

# Cambridge Waste Water Treatment Plant Relocation Project



Preliminary Environmental Information  
February 2022

Air Quality

| Version | Date       | Author(s)   | Check       | Approve        | Comment                    |
|---------|------------|-------------|-------------|----------------|----------------------------|
| Draft   | 17/12/2021 | Gill Cotter | Chris Mills | Matt O'Brien   | 1 <sup>st</sup> draft      |
| P01     | 25/01/2022 | Gill Cotter | Chris Mills | Claire Squires | Update to address comments |
| P02     | 07/02/2022 | Gill Cotter | Chris Mills | Claire Squires | Final review comments      |

**Document reference:** 100102041-MML-XX-00-RP-AQ-0204007

**Information class:** Standard

---

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

## Environmental information paper: Air quality

### Summary

The air quality in the vicinity of the Draft Scheme Order Limits is monitored at multiple locations demonstrating that existing concentrations of monitored pollutants are within the national air quality objectives.

Traffic generated as part of the construction and operation from our Proposed Development is expected to be low compared to existing levels on surrounding roads. We do not anticipate significant air quality effects on people or ecological receptors from emissions associated with additional traffic.

Impacts from construction dust will be temporary and the effects on people and ecological receptors are not expected to be significant following the application of best practice mitigation. Appropriate levels of mitigation will be identified during the assessment phase and secured under the Code of Construction Practice (CoCP).

The proposed WWTP may potentially have boilers and or combined heat and power (CHP) plants. These would meet stringent emission requirements set out in legislation and be designed in accordance with best practice, for example, when determining stack heights. These measures are expected to mitigate against significant air quality effects during the operation of the proposed WWTP. The Environment Agency will be responsible for regulating operational emissions to air from the Proposed Development through an Environmental Permit which will contain measures and requirements for emissions monitoring.

### Document purpose

The Air quality information paper describes potential changes to air quality associated with the construction and operation of the Proposed Development. The paper sets out the preliminary findings of the air quality assessment, comprising a review of the existing environment and identification of potential impacts upon air quality. It sets out how we intend to develop our proposals to avoid and minimise air quality impacts.

The Environmental Information Papers for **Odour, Biodiversity, Community and the Traffic and transport** should also be referred to.

## Air quality overview

Our development proposals are located in a semi-rural location to the north-east of Cambridge. We have considered our development proposals in the context of existing air quality information available for the surrounding area. This has allowed us to:

- understand the existing local air quality and identify any existing air quality problems which could be affected by our proposals
- determine existing sources of pollutants which contribute to existing pollutant concentrations
- identify receptors that are sensitive to changes in air quality

Places that may be sensitive to changes in air quality include places where members of the public might be regularly exposed such as residential dwellings, care homes, health centres and educational facilities such as schools and nurseries. Outdoor spaces used for recreation, where members of the public may spend one hour or more and ecological features may also be sensitive to changes in air quality. Figure 1 shows the information we have collected in relation to air quality and air quality receptors.

The main pollutants related to air quality from our development proposals are:

- oxides of nitrogen ( $\text{NO}_x$ ), particularly nitrogen dioxide ( $\text{NO}_2$ )
- sulphur dioxide ( $\text{SO}_2$ )
- fine particles (particulate matter defined as those less than 10 and 2.5 microns in diameter,  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  respectively)
- dust (defined as particulate matter in the size range 1-75 microns in diameter).

Common sources of these pollutants are transport, domestic heating and burning, agriculture and industry.

South Cambridgeshire District Council and Cambridge City Council have both identified areas where pollutant concentrations have historically been higher than the national air quality objectives. These areas are known as Air Quality Management Areas (AQMA) and require consideration when assessing developments which can affect air quality. The Cambridge AQMA (which covers the Cambridge inner ring road), is located approximately 3km to the south-west of our Proposed Development and the South Cambridgeshire AQMA (the A14 corridor AQMA) is approximately 3km to the west. The Cambridge AQMA was declared in 2005 for exceedances of the annual mean nitrogen dioxide ( $\text{NO}_2$ ) objective. The A14 corridor AQMA was declared in 2008 for exceedances of both the  $\text{NO}_2$  annual mean and the particulate matter ( $\text{PM}_{10}$ ) daily mean objectives. The council intend to revoke this AQMA because in recent years no exceedances of any objectives have been recorded. The location of the AQMAs is presented in Figure 1.

