

# Cambridge Waste Water Treatment Plant Relocation Project



Non-technical Site Selection Summary Report  
For The Cambridge Waste Water Treatment  
Plant Relocation (CWWTPR) Project  
July 2020

# 1. Introduction

## Glossary

<b>CWWTPR</b>	Cambridge Waste Water Treatment Plant Relocation	<b>HGV</b>	Heavy Goods Vehicle
<b>DCO</b>	Development Consent Order	<b>HIF</b>	Housing Infrastructure Fund
<b>EIA</b>	Environmental Impact Assessment	<b>PRoW</b>	Public Right of Way
<b>Green Belt</b>	Land designated as Green Belt in the local development plan	<b>RAG</b>	Red-Amber-Green
		<b>SSSI</b>	Site of Special Scientific Interest
		<b>WWTP</b>	Waste Water Treatment Plant

Since 1895, the current site on Cowley Road has been serving the needs of Cambridge and Greater Cambridge by receiving waste water from people’s homes and businesses, treating it and returning it to the environment.

The site also plays a vital role in storing and treating storm flows during heavy rainfall, before discharging to the River Cam. On average the site treats 1,300 litres of used water a second – that’s equivalent to more than 9 million toilet flushes a day or enough water to fill 44 Olympic size swimming pools!

## 1.1 Purpose of this document

Anglian Water has undertaken a detailed study to identify a suitable site for the relocation of its Cambridge Waste Water Treatment Plant. This document provides a non-technical summary of the study we carried out to identify the three site area options we are taking forward for consultation for the proposed Cambridge Waste Water Treatment Plant Relocation (CWWTPR) project (referred to as the ‘relocation project’ in this document).

Our full suite of site selection reports, including a technical summary, are available on our project website: [www.cwwtpr.com](http://www.cwwtpr.com)

The shared planning service for Cambridge City and South Cambridgeshire Councils has recently published early proposals for the district near Cambridge North station. Those plans will be outlined in the draft North East Cambridge Area Action Plan, which will be published for consultation by the Greater Cambridge Shared Planning Service in summer 2020. Regeneration of the area requires our Cambridge Waste Water Treatment Plant to be relocated. The project forms part of the Government’s Housing Infrastructure Fund (HIF) which helps to deliver homes in areas of high demand.

## 1.2 Summary of the relocation project

Anglian Water is proposing to relocate its Cambridge Waste Water Treatment Plant to support sustainable growth in the city, unlocking potential for thousands of new homes and employment opportunities in a new low carbon city district planned for North East Cambridge.

The new, relocated facility will continue to provide vital services to Cambridge and the surrounding area including Waterbeach in a modern, carbon-efficient treatment plant, to be developed in collaboration with the community.

The proposals for the relocation project are at an early stage. We have identified three possible site areas within which the new waste water treatment plant (“WWTP”) could be located. We want to hear your views on these site areas to help us to decide on a final site.

## Components of a typical waste water and sludge treatment plant

1. Incoming sewer

2. Pumping station

3. Storm storage tank

4. Preliminary treatment (screening and grit removal)

5. Primary settlement

6. Biological treatment

7. Final settlement

8. Tertiary treatment

9. Pumping station
10. Outfall to watercourse

11. Sludge reception

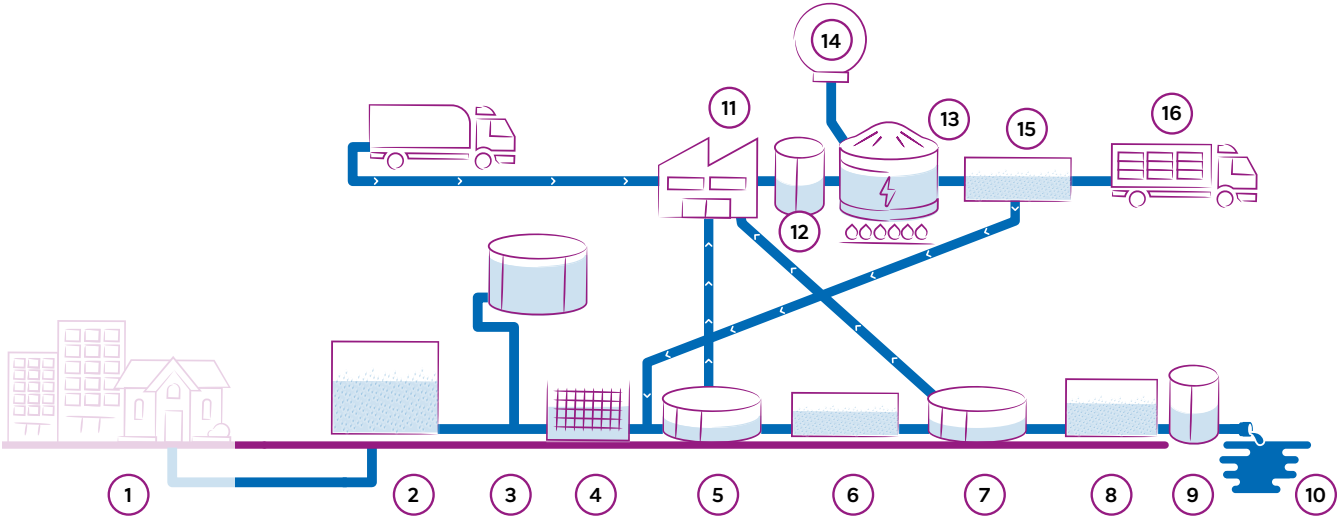
12. Enhanced pre-digestion treatment

13. Biogas storage for renewable energy generation

14. Anaerobic digestion

15. Post-digestion treatment and de-watering

16. Treated sludge biofertiliser



Note: Not to scale and for indicative purposes only.



