



# WATER FRAMEWORK DIRECTIVE REGULATIONS COMPLIANCE ASSESSMENT

Draft Water Resources Management Plan 2024

Cambridge Water

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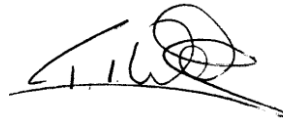
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**Front Cover Image:**

Linton Water tower, Rivey Hill, Cambridge Water

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## EXECUTIVE SUMMARY

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This report outlines the WFD Regulations Compliance Assessment that has been completed to support the Cambridge Water Water Resources Management Plan 2024 (WRMP24), which water companies in England and Wales are required to produce every five years.

Through an extensive optioneering process, considering a wide range of potential options to balance future supply and demand, Cambridge Water has selected the most suitable options to make up the feasible options list. This list includes both demand side and supply side options, of which only the latter require a Water Framework Directive Regulations (WFD) Compliance Assessment.

Eighteen supply side options, that make up part of the feasible options list, have been subject to WFD Compliance Assessment against the three core WFD Assessment Objectives:

1. To prevent deterioration of any WFD element of any water body - in line with Regulation 13(2)a and 13(5)a.
2. To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body in line with Regulation 13(2)b and 13(5)c.
3. To ensure that the planned programme of water body measures in RBMP2 to protect and enhance the status of water bodies are not compromised.

The assessments found two of the 18 options to be potentially non-compliant (low confidence), two options to be compliant (low confidence) and the remainder to be compliant (medium or high confidence).

For the draft WRMP24, Cambridge Water have presented a preferred plan and no alternative plans. A WFD compliance assessment has been conducted to determine the compliance preferred plan which has been assessed against the core WFD Assessment Objective (set out above) and three progressive WFD Assessment Objectives. The supply-side options included in the Cambridge Water draft WRMP24 preferred plan and their implementation dates are as follows:

- CW2401A – Combined Ouse gravel sources Fenstanton to St Ives 01A – implementation 2030
- CW2401B – Combined Ouse gravel sources Fenstanton to St Ives 01B – implementation 2030
- CW2475Aiii – AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant – implementation 2030
- CW2475Biii – AWS potable transfer through CAM area 10Mld with main cost and 0.4ha blending plant – implementation 2030
- CW2475Ciii – AWS potable transfer through CAM area 15Mld with main cost and 0.5ha blending plant – implementation 2030
- CW2437Aii – Northstowe greywater reuse or similar growth small storage – implementation 2035
- CW2438B – Northstowe rainwater harvest or similar growth small storage – implementation 2035
- CW2471 – AWS Milton WWTW effluent discharge reuse – implementation 2035
- CW2473A – Fens Reservoir internal potable water transfer Chatteris – implementation 2035
- CW2457 – River Cam abstraction and treatment works – implementation 2040

The assessment of the preferred plan found that four water bodies, each of them river water bodies, would be impacted by these options. Two of these water bodies have been assessed as having non-compliant impacts on them, specifically resultant of option CW2438B which would capture water from the catchment of these water bodies. There is limited hydrological information in either of these water bodies that can be used to determine the magnitude of hydrological impact however the Catchment Abstraction Management Strategy for these water bodies indicates that they are both under flow pressure at low flows so any reduction in flow has the potential to have significant impacts on the aquatic ecology and water quality. The assessment on these water bodies is assigned low confidence and further hydrological baseline information is required to improve the confidence in the magnitude of impact on each of these water bodies.

The impacts on the remaining two water bodies have been assessed as WFD compliant, noting that one of these assessments is low confidence. The low confidence is associated with uncertainty around how the options that impact the water body will operate, including the hands-off flow condition that will be set for the abstraction and cessation of the WwTW discharge to the water body. There is also limited baseline hydrological data in the water body in which to assess the magnitude of impact against.

