

Cambridge Waste Water Treatment Plant Relocation Project



Preliminary Environmental Information
(PEI) – non-technical summary
February 2022

www.cwwtpr.com

Contents

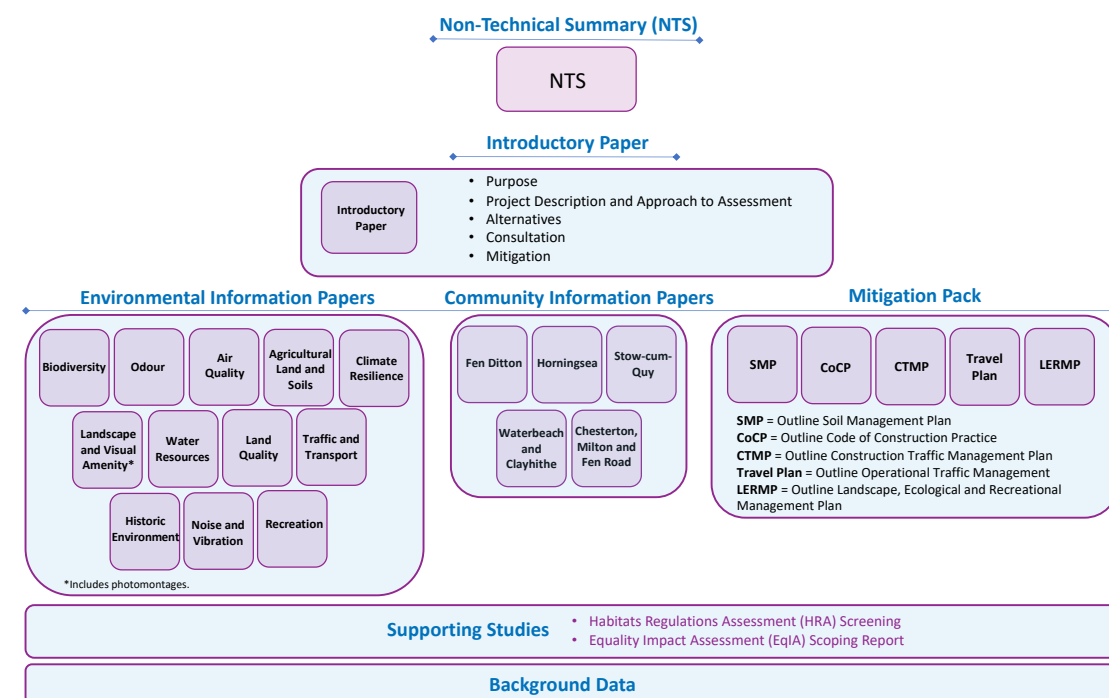
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1. Introduction

This document is a non-technical summary of the Preliminary Environmental Information for Cambridge Waste Water Treatment Plant Relocation Project (“the Project”). It forms part of our consultation documentation, issued in advance of our proposed application for a Development Consent Order (DCO) for the Project.

The DCO process requires an applicant to provide Preliminary Environmental Information (PEI) to consultees so that they develop an informed view of the “likely significant environmental effects” of any proposals.

The PEI is presented as a series of papers, summarised on the document map below. PEI has also been summarised digitally and can be accessed via the Project’s website: www.cwwtpr.com.



It is important to note that the information is “preliminary” and may be subject to change as the Project’s design evolves. Anglian Water is seeking consultees’ comments to inform both the final design of the Project and the further development of environmental mitigation. All comments received from consultees on the PEI will be taken into account before we submit our DCO application, which will be accompanied by a full Environmental Statement, providing the findings of the Environmental Impact Assessment process, and a Consultation Report, showing how consultation responses have been taken in account.

You can comment on the Phase Three Consultation via the website here www.cwwtpr.com. For those unable to access materials digitally, hard copy materials are available at Community Access Points and via post by request.

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1.1 How have we identified “likely significant environmental effects”?

An environmental effect is typically a function of the “importance”, “value” or “sensitivity” of the receptor or resource (for example habitats for wildlife, a watercourse or a community amenity) and the “magnitude” or “scale” of the impact, meaning the change as a result of the proposed development. For some types of environmental impact, such as potential effects on landscape character or heritage assets, the assessments rely on professional judgement, drawing on technical guidance, to assess the significance of effects.

More information on the process used to identify likely significant environmental effects can be found in our scoping report, available here, and in the introduction to the PEI.

1.2 How do we propose to avoid and/or reduce negative impacts?

“Environmental mitigation” is the process of addressing impacts to the environment arising from the Project. This mitigation will be secured through the final scheme design or requirements of the Development Consent Order which grants permission for the Project to be built. The Preliminary Environmental Information papers and mitigation pack present outline details of different types of mitigation. We are especially interested in getting feedback from consultees on the mitigation we are proposing.

1.3 How have we consulted with the community, landowners and stakeholder organisations in relation to environmental effects and mitigation?

We held our Phase Two Consultation on our proposals between 23 June and 18 August 2021. A summary of the feedback from Phase two Consultation can be found here: <https://cwwtpr.com/document-library/>

In addition, Anglian Water has established several Technical Working Groups with key technical stakeholders as part of the project’s pre-application consultation process. We have also established a Community Working Group, with an independent Chair, which meets with representatives from parish councils and local community groups. These groups have contributed to the shaping of the Project and the development of mitigation. We have also discussed the Project proposals with landowners, which has allowed us to better understand their concerns and how the land is used on and around the Project.

1.4 How have we managed the potential impact of Covid-19 on our survey baseline conditions such as traffic and noise?

Stakeholders have expressed concern that the abnormal traffic conditions which arose during the Covid-19 lockdowns may not have represented an accurate sample of traffic movements. As well as reviewing historic data dating back to January 2016, to address this concern we also carried out additional traffic surveys in early December 2021 and will continue to review whether further surveys are required. We have agreed our approach to data collection and surveys with the local highway authority, Cambridgeshire County Council and with National Highways. Noise surveys used to determine the baseline for the Project were also completed over the winter of 2021. The ambient and background noise and air quality levels collected are considered to be suitably representative.

2. Project description

This section sets out a description of the Project comprising information on the site, design, size and other relevant features of the development.

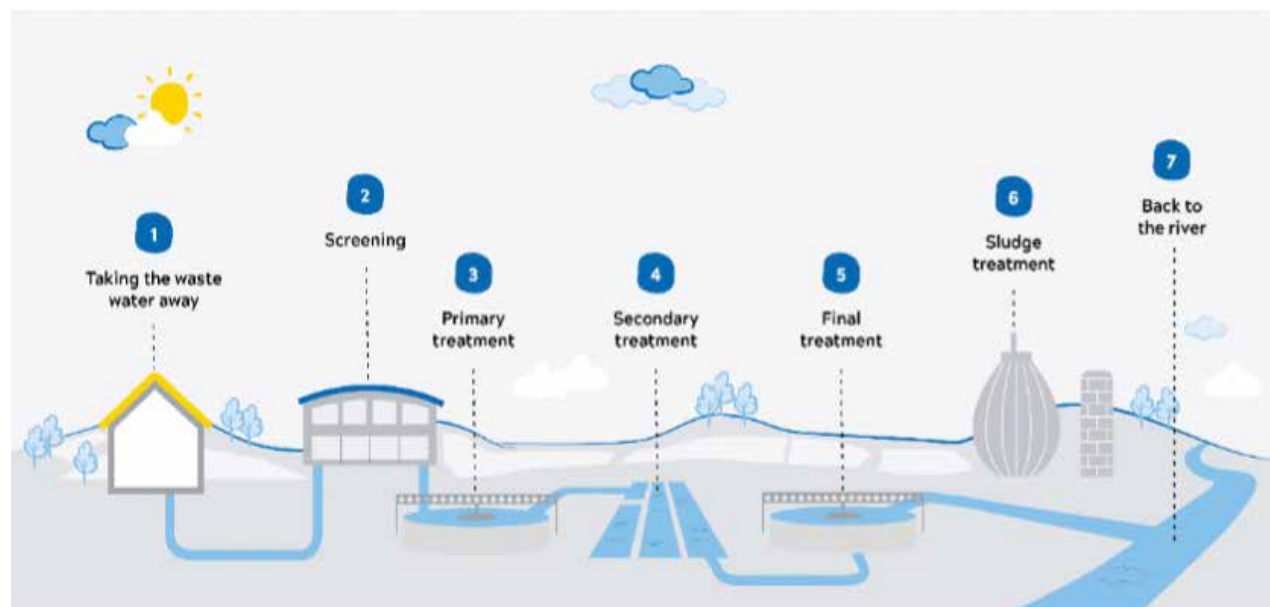
2.1 Project purpose

The Project comprises the relocation of the Cambridge Waste Water Treatment Plant (WWTP) from its existing site on land adjoining the north eastern side of the city of Cambridge, to a new location. The relocation is required to support the delivery of South Cambridgeshire District and Cambridge City Councils' Area Action Plan for a new low-carbon city district in North East Cambridge, which could create 8,350 homes and 15,000 jobs over the next 20 years.