Recent air quality monitoring undertaken by the local authorities<sup>12</sup> between 2017 and 2020 at locations close to our Proposed Development show pollutant concentrations were within the air quality objectives.

The Department for Environment, Food and Rural Affairs (Defra) undertake pollution modelling across the whole country. This modelling shows that existing background concentrations in the study area are within the air quality objectives<sup>3</sup>.

It is expected that ambient concentrations of pollutants such as NO<sub>2</sub> will decrease in the future, due to older more polluting cars being replaced with new ones and electric vehicles becoming more widespread. We predict therefore that air quality conditions at the Proposed Development and surrounding area would improve in future and continue to be within the air quality objectives in future years.

---

<sup>1</sup> South Cambridgeshire District Council 2021 Air Quality Annual Status Report (ASR) available at: <https://www.scambs.gov.uk/media/18620/2021-air-quality-annual-status-report.pdf>

<sup>2</sup> Cambridge City Council 2021 Air Quality Annual Status Report (ASR) available at: <https://www.cambridge.gov.uk/media/10093/air-quality-annual-status-report.pdf>

<sup>3</sup> Defra UK Air Information Resource (AIR) interactive mapping available at: <https://uk-air.defra.gov.uk/data/gis-mapping/>

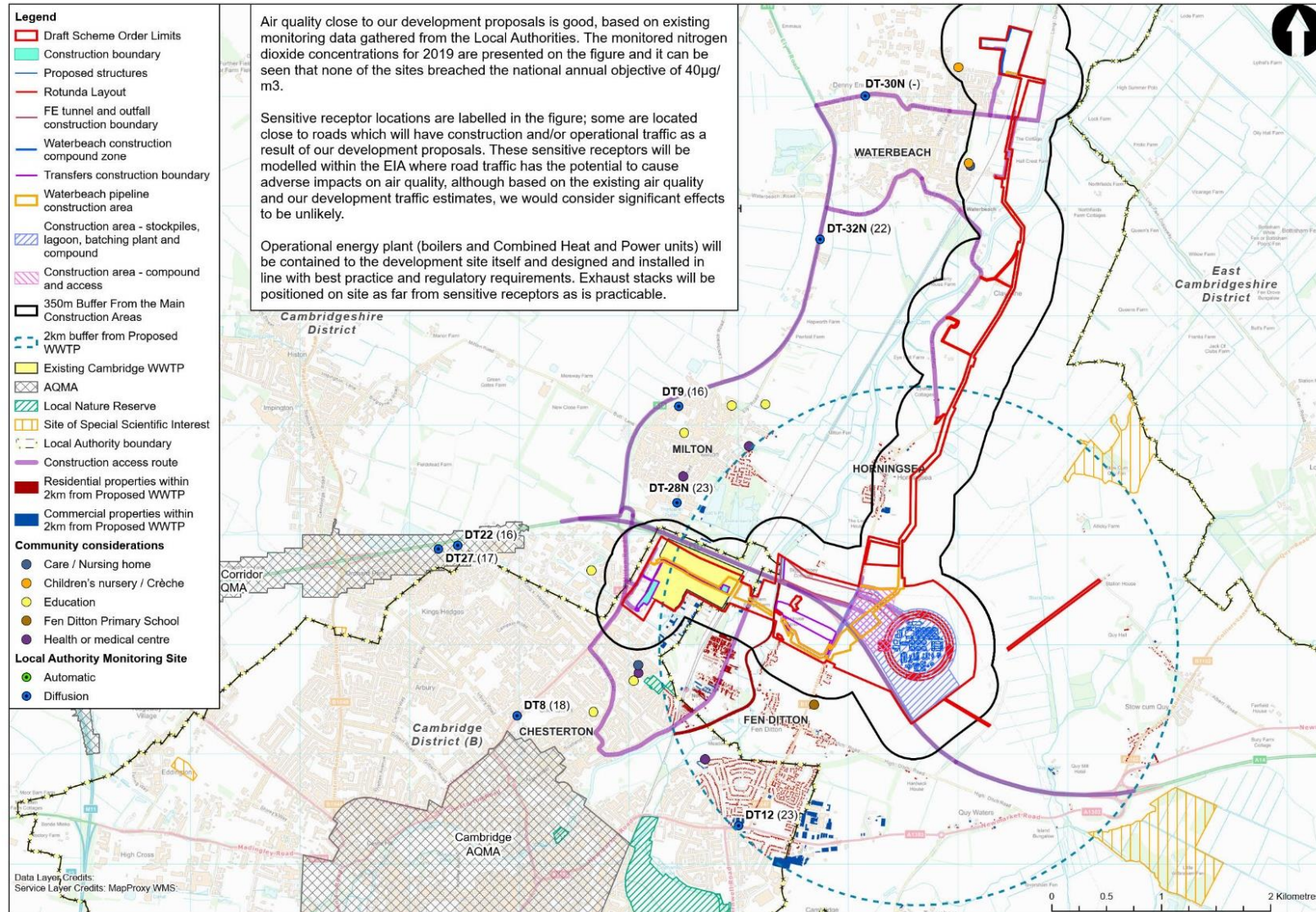


Figure 1: Air Quality Overview

## How will the construction of the proposed relocation of Cambridge Waste Water Treatment Plant change air quality?

Construction works have the potential to temporarily change air quality which may result in effects to people and ecological receptors that are located close by. Changes to air quality during construction are dependent on the construction activities being undertaken, the distance between the activities and the receptors and the control measures that are in place.

Construction of the Proposed Development will introduce temporary new emission sources with the potential to affect nearby sensitive receptors in the form of:

- dust emissions from the construction of the proposed WWTP and to complete our landscape proposals which will last for approximately 24 months; activities include concrete-batching, earth-moving activities and movement of vehicles along on-site haul routes.
- potential for tracking of mud along the B1047 Horningsea Road and onto the A14, which will be the main access route.
- emissions of NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> from movement and operation of site plant for the duration of the construction activities, for example, excavators used to dig trenches and create new earthworks features, use of a concrete batching plant, generators to power equipment needed for construction.
