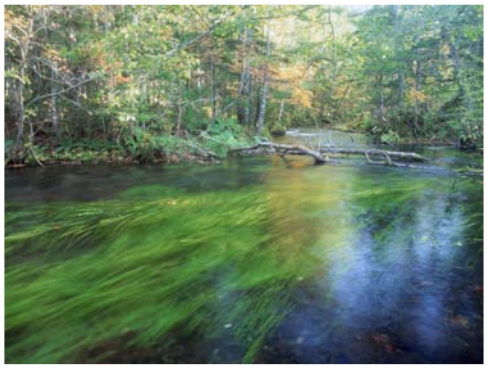
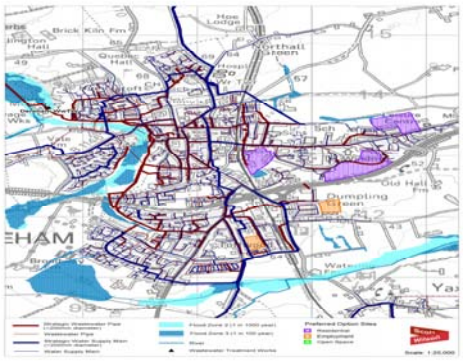
Breckland Water Cycle Study
Phase 2: Detailed Study

Non Technical Summary - Planning Report
May 2010





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Revision Schedule

Breckland Water Cycle Study: Detailed Study - Non-Technical Summary - Planning Report
May 2010

Rev	Date	Details	Prepared by	Reviewed by	Approved by
01	April 2010	D124801: Draft Final NTS	**Sarah Kelly** Water Specialist	**Carl Pelling** Principal Consultant	
02	April 2010	D124801: Final NTS	**Sarah Kelly** Water Specialist	**Carl Pelling** Principal Consultant	**Jon Robinson** Associate Director
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1 Introduction

1.1 Growth Assessment

1.1.1 Breckland is set to become one of the fastest growing areas in the East of England. Over the period 2001 to 2021, it is expected that up to 15,200 homes will be built within the Breckland area, representing a challenge to Breckland District Council (BDC) in ensuring the environment has the capacity to sustain this level of proposed growth and development.

1.1.2 Within the Breckland area, Thetford has been identified as a Key Centre for Development and Change (KCDC) in the East of England Regional Spatial Strategy (RSS). Over the period 2001 to 2021, it is expected that up to 6,000 homes will be built in and around Thetford. Additionally, Thetford has been identified by Communities and Local Government (CLG) as one of 29 National Growth Points (NGP).

1.1.3 Elsewhere in Breckland, the LDF Core Strategy (CS), in line with the RSS and national planning policy, will focus growth (up to 2026) to sustainable locations where services, jobs and infrastructure exist. The Core Strategy has identified the market towns of Attleborough, Dereham, Swaffham and Watton as sustainable locations for growth.

1.1.4 The objective of the Breckland Water Cycle Study (WCS) is to identify any constraints on housing and employment growth planned for the Breckland area up to 2026 that may be imposed by the water cycle and how these can be resolved i.e. by ensuring that appropriate water infrastructure is provided to support the proposed development. Furthermore, it should provide a strategic approach to the management and use of water which ensures that the sustainability of the water environment in the region is not compromised.

1.2 Water Cycle Study Phases

Phase 1: Thetford and Breckland District Outline WCS

1.2.1 The Breckland Water Cycle Study (WCS) has been reported in 2 phases. A Phase 1 Outline WCS was completed in May 2008 for Thetford, followed by a Phase 1 Outline WCS for remaining growth in the district as a whole in November 2008.

1.2.2 Both Phase 1 reports assessed the baseline conditions of various elements of the water cycle in Breckland, including the natural water environment and the capacity of the water services infrastructure that would be used to support growth. In addition, the Phase 1 studies undertook a high level assessment of the likely growth locations and proposed levels of growth in the district, and determined where growth would be achievable within the existing capacity of both the infrastructure and the water environment.

1.2.3 The Phase 1 reports informed the strategic approach for growth as set out in the Breckland Core Strategy, demonstrating that growth in the district was possible subject to further more detailed assessment of key environmental and infrastructure issue identified.

Phase 2: Breckland District Detailed WCS

1.2.4 The Phase 2 detailed study continued on from the Phase 1 studies and was undertaken for growth across the district, including Thetford. It has taken the findings of the Outline studies, and determined the detailed solutions required to deliver growth for the specific identified preferred development allocations, including detailed information on the cost of this infrastructure and the policy required to deliver it. The outcome as been the development of a *water cycle strategy* for the district which informs site specific and other DPDs of the water environment and water infrastructure issues that need to be considered in bringing growth forward at various sites, including guidance for developers in conforming with the requirements of the strategy. The Water Cycle Strategy is reported through the Stage 2 Detailed WCS for Breckland

1.3 Phase 2 - Reporting Format

1.3.1 The undertaking of a Phase 2 Detailed WCS involves a significant amount of technical data collection, analysis and interpretation. However, it is acknowledged that the WCS key purpose is to act as a planning evidence base and hence, the Breckland Detailed WCS has been reported via two distinct documents:

- A Non Technical Planning Report - to act as the principal planning reference for the WCS which summarises the overall water cycle strategy, provides the key findings of the study in relation to the Local Development Framework and the various documents which it informs and sets out planning implications of the solutions proposed from the study; and
- A Technical report - setting out:
    - what solutions are required to deliver the strategy;
    - how the strategy was developed;
    - details of the data used ;
    - detail of how the capacity and new infrastructure assessments were undertaken;
    - detailed results and findings from the assessments;
    - further discussion around the policy and legislative drivers affecting the assessments and conclusions;
    - detail on the policy required to deliver the infrastructure and mitigation required; and
    - detail on the cost of infrastructure and solutions required

1.3.2 Its aim is to act as the technical reference for the evidence base to Breckland's LDF, giving sufficient information to the various key technical stakeholders involved in the study to demonstrate that the strategy developed is robust and achievable.

1.3.3 This report represents the Breckland WCS Phase 2 – Non-Technical Planning Report.

1.4 Study Drivers

1.4.1 There are many key drivers to a WCS that need to be considered and these are covered in more detail in the Detailed WCS Technical report. However, it is important to highlight in this non-technical report that there are two key pieces of legislation that the WCS must consider as an evidence base:

- the EU Water Framework Directive (WFD); and
- the EU Habitats Directive (HD)

1.4.2 The key elements of both of these directives which are relevant to a WCS, are that they aim to protect (and enhance) the quality of water bodies and the ecological species which are reliant on them. In different ways, they both set out environmental targets which need to be met in our water bodies to ensure that they continue to function both for environmental purposes, but also for human use and enjoyment.

1.4.3 Growth in Breckland could impact on our water bodies in several key ways unless key infrastructure and mitigation is developed to prevent it. More housing and employment results in:

- the generation of more wastewater, which although goes through a treatment process, still has the potential to impact detrimentally on the water quality of receiving water bodies.
- physical development for growth results in the generation of greater volumes of surface water which has the potential to impact on flood risk, but also the quality of receiving water bodies; and
- provision of drinking water to growth areas requires more abstraction of raw water resources from the environment which reduces the volume of water available for habitats and species which rely on it.

1.4.4 Therefore, it is essential that the WCS considered the impact of growth on meeting these standards as set by the legislation and a key element of the Detailed Study has been to demonstrate what infrastructure and mitigation needs to be in place to ensure these standards are met. This infrastructure and mitigation provision has resulted in a *Water Cycle Strategy* for Breckland which informs Breckland's LDF of the phasing requirements for housing to ensure that the infrastructure solutions can be implemented before housing and employment areas are developed. The Strategy also sets out who is responsible for providing the solutions and maintaining them after construction.

1.5 Steering Group

1.5.1 The Phase 2 Detailed WCS has been overseen by a Steering Group consisting of representatives from the following stakeholders:

- Breckland District Council (BDC);
- Norfolk County Council (NCC);
- Natural England (NE);
- Environment Agency; and

- Anglian Water Services (AWS).

1.5.2 The stakeholders have provided information and expertise to the study, and have guided the development of the strategy at several key stages. This input has ensured that a strategy has been developed that all key stakeholders can sign up to, allowing agreement to be reached on water environment and water infrastructure issues with respect to the growth set out in Breckland's LDF.

1.6 Wastewater Treatment Issues

1.6.1 The completion of the Phase 1 Outline WCS for Breckland, determined that accommodation of growth at Attleborough would be challenging with respect to providing sufficient capacity for wastewater treatment, whilst also achieving the required water quality targets in the River Thet. This was in acknowledgement that the proposed growth would almost double the population and hence double the volume of wastewater generated at the town which currently discharges into the headwaters of the River Thet where there is limited water quality capacity to accept further discharges.

1.6.2 In recognition of this issue at the examination of the Core Strategy, a smaller working group was established to discuss the specific issue of wastewater treatment at Attleborough. This working group was made up of representative from BDC, AWS, Scott Wilson and the Environment Agency. The working group outputs have fed into and informed the water cycle strategy developed in the Phase 2 WCS.

2 Methodology

2.1 Developing the Strategy

2.1.1 For each development area in Breckland, the preferred sites for growth were assessed alongside the preferred trajectory for housing and employment provision at each town. The key growth towns assessed were Thetford, Attleborough, Dereham, Swaffham and Watton.

Water Resources Strategy

2.1.2 The growth information was then used to create a water supply strategy for each growth town covering:

- volumes of treated water required by growth each new growth area;
- whether Anglian Water Services had planned sufficient Water Resources to supply growth in the district;
- what the impact of supplying the additional water would be on the environment from which it is taken;
- whether there are adequate water supply mains and treatment facilities to transmit the water to the growth areas; and
- what new infrastructure is required to provide all of the water and ensure that standards as set by the HD and WFD are met.

Wastewater Strategy

2.1.3 The growth information was used to create a wastewater strategy for each growth town covering:

- volumes of wastewater generated by each new growth area;
- what the impact of the additional wastewater would be on the receiving water bodies;
- whether there is existing infrastructure to treat the additional wastewater;
- whether there is adequate sewerage to transmit the wastewater to treatment works; and
- what new infrastructure is required to treat all of the wastewater and ensure that standards as set by the HD and WFD are met.

Flood Risk Management

2.1.4 Finally, the volumes of surface water runoff likely to occur as a result of developing the preferred sites was calculated and mitigation methods such as Sustainable Drainage systems were promoted to ensure that increases in runoff to not increase flood risk to existing (and new) properties.

2.1.5 The Wastewater, Water supply and flood risk management elements were combined into a single *Water Cycle Strategy* for each of the growth towns, and the results (including the infrastructure solutions identified are presented in the this Non-Technical report for each of the key growth towns. The following sections summarises this information for each town.

3 Strategy for Thetford

Growth Summary

3.1.1 The Breckland Spatial Strategy[1] identified Thetford as the main strategic location for growth in the Breckland District up to 2026, targeting it with providing 6,500 new homes and 5,000 new jobs over the period 2008-2026.

Water Resources Strategy

Water Resource Availability

3.1.2 The phasing of water resource developments within Thetford will depend on future water use rates, with total water demand from new developments expected to range between 1.5 Ml/d (Million litres per day) and 3.2 Ml/d depending on the water efficiency standards of new dwellings.