The proposed development of Waterbeach New Town lies to the north of Cambridge. The Waterbeach new town development when built out will comprise some 11,000 new homes along with associated business, retail, community and leisure uses. Increased flows from the development of Waterbeach New Town will be transferred to the proposed WWTP. This will require a new pipeline from Waterbeach.

2.2 How will waste water and sludge be treated at the relocated Cambridge WWTP?

The proposed relocated Cambridge WWTP will treat all waste water and wet sludge from the Cambridge catchment just as the existing Cambridge WWTP currently does, plus that from population growth predicted to occur within the catchment to 2041. Flexibility in the plant design will allow growth into the 2nd half of the century to be accommodated, all within the proposed footprint.



The image above provides an overview of the treatment process steps proposed for waste water and sludge which is explained below.

1. The existing Cambridge WWTP receives waste water from the Cambridge catchment either directly from the connected sewerage network or tankered to the plant from homes and businesses that are not connected.
2. This waste water is then screened to remove solids such as grit from road run-off, and large nondegradable objects (such as nappies, face wipes and plastic bags).
3. The screened waste water then flows to primary treatment where a large proportion of the solid organic matter is separated from the water by allowing it to gravitate to the base of the primary settling tanks. The settled solids are pumped to the sludge treatment centre for further treatment and a weir near the top of the tanks then transfers the flows to the secondary treatment stage, which contains further settlement tanks.
4. Secondary treatment is the biological treatment process which relies on bacteria to further break down the solids. For the proposed WWTP the current proposal is to utilise a modern membrane aerated bioreactor (MaBR) configuration to ensure low energy utilisation for maximum oxygen transfer, however other process options remain a potential.
5. Final treatment, which incorporates a tertiary treatment plant, provides the finest grade of treatment to ensure the effluent complies with discharge consent limits.
6. Both the existing Cambridge WWTP and the proposed WWTP have been designed as “integrated treatment plants” incorporating a sludge treatment centre (STC). The STC treats the sludge derived from the waste water being treated at the plant and the “wet sludge” produced by other satellite plants which do not have an integrated STC. The sludge treatment process produces nutrient rich biosolids cake for use as bio-fertiliser for spreading on agricultural land and produce energy via anaerobic digestion as biogas is produced as a by-product.
7. The treated effluent is discharged through an outfall to the nearby River Cam. Both the quality and quantity of this treated effluent is monitored by the Environment Agency.

2.3 Construction timeline

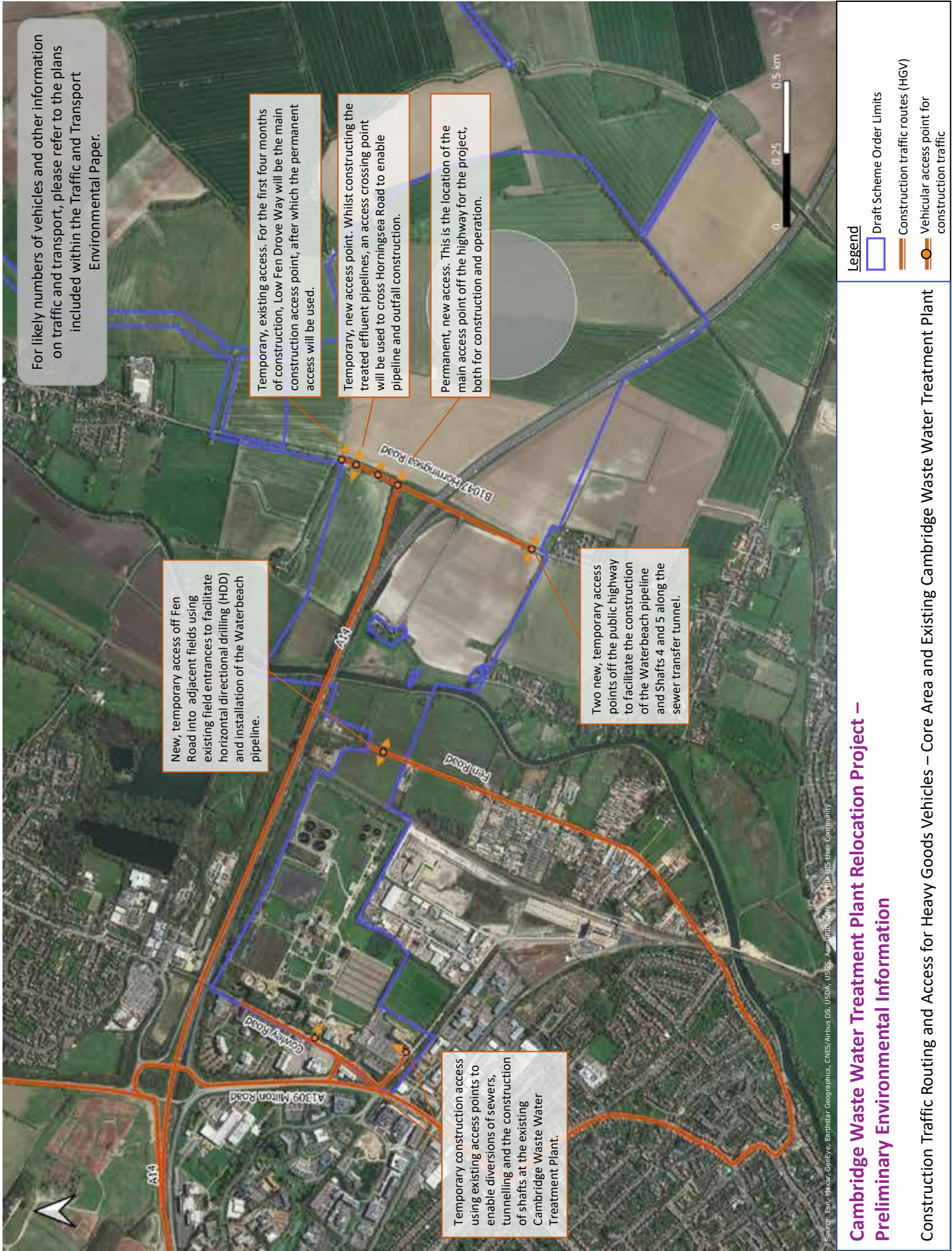
During construction of the proposed WWTP the existing Cambridge WWTP and existing Waterbeach WRC would remain in operation.

The earliest construction is expected to start is in 2024, with the Waterbeach pipeline works. The proposed WWTP is planned to be fully operational in 2028. Indicative durations of construction activities are outlined below. The indicative programme is preliminary only and will be updated in the Environmental Statement accompanying the DCO application.

