

**Oxfordshire County Council (Didcot Garden Town Highways Infrastructure –
A4130 Improvement (Milton Gate to Collett Roundabout), A4197 Didcot to
Culham Link Road, and A415 Clifton Hampden Bypass) Compulsory Purchase
Order 2022**

STATEMENT OF EVIDENCE

**JOHN PATON
INTERIM SYSTEM PLANNING LEAD (WASTEWATER)
THAMES WATER UTILITIES LIMITED**

OPERATIONAL IMPACT

1. **QUALIFICATIONS AND EXPERIENCE**

- 1.1 My name is John Paton, I am the Interim System Planning Lead for Wastewater within the Asset Strategy and Planning business function at Thames Water Utilities Limited ("TWUL"). I work out of TWUL's headquarters: Clearwater Court, Vastern Road, Reading, Berkshire.
- 1.2 I am an Associate Member of the Institution of Chemical Engineering (IChemE), and an Asset Management Professional who has worked with TWUL since 2021. Since June 2023, I have been the System Planning Lead for the Thames Valley and Home Counties region of Thames Water's Wastewater Estate.
- 1.3 My role is to manage a team of System Planners who consider medium to long term investment plans for sewage treatment works ("STWs") catchments. This ensures appropriate accommodations are provided to be able to deliver a sewerage network suitable for TWUL's 15 million customers and the environment.
- 1.4 Culham Sewage Treatment Works ("Culham Works") is a relatively small treatment site within the Thames Valley and Home Counties region. It is my team's responsibility to plan for the provisions of assets that can deliver the performance required, which can be impacted due to external factors such as population growth.

2. **INTRODUCTION AND SCOPE OF EVIDENCE**

- 2.1 The structure of my Statement of Evidence is set out in paragraph 2.3 below.
- 2.2 My Statement of Evidence is structured as follows:-
 - Section 3 sets out background information on TWUL's statutory undertaking;
 - Section 4 sets out an outline of the regulatory price control periods that govern investment in the water industry and TWUL;
 - Section 5 sets out permitting legislation and the permit for the Culham Works;
 - Section 6 sets out a description of the Culham Works Catchment Area;
 - Section 7 sets out a description of the current operations at the Culham Works;
 - Section 8 sets out the methodology TWUL uses to plan for population growth;

- Section 9 sets out the risk population growth poses to operations at the Culham Works;
- Section 10 sets out TWUL's preferred solution for the Culham Works Catchment;
- Section 11 sets out the impact on TWUL if the CPO were to be confirmed;
- Section 12 sets out my summary and conclusions;
- Section 13 is the declaration for my Statement.

2.3 Within this document I have used the defined terms set out in TWUL's Statement of Case dated 15 December 2023 (M.05).

3. **BACKGROUND**

- 3.1 Under section 94 of the Water Industry Act 1991 ("WIA 1991"), TWUL has a duty as a sewerage undertaker to provide and improve our sewerage system. This includes providing and maintaining a system of public sewers, and facilities to treat sewage in order to discharge fully treated effluent into the environment.
- 3.2 As part of our statutory responsibilities, and within the regulatory environment set out by the WIA 1991, we are required to submit a business plan to Ofwat, the financial regulator for the water industry in England and Wales, every 5 years describing the investment activities we will be carrying out. In order to deliver on our statutory obligations, we need to give appropriate consideration to population growth within our region. This is explained further in section 8 of my Statement. For the Asset Management Plan (AMP) Period 8, beginning in 2025, we submitted a draft plan "TMS24 Enhancement case: Sewage Treatment Growth" ("the Draft Enhancement Case") outlining our intention to invest over £350 million, dedicated to addressing the vast amount of growth within the Southeast. A summary extract from the Draft Enhancement Case can be found at page 7 of Appendix 1 of my Statement.
- 3.3 TWUL's status as a Water and Sewerage Company ("WaSCs") means that it is a Statutory Undertaker for the purposes of sections 16 and 17 of the Acquisition of Land Act 1981 ("ALA 1981").
- 3.4 Environmental Permits ("the Permit") are issued to TWUL by the Environment Agency ("the EA") under powers conferred by the Environmental Permitting (England and Wales) Regulations 2016. The Permit for Culham Works outlines the specific requirements that must be met in order to discharge final effluent to the environment.
- 3.5 As explained later in this statement, if the Order (CD:H.1) was confirmed, it could lead to TWUL being in breach of the Permit for the Culham Works. This would be detrimental to TWUL's ability to deliver on our duties under the WIA 1991 and in turn, could cause detriment to our customers and the environment.