3.1.3 Under the lower water use scenario, extra groundwater will be abstracted from existing sources with spare licensed capacity which will be sufficient to supply all growth through to the end of planning period (2026); however, under the higher water demand scenario growth in Thetford will require the transfer of water from Barnham Cross via a new groundwater resource scheme by 2018

3.1.4 The Environment Agency have assessed the fully licensed abstraction volumes against Habitats Directive (HD) and Water Framework (WFD) standards required and have considered that there is no impact from utilising existing sources. In signing up to AWS's Water Resources Management Plan (WRMP), the Environment Agency have also approved in principle the transfer from Barnham Cross, although if this source is required for Thetford (dependent on the water efficiency of new homes) further assessment will be required by AWS once the groundwater source from which the water will be taken is known. Supply of the water is the responsibility of AWS and is not considered to constrain growth

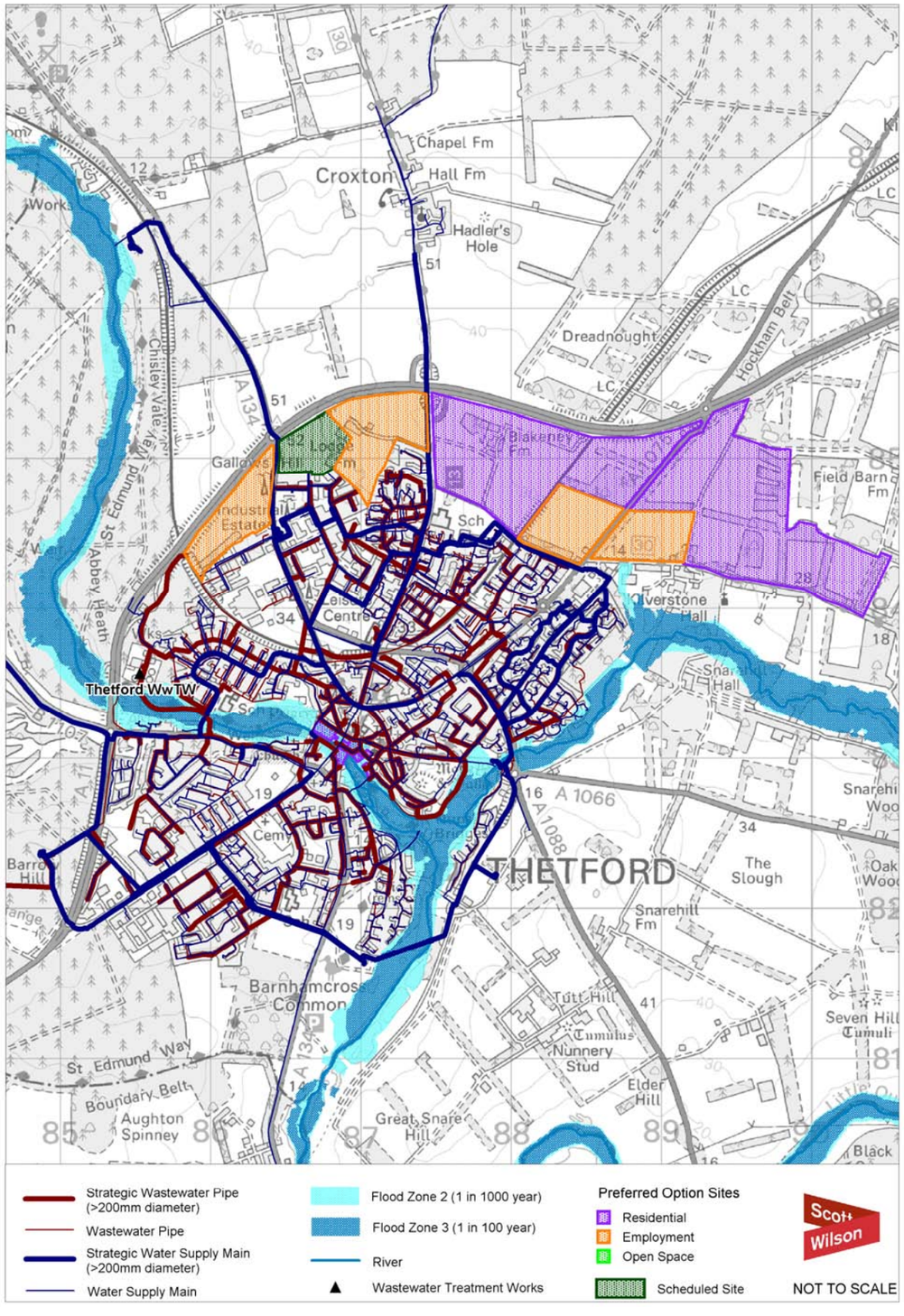
Water Supply Infrastructure

3.1.5 A large water supply main passes to the east of the proposed greenfield development areas and would be sufficient to feed these proposed sites. However, the developers would be responsible for funding the construction of an extension main to the development areas as at present there is no water mains coverage within these areas. This would most likely require a new local pumping station. Local connections would then be required on a house by house basis.

Wastewater Treatment

3.1.6 Wastewater generated within Thetford is currently treated at Thetford WwTW. The preferred solution to wastewater treatment for Thetford is the utilisation of the spare capacity at the WwTW. AWS currently have a consent to discharge which is adequate to allow for the additional wastewater generated as a result of growth without the need for any significant upgrades to the works.

3.1.7 The Environment Agency has determined that Thetford WwTW at current consented capacity is not impacting on any ecologically designated sites downstream. As there is no proposal to increase flow above the current consent, it is considered that there would be no downstream impact in protected sites as a result of growth at Thetford.



[1] Core Strategy and Development Control Policies DPD – Adopted 2009, Breckland District Council, 2009

Wastewater Transmission Infrastructure

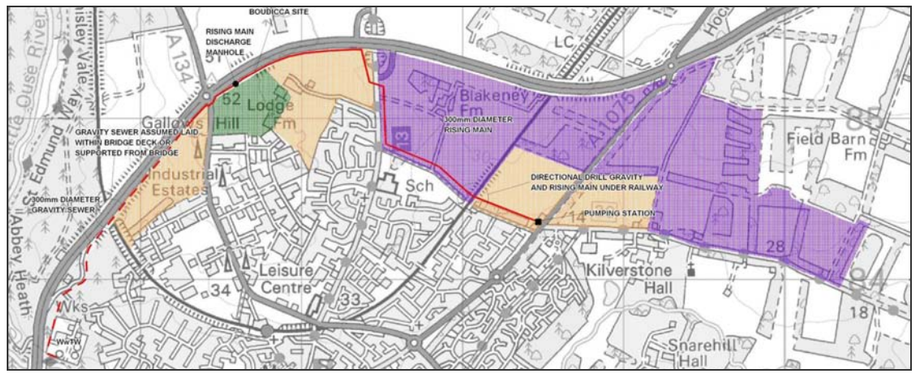
Strategic Connection

3.1.8 There is capacity within the existing sewerage network to accommodate the wastewater from new development within Thetford town centre. The capacity for these connections will need to be investigated on a case by case basis by developers requesting a pre-development application report from AWS which would involve more detailed hydraulic modelling of capacity.

3.1.9 A new strategic sewer is required to serve the development areas to the north of the town which, assuming building commences in 2010, should be operational by 2014. The proposed route for the new pipeline is illustrated in Figure 3-1 (red line). The system would be a mixture of pumped and gravity drains, with a pumping station pumping the wastewater from the north-easterly development area (at the upstream end of the proposed pipeline) to the gravity drained pipes to the south of the A11/A1086 interchange.

3.1.10 Some development can occur in 2013-2014 on the greenfield development areas but these cannot be occupied until the new wastewater sewer is operational in 2014.

Figure 3-1: Wastewater Strategy – Proposed Wastewater Pipeline Route



Local Connection

3.1.11 Local connections to the existing wastewater network within Thetford itself should be possible and will require a lead-in time of approximately a year. Once built, local connections to the new strategic sewer will be possible.

Flood Risk & Management

Flood Risk & the Sequential Test

3.1.12 There is not considered to be a flood risk to proposed development on the two greenfield development areas, though the Level 1 SFRA recommends that development should be planned to ensure that runoff from the A11 will not affect any new property and that new development will not exacerbate sewer flooding of the existing developments to the south.

3.1.13 The town centre development sites lie within Flood Zone 2 or 3. The Thetford Level 2 SFRA provides a number of recommendations regarding mitigation measures, including raised finished floor levels, the use of SuDS and application of the Sequential Test. Site specific Flood Risk Assessments will be required to assess the risk of flooding to and from the sites and should provide details of flood warning and evacuation plans.

Sustainable Drainage (SuDS) Suitability

3.1.14 The development sites will require the installation of SuDS prior to the commencement of occupation of development and it is recommended that these are constructed prior to main site construction to provide water quality benefits for sediment reduction during site preparation; however, this is not expected to impact on the development timescales.

3.1.15 Infiltration SuDS methods should be appropriate for all development areas in Thetford, though the presence of a SPZ Zone 2 local to all sites could present some potential constraints to the use of infiltration method, particularly if there are significant contaminants be present within underlying soils.

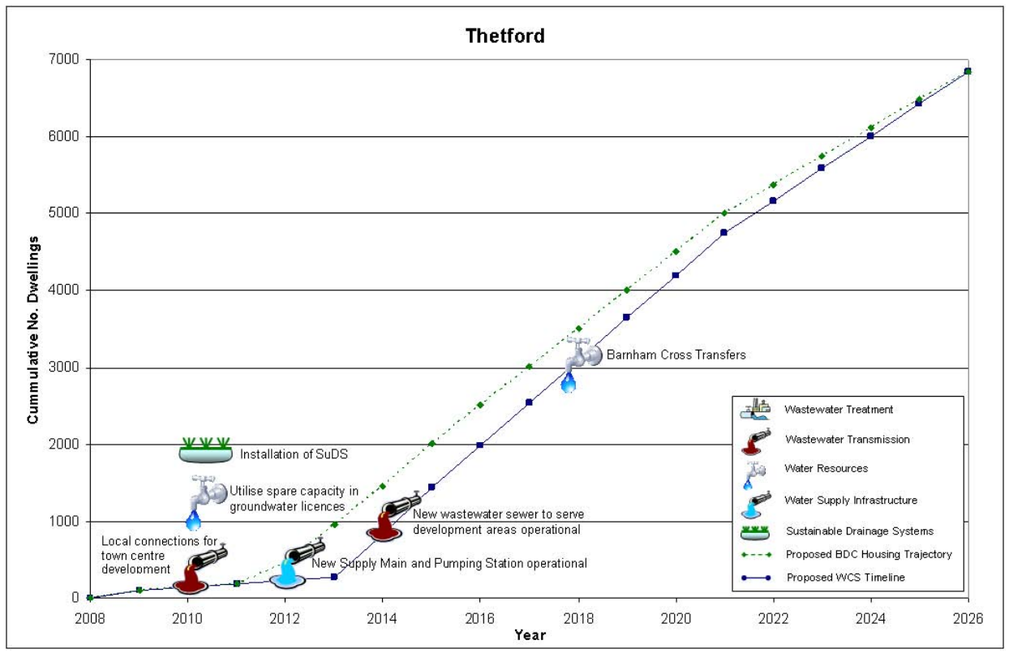
3.1.16 Due to the large site areas to the north of the town, it is likely that both smaller scale source control methods (e.g. soakaways, infiltration trenches) and larger scale regional control methods (e.g. infiltration basins) could be used on these sites.

3.1.17 In the town centre, however, the presence of naturally high groundwater and thin clay layers could be a significant constraint. In addition, as these sites are mostly pre-developed brownfield land, there is a potential for the presence of contaminants to be present. Therefore a full ground investigation would be required prior to development of a surface water management strategy. Given the limited area of the sites, it is likely that small-scale source control SuDS methods (e.g. soakaways) would be most appropriate.

Infrastructure Timeline

3.1.18 The infrastructure timeline and phasing recommendations are illustrated in Figure 3-2.

Figure 3-2: Thetford Infrastructure Timeline and Phasing



4 Strategy for Attleborough

Growth Summary

4.1.1 The Breckland Spatial Strategy[2] identified Attleborough as a major focus for employment and residential growth, targeting it with providing 4,000 new homes and between 1,500 and 2,000 new jobs over the plan period (2008-2026). The majority of this development will be on greenfield land to the south of the town.

Water Resources

Water Resource Availability

4.1.2 The phasing of water resource developments within Attleborough will depend on future water use rates, with total water demand from new developments expected to range between 0.8 Ml/d and 1.7 Ml/d depending on the water efficiency standards of new dwellings.