Construction Phase	Duration	Start	End
Waterbeach works including enabling works & mobilisation and decommissioning of the Waterbeach WRC	12 months	Apr-2024	Apr-2025
Enabling works & mobilisation for non-Waterbeach elements	3.5 months	Aug-2024	Nov-2024
Water Recycling Centre including water testing and dry commissioning	31 months	Oct-2024	Mar-2027
Sludge Treatment Centre including water testing and dry commissioning	19 months	Nov-2024	Jun-2026
Wet Commissioning	5.5 months	May-2027	Feb-2028
Transfer Tunnel	18 months	Nov-2024	Jun-2026
Treated and storm Effluent Main and outfall	14 months	Jul-2025	Aug-2026
De-Commissioning existing Cambridge WWTP	8 months	Oct-2027	Mar-2028

2.4 Construction traffic and access

Construction traffic and access information is annotated on the plans below showing the routes construction traffic would use and the access points into working areas from the public highway.



2.5 Construction activities

Construction activities are described on the annotated plans provided showing the working areas associated with the indicative locations of construction activities. The plans within the Environmental Information Papers add details which define durations of activities where these are relevant to defining impacts such as noise and traffic movements.





Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Working Areas During Construction – Waterbeach Pipeline Route

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Construction traffic vehicular access point
- Waterbeach pipeline working area
- Pipeline installed using open cut methods
- HDD pipeline install below ground, unless otherwise stated

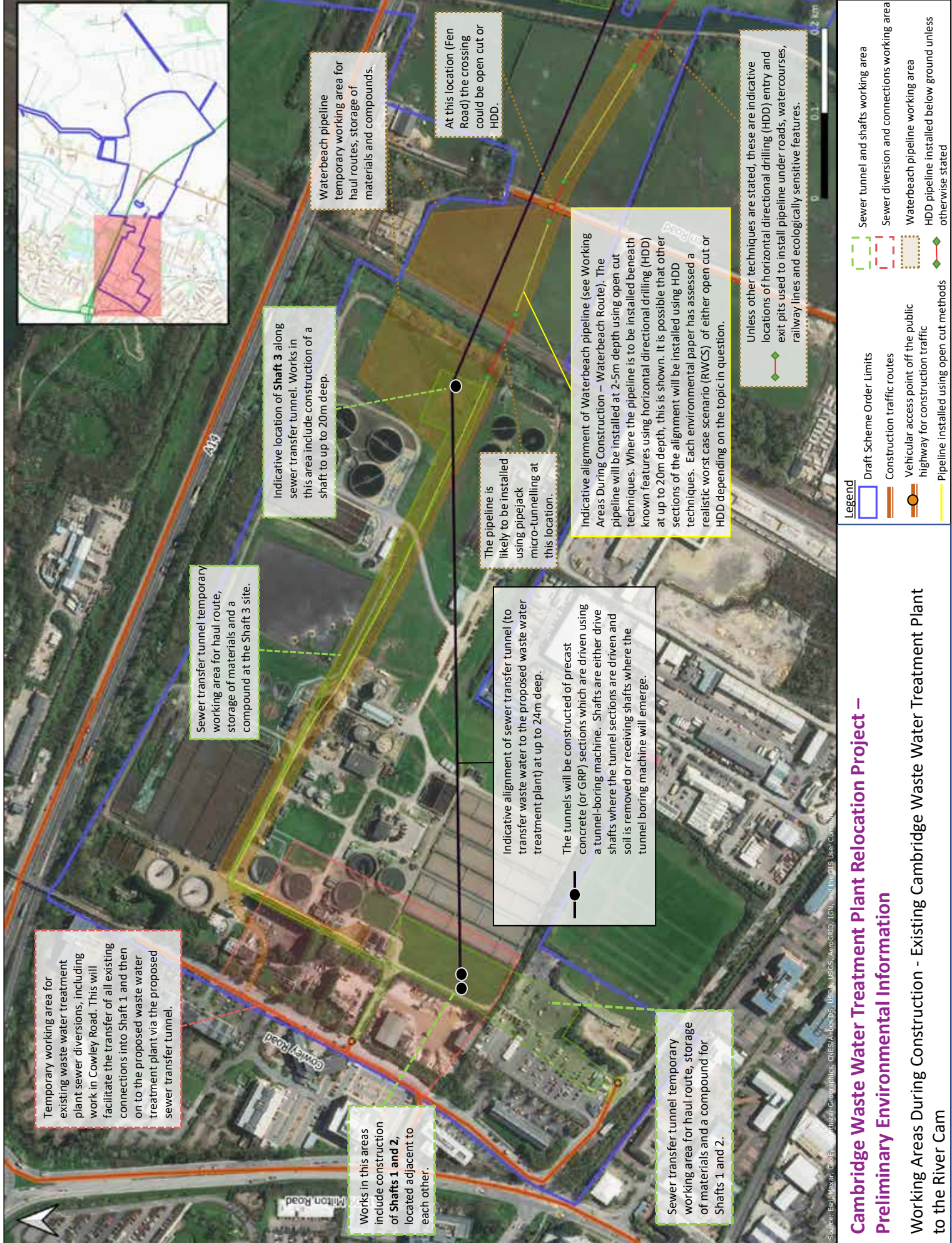
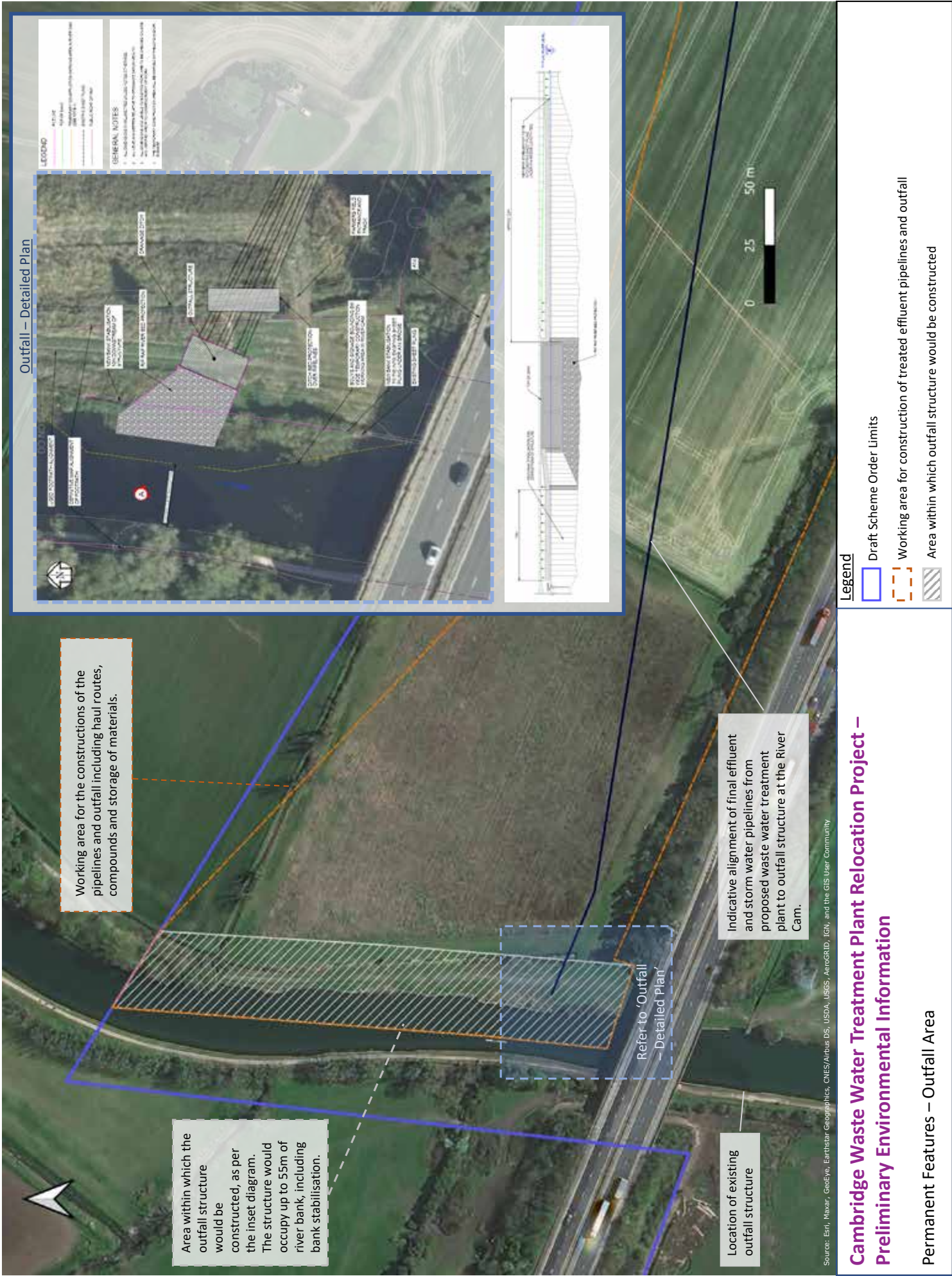