4. **REGULATORY PRICE CONTROL PERIODS**

- 4.1 As a Water and Sewerage Company, TWUL are required to submit a 5-year business plan to Ofwat for approval, the economic regulator of the water industry in England and Wales. This plan sets out how TWUL is going to raise and spend customer's money, and other capital TWUL raises.
- 4.2 In October 2023, TWUL submitted their draft business plan for AMP8, "PR24 Our Business Plan, 2025-2030" (the "Draft Business Plan") which runs from 2025 to 2030. Ofwat's final determination on TWUL's plan is due to be published by December 2024.
- 4.3 TWUL's AMP8 Draft Business Plan details how it is planning to spend £18.7 billion across the Thames Water Estate. An extract from the Draft Business Plan showing the "snapshot" summary of the Draft Business Plan can be found at page 18 of Appendix 2 of my Statement. There are multiple aspects of the plan, one of them being enhancement cases, which, "refers to expenditure for the purpose of enhancing the capacity or quality of service beyond current levels. The expenditure may be driven by a number of factors, including population growth". Due to the level of growth projected across the Thames Water Estate, TWUL have asked for an allowance of over £350 million to invest in sewage treatment work catchments to address population growth. The Draft Business Plan includes proposals to meet the forecast demand (outlined in section 10.2 below) in the catchment area of the Culham Works.
- 4.4 Ofwat's final determination provides a decision as to whether or not they agree with the business plan submitted by each WaSC. Subject to Ofwat's approval, TWUL would be looking to use this funding to upgrade 15 STWs in AMP8, including the Culham Works (as outlined in section 10.2 below).

5. ENVIRONMENTAL PERMITTING

- 5.1 As outlined in section 3, the EA issue permits to WaSCs in England and Wales providing the treatment levels, including flow and quality parameters, that must be met in order to safeguard the environment. For WaSCs, permits are issued to ensure environmental protection for the water course an STW discharges in to.
- 5.2 Some of the key requirements in permit TH/CSSC.2374 ("the Permit") for Culham Works include the following:
- 5.2.1 The quality parameters, which dictate the level of treatment required for final effluent to be discharged to the environment;
 - 5.2.2 The volume of flow that Culham Works is allowed to treat each day;
 - 5.2.3 The volume required to be treated in wet weather, high flow conditions before storm water can be discharged to the environment;
 - 5.2.4 The number of samples required to be taken, to measure compliance with the quality parameters; and
 - 5.2.5 The location of the final effluent discharge point.
- 5.3 The key quality parameters are: biochemical oxygen demand; suspended solids; and ammoniacal nitrogen. These parameters provide a measure of the permitted 'load' entering the river, which has an impact on the health of the river and water quality.
- 5.4 Sampling is required to ensure the treatment process is providing the required level of treatment to the stated limits in the Permit. It is important that sampling is carried out at the correct place, both geographically and in reference to which stage of the process. The sampling point for final effluent at Culham Works occurs when all treatment processes, as discussed in section 7 below, are complete and before the flow is discharged to the environment.
- 5.5 Appended to this statement is the Culham STW Final Effluent Permit, which can be found at page 30, Appendix 4 of this statement.