4.1.3 Under the low water use scenario (0.8Ml/d), extra groundwater will be abstracted from existing sources with spare licensed capacity. This additional water will be sufficient to support growth that is predicted to occur up to 2018, at which point a new groundwater resource is required. Under the high water use scenario (1.7Ml/d), the spare licensed capacity for existing sources will not be sufficient due in part to the growth also occurring at Wymondham, and a new groundwater resource will be required by the end of 2015. AWS are proposing targeted water efficiency measures for existing homes in Attleborough to reduce the impact of additional demand for water from growth up to 2015. The new groundwater resource is likely to come from boreholes at High Oak.

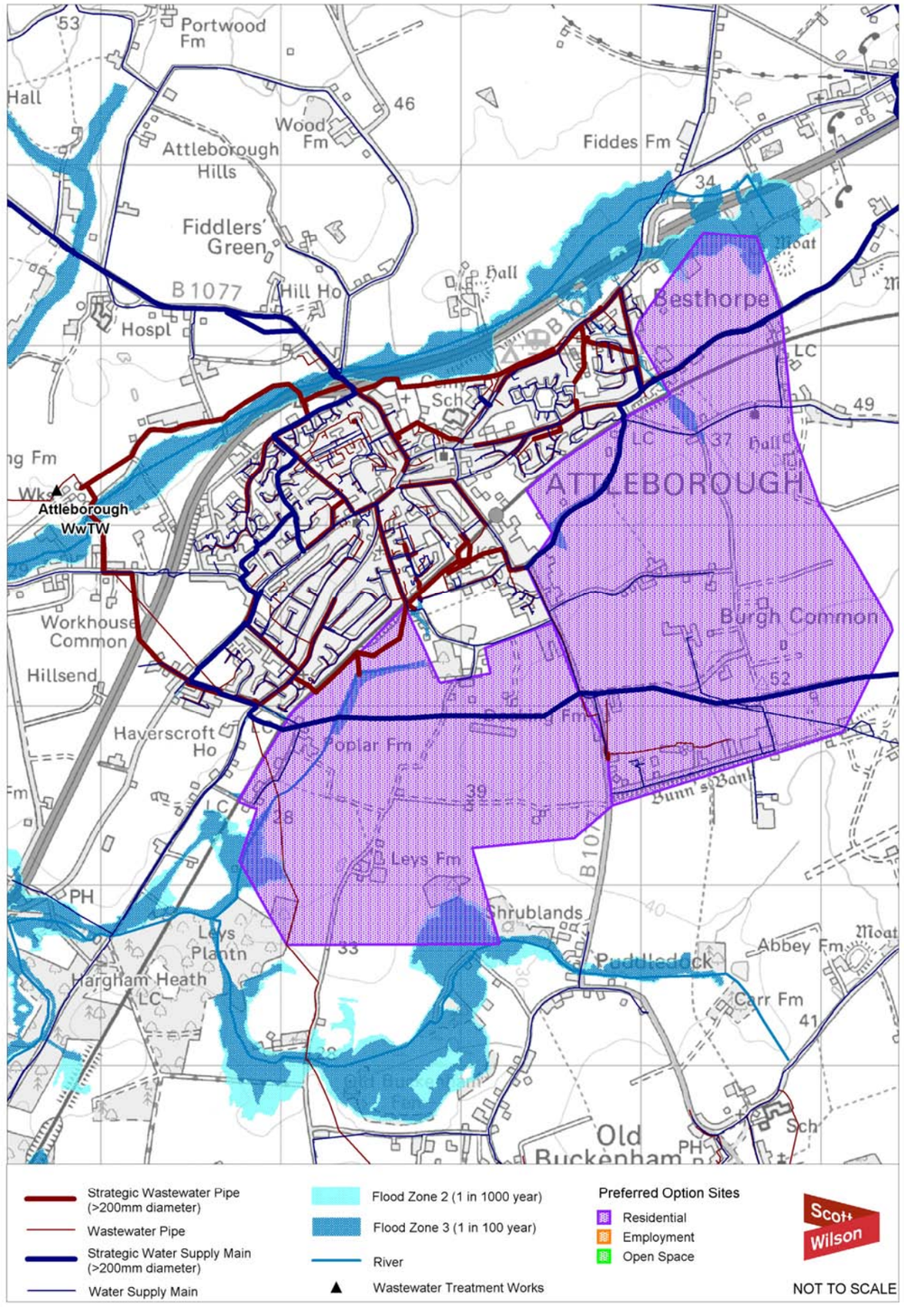
4.1.4 The Environment Agency have assessed the fully licensed abstraction volumes against Habitats Directive (HD) and Water Framework (WFD) standards required and have considered that there is no impact from utilising existing sources to their full licensed limits. In signing up to AWS's Water Resources Management Plan (WRMP), the Environment Agency has also approved in principle the transfer from High Oak. The selection of this source is based on the aim of limiting any impacts on sensitive sites linked to the River Yare or Little Ouse.

Water Supply Infrastructure

4.1.5 A large water supply main passes through both proposed development areas in Attleborough and both would be sufficient to feed the new development areas. However, the developers would be responsible for extensive local connections which would be required on a house by house basis.

Wastewater Treatment

4.1.6 Wastewater generated within Attleborough is currently treated at Attleborough WwTW. The WwTW does not currently have adequate capacity to accept and treat any additional wastewater generated, and the improvements required to meet WFD requirements downstream of the works in the River Thet would be beyond the limits of what can currently be achieved within best available technology.



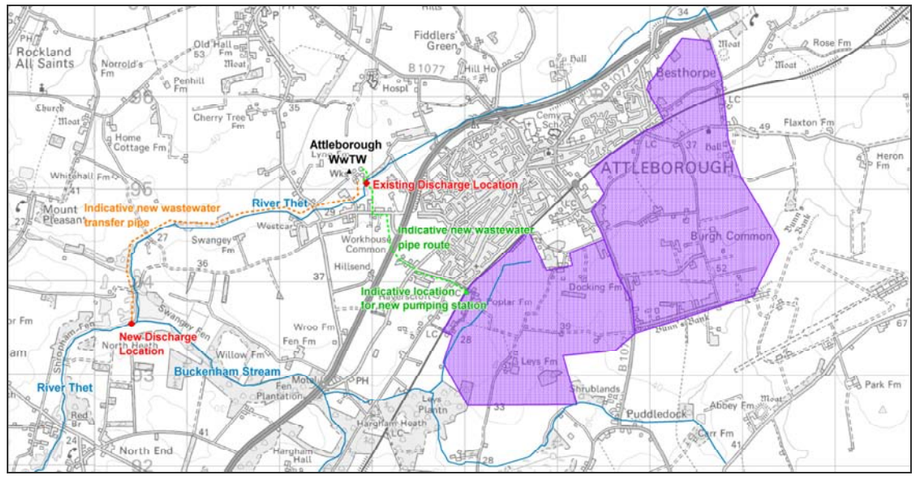
[2] Core Strategy and Development Control Policies DPD – Adopted 2009, Breckland District Council, 2009

4.1.7 A number of solutions have been considered by the Wastewater Working Group and the preferred solution is to continue to treat all wastewater from the new development at Attleborough WwTW but move the discharge location for the works to a new discharge point on the River Thet downstream of Buckingham Stream (Figure 4-1). The volume of river flow at this further point downstream is higher and allows a greater degree of dilution of the treated wastewater effluent as it is discharged. This in turn allows the more stringent WFD targets for the watercourse to be met.

4.1.8 This solution also allows the greatest flexibility in terms of expanding the existing WwTW and thereby minimises the impact on the treatment of wastewater from the existing population as the expansion works take place. The changes required at the WwTW, including the new transfer pipeline for the effluent are substantial and are not expected to be complete and operational until 2016 at the earliest. Development levels will need to be minimised up until this point, as water efficiency measures to reduce wastewater generation for existing dwellings and the potential interim option of transfer of wastewater by tanker is utilised where feasible (see Figure 4-2).

4.1.9 The WCS has determined that there are no European sites downstream of the current discharge that would be affected by water quality changes as a result of the preferred solution. It is considered that because the proposed solution would maintain water quality downstream in order to meet requirements for the WFD water quality standards, there is unlikely to be any impact on ecology generally downstream.

Figure 4-1: Wastewater Strategy – Proposed Wastewater Pipeline Route & Discharge Locations



Wastewater Transmission Infrastructure

4.1.10 There is likely to be capacity in the existing sewerage system serving Attleborough for some additional properties. Development beyond approximately 1,500 properties will require a new main sewer to be constructed, or for the existing sewer to the west of Attleborough to be upgraded to facilitate the transfer of wastewater from the development areas to the WwTW. An indicative route for the main and associated sewage pumping station is provided in Figure 4-1 (green line).

Flood Risk & Management

4.1.11 Both preferred options sites contain some areas covered by Flood Zone 3 and development within these sites should follow the site based sequential test and be directed towards those areas at lower flood risk. The Level 1 SFRA provides recommendations for development in the preferred sites including that development should not take place along a corridor of 30 to 100 metres either side of a watercourse. Assuming the recommendations from the SFRA are followed when designing and building development on the sites, there is not considered to be any flood risk constraints associated with developing on the preferred option sites in Attleborough.

SuDS Suitability

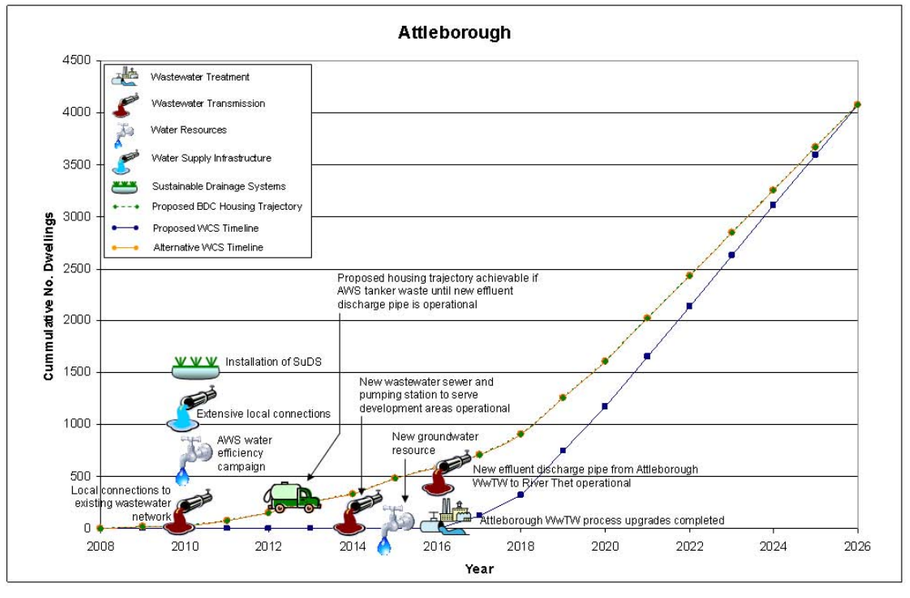
4.1.12 The development sites will require the installation of SuDS prior to the commencement of occupation of development and it is recommended that these are constructed prior to main site construction to provide water quality benefits for sediment reduction during site preparation. Due to the large preferred option site areas, there is potential to use many different SuDS techniques from source control on individual housing blocks to regional control via wet ponds or retention basins. There are various small watercourses at the site for potential connection however; the East Harling Internal Drainage Board (EHIDB) would need to be consulted.

4.1.13 The capacity to infiltrate surface water to ground is reasonably high, and hence infiltration techniques should be encouraged (after a pollution risk assessment has been completed) to manage surface water runoff. Surface water management schemes for the sites should be reviewed at a strategic site level to ensure the overall sustainability of the management techniques and maximum the opportunities for wider environmental benefits such as blue corridors and linked wetland systems.