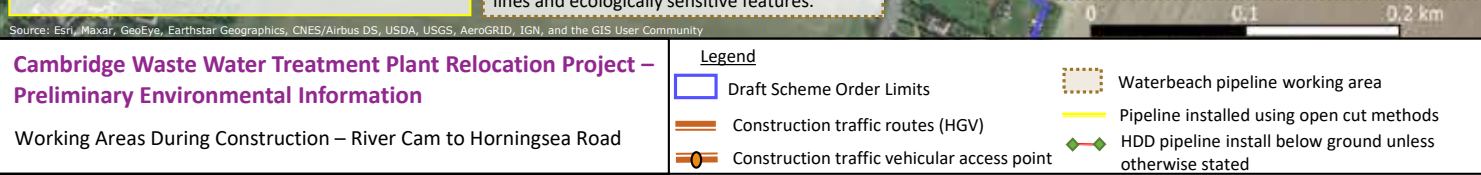
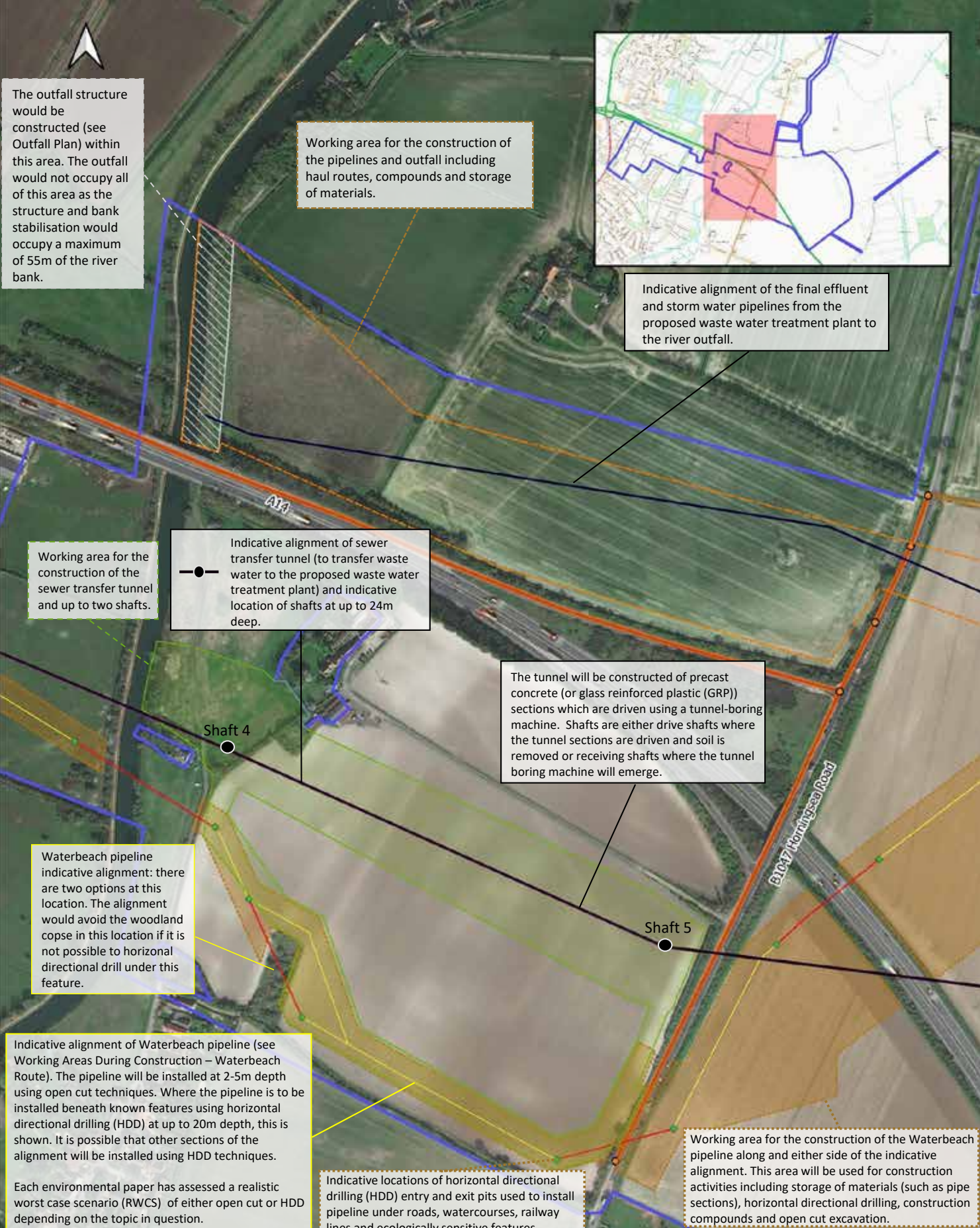
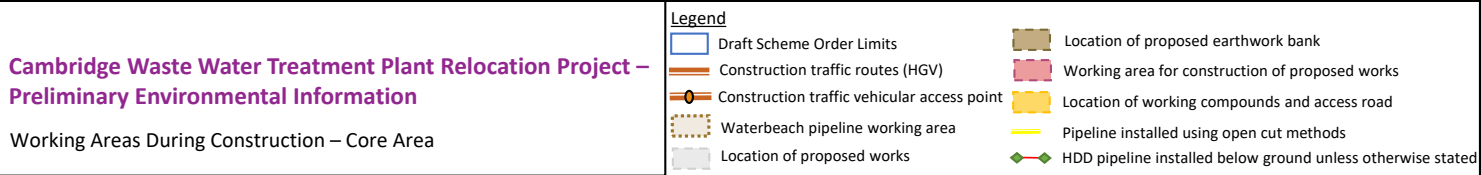
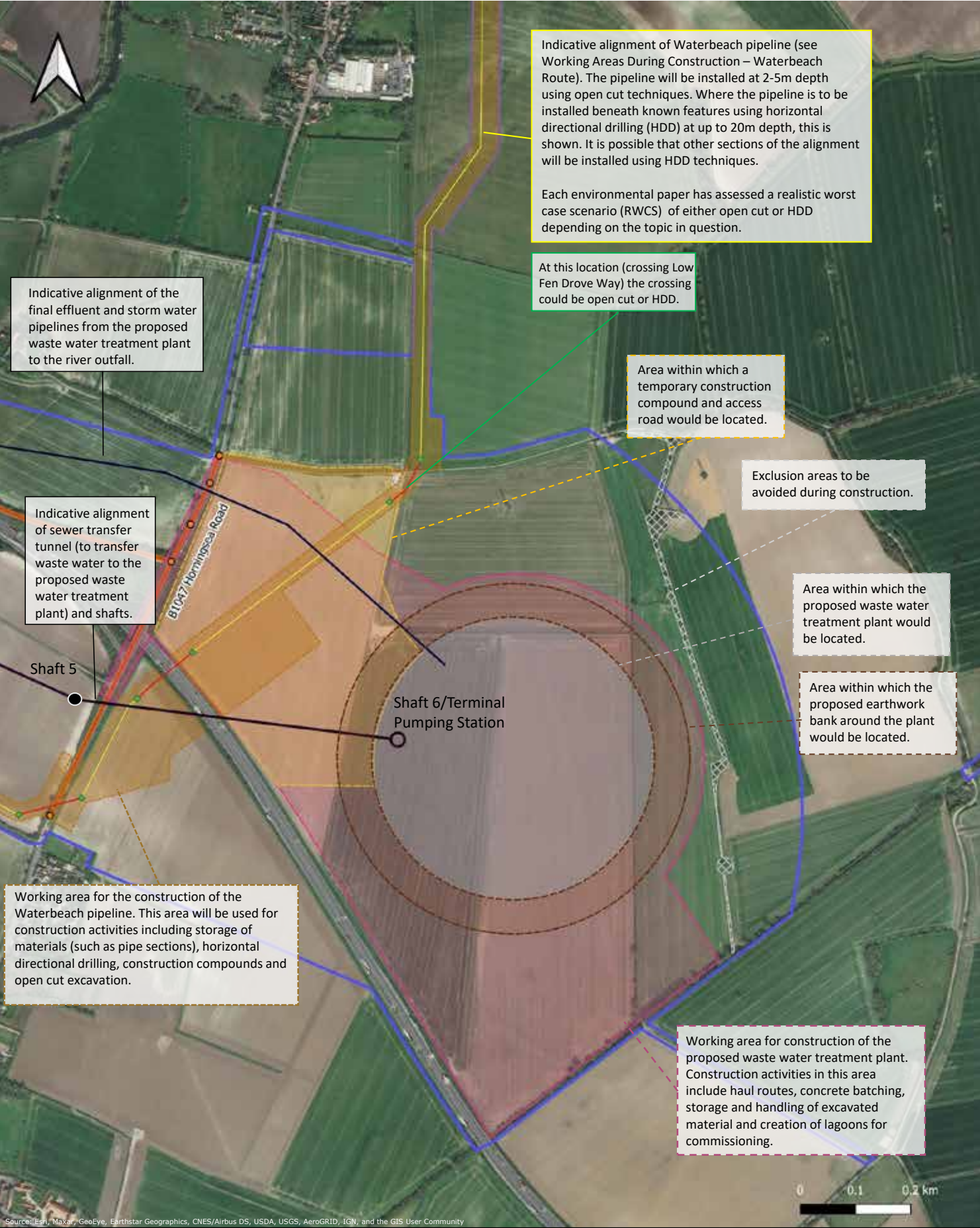
Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Construction Traffic Routing and Access for Heavy Goods Vehicles – Waterbeach Pipeline Route

