

D. Operational assessment

D.1 Anglian Water's operational requirements



Appendix D.1 Operational Requirements

1 Introduction

This document provides further details on Anglian Water's Operational Requirements which have been incorporated into the site selection process for the relocation of the CWWTP.

As set out in the Statement of Requirements, the land requirements for CWWTPR, are in the region of 22 hectares, (not including any necessary landscaping or other mitigating requirements).

The early design assumptions for the processes required are based on known successful WWTP processes and include the following.

- New Road Access into WWTP Location
- Incoming sewer
- Pumping station
- Storm storage and settlement tank
- Preliminary treatment (screening and grit removal)
- Primary settlement
- Biological treatment
- Final settlement
- Tertiary Treatment
- Pumping station
- Outfall to watercourse
- Sludge reception
- Enhanced pre-digestion treatment
- Biogas storage for renewable energy generation
- Anaerobic digestion
- Post-digestion treatment and de-watering
- Treated sludge biofertiliser
- Offices/Welfare Building(s) and Car Parking
- Utilities connections

The land area needs to accommodate the connecting infrastructure which includes but is not limited to the following:

1. A new drive shaft located at the chosen site to enable a connecting tunnel site back to the existing WWTP, that upon completion would be retrofitted as the new on-site Terminal Pumping station.
2. A new Final Effluent tunnel from the new site to a final outfall into the River Cam.
3. Connecting infrastructure from Waterbeach
4. Potential to divert and connect any existing assets which would aid to the operational efficiency of the scheme.

In addition to these operational process requirements, the site selection process has to take the following into account:

1. Anglian Water's statutory and regulatory obligations
2. Anglian Water's strategic corporate commitments
3. Operational resilience
4. Employee health and safety
5. The management of odour
6. The resilience of the plant to potential future urban growth
7. The ability to manage longer term changes in the regulatory or economic environment

The aggregate of these requirements generally favours sites which are relatively more distant from concentrations of population, allowing for management of odour and resilience to changes in the urban environment around Cambridge, including future urban growth towards the perimeter of a site, and potential future shifts in the regulation.

2 Anglian Water's legal obligations

2.1 Statutory Duty pursuant to the Water Industry Act 1991 (as amended)

Anglian Water is the statutory sewerage undertaker for much of the East of England including Cambridgeshire. It is therefore subject to a statutory duty under section 94 (1) Water Industry Act 1991 which requires it to provide an effective system of public sewers, to collect domestic and commercial wastewater, and transfer the contents for treatment to a wastewater recycling centre before ultimately discharging it to a receiving water body.

In fulfilling this duty, Anglian Water must comply with the requirements of all relevant environmental legislation, including the Urban Waste Water Treatment Regulations 1994. The fulfilment of this duty is essential to the protection of the environment and the maintenance of public health.

2.2 Environmental Permit Regulations

The Environmental Permitting (England and Wales) Regulations ("EPR") require Anglian Water to obtain environmental permits for wastewater treatment plants before they can operate because they could harm the environment or human health unless they are regulated. The aim of the EPR is to:

- protect the environment so that statutory and government policy environmental targets and outcomes are achieved;
- deliver permitting, and compliance with permits and certain environmental targets, effectively and efficiently;
- encourage regulators to promote best practice in the operation of facilities; and
- continue to implement European legislation fully.

The Environment Agency regulate and issue the relevant permits that are required. The existing Anglian Water site has environmental permits that cover, the discharge point, the quality and limits of the final effluent discharged via the discharge point into the River Cam, the storm arrangements and the sludge treatment conditions and limits.

Anglian Water have submitted applications to the Environment Agency to update the existing permits for the period up to the commissioning of CWWTP and for all new permits for CWWTP itself.

The conditions and limits imposed on these permits are being discussed and reviewed at present with both the Environment Agency and Natural England. The project's basis of design means that it will be designed to meet the requirements of all current relevant legislation and permits, regardless of the selected shortlisted location.