Infrastructure Timeline

4.1.14 The infrastructure timeline and phasing recommendations are illustrated in Figure 4-2.

Figure 4-2: Attleborough Infrastructure Timeline and Phasing



5 Strategy for Dereham

Growth Summary

5.1.1 The Breckland Spatial Strategy[3] identified Dereham as experiencing significant employment growth coupled with focused housing growth to enhance its position as the administrative centre of Mid-Norfolk. Dereham is targeted with providing 2,000 new homes and up to 1,800 jobs over the plan period (2001-2026). There will be a gradual growth within the town with priority given to brownfield sites within the town, followed by brownfield sites adjoining the town and then peripheral greenfield sites.

Water Resources

Water Resource Availability

5.1.2 The phasing of water resource developments within Dereham will depend on future water use rates, with total water demand from new developments expected to range between 0.2 Ml/d and 0.5 Ml/d depending on the water efficiency standards of new dwellings.

5.1.3 Under the low water use scenario (0.2Ml/d), extra groundwater will be abstracted from existing sources with spare licensed capacity. This additional water will be sufficient to support growth that is predicted to occur up to 2022, at which point a new groundwater resource is required. Under the high water use scenario (0.5Ml/d), the spare licensed capacity for existing sources will not be sufficient, and a new groundwater resource will be required by the end of 2014. AWS are proposing targeted water efficiency measures for existing homes in Dereham to reduce the impact of additional demand for water from growth up to 2014. The new groundwater resource will come from boreholes at West Bradenham. The selection of this source is based on the fact that this borehole, which was drilled as an alternative source to the Watton source works in order to reduce impacts further downstream on the River Wissey, is now no longer required for this purpose and can be used to supply Dereham.

5.1.4 The Environment Agency have assessed the fully licensed abstraction volumes against Habitats Directive (HD) and Water Framework (WFD) standards required and have considered that there is no impact from utilising existing sources to their full licensed limits. In signing up to AWS's Water Resources Management Plan (WRMP), the Environment Agency has also approved in principle the use of boreholes feeding West Bradenham works.

Water Supply Infrastructure

5.1.5 Adequate supply mains pass through, or are located close to, all proposed development sites in Dereham. However, the developers would be responsible for funding local connections on a house by house basis.

Wastewater Treatment

5.1.6 Wastewater generated within Dereham is currently treated at Dereham WwTW. The WwTW does not currently have adequate capacity to accept and treat any additional wastewater generated, and the improvements required to meet WFD requirements downstream of the works in the River Wensum (via the Wendling Beck) would be beyond the limits of what can currently be achieved within best available technology

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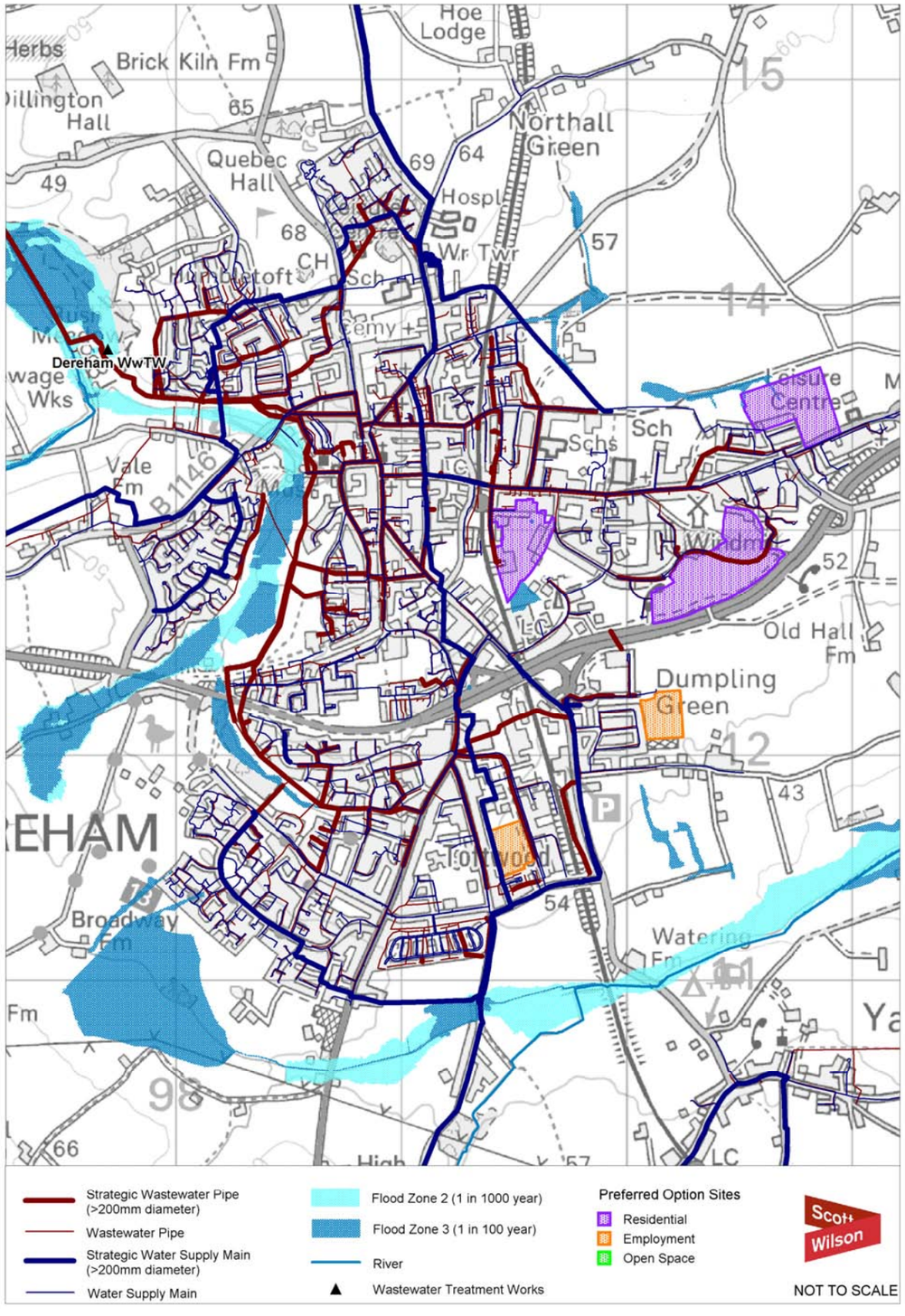


[3] Core Strategy and Development Control Policies DPD – Adopted 2009, Breckland District Council, 2009

5.1.7 Therefore, the proposed solution is to limit the number of new dwellings that can connect to the wastewater system to between 50 and 80 units per year to enable water efficiency measures proposed by AWS for existing homes to reduce the volumes of wastewater generated. It is for this reason that the Water Cycle Strategy for Dereham requires new homes to be built to the highest water efficiency standards under the Code for Sustainable Homes, to further reduce the volumes of wastewater generated by new development and to reduce the burden on the WwTW.

5.1.8 The existing discharge consent has been reviewed by the Environment Agency for impact on European Ecological designated sites under the HD and with the changes to the consent conditions currently being implemented; it is considered that the HD and WFD standards can be met. The proposed solution would not increase wastewater flow at Dereham WwTW beyond that which it is currently consented to do and hence would not impact on HD or WFD targets.

5.1.9 Should development beyond 80 units per year be promoted, developers will need to consider the feasibility of a range of alternative treatment and discharge options as no further discharge can be permitted from Dereham WwTW in order to ensure that the quality of the River Wensum is protected. The Technical WCS report details the potential options, ranging from discharge to ground and a new WwTW discharging to the River Tud; however, further more detailed work would be required to establish feasibility on a case by case basis.

Wastewater Transmission Infrastructure

5.1.10 The Water Cycle Study has identified that the sewerage system in Dereham is currently at capacity in several key locations. The preferred location for growth in Dereham is to the east of the town centre where the current sewerage system drains wastewater along Norwich Road towards the WwTW to the West of the town centre. This main sewer is currently at capacity and cannot accept any further significant wastewater flow.

5.1.11 Several options were considered, including storage of wastewater prior to release to the sewer system; however, it is considered that the only feasible option is an upgrade (or replacement) to the existing Norwich Road trunk sewer. The proposed route would be to upgrade the main sewer along the Norwich Road, along Norwich Street, up north High Street via Quebec Street and to then connect to the main sewer at Swaffham Road. This solution would require significant developer contribution to fund it.

Flood Risk & Management

Flood Risk & the Sequential Test

5.1.12 Part of the north eastern residential site lies within Flood Zone 3 whilst there has been a recorded sewer flooding event just north of southern employment site, though this is not considered to be a flood risk to the site due to the limited flood extent of the event. Flooding from the smaller drains which run through the north eastern development site is considered to be limited in extent due to the size of the drains and their catchment. Therefore, it is considered that the risk of flooding to development within this site is limited and with appropriate mitigation measures, i.e. not building within the flood zones and ensuring finished floor levels are above the flood levels, there is no constraint to development at this site.

5.1.13 There is not considered to be a flood risk to the three remaining development areas within Dereham.

SuDS Suitability

5.1.14 The development sites will require the installation of SuDS prior to the commencement of occupation of development and it is recommended that these are constructed prior to main site construction to provide water quality benefits for sediment reduction during site preparation; however, this is not expected to impact on the development timescales.

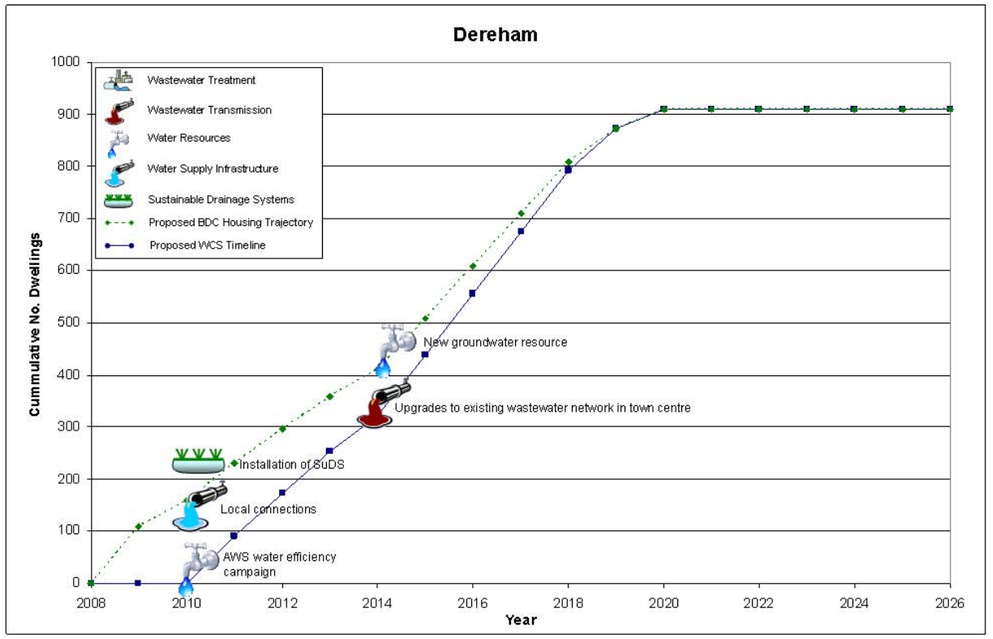
5.1.15 In general, the soils at Dereham are believed to be mainly impermeable and hence may not be suitable for shallow infiltration methods of surface water management, although deeper soakaways should be considered after a full risk assessment for potential groundwater pollution. It is likely that surface water management at the Dereham sites would need to utilise source control methods such as green roofs, storage via permeable paving reservoirs or on-site storage such as retention basins or ponds.