6. THE CULHAM WORKS AND ITS CATCHMENT AREA

- 6.1 The Culham Works is a rural sewage treatment works located in South Oxfordshire. The drainage catchment for the Culham Works consists of the villages of Berinsfield, Culham, and Clifton Hampden, as well as the Culham Science Centre. The next closest sewage treatment works to these villages is some 2 km away.
- 6.2 The Works currently treat flows from a population equivalent ("PE") of approximately 4,000. 'PE' is a measure of the flows and biological load received at the STW, accounting for domestic population, business and commercial premises and well as transient populations associated with tourism etc..
- 6.3 Culham Works is currently able to treat the foul flows that it receives from its drainage catchment, meeting the quality parameters set out in its Permit. Any increases, however, in trade or domestic flow would require an assessment to understand if they will exceed the capability of the STW to meet its Permit conditions.
- 6.4 As explained in section 10.2 below, from 2031, the Culham Works would not be capable of handling the forecast demand without upgrade works.

7. THE CURRENT TREATMENT PROCESS AT THE CULHAM WORKS

- 7.1 Sewage is pumped to Culham Works from three terminal pumping stations in the catchment. Upon arrival, screening equipment is used to remove wet wipes, sanitary products, leaves etc., from the flow.
- 7.2 The next stage of the process is storm water management. As outlined in section 5, sewage treatment works can discharge storm water to the environment under permitted conditions when flows arriving at the works are high. These storm discharges are more commonly known as 'spills'.
- 7.3 Storm tanks are used to capture this excess flow and, once storm conditions subside, pumps are used to return the excess flow to the process in order to be fully treated.
- 7.4 There are two main treatment processes, primary and secondary treatment. The primary stage consists of settlement tanks and the secondary stage consists of a combination of biological treatment and settlement.
- 7.5 Liquid sludge is removed and stored separately at the primary treatment stage. Biochemical oxygen demand and suspended solids are removed at both stages, and generally ammonia is only removed at the secondary stage of the Culham Works.
- 7.6 Once the final settlement is complete, final effluent monitoring and sampling is carried out before the flow is discharged to the environment.
- 7.7 The current layout of the Culham STW maximises the available land, allowing for expansion of the treatment works whilst staying within the site boundaries.

8. **PLANNING FOR POPULATION GROWTH**

- 8.1 The methodology used to determine that Culham Works required upgrades to accommodate for growth is the same methodology as outlined in TWUL's growth enhancement case. An extract from the Draft Enhancement Case showing details of each of the 15 sites which include Culham Sewage Treatment Works and the form of the upgrades required are shown in Table 10 at page 8 of Appendix 1 of my Statement. TWUL invests in upgrading STW catchments once confident that growth will exceed the capacity of the site.
- 8.2 TWUL published a 25-year Drainage and Wastewater Management Plan ("the DWMP") in May 2023, which outlines environmental performance improvements across the entirety of the wastewater life cycle. This extensive plan outlines a full, generic optioneering framework applicable to determining various solutions, including solutions to accommodate for population growth. This has been discussed in full in the DWMP, a summary of the DWMP is appended at pages 24-28 of Appendix 3 of my Statement. Table 11 of the Draft Enhancement Case sets out the generic options that could address the risk to TWUL's sewage treatment works posed by population growth, appended to this statement at pages 9-11 of Appendix 1.
- 8.3 Once it is determined that a STW would not be able to deliver the required environmental protection as outlined in the Permit with the current treatment capacity, the next step is to understand what the most appropriate solution would be. Table 12 of the Draft Enhancement Case summarises the main option types that were considered to meet TWUL's need at the 15 sites including Culham Works. The options highlighted green in the table were retained for final screening, and those in red were discounted. This table can be found at pages 12-13 of Appendix 1 of my Statement. A methodology to determine the possible option types that were feasible for the 15 STW sites are shown at Figure 17 of the Draft Enhancement Case, at page 13 of Appendix 1 of my Statement.