A review of the cumulative impacts between the Cambridge Water draft WRMP24 preferred plan and other water company draft WRMP24 preferred plans has also been undertaken. The review has primarily been informed through the WFD assessment of the Water Resources East draft Regional Plan which identifies the impacts on water bodies impacted by companies plans within the Water Resources East regional group. The review identified no potential additional cumulative impacts on any water bodies impacted by the Cambridge Water draft WRMP24 preferred plan other than on the Ouse (Roxton to Earith) water body (GB105033047921) which is impacted by the Fens Reservoir SRO (Option FND21 in the Anglian Water draft WRMP24 best value plan) along with Option CW2401A and Option CW2401B. Though the impact on this water body is assessed as compliant (medium confidence) based on the options within the Cambridge Water preferred plan, the Anglian Water draft WRMP24 best value plan identifies the impacts on this water body as a result of the Fens Reservoir SRO to have the potential for deterioration to the biological status elements in this water body with low confidence and advocates further investigations to improve this confidence. It is possible that, operated cumulatively, the Fens Reservoir SRO, Option CW2401A and CW2401B could pose a combined risk to WFD compliance in this water body. This risk will require further investigation prior to the implementation of any of these options and discussions are required within the Water Resources East regional group as to the pathway for undertaking these further investigations.

The diversion of the WwTW discharge from Milton WwTW associated with Option CW2471 may assist with the achievement of Assessment Objective 6 (one of the progressive assessment objectives) with there being less WwTW effluent discharge into the water environment. The options in the preferred plan would not assist with the attainment of Assessment Objective 4 or Assessment Objective 5.

# 1. INTRODUCTION

This section sets out the background and purpose of this report (**Section 1.1**), explains the Water Framework Directive (**Section 1.2**) and its context in Water Resource Management Plans (WRMP) (**Section 1.3**).

## 1.1 BACKGROUND AND PURPOSE OF REPORT

Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years. The latest Water Resource Planning Guideline (WRPG) produced by the regulatory bodies<sup>1</sup> (Ofwat, the Environment Agency (EA) and Natural Resources Wales (NRW)) advises that it is the water companies' requirement to have regard to River Basin Management Plans (RBMPs) and Water Framework Directive Regulations in their WRMPs. This report is driven by this requirement and will demonstrate how Cambridge Water has met this requirement in the assessment of their draft WRMP 2024 (WRMP24) feasible options and preferred plan.

## 1.2 THE WATER FRAMEWORK DIRECTIVE

The Water Framework Directive<sup>2</sup> is an EU Directive establishing a framework for Community action in the field of water policy which aims to protect and improve the water environment. The Directive was brought into UK law in 2003 and subsequently revoked by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales. From this point forward "WFD" refers to the legislation applicable to England and Wales, not the EU Directive.

## 1.3 WFD REQUIREMENTS FOR WRMPs

The purpose of a WRMP is to set out how a water company will achieve a secure supply of water for its customers whilst protecting the environment and is resilient to a range of future challenges more extreme droughts, climate change, population growth.

As part of the WRMP, water companies must demonstrate that they have considered a range of environmental legislation, including the WFD regulations. The requirements for a WFD assessment of a water company WRMP are outlined in the 2021 WRPG (Box 1).

### Box 1: WRPG 2021

#### Section 8.2.2. Assessing environmental constraints

##### ***"A. River Basin Management Plan and Water Framework Directive***

*River Basin Management Plan (RBMP) and the Water Framework Directive environmental objectives are a constraint on your options. You should screen out any options that have unacceptable environmental impacts that cannot be overcome.*

*You should ensure that there is no risk of deterioration from a potential new abstraction or from increased abstraction at an existing source before you consider it as a feasible option. Alternatively, if investigations are yet to be completed, you should set out what your alternative options would be should those investigations demonstrate that there will be an unacceptable environmental impact.*

*You should also assess new supply options against the RBMP measures and objectives for each water body and meet your obligations to avoid future deterioration. You should ensure that your feasible options do not compromise the achievement of RBMP objectives.*

*You should talk to the Environment Agency or Natural Resources Wales about any intended actions that may:*

- cause deterioration of status (or potential)*
- prevent the achievement of the water body status objectives in the river basin management plans*
- prevent the achievement of water body status (or potential) for new modifications*

*You should do this as soon as possible before developing your plan. You should make a clear statement in your plan about any potential impacts."*

<sup>1</sup> Ofwat, NRW & EA (2021), Water Resources Planning Guideline – Updated 17 March 2021

<sup>2</sup> European Union (2000) Directive 2000/60/EC of the European Parliament and of the Council



The WRPG refers to ensuring 'no deterioration' of water body status. The 2015 European Court of Justice (ECJ) ruling<sup>3</sup> clarified that 'no deterioration' means a deterioration **between** a whole 'status class' (e.g. 'good', 'moderate', etc.) of one or more of the relevant 'quality elements' (e.g. biological, physico-chemical, etc.). This definition applies equally to Artificial Water Bodies and Heavily Modified Water Bodies in respect of the relevant quality elements that relate to the defined uses of these water bodies. The ECJ ruling further states that if the quality element concerned is already in the lowest class, any deterioration of that element constitutes a deterioration of the status. References to 'no deterioration' in this WFD methodology align to this ECJ ruling.

