

9. Integrated Recommendations

The key findings of the Phase 1 WCS findings and recommendations are presented below. This section also aims to consider the interactions between different elements of water infrastructure provision.

9.1 Water Resources and Demand Management

Although the Environment Agency's CAMS documents indicate that there is no scope to increase abstraction from surface water and groundwater sources supplying the Borough, existing headroom within the water supply system is sufficient to meet additional demand associated with the planned housing growth although this may require transfer of water from outside the water resource zone toward the end of the planning period considered by the WCS. This assessment takes into account the potential constraints on abstraction that may be required to reduce impacts on groundwater dependent wetlands in the area. Overall, therefore, water resources are unlikely to constrain housing growth in the Borough. However, the ecological footprint of the water supply system will be reduced if household water demand is controlled. Reduction in demand will also increase the security of supply and increase the resilience of the system in relation to climate change. It is, therefore, recommended that a reduction in water demand is encouraged through the planning process and through leadership by the Council.

Future demand has been estimated on a range of scenarios based on daily household consumption rates provided in the Code for Sustainable Homes (CSH), the Building Regulations, and using data provided in the water companies' draft Water Resource Management Plans although precisely quantifying future demand is difficult due to unknown effects of water efficiency measures in new and existing homes.

All social funded households are designed to CSH Level 3 since April 2008, and all new buildings will be designed to Buildings Regulations Standards which will equate to CSH Level 1/2. It is recommended that the Borough of King's Lynn and West Norfolk include policy recommendations for all new developments to meet the CSH Level 3/4 with regard to water efficiency in order to reduce the pressure as far as possible on the region's water resources. This would equate to daily per capita consumption of 105 litres. Even with new buildings designed to this standard, future alteration to water fittings may increase water consumption, for example by installing power showers. Retro-fitting water efficiency measures into existing buildings will be equally, if not more, important as the existing housing stock will still make up the majority of demand by 2026. Development of policy and leadership on water demand issues should form part of the Phase 2 work.

Further consideration should be given in Phase 2 WCS on to a schedule of water supply infrastructure provision in relation to specific housing development options. At this stage, uncertainty regarding the location and timing of housing provision makes it difficult to assess these issues in detail.



9.2 Water Quality and Wastewater Treatment

The proposed housing development in the Borough is mainly within the catchment areas of King's Lynn, Downham Market and Hunstanton sewage works. These sewage works discharge into the tidal Great Ouse, the Flood Relief Channel and the Heacham River shortly before it reaches the Wash. Environmental capacity in these waters is sufficient to accommodate the projected increases in wastewater flow associated with the housing developments with the possible exception of the discharge of nutrients to the Flood Relief Channel from Downham Market sewage works and impacts on Heacham Bathing Water. Smaller housing development in the rest of the Borough will also increase emissions of nutrients into smaller more sensitive rivers. Phosphorus and nitrogen concentrations in the rivers in the Borough are already high and likely to fail future Water Framework Directive targets. Consequently, future improvements may be required to treatment processes at the sewage works to reduce nutrient emissions and achieve load standstill or 'no deterioration' in pollution loads. Any resulting investment in water treatment is unlikely to constrain housing growth but the requirements and timing of this work should be considered in more detail in Phase 2 of the WCS. Impacts of housing growth on wastewater discharges and diffuse pollution in the upstream catchment also need to be considered in this context because this determines the environmental headroom to receive additional wastewater loads. Impacts of the discharge from Heacham sewage works and the urban drainage system in Hunstanton and Heacham on the Bathing Water at Heacham provides a potential constraint on housing growth although Anglian Water are addressing this issue through a series of investigations in AMP5. If available, information from these investigations should be considered in more detail in Phase 2 to determine whether water infrastructure is required to mitigate the impacts which may place timing constraints on the housing developments.

Following planned investment the capacity of the sewerage network is believed to be sufficient to accommodate increases in wastewater flows although it may be necessary to assess impacts on the frequency and volume of storm overflows once the details of the extended sewerage network has been modelled by Anglian Water. It will also be necessary to ensure that the timing of this investment ties in with the phasing of housing developments.

Management of water demand, as discussed in Section 9.1, will reduce the increase in the wastewater flows and, therefore, reduce impacts on the sewerage system and the environmental impact of discharges.

9.3 Flood Risk and Drainage

Flood risk is considered in detail in the SFRA for the Borough and the reader should consult this document for further information. In summary, under current conditions flood risk is unlikely to constitute a significant constraint on future growth in the proposed development areas which are beyond the areas of higher flood risk. More detailed assessment of flooding issues related to specific development sites will be required through the planning process following the requirements of PPS25. The Gaywood River development area requires provision of additional flood storage capacity in the flood plain which has already been designed by the King's Lynn IDB. Tidal flood risk is substantially increased under simulated climate change conditions and provision of enhanced



flood defence infrastructure is likely to be required. However, this is beyond the planning horizon considered within this study.

SuDs will be an important element of future developments to avoid increases in downstream flood risk and water quality impacts of urban runoff on local water courses. SuDs also provides opportunities for the development of green infrastructure and a framework for future provision of SuDs should be developed in Phase 2 of the WCS, taking into account the local hydrological constraints, adoption issues, landscape and wider ecological network.

9.4 Development Sites

The findings of the WCS do not indicate that there are specific constraints that would favour particular areas for development as identified in the Core Strategy.

9.5 Sustainability

Provision of water infrastructure should not only address the requirements of housing growth and environmental constraints; it should also consider wider sustainability issues including the carbon footprint. For example, the availability of water resources may not constrain housing growth but any increase in demand would still increase the carbon footprint of the provision. Different water infrastructure options will also have different carbon footprints so appraisal of options should take these issues into account. Assessment of these issues requires more detailed information on the engineering options for the provision of water infrastructure which can only be addressed in Phase 2 of the WCS once site allocations become more clearly defined. At this stage, however, it is important to make clear that sustainability issues should, along with cost information, be an important component of the overall water cycle strategy. Objectives to achieve this will be provided in the scope of the Phase 2 work.