Legend

- Draft Scheme Order Limits
- Construction traffic routes (HGV)
- Construction traffic vehicular access point

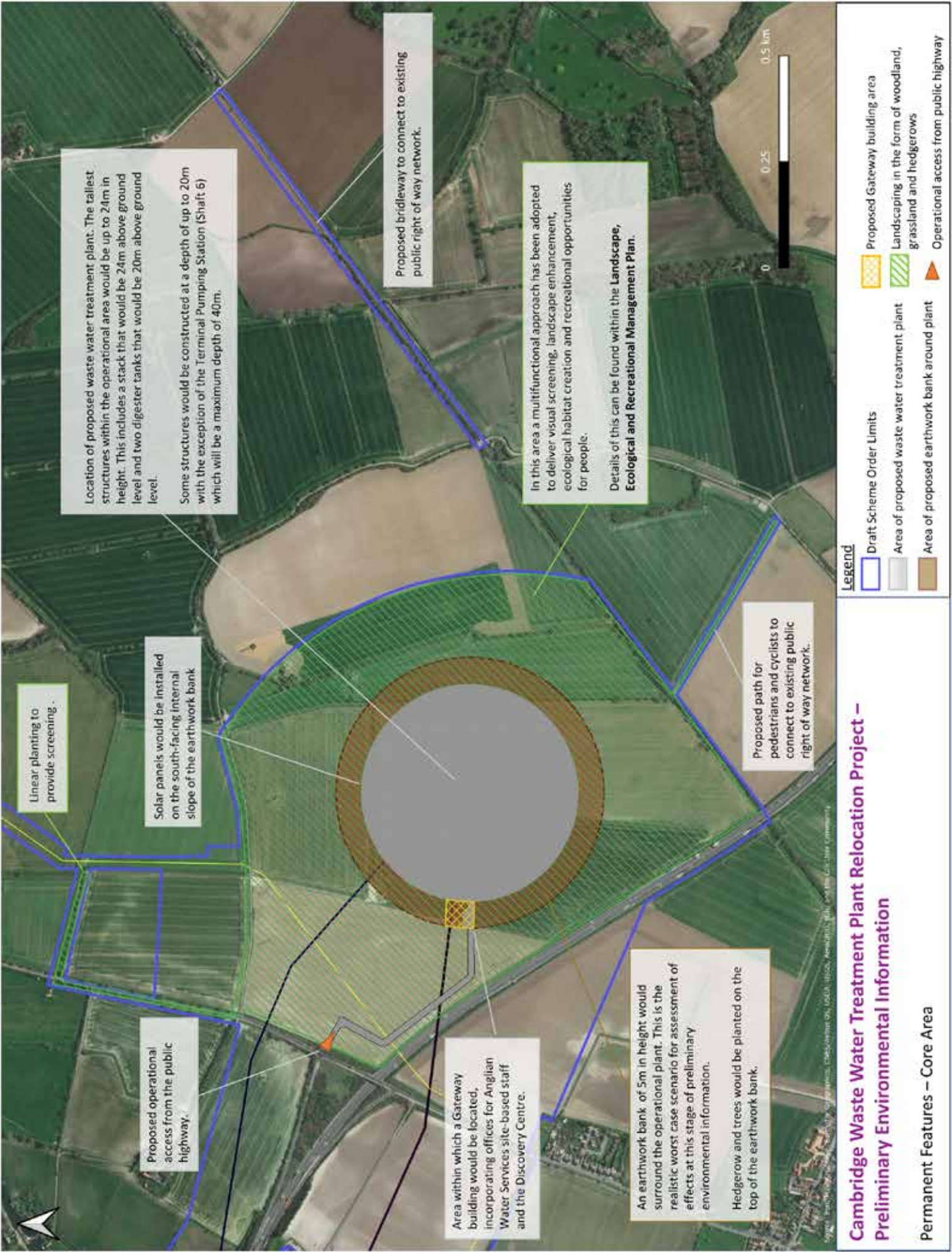




2.6 What are the permanent features of the proposed WWTP, once operational?

The permanent features of the proposed WWTP are shown on the annotated plan below.

All of the land temporarily used in construction for the laying of pipelines, soil handling, siting of construction compounds, haul roads etc will be reinstated. Land will be reinstated as construction areas are demobilised including works such as returning land to previous levels, reseeding areas and replacing hedgerow sections where these were affected by a pipeline route. Once demobilised from the area bounded by Low Fen Drove Way and the A14 the main landscape planting work will also be possible, leading to the delivery of the landscape masterplan involving tree planting, grassland and other habitats and pathways and places for people.





Cambridge Waste Water Treatment Plant Relocation Project – Preliminary Environmental Information

Permanent features of the CWWTPR project

Legend

- Draft Scheme Order Limits
- Indicative air vent locations along sewer tunnel alignment
- Indicative location of permanent outfall structure
- Direction of pipeline 'flow'

Landscape plan



Aerial plan showing landscape proposals for our site

More information on these proposals is available in our Landscape, Ecological and Recreational Management Plan (LERMP) and PEIR.

3. Alternatives

This section sets out a description of the alternatives to the project proposals studied by the Anglian Water. Alternatives were considered as part of the following activities:

- Site selection
- Confirmation of plant footprint
- Selection of treatment process
- Selection of preliminary concept design
- Location of concept design within selected site
- Selection of preferred vehicular access
- Further design refinement

3.1 Site Selection

The site of the proposed WWTP was selected on completion of an in depth four-stage process of assessing potential sites. The first three stages of this process were consulted on during our first consultation. Full copies of the site selection reports are available in the document library on the CWWTPR website: <https://cwwtpr.com/document-library/>.

