> <li>Will it cause nuisance for local communities?</li> <li>Will it create community assets e.g. reservoir nature trail?</li> </ul>	The scheme would enable transfer of water between neighbouring RZs.	This proposal would allow more flexibility in the meeting of demand and supply of water. This would allow better use of water resources across a wider area.	+	Moderate	Medium	Significant
		Scheme would require the construction of new pipeline and modification of existing water works. This scheme would pass close to some community receptors – particularly in Bury St. Edmunds.	There may be temporary construction nuisance (noise, dust, visual, road/pedestrian diversions) for residents from construction of pipeline. Modification works would take place within the existing sites. Construction effects on the local community will be reduced through avoidance of urban areas, although the scheme will still come close by to residential areas near Bury St. Edmunds. The operation of the pipeline is not considered to have a negative effect, unless maintenance work on the pipeline is required.	-	Minor	Medium	Not Significant
		Proposed scheme does not involve directly creating of community assets.	No effects predicted.	0	N/A	N/A	No Effect
5. Deliver WRMP schemes together with the local community and work with the local supply chain.	<ul style="list-style-type: none"> <li>Will the public be kept informed and consulted upon on WRMP proposals?</li> <li>Will local suppliers be used?</li> </ul>	N/A	Public will be kept informed and consulted upon through SEA and EIA processes. Local suppliers should be used where possible.	+	Minor	Medium	Not Significant
6. Protect and enhance biodiversity and geo-diversity across the region.	<ul style="list-style-type: none"> <li>Will it encourage habitat creation?</li> <li>Will it involve loss or damage to statutory or non-statutory habitats?</li> <li>Will it affect aquatic biodiversity?</li> <li>Will it affect habitats that rely on water e.g. wetlands?</li> </ul>	Proposed scheme would pass through two SSSIs, an SPA and Ramsar site, it would pass adjacent to an LNR and it would close within 1km of a further 2 SSSIs, a further 1 LNR and 3	Potential direct loss of habitat and disturbance to protected species in the SPA and Ramsar site and SSSIs.	-	Major	High	Highly Significant

Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
		areas of Ancient Woodland.					
7. Protect and enhance landscape quality and character across the region.	<ul style="list-style-type: none"> <li>Will it negatively affect landscape quality and character?</li> <li>Will it enhance landscape quality and character?</li> </ul>	Pipeline would not run through an area designated as an AONB.	Temporary visual due to digging up ground to lay pipeline. No long-term impact envisaged.	–	Minor	Low	<b>Not Significant</b>
8. Protect historic assets and their landscapes.	<ul style="list-style-type: none"> <li>Will it affect the fabric of an historic asset?</li> <li>Will it affect the setting of a historic asset?</li> </ul>	The proposal would pass within 500m of 4 Scheduled Monuments. The closest RPG is 1km away. The scheme would come close to 26 Grade II listed features and 3 Grade II* listed features.	Potential for temporary impacts on setting for listed features associated with the pipeline construction, although these are not considered to be significant given the temporary nature of the works and the potential for intervening vegetation and other features to obscure the view of the temporary visual intrusion.	–	Minor	Medium	<b>Not Significant</b>
9. Educate, manage, plan and adapt for the effects of climate change.	<ul style="list-style-type: none"> <li>Will it assist in educating people about the impacts of climate change on water resources?</li> <li>Will it help the region to adapt to climate change effects on water resources?</li> </ul>	Projections for future climate change include hotter, drier summers and warmer, wetter winters and more extreme events, such as flooding and drought. Sea levels will rise, increasing coastal erosion risks to people, property and the environment. No proposal for use in education.	Proposed scheme would build resilience to the effects of climate change through improved water supply security.	+	Moderate	Medium	<b>Significant</b>
10. Minimise greenhouse gas emissions and energy use from water resource management operations	<ul style="list-style-type: none"> <li>Will it increase generation of greenhouse gases?</li> <li>Will it increase energy use?</li> <li>Will new assets built as a result of the WRMP be designed to have half the embodied carbon (from 2010 baseline)?</li> <li>Will schemes be designed to</li> </ul>	N/A	The total embodied carbon for this scheme is 7,160 tCO <sub>2</sub> e. The operational carbon for this scheme is 182 tCO <sub>2</sub> e per year.	-	N/A	N/A	<b>Not Significant</b>



Anglian Water WRMP SEA Objectives	Assessment Criteria	Baseline	Potential Effects	Interaction	Magnitude	Importance	Significance
	<ul style="list-style-type: none"> <li>contribute to reducing operational carbon emissions by 10% in real terms by 2015 from 2010 baseline?</li> <li>Will it generate emissions from transport?</li> </ul>						
11. Ensure that a sustainable approach is adopted for new water resource infrastructure and that existing infrastructure is utilised/expanded where possible	<ul style="list-style-type: none"> <li>Will the scheme use sustainable materials?</li> <li>Will it utilise/expand existing infrastructure rather than building new infrastructure?</li> <li>Is the scheme designed to be low maintenance?</li> <li>Will the scheme generate waste/is it a zero waste scheme?</li> <li>Will waste generated by the scheme be halved to landfill?</li> </ul>	Scheme would require construction of new pipeline and modification to existing water works	Negative effects of resource use for construction materials, along with the construction materials required for the treatment works modifications.	-	Moderate	Low	<b>Not Significant</b>
12. Protect best quality soil and agricultural land	<ul style="list-style-type: none"> <li>Will it help maintain water supplies for irrigation?</li> <li>Will it cause loss or damage to soils and agricultural land?</li> </ul>	The proposed scheme would pass through an area of Grades 2 and 3 agricultural quality. This represents average/below average quality.	Likely to include temporary effect on soils and agricultural land through the laying of pipelines. Discharge will be within EA standards so should not pollute the ground.	—	Negligible	Low	<b>Not Significant</b>