5.1.16 Should site investigations indicate that soils at Dereham are more permeable than assumed then infiltration methods should be investigated and informed by a contaminated land assessment to ensure there are no impacts on Source Protection Zones which protect water abstracted from the ground for treatment and potable supply/

Infrastructure Timeline

5.1.17 The infrastructure timeline and phasing recommendations are illustrated in Figure 5-1.

Figure 5-1: Dereham Infrastructure Timeline and Phasing



6 Strategy for Swaffham

Growth Summary

6.1.1 The Breckland Spatial Strategy[4] identified Swaffham as having limited potential for economic growth, with land around the Ecotech Centre in Swaffham, to the northwest of the town, being identified as being allocated for development. Swaffham is targeted with providing 1,000 new homes and 650 jobs over the plan period (2001-2026).

Water Resources

Water Resource Availability

6.1.2 Total water demand from new developments is expected to range between 0.2 Ml/d and 0.4 Ml/d depending on the water efficiency standards of new dwellings.

6.1.3 The demand from both the high and low water use scenarios can be met from spare groundwater licence capacity within the area and will be sufficient to supply demand through to end of planning period (2026).

6.1.4 Since the necessary water resources are within the limits of the existing licences their impact upon European sites have already been considered through the Environment Agency's Review of Consents process and the conclusion of this process is that existing licences are not to be impacting on any European designated ecological sites. It is therefore considered that supplying water to meet growth in Swaffham will not affect the standards required under the WFD and HD for any water body.

Water Supply Infrastructure

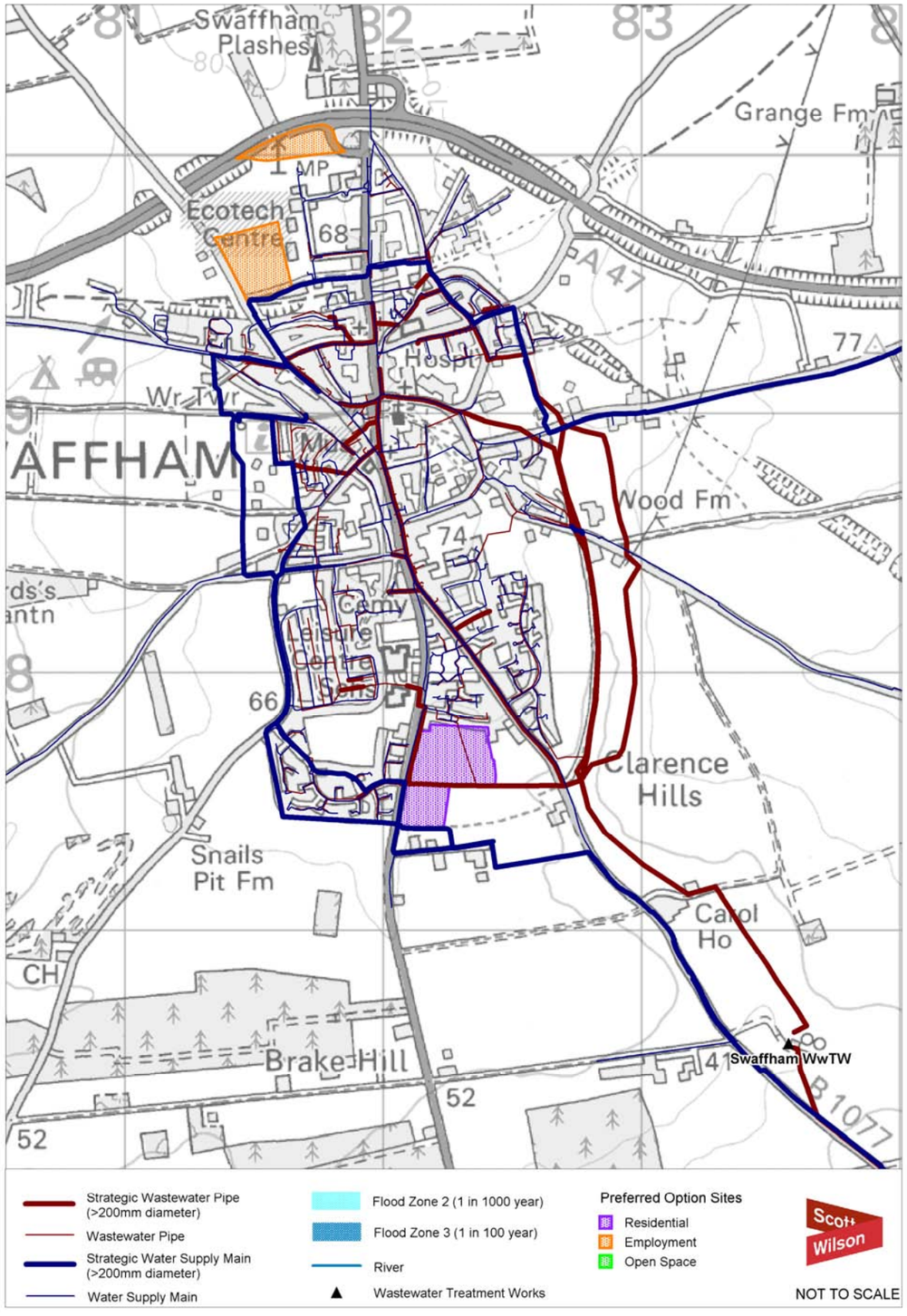
6.1.5 Adequate supply mains pass through, or are located close to all proposed development sites in Swaffham. However, the developers would be responsible for funding local connections on a house by house basis.

Wastewater Treatment

6.1.6 Wastewater generated within Swaffham is currently treated at Swaffham WwTW. The WwTW does not currently have adequate capacity within its consent to accept and treat the wastewater generated from the proposed development and meet Water Framework Directive requirements downstream of the works in the River Wissey.

6.1.7 However, AWS are in the process of applying for a new flow consent for Swaffham WwTW which will require improvements at the WwTW to meet the new quality conditions for existing wastewater flow.. To accommodate the proposed growth at the works, further improvements would be required and potentially another flow consent increase.

6.1.8 The Wastewater Working Group consider that the problem with achieving compliance with the WFD targets downstream of the Swaffham WwTW discharge point is a result of the wastewater generated from the current population and that which has been approved (approximately 500 of the proposed 750 new dwellings between 2008 and 2026). Therefore, they believe that, with the improvements planned to the WwTW the growth of a further 250 dwellings will not materially alter the consent required to rectify the existing situation and with a high level of water efficiency (to reduce wastewater generation), accommodation of a further 250 homes will be manageable.



[4] Core Strategy and Development Control Policies DPD – Adopted 2009, Breckland District Council, 2009

6.1.9 It is for this reason that the Water Cycle Strategy for Swaffham requires new homes to be built to the highest water efficiency standards under the Code for Sustainable Homes, to further reduce the volumes of wastewater generated by new development and to reduce the burden on the WwTW.

Wastewater Transmission Infrastructure

Strategic Connection

6.1.10 There is sufficient capacity within the existing network to serve development to the south of the town without requiring any upgrades to the network. Development of employment areas to the north of the town will also be able to be accommodated within the existing network assuming that the development is for dry trades (i.e. employment not requiring process water). As such It is considered that no strategic upgrades or new mains are required to serve new development in Swaffham.

Flood Risk & Management

Flood Risk & the Sequential Test

6.1.11 Surface water and sewer flooding have been reported in close proximity to, but not within preferred option sites to the north of the town. As neither of the flooding incidents occurred on the sites themselves and are considered to be limited in extent flood there is not considered to be a flood risk to any of the preferred options sites within Swaffham.

SuDS Suitability

6.1.12 The development sites will require the installation of SuDS prior to the commencement of occupation of development and it is recommended that these are constructed prior to main site construction to provide water quality benefits for sediment reduction during site preparation; however, this is not expected to impact on the development timescales.

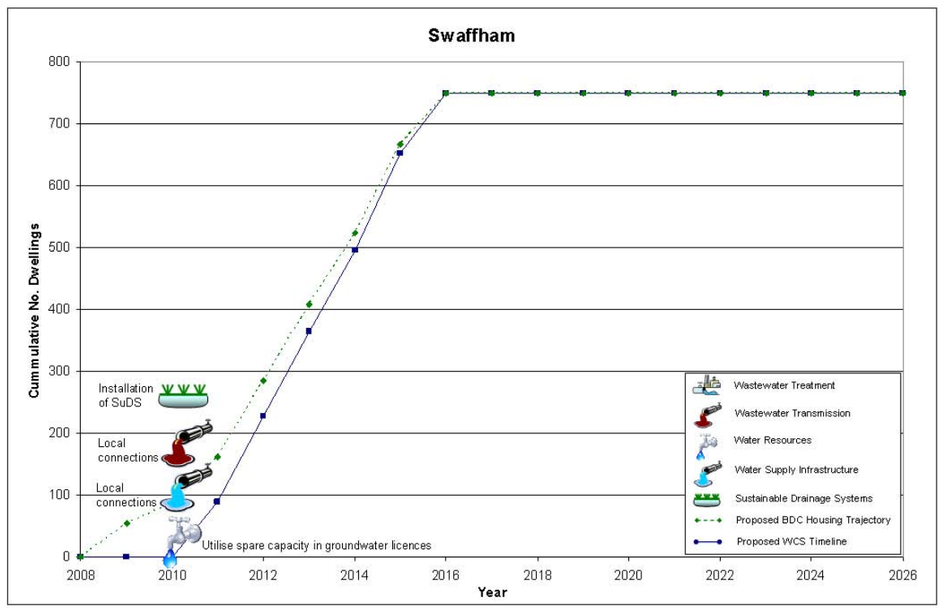
6.1.13 In general, it is likely that source control infiltration techniques (e.g. soakaways, infiltration trenches, swales or permeable surfacing) would be the primary method of surface water management in Swaffham. In the event that infiltration is not possible as the sole method of surface water management then connection to the existing surface water network (after attenuation) would need to be investigated.

6.1.14 The sites are all located within a Source Protection Zone (level 3), which is unlikely to be a significant constraint unless high levels of contaminants would be mobilised as a result of the use of infiltration SuDS methods. A Ground investigation is therefore recommended for development sites at Swaffham.

Infrastructure Timeline

6.1.15 The infrastructure timeline and phasing recommendations are illustrated in Figure 6-1.

Figure 6-1: Swaffham Infrastructure Timeline and Phasing



7 Strategy for Watton

Growth Summary

7.1.1 The Breckland Spatial Strategy[5] identified Watton as having limited potential for economic growth, with the proposed growth in jobs occurring within the town or existing employment areas. Watton is targeted with providing 900 new homes and 250 jobs over the plan period (2001-2026). The majority of the housing development will be on brownfield sites within and on the periphery the of town, and development of peripheral greenfield sites.

Water Resources

Water Resource Availability

7.1.2 Total water demand from new developments in Watton is expected to range between 0.1 Ml/d and 0.2 Ml/d depending on the water efficiency standards of new dwellings.

7.1.3 Anglian Water's water resource planning for the next 25 years (the WRMP) shows that Watton will have a slight surplus of water surplus by 2026 and therefore significant investment in new water resources is unlikely to be required. The demand generated by the proposed growth in Watton will be been catered for in AWS's existing and planned resource, and hence available resources are adequate to meet the small increase in demand without affecting any HD or WFD standards in local water bodies.

Water Supply Infrastructure

7.1.4 Adequate water supply mains pass through, or are located close to all proposed development sites in Swaffham. However, the developers would be responsible for funding local connections on a house by house basis.

Wastewater Treatment

7.1.5 Wastewater generated within Watton is currently treated at Watton WwTW. The preferred solution to wastewater treatment for Watton is the utilisation of the existing capacity at the works, which will not require a change in consent conditions to accommodate growth and still maintain WFD targets downstream.