The study stages (Stage 1 Initial Site Selection, Stage 2 Coarse Screening, Stage 3 Fine Screening and Stage 4 Final Site Selection) were used to assess location options in increasing levels of detail, each building on the findings of the previous stages. Less suitable options were eliminated at each stage resulting in the identification of the best performing site to progress through the consultation and environmental impact assessment processes required for a DCO application.

After consultation on three short-listed sites following Stage 3 (Fine Screening) we progressed to the final site selection (Stage 4).

The Stage 4 assessment used the information collated during the first stages of the site selection process combined with the results of further technical feasibility assessments, initial environment walkover surveys and phase one non-statutory public consultation to assess each of the site area options against one another.

The site finally selected was considered to represent the best performing site area. It was considered that it presented the greatest opportunity to deliver a development that incorporates wider benefits, rather than seeking to solely mitigate negative impacts, would contribute to Anglian Water's corporate objectives and would address many of the concerns raised by the local community and stakeholders.

Having selected the site, the design and layout of the site was refined further.

3.2 Selection of treatment processes

The treatment processes and technologies outlined in the project description have been selected through a series of "Risk, Opportunity and Value" (ROV) studies and workshops. This technical analysis considered a wide variety of technologies, concluding that Membrane Aerated Biofilm reactor technology (MABR) for secondary treatment represented a well-balanced outcome, considering a wide number of factors including carbon, reliability, odour profile, capital cost, operational cost, and operational complexity. However, the final choice of technology will be kept under review and enhanced activated sludge processes (ASP) remain under consideration.

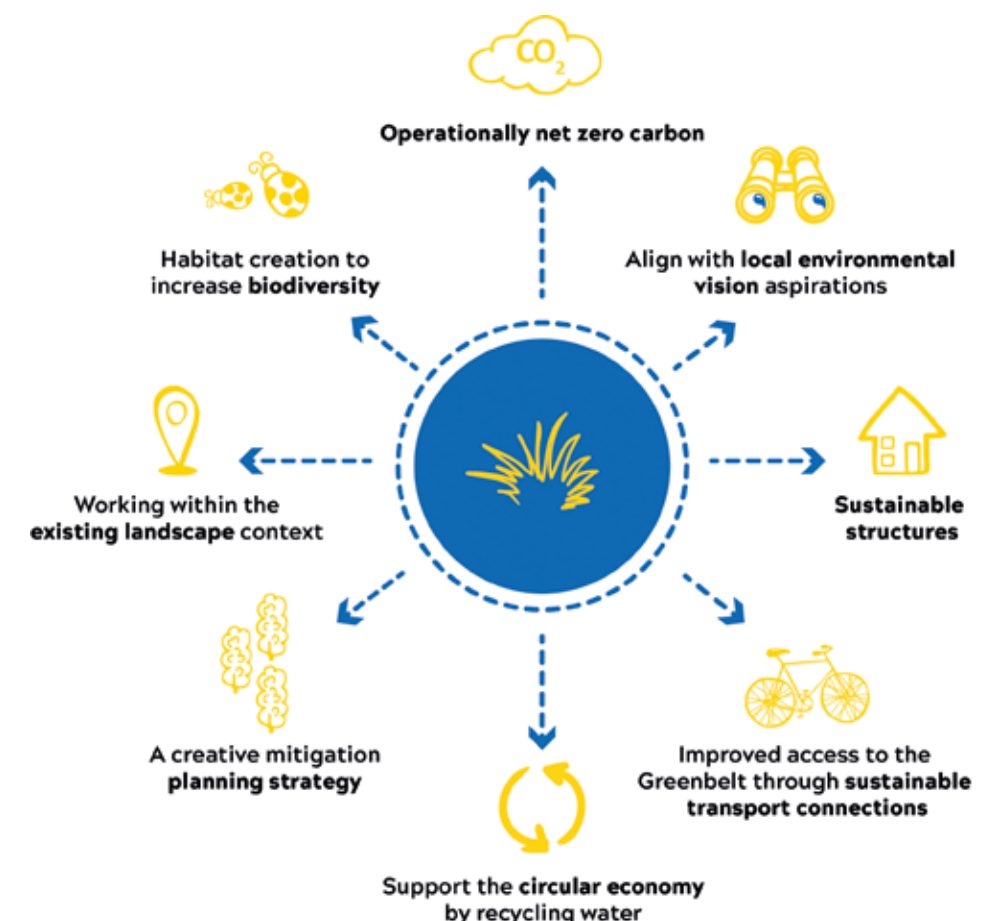
3.3 Development of Preliminary Concept Design

Guided by Anglian Water's purpose and wider commitments, and the National Infrastructure Commission's Design Principles for National Infrastructure we developed a set of project level design principles, as follows:

- to create a modern, low carbon waste water treatment plant
- to reduce the footprint of the new plant to 22 hectares, which is about half the size of the existing plant
- to create a strong identity for the site while screening the facility and reducing visual impacts on the surrounding community and landscape
- to re-use excavated material on site which can be used to screen the facility and also reduce the carbon and traffic impact from construction
- to minimise odour by incorporating solutions to address it at source and using best operational practices
- to reduce harmful carbon emissions through sustainable design, helping address climate change
- to increase biodiversity by creating new wildlife habitats
- to improve access to the countryside with new paths and accessible open spaces; and
- to connect the site into the wider landscape and establish new wildlife corridors.

Subsequently, guided by advice from architects, landscape architects, ecologists and other design professionals, further environmental objectives for the project design were developed, as shown in the figure below. We also developed a design narrative, which is set out in the Landscape, Ecology and Recreation Masterplan (LERMP), which forms part of the PEI.

Following further advice from the Design Council, including formal design panel review from independent built environmental experts of the three concept designs, and consultation with a number of technical stakeholders, a "rotunda" concept design was selected for the Project.



3.4 Vehicular access

In parallel with the design processes outlined above, a range of potential permanent vehicle access options to the site were explored, including through engagement with National Highways (formerly Highways England) and Cambridgeshire County Council as the relevant highway authorities. Issues considered as part of this work included the safety of road users, the management of potential disruption to local communities and the existing road network and project economics (the relative costs of different options). As a result of this work, three potential permanent access options were taken forward to Phase Two Consultation (June to August 2021).

These were:

- Option 1: Access off Junction 34 of the A14 (Fen Ditton) which consisted of two sub options (1A and 1B);
- Option 2: Access off Junction 35 (Quy); and
- Option 3: A new junction on the north side of the A14.

Highway and transport technical advice concluded that:

- There were significant Department of Transport (DfT) policy challenges to the delivery of Option 3.
- National Highways and Cambridgeshire County Council, as the relevant highways authorities, advised throughout the early consultation on the site access assessment that Option 3 did not pass the policy tests of DfT Circular 02/2013.

A highway safety audit concluded that all the options considered could be safely delivered.

Option 1 was found to be the best performing access option in comparison to Options 2 and 3 across a range of other, non-highways, criteria including land use, biodiversity, green belt, air quality, carbon, operational management, and cost.

Option 1 was therefore selected as the preferred permanent access option for the project. This option has subsequently been refined, as presented in the Phase Three consultation materials.

3.5 Climate resilience

The design of the proposed WWTP has taken into account the potential effects of the changing climate into the 2080s.

Climate change will mean changes in annual and seasonal averages as well as an increase in the frequency and intensity of extreme weather events such as storms, high winds, and heavy rainfall. As well as higher average maximum and minimum temperatures, we are likely to see more frequent heatwaves, with the temperature on the hottest days of the year increasing more than the average values.

4. Likely significant environmental effects

4.1 Overview

The relocation of Cambridge WWTP has been recognised by the Secretary of State for Environment, Food and Rural Affairs as being a Nationally Significant Infrastructure Project. It will be a large-scale construction project spanning several years.