3 Anglian Water's strategic corporate commitments

As a purpose led company Anglian Water is committed to seeking positive environmental and social outcomes for the region it serves. Anglian Water's Strategic Direction Statement 2020 – 2045¹ maintains four core ambitions, as follows.

- To make the East of England resilient to the risks of drought and flooding
- Enable sustainable economic and housing growth in the UK's fastest growing region
- Reach net zero carbon emissions by 2030
- Work with others to achieve significant improvement in ecological quality across the Anglian Water catchment

Anglian Water has set out in further details how it will deliver these ambitions in its Five Point Green Delivery Plan which can be found at www.anglianwater.co.uk/siteassets/household/about-us/green-recovery-five-point-plan.pdf.

The five points are as follows.

1. Becoming a net zero carbon business
2. Accelerating sustainable housing and infrastructure growth
3. Creating green jobs and boosting skills
4. Delivering climate change adaptations and resilience
5. Enabling nature recovery

In order to become a net zero carbon business by 2030, Anglian Water as a company will source 44% of its energy requirements from on-site renewable sources by 2025 by utilising innovative solutions around solar energy and heat generated by its sludge treatment processes. Anglian Water will continue to collaborate with a wide range of companies through its supply chain and innovation networks to discover and implement new approaches to technology led solutions.

Anglian Water is also committed to driving down whole life carbon emissions in the delivery of major infrastructure projects. Working with Government and other leading business Anglian Water developed the world's first standard for managing carbon in infrastructure (PAS 2080) which is now being used nationally and internally.

¹ Anglian Water Services Limited, Strategic Direction Statement 2020–2045, LED612/11/17

Anglian Water intends to utilise these carbon reduction objectives to drive innovation into the delivery of CWWTP. Following the guidance set out in the Water UK “Net Zero 2030 Routemap” Anglian Water will shape the way it powers the plant and vehicles serving it, as well as continuing to explore opportunities to decarbonise heat generation for the local community and to apply circular economy thinking across the facility in order to maximise resource reuse, whilst preserving and enhancing the surrounding natural capital, including the River Cam.

To achieve all these objectives Anglian Water will as part of the delivery of the project reduce its capital carbon by 70% against a 2010 baseline using the Anglian Water’s PAS 2080 carbon modelling process, thereby reducing the impact of the project.

The project will also reduce operational carbon by 27% against a 2010 baseline using the AW PAS 2080 carbon modelling process, ensuring the facility remains carbon efficient throughout its life. Using innovative wastewater treatment technologies, Anglian water will reduce its process emissions at the plant by 60% against a 2010 baseline, by looking to harvest rather than treat vital nutrients entering the plant as well as filtering and removing harmful process emissions.

In order to achieve Anglian Water’s targets on becoming net zero carbon by 2030 the chosen site must have sufficient space to allow for the mitigation and possible enhancements needed to achieve these targets as well as those within the 5-point green recovery plan.

In addition, the biogas created at the plant through sludge treatment provides a valuable source of renewable energy. Anglian Water will explore ways to harness this energy, for example, to help improve the carbon impact of Anglian Water’s vehicles and to provide heat for the homes of nearby communities.

Treating wastewater as a resource promotes the circular economy thinking to harvest nutrients for use within our communities, thereby reducing the carbon impact of these resources. As the design of the treatment plant develops Anglian Water will explore the latest in construction techniques and products to minimise the impact of the delivery of the project, ensuring the treatment plant is a champion of the sustainability ethos that Cambridge is renowned for.

CWWTPR provides an opportunity to plan from the start how best to maximise the use of renewables in providing the necessary power needed to serve the Anglian Water community. Building on the vision set out in the UK Government Energy White Paper “Powering our Net Zero Future”, Anglian Water has the opportunity to benefit from the fast-developing renewable industry and deploy cutting edge solutions to ensure the plant is resilient in its power needs. Anglian Water also understands the role in ensuring the community moves to an energy solution matrix that aligns with Government’s net zero carbon goals. Anglian Water will, therefore, be ensuring the treatment plant not only serves its own heat needs, but where possible contributes to the needs of the local network.