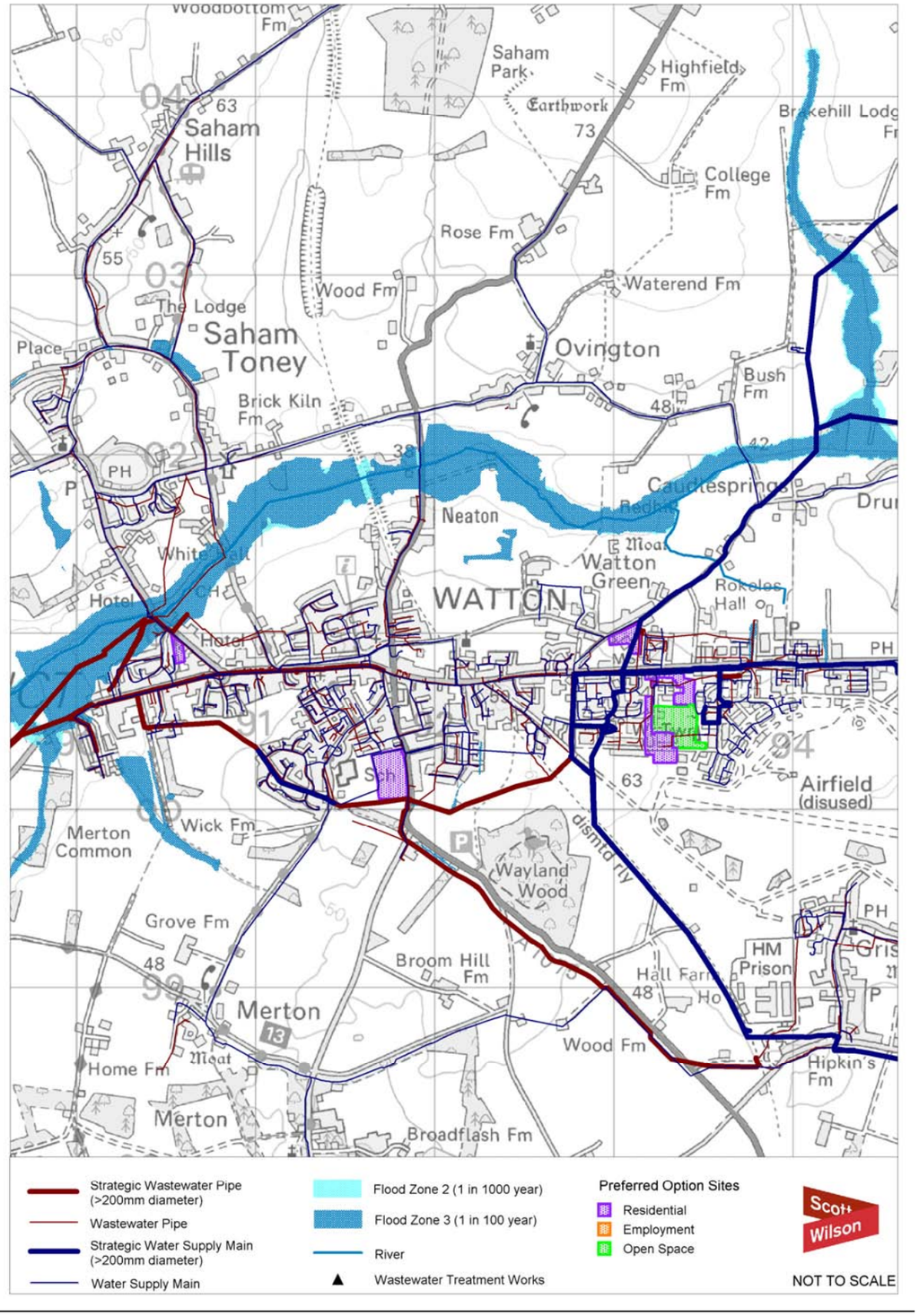
7.1.6 Despite this, AWS have stated that some extension would be required at the WwTW to treat the additional load generated from proposed development in the town but this is not expected to affect growth phasing.

Wastewater Transmission Infrastructure

Strategic Connection

7.1.7 AWS have confirmed that whilst existing capacity in the network is fairly limited, a new sewer is currently proposed to serve the former RAF site to the southeast of the town. The new pipeline route would pass through, or in close proximity to, preferred options sites to the south of the town and as such, the new sites would be able to connect to the new sewer (see Figure 7-1).

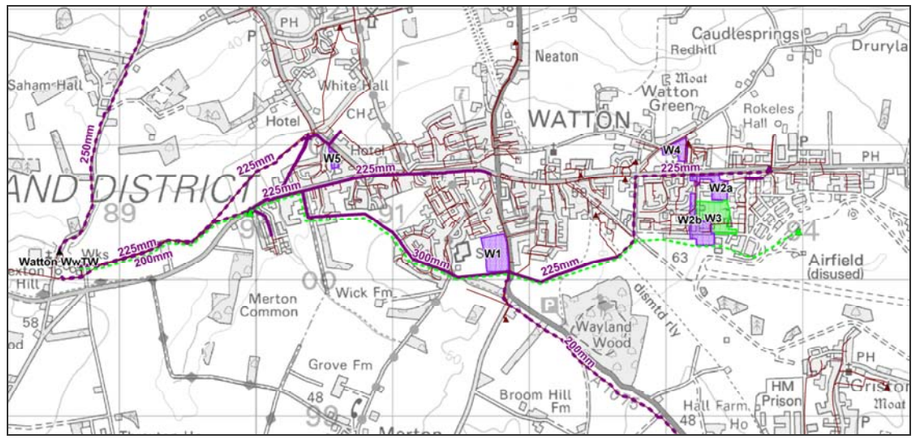
7.1.8 AWS have indicated that the new sewer currently being planned could be increased in size to accommodate the small amounts of additional wastewater generated at the new sites, and that a cost commensurate with the scale of the development at each site will be sought from the developers of the preferred sites that will connect to this.



[5] Core Strategy and Development Control Policies DPD – Adopted 2009, Breckland District Council, 2009

7.1.9 Development of the sites to the north of Watton are considered to have sufficiently low amounts of development to allow connection to the existing system.

Figure 7-1: Indicative route of new sewer route for Watton (green line)



Flood Risk & Management

Flood Risk & the Sequential Test

7.1.10 Only the north western preferred options site has any reported incidents of flooding in the vicinity of the site, with sewer flooding reported in Swaffham Road which runs parallel to the eastern boundary of the proposed site. This is considered to be an isolated event with limited flood risk to nearby properties and therefore there is not considered to be a flood risk to any of the preferred options sites within Watton.

SuDS Suitability

7.1.11 The development sites will require the installation of SuDS prior to the commencement of occupation of development and it is recommended that these are constructed prior to main site construction to provide water quality benefits for sediment reduction during site preparation; however, this is not expected to impact on the development timescales.

7.1.12 In general, the soils and geology in and around Watton are believed to be suitable for infiltration techniques such as soakaways, infiltration trenches, filter drains or swales. For some of the larger sites higher attenuation volumes are required and as such infiltration techniques could be combined with surface storage features such as retention basins. Due to the land take required, these may not be as applicable for the smaller sites.

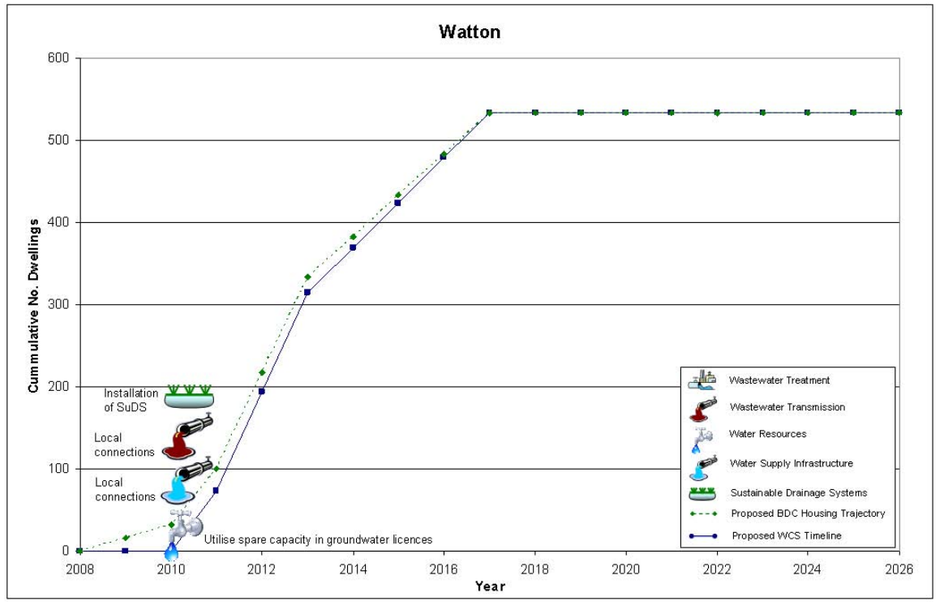
7.1.13 Given the location of north western site near the base of a river valley, it is likely that soils may be naturally wet which could reduce the potential for infiltration SuDS techniques. If this is the case then other source control methods could be investigated such as storage via permeable paving reservoirs, green roofs or water recycling.

7.1.14 All sites are located within a Source Protection Zone with the majority of sites being within Zone 1 – Inner Protection. This could place constraints on the quality of water being infiltrated and therefore, SuDS options and designs should be informed by contamination assessments. It is likely that runoff to ground will be limited to clean roof run off only, unless water quality control techniques such as oil interceptors are included in permeable paving and other infiltration devices.

Infrastructure Timeline

7.1.15 The infrastructure timeline and phasing recommendations are illustrated in Figure 7-2.

Figure 7-2: Watton Infrastructure Timeline and Phasing



8 Water Efficiency Guidance

8.1.1 Given the scarcity of available raw resources in the region, it is key that the Water Cycle Strategy process considers options for how demand from new development can be managed via effective policy to ensure that future demand for new water supply is minimised; this is particularly the case for growth in Dereham and Swaffham which requires a high level of water efficiency for new homes as part of the solution to wastewater treatment provision.

8.1.2 The Water Cycle Strategy has shown that by reducing water demand from new homes to a minimal level, new development could be served with the capacity present in existing abstraction licences for longer, thereby delaying the point at which costly new resources need to be developed and in some cases, negating the need for new resources completely.

8.1.3 There is also potential that a WCS can influence policy on water use from existing customers to further secure future water supplies. A water efficiency plan (WEP) has therefore been developed to feed into policy recommendations for Breckland's key Development Plan Documents (DPDs) to be included in the Local Development Framework (LDF) and this is included in the full Technical Report for the Detailed WCS.

8.1.4 The first step in a water efficiency plan is to consider the water efficiency measures being adopted by AWS in its WRMP. It should be assumed that these measures will be undertaken, and this will aid in identifying additional measures that are required through policy within the LDF.

8.1.5 The following provides outline guidance for how developers of new houses can meet the requirement of the Water Cycle Strategy and reduce water use as far as possible.

Water Efficiency in New Homes – Developer Guidance

8.1.6 New homes can be fitted with a range of fixtures and fittings to reduce demand, in addition, new developments can have community wide measures to reduce the demand in water, this can range from rainwater harvesting to grey water recycling6.

8.1.7 The Code for Sustainable Homes (CSH) sets out the maximum water demand required to meet the different levels of the code and gives examples how this level of efficiency can be reached. This provides a flexible outline for improving the overall sustainability of a house. **Table 8-1** outlines the water demand that needs to be achieved to reach each of the sustainability levels.

Table 8-1 Code for Sustainable Homes – Water consumption targets for the different code levels and examples of how these targets can be attained in new build

Code for sustainable homes levels.	Amount of Water (litres per person per day)	Examples of how to achieve water efficiency level.
1	120	Install efficient equipment within the home – 18l max volume dishwasher and 60l max volume washing machine. Install 4/6l dual flush toilets. Install 6-9l/min showers. Educate users about how to be efficient water users. Installation of water meters.
2	120	
3	105	As above. In addition, install water butts and equipment to use rainwater in the garden. Install aerating fixtures into bathrooms

[6] the use of wash water from showers and sinks in toilets after on site treatment

Code for sustainable homes levels.	Amount of Water (litres per person per day)	Examples of how to achieve water efficiency level.
4	105	and kitchens. Include surface water management in the surrounding development.
5	80	As above, in addition: Grey water recycling, reduction of surface water from the development. Provide water audits for people to show them where they can reduce water usage.
6	80	

8.1.8 The examples of water efficiency measures included in Table 8-1 are an outline of the possible ways to improve water efficiency. There are many more possibilities that are site specific. Many of these are shown in the Ofwat water efficiency initiatives[7] for water and sewerage companies. Other steps which should be considered in new builds include: rainwater harvesting from roofs and paved areas (through the use of permeable surfaces); grey water recycling (with some mains support) which can provide enough water to run all toilets, a washing machine and outside taps.