## 1.4 CONTENTS OF THIS REPORT

This report contains the following sections:

- Section 1. Introduction
- Section 2. WFD Regulations Compliance Assessment Methodology
- Section 3. Option-level (Stage 1) WFD Assessment Outcomes
- Section 4. Programme- Level (Stage 2) WFD Assessment
- Section 5. WFD Assessment of preferred plan against other Plans and Projects (Stage 3)
- Section 6. WFD Compliance Summary of the Cambridge Water Draft WRMP24

The report is also supported by a set of four appendices:

- A. Option-level screening
- B. Option- level impact assessments
- C. Programme-level screening
- D. Programme-level impact assessments

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<sup>3</sup> ECJ Case C-461/13: Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland <http://curia.europa.eu/juris/document/document.jsf?docid=178918&mode=req&pageIndex=1&dir=&occ=first&part=1&text=&doclang=EN&cid=175124> [accessed 30.6.16]

## 2. WFD REGULATIONS COMPLIANCE ASSESSMENT METHODOLOGY

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The purpose of this section is to set out the approach used when assessing the WFD compliance of the feasible options and preferred plan of Cambridge Water's draft WRMP24. **Section 2.1** identifies the WFD Assessment Objectives used throughout the WRMP process. **Section 2.2** describes the proportionate level of detail for the assessments.

The assessment approach presented here has been applied to the feasible list of options and preferred plan.

All assessments have been undertaken for the reporting unit of a WFD water body. The appropriate baseline information for water bodies status and targets is as set out using 2021 WFD status as published in the third cycle of RBMPs (RBMP3). It is worth noting that the final RBMP3s are expected to be published later in 2022, however, the assessments in this report are using the draft RBMP3 status. In the absence of the RBMP3 water body measures, assessments have been undertaken against the measures published at RBMP2.

### 2.1 WFD ASSESSMENT OBJECTIVES FOR TESTING COMPLIANCE

This section provides the WFD Assessment Objectives used as a test of constraint when testing WFD compliance at an individual potential option-level (**Section 2.1.1**) as set out in WRPG (2021)<sup>4</sup>. This section also provides the additional, progressive WFD Assessment Objectives that have been assessed at a plan-level once selected options have been collated into programmes for draft WRMP24 (**Section 2.1.2**).

#### 2.1.1 Option-level WFD Assessment Objectives

Principally, the WFD acts as an indicator of constraint and determines where the draft WRMP24 or options within do not meet WFD Objectives set out in Regulation 13 of the WFD Regulations. In line with WRPG (2021) and UKWIR (2021) guidance the principle WFD Assessment Objectives that the draft WRMP24 (both the feasible list and programmes) has been tested against are:

1. To prevent deterioration<sup>5</sup> of any WFD element of any water body - in line with Regulation 13(2)(a) and 13(5)(a).
2. To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body in line with Regulation 13(2)(b) and 13(5)(c)<sup>6</sup>.
3. To ensure that the planned programme of water body measures in RBMP2 to protect and enhance the status of water bodies are not compromised.

If an option has been assessed to definitively not comply with the WFD Assessment Objectives set out above then the option has been reported as WFD non-compliant and removed from the WRMP process. This only applies to options for which a clear and obvious conclusion around non-compliance can be reached, and for which no mitigation to provide compliance is possible.

If an option is assessed to potentially not comply with the WFD Assessment Objectives set out above then the option has been reported as potentially WFD non-compliant. If an option is reported as potentially WFD non-compliant it has remained in the WRMP process as it may be appropriate to consider the option further where it is considered that additional evidence to improve confidence in the assessment and/or enhanced design could mitigate the potentially WFD non-compliant issues. It is at the discretion of Cambridge Water as to whether a potentially WFD non-compliant option continues to progress through the WRMP process; however, if a potentially WFD non-compliant option is progressed it will be discussed and agreed by the Cambridge Water with the relevant regulatory body.