9. **POPULATION GROWTH IN THE CULHAM WORKS CATCHMENT AREA**

- 9.1 According to the South Oxfordshire Local Plan there are two large developments proposed within the catchment area for the Culham Works. These are the *Land adjacent to Culham Science Centre* and *Berinsfield Garden Village*. Both of these are allocated sites.
- 9.2 The land around the Culham Science Centre has been released from the Green Belt to enable the land to deliver approximately 3,500 new homes with occupation starting in 2029.
- 9.3 Land at Berinsfield has also been released from the Green Belt and was awarded Garden Village status in 2019. The land will be developed to provide around 1,700 new homes with occupation starting in 2030.
- 9.4 As a result of the proposed housing developments, the population within the Culham Works catchment area is expected to increase by approximately 46% by 2031, this is shown in Table 10 of the Draft Enhancement Case which is appended at page 8 of Appendix 1 of my Statement. This means that the PE for the Culham Works will increase from circa 4,000 PE in 2021 to over 5,800 in 2031.
- 9.5 The planned growth in the population of the catchment is projected to further increase during asset management plan (AMP) period 9, which runs from 2030 to 2035. The PE for the Culham Works is expected, therefore, to be circa 10,500 by 2036. This represents an increase of 162% from the current estimated PE for the Culham Works. This is the highest projected percentage increase of any asset across TWUL's estate.

10. **PREFERRED SOLUTION TO ACCOMMODATE FOR POPULATION GROWTH IN THE CULHAM WORKS CATCHMENT**
- 10.1 Major upgrades of the Culham Works are required to meet this increased growth. Upgrades are required, in order to respond to the growth projections, to:
 - 10.1.1 Facilitate the processing of the increased volume of flow arriving at the Culham Works.
 - 10.1.2 Provide the required treatment capacity to comply with the quality parameters as set out in the Permit.
 - 10.1.3 Comply with the increased Flow to Full Treatment (to ensure that the Flow to Full Treatment permit is sufficient to not increase the number of and duration of storm overflow events).
 - 10.1.4 Increase storm tank capacity so that in the event of rainfall or snow melt, premature discharges to the environment do not occur.
- 10.2 Due to the forecast levels of growth within the Culham catchment, TWUL began planning for upgrades to the Works in 2022, with high level designs produced to inform our Draft Business Plan. The preferred solution is to increase the current Works capacity by upgrading the Works by extending/adding to the existing operational equipment. The preferred solution was developed with a view of utilising existing land owned by TWUL.
- 10.3 The preferred solution of extending the Culham Works on the adjoining land within TWUL's ownership has the benefit of:
 - 10.3.1 Enabling TWUL to accommodate the projected growth by making use of approximately 90% of the land already owned by TWUL within the confines of the Culham Works, without the need for further land purchase.
 - 10.3.2 Providing treatment capacity to the 2036.
 - 10.3.3 Delivering the most efficient solution for TWUL's customers, ensuring customer's money is spent appropriately.
 - 10.3.4 Avoiding any delays and further costs associated with the acquisition of new land for upgrade works.
- 10.4 In order to accommodate the projected growth, the proposed upgrades will commence within the next 2 to 5 years in order to ensure that the upgrades are delivered ahead of 2031.