Water Neutrality

8.1.9 Water neutrality is a concept whereby the total demand for water within a planning area after development has taken place is the same (or less).than it was before development took place. In order for the water neutrality concept to work, the additional demand created by new development needs to be offset by reducing the demand from existing population and employment. If this can be achieved, the overall balance for water demand is 'neutral'.

8.1.10 A high level water neutrality assessment has been undertaken as part of the Breckland WCS and is detailed in the full Technical Report. The assessment shows that Water Neutrality is potentially feasible in Dereham and Watton and to a lesser extent, on Swaffham.

[7] OFWAT, 2006, Water Efficiency Initiatives – Good Practice Register Water Sewerage Companies (England and Wales) – 2006,http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/goodpracticeregister_2007.pdf/$FILE/goodpracticeregister_2007.pdf Accessed 28-03-08.

9 Infrastructure funding

9.1 Infrastructure responsibility

9.1.1 Both water supply (and treatment) and wastewater treatment are the responsibility of AWS within the Breckland study area. At present, the Water Industry Act 1991, and agreements between the industries regulator (Ofwat) and water companies prevent developers contributing towards the provision of water resource schemes (which are also to be used to serve other and existing development), water treatment and upgrades to *existing* wastewater treatment facilities. These elements of the WCS will be funded by customer charges for water which are set by Ofwat. Customer charges are set across a company's supply area and the same charges apply for all customers equally (i.e. customers in one area will not pay more than in another area even if costs for new infrastructure to service that area are higher). Hence there is no possibility for seeking contributions to this type of infrastructure.

9.1.2 It is possible that new wastewater treatment facilities which are proposed solely for a development area can be funded by developers and in some cases, later adopted by the a water company. Developers can also consider funding the development of a new water resource (and water treatment facility) proposed to serve a new development specifically, which again, could be later adopted by the incumbent water company. Developer funding would be considered as part of this Water Cycle Strategy, if new wastewater treatment and water supply options are considered solely to serve new development areas.

9.1.3 The provision of wastewater and water supply mains as part of the water cycle strategy can be part contributed to by developers. In the case where it is required specifically to deliver new development, there are mechanisms that would allow developer contributions to be made towards the funding of water supply and wastewater networks or mains infrastructure on a scale commensurate with the number of housing proposed by each developer. If investment is required to local water or wastewater networks, Ofwat takes the view that water and wastewater companies should seek to part finance this work through contributions from developers. This reduces the financing burden on existing customers, who would otherwise have to pay for it through increases in general charges.

9.1.4 In addition, flood risk infrastructure required to service a development can be entirely funded from developer contributions. Delivery of SuDS will be the responsibility of the developer; however the 'approving body' under the Flood and Water Management Act 2010 must approve the SuDS prior to construction. In most cases, ongoing maintenance of SuDS will also be the responsibility of the approving body under the Flood and Water Management Act as part of wider surface water management responsibilities. The approving body is the unitary authority which for Breckland will be Norfolk County Council.

9.1.5 Delivering water efficiency in new homes will be the responsibility of the developer and the cost (of construction and maintenance) will be borne solely by the developer. AWS are currently funding water efficiency measures across Breckland as part of their current 5 year cycle of investment (e.g. such as meter installation); however, this is for existing homes and will not be available for new properties.

9.1.6 In summary, developer contributions can be sought for wastewater and water supply mains, and flood risk infrastructure, *and (*in rarer cases) where new wastewater treatment facilities and water resource schemes are required solely for new development.

9.1.7 The full Technical Report for the detailed study provides further detail of who is responsible for funding, delivering and maintaining each element of infrastructure proposed in the Water Cycle Strategy.

Table 9-1: Infrastructure & mitigation solutions - funding, ownership and maintenance summary

Growth Town	Water Cycle Strategy assessment area	Proposed solution	Funding source			Construction responsibility			Maintenance responsibility
			AWS	Developer	Part AWS & developer	AWS	Developer	Developer & AWS requisition	
Thetford	Water Resources	Existing licence & new groundwater source	✓			✓			**AWS**
	Water Supply Infrastructure	New waste supply Main and pumping station		✓				✓	**AWS** (once requisitioned)
	Sewerage	New wastewater main and pumping station		✓				✓	**AWS** (once requisitioned)
	Sustainable Drainage	Infiltration SuDS and surface attenuation		✓			✓		**Norfolk County Council**[8]
	Water Efficiency	Code Levels 3/4		✓			✓		**Site / Unit purchaser**
Attleborough	Water Resources	Existing licence & new groundwater source	✓			✓			**AWS**
	Wastewater Treatment	WwTW extension and new discharge pipeline	✓			✓			**AWS**
	Sewerage	New wastewater main and pumping station		✓				✓	**AWS** (once requisitioned)
	Sustainable Drainage	Infiltration SuDS and surface attenuation		✓			✓		**Norfolk County Council**[8]
	Water Efficiency	Code Levels 3/4		✓			✓		**Site / Unit purchaser**

[8] Norfolk County Council would be the approving body for SuDS under the Flood and Water Management Bill 2010, assuming the SuDS are built to approved standards, Norfolk County Council would be responsible for ongoing maintenance of the SuDS.

Growth Town	Water Cycle Strategy assessment area	Proposed solution	Funding source			Construction responsibility			Maintenance responsibility
			AWS	Developer	Part AWS & developer	AWS	Developer	Developer & AWS requisition	
Dereham	Water Resources	Existing licence & new groundwater source	✓			✓			**AWS**
	Wastewater Treatment	Limited development per annum							**N/A**
	Sewerage	New wastewater main			✓			✓	**AWS** (once requisitioned)
	Sustainable Drainage	Mainly surface attenuation		✓			✓		**Norfolk County Council**[8]
	Water Efficiency	Code Levels 5/4		✓			✓		**Site / Unit purchaser**
Swaffham	Wastewater Treatment	Further WwTW upgrade & use of process changes	✓			✓			**AWS**
	Sustainable Drainage	Infiltration SuDS		✓			✓		**Norfolk County Council**[8]
	Water Efficiency	Code Levels 5/4		✓			✓		**Site / Unit purchaser**
Watton	Wastewater Treatment	No changes to consent – minor works upgrades	✓			✓			**AWS**
	Sewerage	Upsizing of current new main solution			✓			✓	**AWS** (once requisitioned)
	Sustainable Drainage	Infiltration SuDS		✓			✓		**Norfolk County Council**[8]
	Water Efficiency	Code Levels 5/4		✓			✓		**Site / Unit purchaser**

9.2 Funding Options

9.2.1 It is important that the Breckland WCS considers mechanisms for obtaining and securing funding toward water infrastructure that the developers can contribute to. The following sections describe possible options in relation to limitations placed on developer contribution to water services under the Water Resources Act 1991, which Breckland should consider as part of producing policy for the LDF. Further detail is included in the full Detailed Study Technical Report

S106 Contributions

9.2.2 Under Section 106 of the Town and Country Planning Act 1990, developer contributions, also known as planning obligations may be sought when planning conditions are inappropriate to enhance the quality of development and to enable proposals that might otherwise have been refused to go ahead in a sustainable manner.

9.2.3 Developer contributions are intended to ensure that developers make appropriate provision for any losses or supply additional facilities and services that are required to mitigate the impact of a development. For example affordable housing, school places, roads, pedestrian crossings and other transport facilities, open spaces or equipped playgrounds or new long term maintenance of open space, travel plans, residents parking schemes, public art, libraries and other community buildings.

9.2.4 Section 106 agreements are very frequently used in the strategic planning process for provision of key infrastructure requirements. However, in general the charge levied is required to be commensurate with the developer's impact.

9.2.5 Therefore, in the case of wastewater network, water supply network and surface water attenuation provision, a single section 106 levy cannot be applied to all new development and a cost apportionment mechanism would have to be derived dependent on the level of impact each development is likely to have and this is not always a straightforward process. For instance, the WCS has shown that the provision of SuDS and the relative costs will differ for different development areas according to the level of infiltration that is possible (according to geology) or acceptable (according to groundwater source protection zones).

Tariff System

9.2.6 Similar to a section 106 agreement and used successfully by the Milton Keynes Partnership, a tariff system charges a single per dwelling fee to a developer to contribute towards the strategic infrastructure required to service it. However, the regulations introduced to accompany the Community Infrastructure Levy (CIL) make it clear that tariffs will no longer be used after 2014 by which time, infrastructure related to development will principally be secured by the CIL in combination with s106 agreements where applicable.

9.2.7 Generally, this does not include for water infrastructure but several WCSs are considering this as a potential option for providing a pot of funds to pay for strategic flood risk management infrastructure such as strategic SuDS and greywater recycling systems on a community level.

Unilateral Undertaking

9.2.8 A Unilateral Undertaking is an offer of specific undertaking from a developer. It is usually considered to be quicker, less costly and advantageous to the applicant/owner, as the council does not need to be a party to such a deed. It is preferable to use this rather than Section 106 Agreement when:

- There is a straightforward contribution required;
- There is no requirement for the Council to covenant to do something;
- No payback requirement is necessary;
- No affordable housing is required;

9.2.9 This system could work well for providing developer sums towards strategic wastewater and water supply network infrastructure as Breckland Council do not necessarily need to covenant to provide the funding mechanism for water company infrastructure.

Community Infrastructure Levy

9.2.10 There is now provision in legislation (under the Planning Act 2008) for introducing a Community Infrastructure Levy. Regulations under this act are expected to come into effect in April 2010 (subject to Ministerial approval) and these are intended to ensure that costs incurred in providing infrastructure to support development can be funded.

9.2.11 It is currently unclear precisely how this will apply to water infrastructure, and it will be up to local planning authorities to bring forward charging schedules; however, it does provide a likely mechanism. This Water Cycle Study should be used by Breckland Council as part of the evidence base for preparing a CiL document as part of the LDF, particularly in relation to those elements of water infrastructure which are not covered by the OFWAT regulations.

9.3 Proposed Funding Process

9.3.1 Section 106 or tariff systems are likely to be the best mechanism for providing funding to pay for strategic level flood risk management infrastructure such as SuDS. However, for funding the strategic wastewater and water supply mains, the situation is not so straightforward.

9.3.2 Under the Water Industry Act 1991, an Infrastructure charge may be levied on new and existing property connected to the public sewerage system for the first time. In cases where this is required in Breckland, this charge will be applied directly by AWS for new development that does not need new offsite infrastructure.

9.3.3 However, if the existing network infrastructure (water supply or wastewater) is not adjacent to a proposed site, the developer will be required to fund or at least contribute to this infrastructure through the requisition process under the Water Industry Act. The formal requisition procedures as set out in the Act (sections 41 and 98) a legal mechanism for developers to provide the necessary infrastructure to service their site.

9.3.4 How this process is ultimately undertaken for the proposed development in the Breckland cannot be decided by this WCS i.e. a decision could be taken that developers pay for new mains through a requisition process directly with AWS so that the developer pays for the

infrastructure to be built and it is taken on, or requisitioned by AWS. However, because many of the wastewater main upgrades are strategic in nature, the conclusion of the funding element of this study is that a formal developer contribution mechanism should be set out for development which is dependent on the construction of new strategic wastewater and water supply mains before they can be built and serviced with wastewater collection.