## 2. Our site selection process

### 2.1 Introduction to our site selection process

Anglian Water is undertaking a detailed site selection study to identify a suitable location for the relocated Cambridge Waste Water Treatment Plant. The aim has been to identify locations that are technically and operationally feasible, minimise environmental and community impacts and comply with national and local legal, regulatory and planning frameworks for waste water treatment plants.

The study involves a ‘sieving’ approach and comprises stages to exclude areas of land where the plant could not be relocated (taking account of, for example, flood zones and proximity to protected and statutory designated sites). The process resulted in an initial longlist of 14 site areas which were then assessed for their performance against environmental, community, operational, planning and economic criteria. Figure 1 provides an overview of this step by step process.

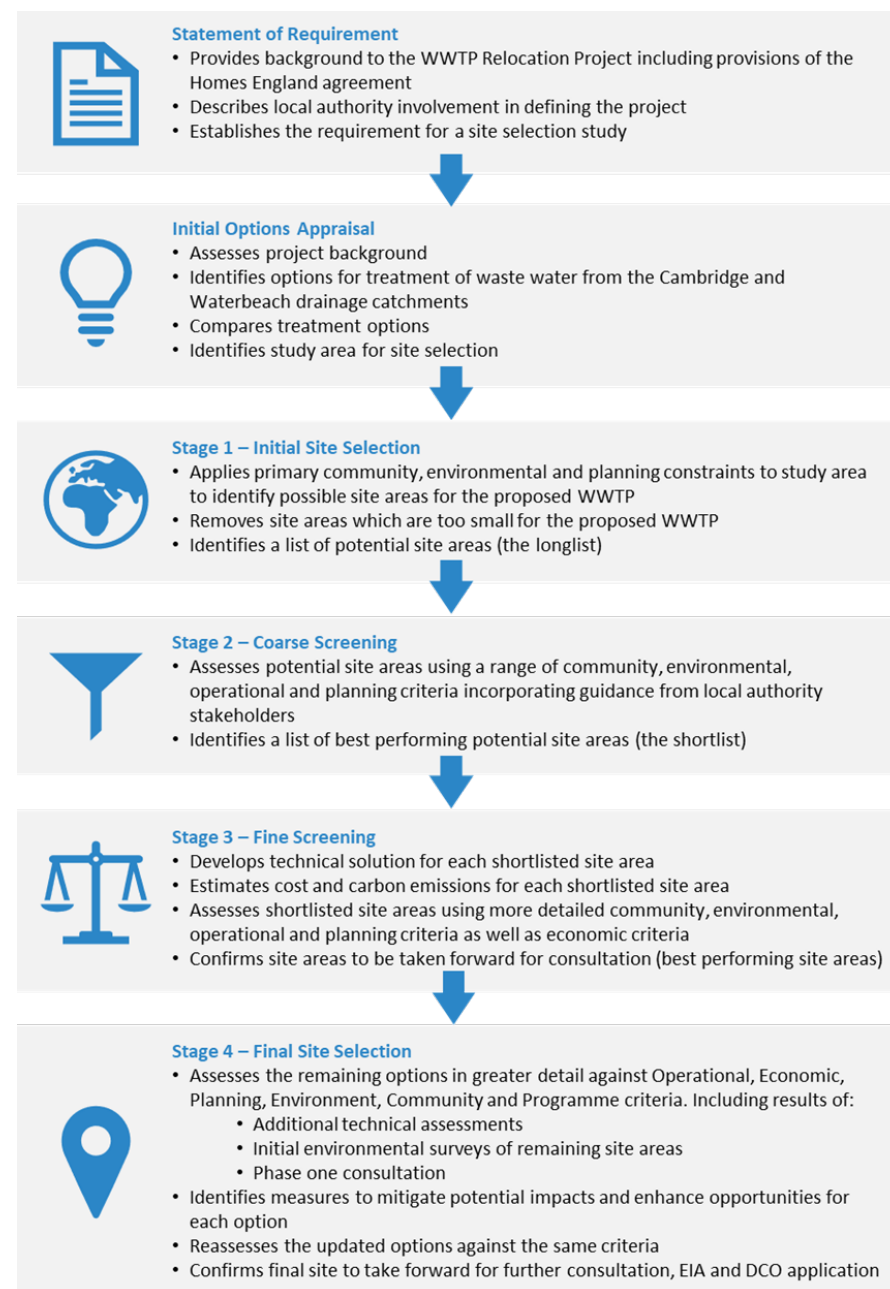


Figure 1 (step by step process of site selection)

## 3. How we identified our initial options

### 3.1 Overview of our initial options appraisal

Our initial options appraisal considered the project background, the existing plant’s catchment areas (see figure 2), infrastructure, policy requirements, and other strategic and technical factors. These included:

- The need for the relocation project – the relocation project is required to support sustainable growth in and around Cambridge. It will unlock the regeneration of North East Cambridge as the existing WWTP occupies a significant part of the area
- Types of waste water treatment technology – different treatment technology types have widely varying characteristics including significant differences in operational complexity, energy usage (and hence carbon emissions), economics and space needed
- National and local planning and waste policies – such as the ‘proximity principle’ (see below), minimising the impact transporting it would have on the wider environment
- Economic and environmental factors – how to minimise construction costs, environmental impacts and carbon emissions
- The number of WWTPs required – with one larger WWTP being more efficient than several smaller ones, needing less space overall and providing lower costs to customers

After considering the different factors above, we identified several possible options for the relocation project that included: a single new WWTP in the existing Cambridge and Waterbeach drainage catchment areas, north or south of the existing WWTP; a single new WWTP (or expansion of an existing WWTP) outside of the existing Cambridge and Waterbeach drainage catchment areas; or several new WWTPs (or expansion of existing WWTPs), in various locations in or near the existing Cambridge and Waterbeach drainage catchment areas. A “drainage catchment” is the area within which waste water from the connected Anglian Water sewerage network drains a locality, typically, to the nearest WWTP for treatment. It also refers to any currently unconnected localities within this area, which might as a result of growth or an application for first time sewerage, also become part of the sewerage network and drain to this WWTP.

The drainage catchment areas are shown in figure 2.

### 3.2 How we evaluated our initial options

The initial options outlined above were evaluated against assessment criteria using a Red, Amber or Green system (RAG), where Green is the best and Red is the worst. The things we considered were most important to assess as part of our evaluation were:

- Proximity principle – a need to treat and/or dispose of wastes in close proximity to their point of generation
- Potential environmental impact of disposing of the water – how close the new waste water treatment plant would be to the source of the water and whether a change of discharge location would be needed
- Impacts on local communities – from factors such as traffic, odour, noise and visual impacts
- Carbon emissions – comparison based on the potential scale of carbon emissions for each option
- Construction – how difficult the WWTP would be to construct and the level of impact construction could have
- Value for money – comparison of the potential scale of the lifetime costs for each option

### 3.3 Our conclusions

Our RAG assessment showed that the best performing option was for a single WWTP located in the north of the combined Cambridge and Waterbeach drainage catchment area. However, we also thought the option of a single WWTP located in the south of the Cambridge drainage catchment area was a possible alternative which should be considered further.

Therefore, both options were taken forward for further investigation, meaning the area which we took forward for site selection included the whole of the Cambridge drainage catchment area, north and south of the A14, together with the Waterbeach drainage catchment area, as shown in figure 2.