The construction of the Project will give rise to temporary changes to traffic volumes and types as well as noise and vibration. It will also be visible at this time, particularly because landscaping and planting will not have fully established. These changes are likely to affect community amenity.

The scale of the infrastructure needed to ensure the long-term resilience of waste water treatment capacity in Greater Cambridge inevitably means impacts will be felt. Anglian Water recognises and are sensitive to the community's concerns and questions about this. To assist with understanding these potential impacts, we have presented them both by topic and by community areas. Mitigation to avoid or reduce these construction impacts is presented, supported by a draft set of management plans for consultation.

Once operational the proposed Cambridge WWTP will continue to be visually prominent as a large infrastructure project with associated operational changes such as traffic movements. Mitigation for these impacts is also presented, supported by a draft set of long-term operational management plans for consultation, including a Landscape, Ecological and Recreational Management Plan (LERMP).

4.2 Communities

Change in views

There would be significant visual effects during construction on views from or close to Horningsea Road, High Ditch Road, Low Fen Drove Way, on Public Rights of Way (PRoW) and from isolated residential properties along the Waterbeach pipeline route. The construction works will be prominent in some views over the farmland.

Some changes in views will be temporary only – for example following the construction of the buried pipelines and tunnels and the re-instatement of the agricultural land those elements would not be visible. However, the visual impact of the proposed WWTP would remain significant at the commencement of the plant's operation, reducing over time as the tree, hedge and scrub planting became more established. By year 15, when the planting scheme would be mature, impacts would potentially remain significant on a small number of receptors on Horningsea Road (through hedgerow gaps), High Ditch Road and Low Fen Drove Way due to the prominence of the proposed WWTP in views and the shortening of long views over the open landscape arising from woodland planting.

Photomontages have been produced to show the changes in time from selected locations, an example from a viewpoint on Horningsea Road in year 1 and year 15 of operation is shown on the following pages. These images were created to be viewed at A3. The PEI on landscape impacts provides further photomontages together with advice on how the photomontages should be viewed.

View east from Horningsea Road near Low Fen Drove Way (year 1)



Verified photomontage year 1 (planar projection, field of view 39.6 degrees x 27 degrees, to be viewed at A3)

View east from Horningsea Road near Low Fen Drove Way (year 15)



Verified photomontage year 15 (planar projection, field of view 39.6 degrees x 27 degrees, to be viewed at A3)

Fen Ditton

During the construction period additional traffic and congestion could occur along Horningsea Road and adjoining roads, contributing to temporary delays as well as affecting pedestrians and cyclists, including those travelling to Fen Ditton Primary School. A limited number of construction vehicles will use Horningsea Road south of the A14 to access tunnelling and pipeline works. Some residents may also experience temporary noise, vibration, and visual impacts during construction of these works, including around Red House Close and Poplar Hall.

In the long term, the proposed WWTP may be visible from some locations. The PEI landscape paper presents photomontages for views from High Ditch Road and from the Horningsea Road bridge over the A14. Other viewpoints will be considered as part of the ongoing EIA process and presented as part of our DCO application.

Our Landscape Masterplan proposals are intended to benefit the wider local area. These benefits are further outlined in the Recreation Environmental Information Paper.

Horningsea

Although none of our construction traffic will enter Horningsea Village, there will be construction vehicle access to the north (accessed via the A10) and south of Horningsea, which may cause temporary journey delays for road users during the construction phase. Some locations, including land around Low Fen Drove Way, Horningsea Road, Biggin Abbey and The Gatehouse, may be affected by visual impacts during the construction of the Project. Combined traffic, noise and visual effects associated with construction activity are likely to arise in some locations. The new outfall structure on the bank of the River Cam will lead to a temporary diversion of footpaths south of Horningsea, which may impact users' amenity and convenience. The construction of the Waterbeach pipeline to the east of Horningsea Village may also affect residential amenity temporarily.

The location of the proposed WWTP means that there will be few properties close to the WWTP component of the Project, meaning any operational noise or odour effects are not expected to be significant. Mitigation measures have been identified to minimise any adverse visual effects, although some of these will not become fully effective until landscaping and planting has matured. Some limited advance planting of trees and hedgerows will help to reduce the immediate prominence of the Proposed Development in views following construction.

In the PEI landscape paper a number of photomontages are presented for views from the Horningsea area, including from near Biggin Abbey, from Horningsea Road, from Low Fen Drove Way and from footpath 130/6, around 1km from the site boundary.

The footway and cycleway along Horningsea Road will be improved as a result of the Project. Further community benefits include improved recreational access arising from our Landscape Masterplan proposals. These benefits are further outlined in the Recreation Environmental Information Paper.

Stow-cum-Quy

Construction impacts on residents of Stow-cum-Quy, other than visual impacts, are unlikely to be significant. During construction and operation, the changes to the existing farmland would be largely screened from views from the village and adjoining properties, and therefore have minimal impact on the landscape in this location. In the long term, the Landscape Masterplan proposals will benefit the local area, including the community of Stow cum Quy. Direct access to Low Fen Drove Way and footpaths to Fen Ditton and the River Cam will be improved by the provision of the new bridleway.

Waterbeach and Clayhithe

The communities of Waterbeach and Clayhithe are located closest to the Waterbeach pipeline component of the Project. During construction, there is anticipated to be increased traffic around the local road network in Waterbeach and along Clayhithe Road. Residents and community facilities on the roads where construction traffic routes are proposed may experience a combination of changes from an increase in traffic and construction noise. Measures have been identified to avoid or reduce impacts during construction. These measures will be secured via management plans including a Construction Traffic Management Plan and Code of Construction Practice.

Following construction there is unlikely to be any significant long-term effect. The pipeline will be buried and agricultural land re-instated. Long distance views of the WWTP itself will be limited and likely only fleeting. The PEI does not present a photomontage of the proposed WWTP from Waterbeach; the ongoing EIA process will consider likely long-term visual impacts in more detail. However, the photomontage in the PEI showing the view south from footpath 130/6 near Horningsea provides a useful indicative and preliminary indication of such longer distance views.

Chesterton, Milton and Fen Road

During construction, there may be potential delay and disruption to the community from construction vehicles using roads to access construction sites. This could result in temporary traffic delays. Construction traffic will also be present on Cowley Road and Fen Road.

Measures have been identified to avoid or reduce impacts during construction. These measures will be secured via management plans and include a Construction Traffic Management Plan and Code of Construction Practice.

Once operational the working areas will be reinstated and therefore there will be no longer term impacts.

4.3 Recreation - walkers, cyclists and horse riders

Temporary adverse effects on users of public rights of way (PROWs) may arise during the construction phase, as described in the community sections above.

At the end of the construction period the provision of new paths and recreational areas within the landscaped setting of the plant, and a new bridleway linked Low Fen Drove Way to the wider PROW network serving Quy Fen and Anglesey Abbey, may give rise to significant beneficial (positive) effects.

4.4 Recreation - users of the River Cam

Significant adverse temporary effects are likely for users of the River Cam due to disruption during construction of the outfall structure near the A14 bridge over the river.

The works at this location is likely to take up to 3 months. The outfall construction will require temporary restrictions along a 50m stretch of the Cam, reducing the navigational width from over 20 metres to approximately 12 metres during the works. This narrowing is needed to ensure a safe working area and will be marked out by a string of buoys in the river. The River Cam will remain navigable throughout.

Phasing and management of works to minimise the impact of construction on specific events in the rowing calendar. This will be discussed and agreed with stakeholders including event organisers as part of the community engagement strategy.

Users of the Cambridge Sailing Club and Cambridge Motorboat Club are likely to experience temporary noise, and potentially visual impacts, during installation of the Waterbeach pipeline underneath the River Cam by horizontal directional drilling, but navigation will not be affected.