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<sup>4</sup> Specifically set out in WRPG 2021 (updated 17 March 2021) at Section 8.2.2

<sup>5</sup> As defined in Section 1.3

<sup>6</sup> WRPG (2021) states that this a test to identify any options that 'prevent the achievement of the water body status objectives in the river basin management plan'. At present this is RBMP2. Discussion with EA and through review of EA internal guidance<sup>#1</sup> identified that the EA consider 'less stringent objectives are not permanent and the assessment of any new activity or project must take into account the need to continue to aim for good status. The new activity or project must not jeopardise the achievement of Good status in the future, irrespective of whether a less stringent objective was set in RBMP2'.

<sup>#1</sup> EA (2021) Supporting implementation of river basin management plans position. LIT 14339. 01/2021



### 2.1.2 Plan-level WFD Assessment Objectives

The WFD Assessment Objectives in **Section 2.1.1** are the fundamental WFD Assessment Objectives that have been tested against at **both** the option-level and plan-level.

There are a number of further WFD Assessment Objectives, set out in the WRPG, which have been tested against at a plan-level. These further tests have only been applied to a Plan containing options which pass WFD Assessment Objectives 1-3. These are considered as progressive WFD Assessment Objectives rather than tests of constraint and do not lead to WFD non-compliance where they are not achieved. These are as follows:

4. To assist the attainment of the WFD Objectives for the water body – in line with Regulation 13(2)(b) and 13(2)(c)
5. To assist the attainment of the objectives for associated WFD protected areas – in line with Regulation 13(6)
6. To reduce the treatment needed to produce drinking water and look to work in partnership with others; promoting the requirements of Article 7 of the WFD<sup>7</sup>.

A negative answer to the WFD Assessment Objectives above does not determine that the plan has WFD constraints; however, they can be used in decision making by the water company.

Where WFD Assessment Objectives 1, 2 and/or 3 are not met by a programme or plan then, unless there is no reasonable alternative, that plan has not been progressed as the preferred plan without discussion with the relevant regulatory body. Discussion with the regulatory body will include:

- If a plan is reported as potentially WFD non-compliant it may be appropriate to consider an adaptive plan where it is considered that additional evidence to improve confidence in assessment and enhanced design could mitigate the potentially WFD non-compliant issues.
- Where a plan is assessed as WFD non-compliant, in circumstances where there is an over-riding public interest or the benefits of achieving the WFD Assessment Objectives are outweighed by benefits to human health, human safety or sustainable development there is scope to apply for a Regulation 19 exemption as to why these WFD Assessment Objectives are not achieved.

## 2.2 PROPORTIONATE LEVEL OF DETAIL FOR ASSESSMENTS

Throughout the WRMP process WFD compliance has been tested at relevant stages parallel to the wider WRMP programme. The approach taken to test WFD compliance for feasible options and consequent programmes of options is as follows:

- 1) Option-level Assessment – As set out in **Section 2.2.1**, this is a full assessment that covers the feasible list of options.
- 2) Programme level assessment – As set out in **Section 2.2.2**, the cumulative effects of the options that make up any Programmes have been assessed
- 3) Preferred draft WRMP24 programme assessment – As set out in **Section 2.2.3**, the preferred draft WRMP24 plan for Cambridge Water has been assessed for impacts with other water companies draft WRMPs and regional plans.

In order to ensure the WFD assessment is proportionate for each stage an outline of the assessment for each stage is provided in this section.

### 2.2.1 Stage 1 Option-level assessments

Stage 1 is where there is scope for the most detailed assessments. As advocated in the UKWIR (2021) guidance, each option has gone through a process to determine if it is compliant with the three principle WFD Assessment Objectives (as set out in **Section 2.1**). For proportionality of option assessment there are 4 steps with each step becoming increasingly detailed. Where there is sufficient confidence in an assessment's conclusions the option has not progress onto the next step. The four steps are as follows:

- Step 1 Screening based on activities - to either exclude options from further assessment where it could be reasonably expected that the option would not have an influence on any WFD status elements or

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<sup>7</sup> Specifically set out in WRPG 2021 (updated 17 March 2021) at Section 9.4.5

supporting elements, or identify which activities require progressing to Steps 2 or 3 assessment and in which water bodies (**Section 2.2.1.1**).

