7 Other Considerations

7.1 Sustainable Urban Drainage Systems (SUDS)

It is likely that this Water Cycle Study will consider the use of SUDS in part to control flooding. Information pertaining to the use of SUDS in this area will be included in the SFRA and should be reviewed accordingly.

7.2 Subsidence Issues (dissolution features)

In some parts of Norwich, the ancient practice of Chalk and flint mining beneath the city has caused problems of subsidence. This has caused problems for new housing and road development in the past. The locations at which mines are known to be present are principally along the Chalk outcrop on either side of the River Wensum. The extent of the workings at each of these sites though is not known.

At location where subsidence occurs, the depression formed may act as a drainage point for a larger area, which in turn increases the amount of solution which takes place at such points. This in turn may mean that preferential pathways may be set from the surface to the underlying Chalk. Such pathways are not reflected by the Environment Agency's Groundwater Vulnerability Map. Once again, only a detailed investigation of the ground conditions on a site-by-site basis can determine whether any such features are likely to present.

Furthermore, any Sustainable Drainage Systems which are considered in areas of problematic dissolution features will need to be reviewed and implementation of these systems undertaken with caution.

7.3 Developer Checklist

A developer checklist has been suggested for other Water Cycle Studies. This is a high-level measure checklist that developers are expected to meet and includes aspects relating to water supply, sustainable drainage systems, and sewage treatment works. It is intended that this checklist can be used by the Planning Authority to gauge whether a development meets a baseline standard. Typical inclusions in the checklist include the following:

- Confirmation of a standard rate of runoff from the development site
- Confirmation of flood risk associated with the site
- Confirmation of the use of SUDS where possible
- Confirmation of water supply capacity
- Confirmation of sewer capacity

7.4 Construction Techniques

7.4.1 Eco homes rating

EcoHomes is the homes version of BREEAM (Building Research Establishment (BRE) Environmental Assessment Method). EcoHomes covers houses as well as apartment buildings and can be applied to both new and renovated homes. It considers the broad environmental concerns of climate change, resource use and impacts on wildlife. It balances these against the need for a high quality of life and a safe and healthy internal environment. Many of the issues are optional, ensuring EcoHomes is flexible enough to be tailored to a particular development or market. Credits are awarded where specific performance levels are achieved in each category. Various options are available to developers to gain these credits. EcoHomes assessments are carried out by independent assessors.

Launch of the Code for Sustainable Homes

The Code for Sustainable Homes (CSH) replaced EcoHomes for the assessment of new housing in England in April 2007. BRE has worked closely with the UK Department of Communities and Local Government to enable the CSH to be based on the EcoHomes methodology. The Code method contains mandatory requirements such as, energy and water efficiency, surface water management, site waste management, household waste management and use of materials

These mandatory requirements guarantee to deliver environmental savings in the specific areas. The CSH assessments are carried out in two phases; an initial assessment and interim certification is carried out at the design stage; a final assessment and certification is carried out after construction.

The cost of assessment will depend upon the level of advice and assistance required from the assessor, and the complexity of the scheme. For example, each different house type on a development requires a degree of separate assessment.

Government intends that the minimum Code for Sustainable Homes requirements will be raised over time through revisions to the Building Regulations, so that by 2016 all new housing should be zero carbon.

7.4.2 Upgrading of existing water main and sewers

There are several trenchless construction methods (e.g. pipe bursting, directional drilling etc) that can be used to good effect to repair and or replace existing buried pipes particularly in built up areas. The recent development and growing availability of equipment used in these methods means that their use is becoming increasingly cost effective whilst at the same time minimizing environmental impacts of construction. Many of these techniques will already be in use to effect repairs aimed at reducing leakage of water, something that will help the Norwich Water Cycle in the long term.

7.5 Water Efficiency Measures

The growth of homes in the Anglian region will place increasing strain on available resources. Anglian Water Services (AWS) have already noted this and through existing schemes has already achieved efficiencies through increased metering and reduction of water supply leakage [10]. Meter penetration has reached 57% of AWS's customers [11] and they have managed to reduce its levels of leakage to 19% of the water put into supply (based on 2005/06)[12].

New developments can be built with water efficiency in mind. The DCLG (Department of Communities and Local Government) have recently consulted on a water efficiency figure for all new builds of between 120 and 135 l/h/d (litres per head per day).

Approaches to water efficiency differ between the two groups of customers supplied by AWS. The two groups are metered and unmetered customers.

- Metered customers will already be 'water conscious' and a typical AWS metered customer uses around 128 l/h/d It can be assumed that these customers will have taken easy steps to improve their water efficiency for example, by mending dripping taps, installing water butts and replacing old washing machines with new more water efficient models.
- Unmetered customers in the Anglian region typically use 160l/h/d. Unmetered households may not be able to afford to switch to a meter (under existing water tariffs) and their options for reducing water usage may be less than for metered customers. Help in the form of a water efficiency audit may be useful step for customers to understand where they might be using most water. The next step may be to provide certain groups of unmetered customers, such those receiving social security payments with small grants to enable households to convert to more water efficient technologies such as showers and low flush toilets.

Existing homes can achieve significant savings through the retrofitting of efficient devices for example; the installation of 6 litre flush toilets can give a saving of 8% and potentially even more savings with 4.5 litre flush toilets. It should be noted that all new homes being built today are fitted with 6 litre flush toilets as a matter of course today.

Other ways of saving water in home include the installing aerators on taps and showers to reduce the amount of water wastes or fitting flow restrictors on showers, which reduces flow to a maximum of 8 litres per minute.

In addition to this, other steps which can be included in new builds or incorporated into existing homes to improve their water efficiency with a bit of imagination 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.

[10] Anglian Water's Water efficiency plan
[11] Anglian Water's Drought Plan. AWS, 2006
[12] OFWAT Security of Supply, Leakage and water efficiency 2005/06 report.

7.6 Construction Phasing

It is necessary to ensure that the implementation of the recommendations for the Water Cycle Study are aligned with other capital investment schemes such as Environment Agency, Anglian Water or Local Authority Schemes.