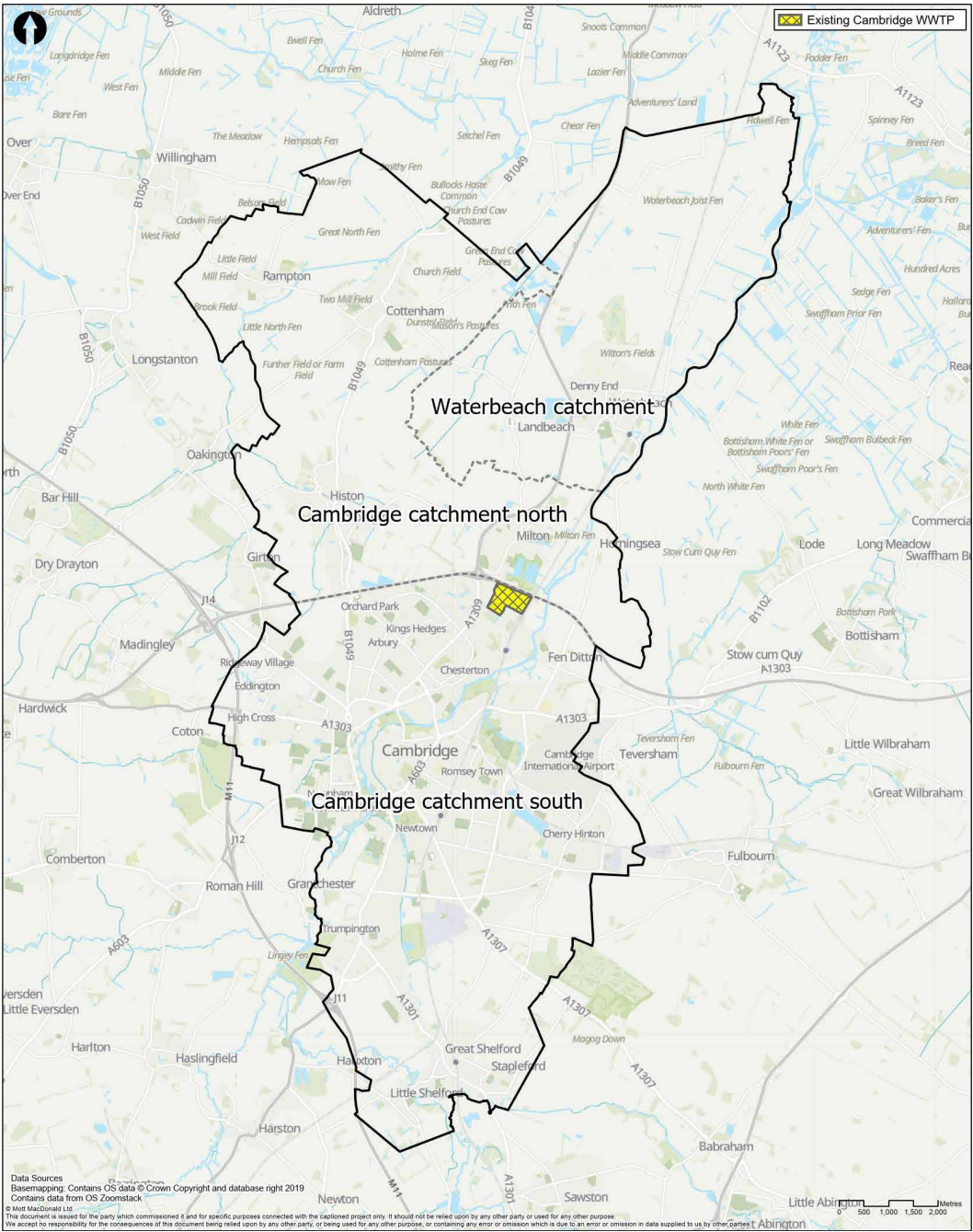


Figure 2 (showing drainage catchment areas)

## 4. Stage 1. How we identified a longlist of potential site areas

### 4.1 Objectives of Stage 1

The objective of Stage 1 was to identify a ‘longlist’ of potential site areas for the new WWTP which could then be taken forward for more in-depth assessment in Stage 2.

We mapped environmental, community and operational constraints in the area to see where a new WWTP could not be appropriately located. We then reviewed the remaining ‘unconstrained areas’ to identify the locations that would be large enough for the relocation project, which, taking into account different technology types, would require an area of around 22ha (around half the size of the existing WWTP).




The Green Belt was also identified as an important planning constraint that must be considered when selecting suitable sites for the new WWTP. However, it was considered that the Green Belt should not be used as a primary constraint at the initial stage of site selection for the following reasons:

- The Cambridge Green Belt covers a large proportion of the Study Area (approximately 50%) and the remaining area comprises the Cambridge urban area and rural areas relatively distant from the existing WWTP;
- As the Green Belt designation is a non-statutory planning policy designation, development within it may be acceptable if very special circumstances exist.

### 4.2 The constraints we assessed at Stage 1

The relevant national, regional and local policies were reviewed to identify the primary constraints and, where appropriate, buffer zones were applied around them. The use of buffers ensured that any unconstrained areas would be away from residential properties, protected and statutory designated sites and existing important infrastructure in order to limit any potential impacts on them.

We mapped the following constraints to identify ‘unconstrained areas’ that may be suitable for the relocation project:

-  **Environmental constraints, including:**
  - Flood zones
  - Landfill sites
  - 500m buffer around protected and statutory designated sites e.g. Sites of Special Scientific Interest (SSSI)
  - 100m buffer around watercourses
-  **Community constraints:**
  - 400m buffer around all residential properties to reduce the risk of potential odour impacts
-  **Operational constraints, including:**
  - Airfields and runways e.g. Cambridge Airport
  - Major transport infrastructure e.g. buffers around A, B roads and railways
  - Buffer around oil, gas and electrical infrastructure in the area



4.3 Our conclusions of Stage 1

All of the constraints and buffer zones were placed onto the Study Area map (as shown in figure 3) in order to identify the remaining unconstrained areas. The total footprint for the new WWTP site is considered to be around 22 hectares (ha). Using this footprint, the unconstrained areas were reviewed and those under 22ha were removed. The 14 remaining unconstrained areas equal to, or greater than, 22ha then became the longlist of potential site areas (site options A-N, as shown in figure 4).