- Step 2 Screening based on magnitude of hydrogeological/hydrological impact and water body context- to either exclude options from assessment where they are negligible or low impact, or identify which activities require progressing to Step 3 assessment and in which water bodies (**Section 2.2.1.2**).
- Step 3 Impact assessment – either using existing assessments or an expert judgement approach based on source-pathway-receptor to establish likelihood of compliance with agreed WFD Assessment Objectives in all relevant water bodies. A confidence rating has been given to all assessments to reflect the amount of uncertainty in the design, environmental baseline and magnitude of impact (**Section 2.2.1.3**).
- Step 4 Detailed impact assessment - specific to the option using measured baseline data, including additional bespoke collected evidence, and detail on design and operating pattern. As of yet, none of the options in this draft WRMP24 have been subject to this level assessment. This step is not normally proportionate at the WRMP level.

Further detail on how these steps have been assessed is set out below for the option-level assessment.

**2.2.1.1 Step 1: Screening based on activities**

All options in the feasible list have been subject to this step. Where an option is screened as WFD compliant at this stage it is be accompanied by a robust explanation as to why this assessment can be made without the need to progress the option to Step 2. Instances where there is considered no risk to WFD compliance are identified as:

- Demand management activities;
- Supply options which have passed a sustainability assessment<sup>8</sup> at an abstraction rate up to the proposed option rate;
- Network constraint (i.e. improving infrastructure to achieve greater deployable output) options that do not result in additional abstraction (in comparison to recent abstraction rates), or where that additional abstraction has been identified as sustainable<sup>9</sup>; provided the construction does not affect WFD protected areas or increase the risk of the transfer of INNS.

Where an option is concluded as not compliant with the WFD Assessment Objectives after Step 1 screening, the option has been progressed to Step 2 screening.

**2.2.1.2 Step 2: screening based on magnitude of hydrogeological/hydrological impact and waterbody context**

Step 2 screening identifies the water body name, ID and type of any water bodies that could potentially be impacted. The potential impacts are determined by the type of option. The UKWIR (2021) guidance identifies a range of option types and their potential impacts (**Table 2-1**).

**Table 2-1 Potential effects to screen in to WFD assessment by option type**

Option type	Impact type to test
New groundwater abstraction, increase in license rate	<ul style="list-style-type: none"> <li>• Change in groundwater quantity</li> <li>• Impact on groundwater dependent terrestrial ecosystems</li> <li>• Impact on connected surface waters (flow change effects on ecology and water quality dilution)</li> <li>• Likelihood of saline ingress into aquifer</li> </ul>
Aquifer recharge/ aquifer storage and recovery	<ul style="list-style-type: none"> <li>• Effects specific to source water used for recharge</li> </ul>
Reservoir	<ul style="list-style-type: none"> <li>• Impact on connected surface waters (flow change effects on ecology and water quality dilution)</li> </ul>

<sup>8</sup> e.g. Surface water options WRGIS Band 1, 2 and 3 pass at fully licensed; groundwater options passing WFD groundwater tests; WINEP investigation are identified as sustainable by EA (UKWIR, 2021).

<sup>9</sup> *ibid*

Option type	Impact type to test
Run-of river abstraction	<ul style="list-style-type: none"> <li>Flow change effects on ecology and water quality dilution</li> </ul>
River regulation	<ul style="list-style-type: none"> <li>Flow change effects on ecology and water quality dilution in regulated reach</li> </ul>
Reuse	<ul style="list-style-type: none"> <li>Flow and water quality change effects on ecology and chemical status in receiving watercourse</li> <li>Flow and water quality change effects on ecology and chemical status in water course previously receiving discharge</li> </ul>
Desalination	<ul style="list-style-type: none"> <li>Hydrodynamic changes on ecology in abstracted water body, including through pathways of salinity and sedimentation pattern change</li> </ul>
Inter-basin transfer	<ul style="list-style-type: none"> <li>Flow change effects on ecology and water quality dilution in donor watercourse</li> <li>Direct ecological effects from introduction of invasive non-native species</li> <li>Flow and water quality change effects on ecology and chemical status in receiving watercourse</li> </ul>

At this stage the context of the water body will be considered to identify any additional constraints i.e. any planned water body measures in RBMP2.