- emissions of NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> from construction traffic along the local road network (including the A14 and A10).

The risk from dust impacts during construction, assuming no mitigation is in place, will be established using the Institute of Air Quality Management (IAQM) guidance<sup>4</sup> which is best practice. The risk identified from this assessment will be used to determine appropriate and proportionate mitigation for effective dust management. With mitigation in place, as there will be prior to works commencing, residual significant effects are not anticipated.

The dust risk assessment will not consider demolition, as no demolition works would be required under our development proposals. Receptors closest to construction activities include homes, which are defined in the IAQM guidance as 'High' sensitivity receptors.

Our initial estimates of the volume of vehicle movements are described in the **Environmental Information Paper: Traffic and transport**. It is expected that on average there will be approximately 100-200 daily heavy-duty vehicle (HDV) movements during construction, with a peak of 200-300 daily HDV movements. The additional number of vehicles is a small proportion relative to the existing traffic flows on roads that the construction traffic would use; for example, the B1047 Horningsea Road had an estimated daily flow of approximately 5,000 vehicles in 2021<sup>5</sup>. Considering the likely increases in traffic, existing traffic flows and current pollution levels, we would consider it unlikely that

---

<sup>4</sup> Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. [www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf](http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf)

<sup>5</sup> Estimated by the Traffic Team for the Proposed Development

traffic impacts would be greater than 'Slight Adverse' at selected receptors closest to affected roads, as defined in the best practice IAQM/Environmental Protection United Kingdom (EPUK) guidance<sup>6</sup>. We would not consider significant effects from construction traffic likely, a conclusion that is reached on the majority of projects when considering the construction phase. This will be assessed further once traffic data is finalised and our conclusions confirmed within the EIA.

### How will the operation of the proposed Cambridge Waste Water Treatment Plant change air quality?

The operation of the proposed WWTP has the potential to change air quality which may result in permanent effects for people and ecological areas nearby. We have identified operational emissions sources; these are presented in Figure 1.