11. **IMPACT OF ACQUISITION ON TWUL'S OPERATION AS A STATUTORY UNDERTAKER**

- 11.1 The land identified for the upgrade works to the Culham Works has been identified for compulsory acquisition by the Acquiring Authority in the Oxfordshire County Council (Didcot Garden Town Highways Infrastructure – A4130 Improvement (Milton Gate to Collett Roundabout), A4197 Didcot to Culham Link Road, and A415 Clifton Hampden Bypass) Compulsory Purchase Order 2022.
- 11.2 The land the Acquiring Authority, Oxfordshire County Council, is seeking to permanently acquire can be split into two areas:
- 11.2.1 The land at the rear of Culham Works, which is required for current site operation (parcel 17/11i), and
 - 11.2.2 The land at the front of Culham Works, required for future expansion to accommodate for growth.
- 11.3 Both areas of land are required in order for TWUL to carry out our duties as a statutory undertaker, whilst meeting the needs for the growth in the Culham Works catchment area up to 2036. As outlined above, TWUL is required under the Permit to carry out final effluent flow monitoring and quality sampling. The land at the rear of Culham Works contains the key assets to ensure we comply with these sections of the Permit.
- 11.4 The acquisition of the land would cause two main issues for TWUL's operations.
- 11.5 First, if the Order were to be confirmed, TWUL would lose access to the land where these assets are contained, and they would need to be moved. However, as the location of the final discharge point is agreed with the EA, TWUL would not be able to move the discharge, monitoring, and sampling points without prior engagement with the EA.
- 11.6 Therefore, loss of the land at the rear of the Culham Works would introduce the risk of TWUL to be in breach of current requirements of the Permit. This could lead to TWUL being prosecuted by the EA. If it were to be agreed with the EA and the final effluent monitoring, sampling, and discharge point could be moved this would result in TWUL having to carry out capital work to enable this.
- 11.7 Second, as outlined above, the land at the front of the Works does not currently have any assets situated on it. However, the land is essential for future expansion of the Works in order to accommodate for increased flows as a result of population growth. If the Order (CD:H.1) were confirmed, TWUL would no longer own this land such that it could not be used to carry out the upgrades as required.

- 11.8 If TWUL cannot use the land currently within its ownership in order to upgrade the Culham Works as currently proposed, it would have no alternative but to acquire additional land. This poses a significant risk to delivery. If such land could not be obtained by agreement, TWUL would need to rely on use of its own CPO powers to acquire land, with no guarantee of success and inevitable delay. We anticipate that such a process would cause a delay in the upgrade works by between 2 and 2.5 years, thereby inhibiting our ability to deliver our statutory duty. If the Order was confirmed, TWUL simply would not be able to meet the current timeframe for the delivery of the upgrade works. Confirmation of the Order would therefore prevent the implementation of TWUL's preferred solution for meeting growth within the catchment as proposed.
- 11.9 Developers are entitled to connect to our sewerage network regardless of capacity. Section 106 of the WIA 1991 provides developers a statutory right to connect to a public sewer. TWUL, as the statutory undertaker, has a responsibility to provide upgrades to the Culham Works to accommodate increased demand, growth, and climate change.
- 11.10 If development was to be delivered in line with the current housing delivery trajectory, the inability to upgrade the Culham Works as proposed could result in the following:
- 11.10.1 Flooding of land surrounding the Culham Works as a result of increased flows within the catchment without adequate capacity to drain the catchment effectively;
 - 11.10.2 Internal and external property flooding as a result of foul water flows surcharging the network, for example, at manholes;
 - 11.10.3 Increased storm overflow events;
 - 11.10.4 Events that result in breaches of the site's statutory permits, resulting in penalties from our economic regulator and the risk of prosecution from the Environment Agency; and
 - 11.10.5 Non-compliance with the site's quality parameters in each year that upgrades are delayed, resulting in financial penalties. This could lead to pollutions and deterioration of the watercourse.

12. **SUMMARY AND CONCLUSIONS**

- 12.1 Taking into account the evidence presented earlier in my statement the Order (CD:H.1) could cause serious detriment to TWUL's customers and the environment, and we would not be able to execute our statutory responsibilities effectively.

12.2 On 14 December 2023 TWUL submitted a representation to Defra in order to provide a basis on which Defra could reach a view as to whether the test in section 16 of the Acquisition of Land Act 1981 was met. Defra responded to the representation on 15 January 2024, making clear that it agrees with the evidence of TWUL in respect of the impact of the Order on its undertaking. Furthermore, Defra made the following request: "We would like to request that [the Secretary of State for Transport] do[es] not proceed to make the Order whilst it includes the land required by Thames Water for expansion of the Culham Works and the land in parcel 17/11i which is already required as part of Thames Water's daily operational activity".

13. **DECLARATION**

13.1 I believe that the facts stated in this statement of evidence are true and I confirm that the opinions expressed in this statement of evidence are my true and professional opinions.



JOHN PATON

TUESDAY 30TH JANUARY 2024