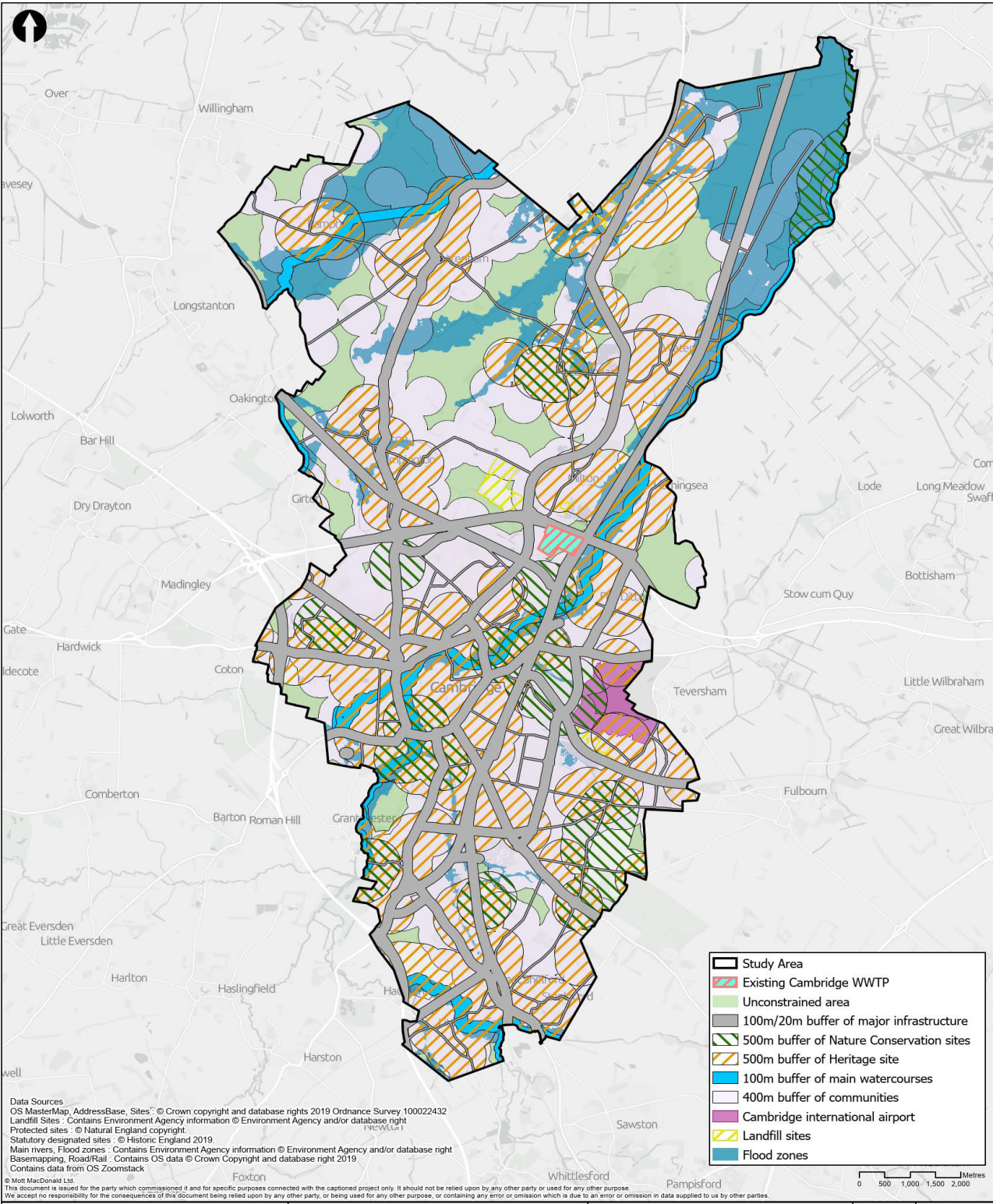


Figure 3 (showing application of constraints)

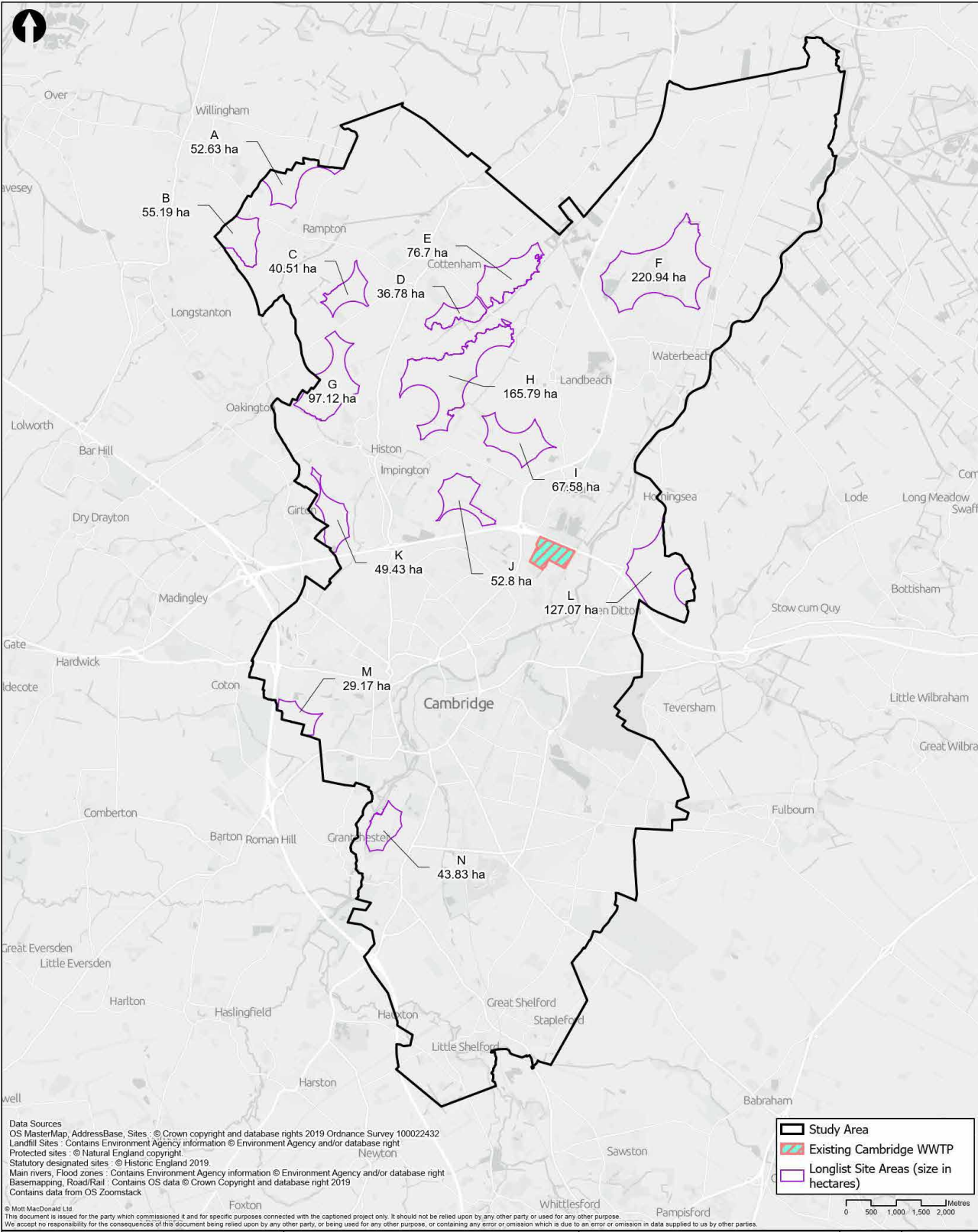


Figure 4 (showing longlist of sites)



## 5. Stage 2. How we identified a shortlist of potential site areas

### 5.1 Objectives of Stage 2

Stage 2 involved a ‘sieving’ approach to reduce the longlist to a shortlist of possible site areas after our initial Stage 1 assessment.