Once operational, the proposed WWTP may result in changes to air quality as a result of:

- changes to road alignments caused by the new access road to site
- changes in traffic flows due to vehicles along the B1047 Horningsea Road, A14 and the A10 (including people working at the WWTP and deliveries made to the WWTP)
- emissions (primarily NO<sub>x</sub> and SO<sub>2</sub>) from the operation of the proposed WWTP boilers and Combined Heat and Power (CHP) units and flare (emergency use only)
- pollutant emissions (mainly methane and carbon dioxide) released due to an onsite emergency

The access routes and number of vehicle movements expected during operation are set out within the **Environmental Information Paper: Traffic and transport**. These show that vehicle movements for people travelling to the proposed WWTP as their place of work are similar to the number of trips currently made to the existing Cambridge WWTP. Our initial estimates for the operation of the proposed WWTP show that there would be approximately 100 average daily light-duty vehicle (LDVs) and approximately 150 HDV movements. Most of the traffic travelling to the proposed WWTP will be workers and delivery vehicles. Although the overall traffic flows associated with the operation of the proposed WWTP would not vary largely from those associated with the existing Cambridge WWTP, the operational traffic would be redistributed on local roads as workers and deliveries take new routes to the proposed WWTP.

The number of additional vehicles relative to the traffic movements on the B1047 Horningsea Road (5,000 daily vehicle movements in 2021<sup>5</sup>), the A14 and A10 are not large and therefore we would consider it unlikely that operational traffic impacts would be greater than 'Slight Adverse' at receptors which would experience the greatest change in air quality, as defined in the best practice IAQM/EPUK guidance, and overall significant effects

---

<sup>6</sup> Environmental Protection UK and Institute of Air Quality Management (January 2017), 'Land-Use Planning and Development Control: Planning for Air Quality' version 1.2 <https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf> (Table 6.3)

are unlikely. This will be assessed in detail in the ES once we have more detailed traffic information.

The proposed WWTP process will generate biogas which may be used in the proposed on-site CHP plant and boiler plant, or the biogas can be treated and input into the national gas grid. These provide heat to help the processes on site to treat waste, and the CHP generates electricity which can be exported to the National Grid. The CHP and boiler plant emit pollutants to air, primarily NO<sub>x</sub> which can affect air quality near to the Proposed Development. There could also be trace amounts of SO<sub>2</sub> emitted during combustion of biogas at the proposed WWTP. The CHP and boilers would have a maximum combined thermal input of less than 10 Megawatt and therefore overall emissions will be small. The CHP and boilers will meet stringent emission requirements and be designed in such a way that effects on air quality are minimised.

In the unlikely scenario that there is a failure of the CHP and boiler plant, the onsite flare may need to be used. This is to ensure the safety of workers and people nearby by preventing a build-up of the biogas recovered during the treatment processes. The flare that will be installed will be of a specialised design to minimise emissions to air during use and flare usage will be limited under the Environmental Permit. If the flare was also unavailable due to failure, an extremely unlikely event, the biogas that is generated during the treatment process may need to be vented to the air to reduce pressure in the system. If methane was released, this would dissipate from site readily as it is lighter than air. An event of this nature would be extremely rare and emergency procedures would be in place to limit this release to the shortest time possible, to minimise environmental risks.

At this stage, we are continuing to refine our design and these details will be used to undertake a full assessment as part of the ongoing EIA. In completing this assessment computer modelling will be used to determine the concentrations of air pollutants (specifically, NO<sub>2</sub>, NO<sub>x</sub> and PM<sub>10</sub>) surrounding the proposed WWTP to fully understand the impacts and to help finalise the design. The same computer modelling approach would be undertaken as required by the Environment Agency when determining whether to award an Environmental Permit. At this stage, bearing in mind the total combined thermal input is less than 10 MW, the stringent legislation surrounding the emission performance and the control measures, significant effects are not anticipated.

## How will we manage our development activities to avoid, reduce or offset adverse changes?

The management of emissions to air related to how we will manage our activities in construction, the types of technology selected within the proposed WWTP and ultimately how we intend to operate the proposed WWTP.

The **PEI Introductory Paper** explains how the Development Consent Order (DCO) will require us to deliver mitigation. Mitigation will be secured through the requirements of the DCO which grants permission of the Proposed Development to be built. Furthermore, we would be subject to specific regulations for some activities in construction as well as the Environmental Permits required for us to be able to operate.