Anglian Water will be exploring opportunities to see where the water recycled can add the most value to the surrounding water resources, either through further processing or transfer. Anglian Water will also deploy local water reuse measures on the structures it develops to minimise their water footprint.

Working with the Environment Agency and Natural England, Anglian Water will ensure the water is recycled back to the River Cam in the most sensitive way.

4 Odour (operational)

Odour modelling has been carried out as part of the site selection process to predict the potential impact of odour from an indicative CWWTPR footprint at each site during normal operations, in line with the Institute of Air Quality guidance for considerations during planning stages of projects.

The modelling reflects the covering of some tanks and process units to allow for the air from these to be extracted to odour control units or biogas management equipment, as appropriate. Anglian Water from their experience of operating over 1,000 wastewater treatment works understands that there is a delicate balance between covering tanks that may hold an odour potential and leaving others with less odour potential open, to ensure ease of operation. The decision to cover tanks also requires complying with Health and Safety related guidance and regulations, as well as considerations for asset life implications arising from creating sealed environments.

Covering tanks or process units increases technical complexity with the need for additional equipment from sensors, overflows and release valves, complicated monitoring software, to the covers and their associated support structures and odour control ducting and treatment themselves. Furthermore, it also introduces further risks associated with the potential for any of these components' failure. In addition, significant employee health and safety risks arise from working in confined spaces where hazardous gaseous may be present. Health and safety guidance advise the avoidance of carrying out tasks in confined spaces.

The odour modelling suggests CWWTPR could be developed at Sites 2 and 3 within the thresholds recommended by the relevant technical guidance, without the need to cover any tanks or assets additional to the baseline. To meet those thresholds at Site 1, the modelling suggests that further tanks or assets would need to be covered.

5 Future urban growth

Anglian Water needs to ensure that the relocated WWTP remains resilient in the face of change, including in respect of future urban growth and the evolution of environmental and industry regulation.

It is likely that over the lifetime of the project that the urban growth of Cambridge will continue. The potential for interactions between new development and wastewater infrastructure is managed by Anglian Water through its asset encroachment policy.

In order to manage odour and other potential operational effects, Anglian Water needs to maintain a suitable distance between the water recycling centres it operates and the communities they serve. In what is one of the fastest growing regions of the UK, however, there cannot be a blanket presumption against new development in the proximity of our infrastructure. Anglian Water has, therefore, an established approach to assess and manage the risks associated with proposed new development close to our works and any impact from them.

Our assessment of encroachment risk is aligned with the relevant planning policies in the adopted Cambridgeshire and Peterborough Minerals and Waste Plan which provides for wastewater treatment safeguarding areas (policy CS31).

The policy states that within a 400m safeguarding area around a WWTP there is a presumption against allowing development which would be occupied by people and planning permission will only be granted where it is demonstrated through an odour assessment report that the proposed development would not be adversely affected by the continued operation of the existing water treatment works.

Where applications for development are made within 400 metres of one of our WWTP it is our policy to assess the encroachment risks following a review of all relevant data (including the site manager's experience of odour issues) and engage with the local planning authority accordingly.

As outlined in the site selection report, we have adopted this 400m threshold, together with the use of odour modelling, to determine an appropriate physical buffer between the proposed sites and sensitive receptors. However Anglian Water's preference during site selection has been, wherever possible, to seek a greater distance than this minimum to ensure that potential future encroachment can be minimised. Sites with a greater distance from concentrations of population provide lower risks in this respect.

6 Future operational needs

As discussed above, the capacity of the proposed relocation project is based on a robust assessment of future demand to 2050. However, Anglian Water also believes that it is desirable to consider the future potential for improvement or modifications of the plant in the very long term due to population or regulatory changes, particularly if it is remembered that the current site first started operating over a century ago. It would be prudent to assume a similar lifespan for activities at any new site. Therefore, where possible during the site selection process, Anglian Water has considered the potential for the site to be expanded or adapted in the event that tighter environmental requirements are imposed on the water industry or for population growth occurring after 2050.