Each site area was evaluated against several different criteria using our Red, Amber, Green (RAG) assessment system. The results of the RAG assessment for each site were compared against each other to identify a shortlist of the best performing sites.

### 5.2 What we assessed at Stage 2



#### Impacts on the environment, including:

- Risk of building on contaminated land
- Potential risks to groundwater aquifers and watercourses
- Potential impacts on sites designated for nature conservation
- Potential impacts on the historic environment, for example on the setting of listed buildings or on archaeological remains
- Potential landscape and visual effects, including on Public Rights of Way (PRoWs) and communities
- Consideration of the agricultural land classification and the extent of high-grade agricultural land within the site areas.



#### Impacts on the community, including:

- Traffic impact e.g. throughout construction and operation (including spoil removal during tunneling)
- Noise and air quality during construction
- Local residents’ amenity (i.e. recreational and rights of ways) during construction and operation of the scheme
- Impacts on community facilities and businesses in the local area



#### Operational constraints, including:

- Whether the shape of the site area would be suitable for a WWTP
- How easy it would be for heavy goods vehicles (HGVs) to access the site
- The length of tunnels and pipelines required, how difficult they would be to construct and also the scale of the carbon emissions resulting from construction.



#### Planning constraints, including:

- Policy, site allocation and planning permissions
- Sensitivity of neighbouring land uses
- Whether the site lies within the Green Belt



Anglian Water’s goal is to be a net zero carbon business by 2030

A separate carbon study was undertaken to assess the carbon emissions of the relocation project. The assessment concluded that the site areas furthest from the existing WWTP (site areas A and B) had the highest estimated carbon emissions, whilst site areas which are closer to the existing WWTP (i.e. site areas I, J and L) had the lowest carbon emissions. This is due to the site areas further away from the existing WWTP requiring longer tunnels and pipelines than the closer site areas.

In terms of scale, the results indicated that the carbon emissions of site areas I, J and L were all less than half of the carbon emissions of site areas A and B. This is demonstrated in figure 5, which illustrates the RAG rating of the carbon emissions for the potential site areas.