The sections of riverbank within which construction activities are proposed will result in temporary disturbance to the river (noise, presence of construction, visual changes) which may deter use by anglers. Due to this temporary disturbance, anglers may experience a short-term temporary disturbance and may not to choose to fish in locations close to construction activities.

Once construction of the outfall and the Waterbeach pipeline under the River Cam is complete there are not anticipated to be any significant operational impacts on river users from the project.

4.5 Landscape and historic environment

Eastern Fen Edge Landscape Character

As with the construction of any infrastructure project there will be significant landscape effects, in this case on the Eastern Fen Edge Landscape Character Area. The Eastern Fen Edge is an open landscape of low-lying farmland separated by drainage ditches, hawthorn hedges, tree-lined farm tracks and woodland belts. This is a rural area where the introduction of a large-scale construction works will change the character of the farmland. Once constructed the introduction of the large-scale infrastructure into the rural area would change the character of the Eastern Fen Edge Landscape Character Area. Adverse landscape effects would reduce by year 15 of operation, but they would potentially remain significant on the Eastern Fen Edge Landscape Character Area due to the presence of large-scale infrastructure and introduction of more woodland in the currently open landscape.

The Landscape Masterplan

The Project would result in adverse landscape effects during construction and operation. These effects would be reduced through the implementation of a landscape masterplan which aims to create a green setting for the proposed waste water treatment plant that would contribute positively to the local landscape context. It responds to the landscape guidelines in the Greater Cambridge Landscape Character Assessment (2021) with new hedgerows, woodland and tree belts, linear sustainable drainage features and substantial new areas of grassland.

Built heritage

There will be indirect temporary effects during construction on Biggin Abbey, Poplar Hall, the Fen Ditton Conservation Area and the Baits Bite Lock Conservation Area. The magnitude of these effects is likely to be minor, but as the assets are of high value, the significance of effect is considered to be moderate to slight. This is due to the presence of construction compounds, cranes and other activity within or within the setting of these assets.

The heritage value of Biggin Abbey and, to a lesser extent, Baits Bite Lock Conservation Area will be impacted by permanent changes to their setting. The introduction of the proposed WWTP into the agricultural landscape surrounding Biggin Abbey will adversely affect the rural setting which contributes to the property's heritage value. The PEI includes a photomontage of the view east from Biggin Abbey towards the proposed WWTP.

Archaeological remains

Extensive archaeological surveys have taken place on the site of the proposed WWTP and surrounding landscaping, wastewater transfer corridor and outfall to the River Cam. Surveys of the Waterbeach pipeline route are currently ongoing.

Impacts on archaeological remains, especially any of national importance, will be avoided or reduced through the design of the Project. Where it is not possible to mitigate the loss of archaeological remains a programme of archaeological recording, through excavation or watching briefs will be undertaken.

4.6 Biodiversity

There will be a positive impact on natural habitats across the Project area. A preliminary Biodiversity Net Gain (BNG) assessment indicates that our Landscape Masterplan will deliver a net gain of at least 20% for both habitat and linear features (hedgerows).

In the vicinity of the River Cam, due to the installation of the Waterbeach pipeline and construction of the outfall, there is the potential for the loss of small areas of floodplain grazing marsh and river bank habitat. We are considering how to minimise those impacts and our final net gain calculation for those habitats will be presented as part of our DCO application.

The landscape and ecology design proposals create a range of new habitats, including species-rich grassland, woodland, and hedgerows. The new habitats will complement the proposed Cambridge Nature Network, providing a new component and potential extension to the stepping stones, corridors and core areas described in that vision. The Project therefore has the potential to contribute towards a functioning ecological network. The proposed waste water treatment plant sits within the drier areas of the southern area of the National Trust's Wicken Fen Vision, which proposes rough grassland, new woodland and coppice belts. The landscape design proposals have incorporated these concepts.

4.7 Agricultural land and soils

The development of the project will involve the permanent loss of around 90ha of land from agricultural use, including 30 hectares of Grade 2 ("Very good") land. This represents a significant impact on agricultural activities.

The soils from the area of the proposed WWTP within the landscaping bund (amounting to around 22ha) will be reused within the landscaping scheme. A draft Soil Management Plan has been produced as part of the PEI, explaining how sustainable soil handling will take place during construction. Due to these measures no permanent likely significant impacts to soil resources will arise.

4.8 Water and pollution control

The River Cam

The relocated Cambridge WWTP will result in reduced concentrations of all regulated water quality components in final treated effluent entering the River Cam under non-storm conditions. This means that when the new facility starts to operate, water quality in the River Cam will improve.

Storm overflows play a vital role in our combined waste water network systems as they work like pressure release valves to protect homes and businesses from flooding during periods of extreme rainfall. The Environment Agency (EA) issues permits for our storm overflows.

The new facility will provide greater resilience and improved storm management, meaning storm overflows and Combined Sewer Overflows (CSOs) are far less likely to occur. This means that, as Greater Cambridge continues to grow, the facility will be able to treat a greater volume of storm flows to a higher standard than would be the case at today's facility.

Groundwater

Detailed technical discussions, supported by extensive studies, including a Hydrological Impact Assessment Report (HIA) and ground investigations, on the protection of ground water have taken place with the Environment Agency.

The Hydrological Impact Assessment Report (HIA), which included transport contaminant modelling, considered the potential hydrogeological effects of the proposed scheme, including impacts to ground and surface waters associated with dewatering, discharge and contamination, through both the construction and operational phases of the scheme. It also considered impacts associated with construction of permanent foundations and below ground structures, construction and operation of tunnel shafts and waste water transfer pipelines, including potential impacts to Stow-cum-Quy Fen SSSI.

The Project will be constructed and operated without adversely affecting groundwater quality, including groundwater within aquifers used for water supply. The low permeability, clay-like or silty materials in the Grey Chalk underlying the proposed WWTP would be a major factor in limiting any potential contaminant movement, with contamination in any event considered unlikely to arise.

Changes to groundwater levels during construction would be temporary and would be mitigated by rigorous protection measures including the need for additional consents for works that could affect surface water or ground water and the implementation of measures to protect springs, boreholes and watercourses, including control of surface water runoff.

Regular contact with owners of private groundwater abstractions will be maintained while construction is in progress, in order to monitor their water supply.

Surface Water

Final effluent currently flows from the Waterbeach Water Recycling Centre to Bannold Drain. These flows will cease, increasing water quality in the drain and into the River Cam but potentially affecting any surface water abstractions dependent on the flow in the drainage ditches, which would decrease.

Contaminated Land

Preliminary Risk Assessment has only identified localised existing sources of contamination generally associated with limited areas of the existing Cambridge WWTP where shafts will be excavated. New contamination sources and/or pathways will not be introduced as these will be avoided through the measures as set out in the Outline Code of Construction Practice. Following mitigation there are therefore unlikely to be significant land contamination effects.

5 Conclusions

This Non-Technical Summary has presented a summary of the significant environmental impacts likely to arise from the construction and operation of the proposed WWTP.

The table below summarises the main conclusions of the PEI papers:

Significance level	Environmental topic	Temporary or short term effect	Permanent or long term effect
Effects of major adverse significance	Landscape		✓
	Construction noise and vibration (Shaft 4)	✓	
Effects of moderate adverse significance	Agricultural land and soils		✓
	Recreation (river users and users of public rights of way)	✓	
	Historic Environment		✓
Effects of minor adverse significance	Construction Traffic and Transport	✓	
	Construction Noise and vibration (excluding Shaft 4)	✓	
Effects of negligible adverse significance	Odour		✓
	Air Quality (during construction)	✓	
Neutral effects (neither adverse nor beneficial)	Operational Traffic and Transport		✓
	Operational Air Quality		✓
Effects of negligible beneficial significance	Not applicable		

Significance level	Environmental topic	Temporary or short term effect	Permanent or long term effect
Effects of minor beneficial significance	River Cam Water Quality		✓
Effects of moderate beneficial significance	Recreation		✓
	Biodiversity		✓
Effects of major beneficial significance	Not applicable		



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