9.3.5 The WCS has shown that wastewater treatment requirements of all proposed growth in the Breckland cannot be met without some investment in strategic wastewater mains (e.g., in Thetford and Attleborough) and as a result, developers should be required to contribute towards the provision of this infrastructure commensurate with the size of the development proposed.

9.4 Further Cost Considerations

Minimisation of Cost

9.4.1 Even where direct funding of infrastructure is not an option, developers can at least contribute to minimising the capital cost of water infrastructure and policy can be developed to ensure that this is achieved.

9.4.2 It can be seen from this WCS that a key variable to provision of water services infrastructure is water consumption. To a large extent, developers can be encouraged to reduce this through initiatives such as grey water recycling, having developments with less impermeable surfaces, specifying higher quality materials for pipework etc. By way of example, if the percentage return to sewer can be reduced from 90% to 75%, the number of additional properties that can be accommodated per 1 m3/d headroom at an existing sewage treatment works is 0.8. If reducing the infiltration of ground water into drains supports the reduction in percentage return to drain by using higher quality drain pipes, the number of additional properties that can be supported per 1 m3/d headroom at the same WwTW can be further increased.

Water Resource Provision - Employment

9.4.3 Since December 2005, non-household customers who are likely to be supplied with at least 50 mega litres of water per year at their premises are now able to benefit from a new Water Supply Licensing mechanism. If eligible, they may be able to choose their water supplier from a range of new companies entering the market. The Water Supply Licensing mechanism enables new companies to supply water once Ofwat has granted them a licence. These companies can compete in two ways:

- by developing their own water source and using the supply systems of appointed water companies (such as AWS) to supply water to customers' premises. This would be carried out under the combined water supply licence; or
- by buying water 'wholesale' from appointed water companies (such as AWS) and selling it on to customers. This would be done under a retail water supply licence.

10 Policy and Recommendations

10.1 Introduction

10.1.1 Following the completion of the Stage 2 Breckland WCS, the following recommendations are made to ensure that the overall water cycle strategy proposed is adhered to (through recommended policy) and that the study findings remain as current as possible based on best available information (through making the WCS a live document that is reviewed upon release of certain key water cycle related documents and information).

10.2 Water Cycle Policy

10.2.1 This section draws on the various assessments undertaken in this Detailed WCS study as well as previous WCS stages. It summarises the key issues and suggests direction for policies to be included in the Breckland LDF, future Area Action Plans and suggested Supplementary Planning Guidance documents to ensure that the aims of this WCS and a sustainable water environment are achieved.

General

Policy Recommendation 1: Development Phasing

10.2.2 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 the Breckland WCS.

10.2.3 Reason: The WCS has demonstrated some capacity within existing infrastructure; however this capacity is limited and upgrades (or new) infrastructure is required in some places to deliver full housing requirements up to 2026. Development must not be permitted to develop until the water services infrastructure is in place to service it.

Policy Recommendation 2: Developer Contribution

10.2.4 As well as connection fees required under the Water Industry Act, developers will be required to contribute to strategic wastewater network infrastructure required specifically to service new development areas proposed in the Breckland Core Strategy.

10.2.5 *Reason: The WCS has shown that in general, contributions directly to treatment and water supply infrastructure is not possible under the Water Resources Act 1991. However, AWS are able to requisition or adopt infrastructure funded by developers which is required solely for new development. This position is encouraged by Ofwat and hence developer contribution will be required towards the proposed wastewater network solutions for growth in Thetford, Watton and Attleborough..*

Wastewater treatment and transmission

Policy Recommendation 3: Strategic Wastewater Network

10.2.6 Recognition is made that the provision of a new strategic wastewater mains will be required in Thetford, Attleborough and Watton to connect new development areas and transfer much of the wastewater generated to the WwTW for treatment at each town.

10.2.7 The LDF needs to ensure that the provision of this wastewater mains is fully supported.

Policy Recommendation 4: Strategic Wastewater Treatment

10.2.8 Recognition is made that the provision of upgrades to wastewater treatment facilities at Thetford and Attleborough is required in order for demands of future growth to be met. Expansion of these works will be required.

10.2.9 Reason: The WCS has demonstrated that some of the WwTW will need to add process streams or expand the capacity of processes in order to treat the additional flow, or to higher standards to meet current and future water legislation (WFD and HD standards). The LDF needs to ensure that the expansion of some WwTW sites is fully supported.

Policy Recommendation 5: Protection of Amenity

10.2.10 Development will only be permitted adjacent to WwTW only if the distance between the works is sufficient to allow adequate odour dispersion (400m).

10.2.11 Reason: The WCS has demonstrated that Dereham and Thetford WwTWs are located close to proposed new development areas. Therefore, development would need to be managed so as to prevent nuisance from odour associated with the treatment process.

Water Resources & Supply

Policy Recommendation 6: Water Efficiency

10.2.12 All new houses should be designed to have a water demand in keeping with at least levels 1 & 2in the Code for Sustainable Homes in an effort to move the district as close to water neutrality as possible, particularly in Dereham and Swaffham were reductions in generation of wastewater flow are required.

10.2.13 Reason: The WCS has highlighted that water resources are 'seriously stressed' in the study area and that, and that WwTW are at or close to their limits for further wastewater treatment. The study has also shown that combining investment in measures to reduce water use in existing homes with new homes built to high levels of water efficiency targets under the code for sustainable homes, it is theoretically possible to attain close to water neutrality[9] at the end of the plan period in most locations.

Policy Recommendation 7: Protection of Water Resources

10.2.14 New development will not be permitted in source protection zones unless the Environment Agency is satisfied that the risk is acceptable.

[9] Water neutrality refers total water use of all homes in the study area after new development is complete (2026) is no greater than the base year (2009).

10.2.15 *Reason: The WCS has highlighted that water supply in the Breckland study area is highly dependent on groundwater abstraction and as such, it is important to continue to protect the areas that recharge the groundwater through suitable management of surface activities. Several Development locations (particularly in Watton) are over or close to source protection zones around abstraction boreholes and hence Environment Agency agreement will need to be achieved for some development types in these areas.*

Policy Recommendations 8 & 9: Dereham Wastewater Treatment and Water Efficiency in Dereham

10.2.16 New development falling within the Dereham WwTW catchment will be limited to 50-80 units per annum; and

10.2.17 New housing development falling within the Dereham WwTW catchment should achieve water use meeting the requirements of levels 3 & 4 under the Code for Sustainable Homes and where possible, should aim to achieve levels 5 & 6.

10.2.18 *Reason: The WCS has highlighted that treatment capacity at Dereham WwTW is limited and currently at capacity. An increase in treated flow is not possible within the limits of available technology in order to protect downstream water quality and designated Habitats Directive sites (Wensum SAC). Therefore, further headroom to accommodate for growth can only be achieved by increasing water efficiency for existing housing stock and ensuring that new housing is as water efficient as possible.*

Flood risk and drainage

Policy Recommendation 10: Site drainage

10.2.19 All new development, including that on brownfield development, should be served by separate surface water and wastewater drainage. No new development will be permitted to discharge runoff to foul drainage connections.

10.2.20 *Reason: The WCS has highlighted that sewer flooding and Combined Sewer Overflows are an existing concern in several Breckland growth areas (particularly Watton and Dereham) and that with climate change, capacity will be limited. Therefore further discharges of surface water to foul or combined drainage should not be permitted to prevent exacerbation of existing problems.*

Policy Recommendation 11: Surface Water Management

10.2.21 All new development, including that on brownfield development, should not be constructed until sufficient surface water management and attenuation has been provided to ensure that flood risk from the development as a result of surface water runoff can be managed in line with PPS25 both during construction and the design life of the development.

10.2.22 *Reason: The WCS has determined that management of surface water is key to preventing downstream flood risk as a result of development. Therefore, design of runoff attenuation (through SuDS design) needs to be built into developments as part of the master plan and as part of the Environmental Management Plan for construction for major developments. The WCS has provided advice on the size, location and type of SuDS that will be suitable in each development location.*

Policy Recommendation 12: Specific Flood Risk for Thetford

10.2.23 The Level 2 Thetford SFRA provides guidance to Breckland District Council on the preparation of detailed flood risk policies for sites, including requirements and conditions to be considered at the planning stage. The policies recommended as part of Level 2 SFRA for Thetford, and based on work undertaken for both the Level 2 study and the Breckland District Level 1 SFRA are provided here to ensure that flood risk is taken account of appropriately during the planning process. The specific policy recommendations include:

- Breckland Council should adopt the 1 in 100 year event with climate change flood extent as Flood Zone 3a;
- Development should be safe throughout its life, to achieve this dry pedestrian egress and emergency vehicular access should be achievable above the 1 in 100 year flood level, when accounting for the anticipated effects of climate change;
- Where development is proposed within the 1 in 1000 year flood extent, an evacuation plan should be prepared in liaison with the Environment Agency and Norfolk County Council emergency planners. The Flood Plan should set out specific actions based on the level of flood warning;
- In accordance with PPS25, development should be sequentially located based on flood risk vulnerability classification (PPS25 Table D.2), to areas of lowest risk. Opportunities to increase biodiversity and improve amenity value (e.g. pedestrian / cycle routes along the river) should be sought in areas of higher risk adjacent to the river;
- A development should not increase flood risk on site or elsewhere, and where possible, opportunities should be taken to decrease overall flood risk;
- The Environment Agency requires compensation (level for level and volume for volume) for loss of floodplain storage in Flood Zone 3a/b. A site specific FRA should demonstrate that loss of floodplain will have no risk on existing third party developments;
- SuDS should be implemented to ensure that runoff from the site (post development) is either to greenfield runoff rates where the site is undeveloped at present or provide betterment, where possible, where the site is previously developed. This should include space set-aside within the confines of the site to accommodate SuDS;
- In the application of SuDS techniques it is recommended that attenuation techniques are given priority, due to Thetford Town Centre being located within a SPZ. In general, infiltration techniques should not be used in areas where the underlying groundwater is considered sensitive;
- Developments should look to incorporate water re-use and minimisation technology for example green roofs and rainwater harvesting. This will aid developments in the adoption of source control SuDS as part of PPS25 requirements;
- Basements should not be used for habitable purposes. Where an underground car park is proposed, it is necessary to ensure that access points and any venting or other penetrations are situated 300 mm above the 1 in 100 year fluvial flood level when accounting for the anticipated effects of climate change for the life of the development;
- The EA requires development to be set-back a distance of 9 m from a watercourse to allow appropriate access for routine maintenance and emergency clearance, if necessary The

Environment Agency should be consulted on development involving the carrying out of works or operations in the bed of, or within 20 metres of the top of a bank of, a main river10;

- Development should not have a detrimental impact on the water environment through changes to water chemistry or resource and this should be ensured through the use of drainage systems which limit the occurrence of pollution to the water environment.

10.3 Developer Checklist

10.3.1 In addition to the high level policy suggestions, a developer checklist has been provided and is reported in the full Technical Report for the Detailed WCS. The checklist includes for all the necessary steps that a developer would need to take to meet with the key water based legislative and policy requirements.

10.3.2 The overall intention is that all developers would be asked to use the water cycle developer checklist as part of the planning application process and to submit a completed version with their planning applications. The Environment Agency is a statutory consultee with regards to flood risk and the water environment and as such, will need to sign up to the checklist as will the partner authorities, Natural England and the water and wastewater undertaker.

10.4 Further Work Suggestions

10.4.1 It is recommended that the Breckland Detailed Water Cycle Study remains a live document and its recommendations and findings are reviewed and reassessed as updates are made to key inputs and legislation such as the WFD, the Habitats Directive Review of Consents process and updates to AWS's Water Resources Management Plan (WRMP) on a 5 yearly cycle.

[10] Introduced by Statutory Instrument 2006 No.2375 "The Town and Country Planning (General Development Procedure) (Amendment) (No.2) (England) Order 2006". Available at www.opsi.gov.uk/si/si2006/uksi_20062375_en.pdf