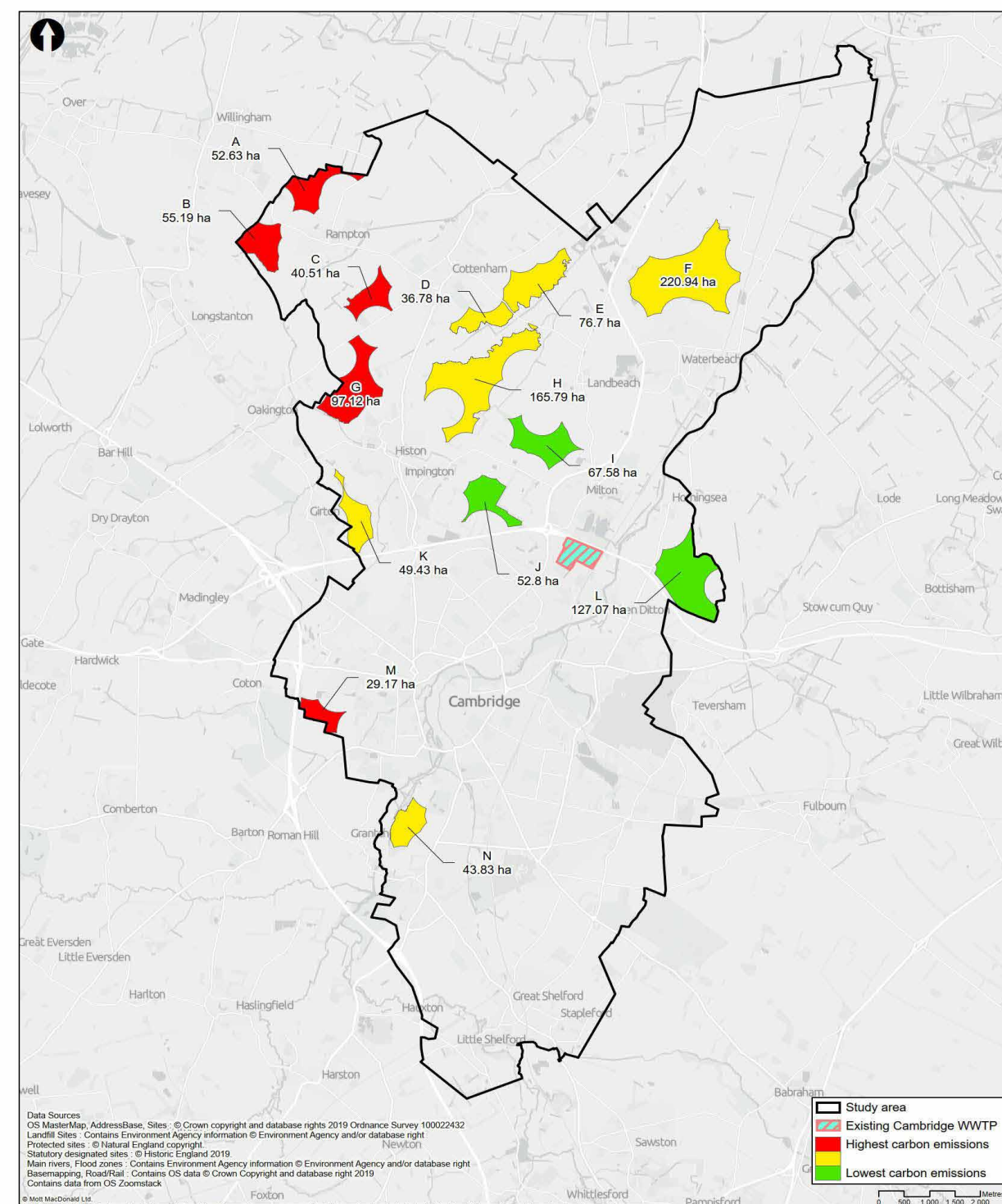


Figure 5 (showing RAG carbon emissions ratings)

### 5.3 Our Stage 2 conclusions

Following the completion of the RAG assessments, the results for each site area were compared with one another to identify the best performing site areas to be included in the shortlist.

There were several site areas which performed poorly against a range of important criteria and these sites were removed from further consideration. The remaining site areas (A, B, C, H, I, J and L) all had the constraints that would need to be overcome, but otherwise performed better overall than the site areas removed from further assessment.

The remaining site areas fell into two groups (site areas A, B and C and site areas H, I, J and L). Site areas A, B and C benefit from being located outside of the Green Belt but had the disadvantage of high potential impacts on local communities, as well as greater construction risks (for example due to tunneling complexity), higher carbon emissions and the risk of impacts to groundwater.

Site areas H, I, J and L are located within the Green Belt but all performed better in terms of minimising potential impacts on local communities and, as they needed shorter tunnels and pipelines to transport the waste water, they also have lower construction impacts, carbon emissions and less risk of impacts to groundwater.

These seven sites formed the shortlist of sites taken into Stage 3 of the site selection.