This section sets out our proposed mitigation proposals for air quality.

### In construction

Mitigation will be in place to avoid or minimise the impacts during construction of the Proposed Development so that people and ecological receptors are not adversely affected by our development proposals.

Measures to mitigate air quality impacts during construction are secondary and inexorable.

#### Secondary mitigation (foreseeable)

The types of mitigation measures required to ensure there will not be significant effects from construction dust will be finalised in the ES. The assessment will use the most up to date construction plan and assess potential impacts following the assessment approach outlined within the IAQM guidance<sup>7</sup>. This will confirm the site-specific mitigation measures that will be required. These will be implemented through the CoCP and site-specific CEMPs which would form part of the DCO and therefore become a requirement.

Air quality mitigation will be implemented through the following:

- **CoCP** - an overarching document governing construction practices across all sites within our development proposals, an outline of which is included within the PEI
- **Construction Traffic Management Plan (CTMP)** – to manage construction vehicle movements to minimise disruption on the public highway, an outline of which is included within the PEI
- **Air Quality Management Plan (AQMP)** – to manage air quality emissions from construction, this will include a dust management plan
- **Waste Management Plan (WMP)** – to manage activities during construction to minimise waste (and associated vehicle movements).

---

<sup>7</sup> Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. [www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf](http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf)

### Tertiary mitigation (inexorable - regulation)

There is also a legal requirement to control pollutant emissions from construction under regulations such as the Environmental Protection Act 1990<sup>8</sup>.

### **In operation**

#### Primary mitigation (inherent mitigation)

The design will include mitigation measures to minimise effects on air quality and management measures will be in place to further avoid or minimise the impacts during operation so that people and ecological receptors are not significantly affected by our Proposed Development. The following measures will minimise the impacts on air quality:

- the layout of the site to position the exhaust stacks and flare as far from sensitive receptors as is practical
- the exhaust stacks to be designed to promote dispersion of pollutants (set at an optimum height).

#### Secondary mitigation (foreseeable)

We will produce an **Operational Travel Plan** to reduce the movements of operational vehicles on the public highway and limit movements during peak traffic times. Measures within the travel plan are primarily to reduce the traffic impacts from our Proposed Development but this will also have a positive impact on air quality.

### Tertiary mitigation (inexorable - regulation)

Regulatory requirements also serve to prevent adverse air quality impacts. All potential sources of emissions associated with the proposed WWTP will comply with relevant legal requirements. For example, where applicable, the CHP and boiler plant will meet required stringent emission standards that are prescribed within UK law. These will be specified within a site-specific Environmental Permit, which will be issued by the Environment Agency. This Permit will put limits on all stationary emissions to air from the Proposed Development.

## **What might the likely significant effects to air quality be in relation to the proposed relocation of Cambridge Waste Water Treatment Plant?**

The air quality in the vicinity of the Draft Scheme Order Limits is monitored at multiple locations demonstrating that existing concentrations of monitored pollutants are within the national air quality objectives.

---

<sup>8</sup> Parliament of the United Kingdom (1990) Environmental Protection Act 1990

We have estimated that traffic movements for construction and operation are low relative to the flows on the surrounding roads and therefore we do not anticipate significant air quality effects on people or ecological receptors from traffic emissions.

Following the application of best practice mitigation, which will be identified during the assessment phase, impacts from construction dust will be temporary and the effects on people and ecological receptors are not expected to be significant.

In the case of operational emissions, the regulatory requirements to meet stringent emission levels and our use of best practice design when determining stack heights and positioning the boilers and CHP is expected to mitigate significant effects. The Environment Agency will regulate operational emissions to air from the site through an Environmental Permit which will include conditions to avoid significant air quality effects.

The above assumptions of significance will be fully assessed and confirmed within the EIA.

## References

Environmental Protection UK and Institute of Air Quality Management (January 2017), 'Land-Use Planning and Development Control: Planning for Air Quality' version 1.2

Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. [www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf](http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf)

Defra (2012) The National Policy Statement for Waste Water (2012): Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-waste-water> Parliament of the United Kingdom (1990) Environmental Protection Act 1990