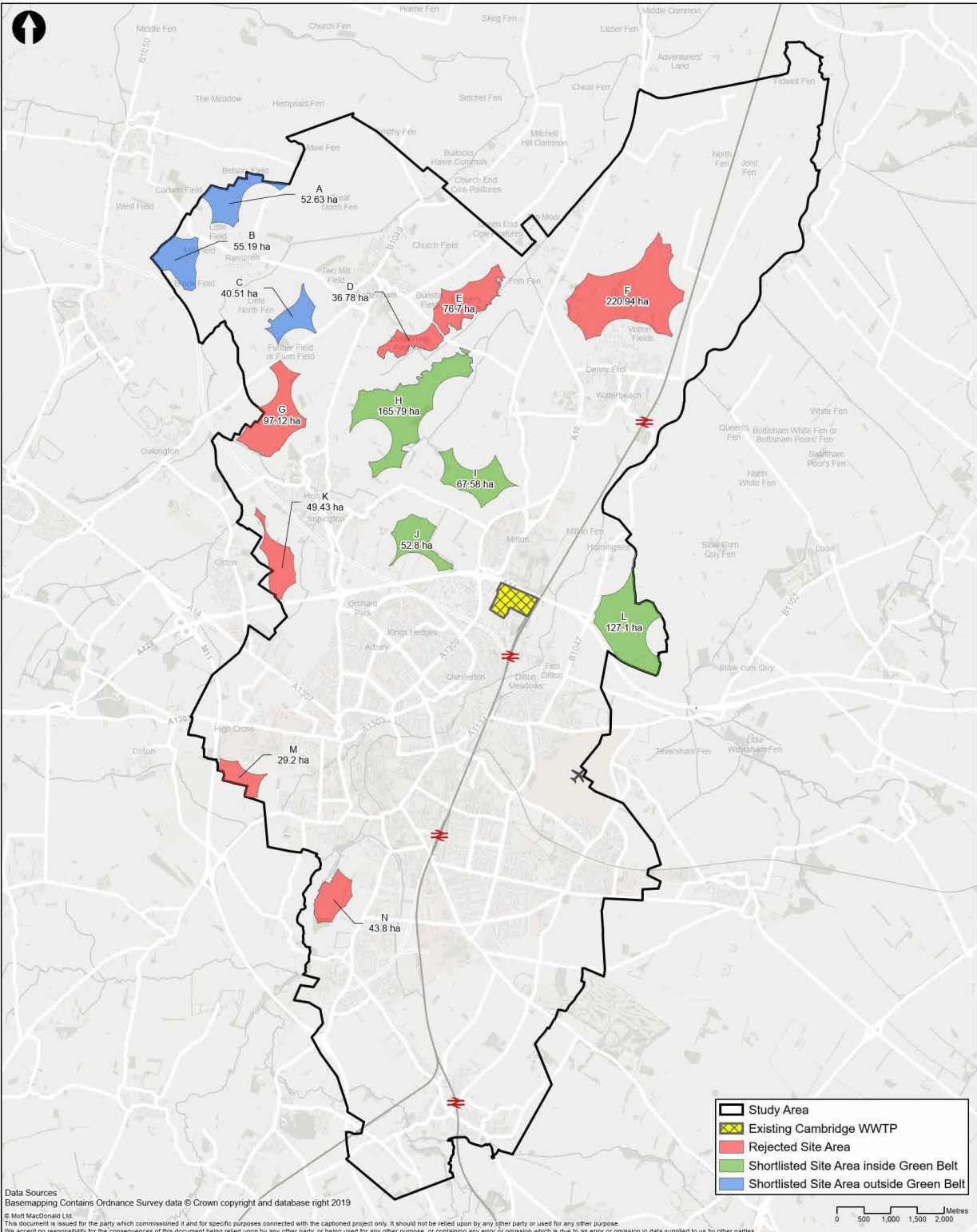


Figure 6 (Stage 2 results - shortlist of sites)

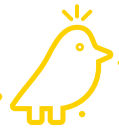


# 6. Stage 3. How we identified our final shortlist of site area options

## 6.1 The objectives of Stage 3

At Stage 3, we carried out a more detailed assessment of the remaining seven shortlisted site areas against environmental (including carbon), community, operational and planning criteria to identify the final site area options to take forward to public consultation. In addition, we also assessed economic criteria including the affordability of the sites. The proposed relocation will be funded by the Government’s Housing Infrastructure Fund (HIF) which is an initiative to help deliver housing in areas of high demand.

## 6.2 What we assessed at Stage 3



### Environmental

- Carbon emissions – for the tunnels, shafts, pipelines and pumps needed for each site over the lifetime of the project
- Landscape and visual sensitivity – potential impact on the landscape context and visual amenity for each site
- Nature conservation and biodiversity – potential impact on designated sites, habitats and protected species
- Historic environment – consideration of any potential heritage risks and constraints
- Contaminated land – assessment of the potential sources of contamination and the extent of the risk of this
- Groundwater – assessment of the potential negative impacts of the tunnels and shafts on groundwater
- Surface water – consideration of the extent to which the potential negative impacts on bodies of water such as rivers, ponds and lakes can be mitigated



### Community

- Non-traffic impact of construction – assessment of potential construction impacts on noise, dust and disruption
- Traffic impact of construction – assessment of potential construction traffic impacts on congestion, air quality, noise and road safety
- Impact on Public Rights of Way – assessment of potential impacts on Public Rights of Way



### Operational

- Ease of access – suitability of connecting road access for Heavy Goods Vehicles and other large or sensitive loads



### Planning

- Green Belt – assessment of whether development would be within the Green Belt
- Risk to aviation – assessment of the potential impacts of development on aviation in relation to Cambridge Airport



### Economic

- Affordability – would development of the new WWTP on the site be achievable and provide value for money within the limits of Government’s HIF

## 6.3 Our Stage 3 conclusions

Site areas I, J, H and L are within the Green Belt. Very special circumstances need to be demonstrated to promote one of these site areas for development. Site areas A, B and C are outside of the Green Belt and would not need to demonstrate such circumstances.

### The advantages to sites I, J and L include:

- They have the lowest carbon emissions for construction and operation of the waste water transfer infrastructures (tunnels, pipelines and pumping stations);
- The road transport routes from the main strategic road network to site areas I, J and L are also relatively shorter and would not pass through the centre of any villages. The routes for the 4 other site areas would all pass through the centre of at least one village or pass community facilities such as schools and nurseries. The relatively shorter length of the tunnel to each site area from the existing WWTP and the return pipeline or tunnel to the river, was a key factor meaning site areas I, J and L perform better than all other site areas for this criterion. Sites furthest away from the existing site (A, B, C) are significantly more costly requiring longer tunnels and pipelines.

Development at site areas A, B and C was considered to be unaffordable and not deliverable within the Government’s HIF. They would also present a greater impact on the local community and would result in higher lifetime carbon emissions. As a result, it was considered that these site areas are not feasible options for development of the relocation project.

Therefore, based on criteria used to assess the site areas in this site selection process, the remaining suitable site areas in which to develop the relocation project under the Government’s HIF were H, I, J and L.

Site area H presented a greater impact on the local community, higher carbon emissions and greater risk of impact on groundwater in comparison to site areas I, J and L. Therefore, we also removed site area H from further assessment.

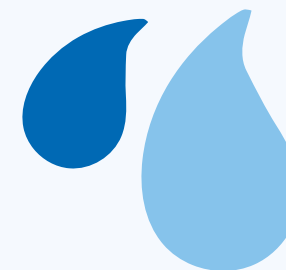


### Best performing site areas

Site areas I, J and L were assessed to be the best performing site areas. All three sites are suitable and feasible for the relocation project against the criteria assessed at this stage and will be taken forward for consultation in our phase one community consultation. They will also be subject to the final stage of site selection including environmental baseline surveys.







## Contact us

**Our consultation team is on hand to answer your questions and listen to your feedback on the proposals for the relocation project.**

You can contact us by:



Emailing at [info@cwwtpr.com](mailto:info@cwwtpr.com)



Calling our Freephone information line on **0808 196 1661**



Writing to us at **Freepost: CWWTPR**



Visiting our website at [www.cwwtpr.com](http://www.cwwtpr.com)



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