For any options that are sourced from groundwater a hydrogeologist has determined any local surface water bodies that are hydraulically connected. The impact on both the groundwater water body and the surface water bodies has been assessed. Similarly, any links between lake water bodies and river water bodies have been taken into consideration when assessing options that impact lake water bodies.

Impacts are not confined to the water body where the option is located as the impacts of an option can transverse multiple water bodies. In these instances, assessments have been conducted against each water body in the flow pathway until no WFD compliance risk is identified.

In England & Wales, hydrology is a supporting element to WFD status and is not a status element that contributes directly to WFD ecological status. Regulators' hydrogeological/hydrological assessment tools and their outputs can provide suitable information from which to assess the magnitude of effect. Hydrogeological/hydrological appraisal tasks that have been undertaken are:

- Review the regulatory position<sup>10</sup> on water available for abstraction in an aquifer, reach or catchment, based on modelling tools. The available quantity can be compared with the increase in abstraction associated with an option. These assessments often include an indication of water availability under different flow conditions which adds specificity to potential operational considerations such as hands-off flow conditions.
- Review the regulatory position on WFD hydrology, including the pass forward flow from rivers to transitional waters<sup>11</sup>.
- Review the regulatory position on the extent of influence of flow on status elements failing their targets, including biological status elements, physico-chemical status elements, hydro-morphology and groundwater quantitative status<sup>12</sup>.
- For surface waters, review the likely changed river flow regime against measured river flows from nearby gauging stations long-term records held on the National River Flow Archive<sup>13</sup> to inform the magnitude of change in flow.

Where the hydrogeological/hydrological appraisal identifies operational activities that are considered with confidence to be low impact these will be concluded as WFD compliant.

<sup>10</sup> Environment Agency Abstraction Licensing Strategy datasets:  
<https://data.gov.uk/dataset/b1f5c467-ed41-4e8f-89d7-f79a76645fd6/water-resource-availability-and-abstraction-reliability-cycle-2> (April 2021)  
<https://data.gov.uk/dataset/54181453-b5bd-4694-96b2-a1b5d40985b5/groundwater-management-units-coloured-according-to-water-resource-availability-colours> (September 2020)  
 Natural Resources Wales Catchment Abstraction Management Strategy datasets:  
<http://lle.gov.wales/catalogue/item/WaterResourceReliabilityData> (March 2021)  
<http://lle.gov.wales/catalogue/item/WaterResourceAvailabilityData> (March 2021)

<sup>11</sup> In England this is reported by the EA through the RNAG assessment (Reasons for Not Achieving Good status/potential)

<sup>12</sup> *ibid*

<sup>13</sup> <https://nrfa.ceh.ac.uk/data/search>

### 2.2.1.3 Step 3: Impact Assessment

Where a WFD assessment has not identified an option as WFD compliant through the screening processes of Step 1 and Step 2 the option has been subject to impact assessment.

For each option the construction and operational activities which have been screened in to Step 3 impact assessment are identified. A source-pathway-receptor approach to identifying effects on WFD Assessment Objectives has been undertaken. Using that approach, the source of change is the construction or operational activity. The pathway includes physical environment changes such as water level change, flow velocity change, morphological change. The receptor is the WFD status elements.

For a proportionate assessment, WFD status elements have been screened for those at risk of change from water resource plan options. These have been used as the basis of the assessment for deterioration and target impediment WFD Assessment Objectives, with other elements included on a case-by-case basis. Where the pathway of option impact is physical environment changes only (e.g. not to water quality), the sensitive biological status elements (to flow and morphology) are as follows:

- River water bodies: macrophytes, invertebrates, fish
- Lake water bodies: macrophytes
- Transitional water bodies: fish, benthic invertebrate (extent), sea grass (extent)
- Coastal water bodies: benthic invertebrate (extent), sea grass (extent).

Further pathways are dependent on local conditions and local environmental quality pressures such as changes in dilution of point or diffuse pollution pressures, changes in fish passability at structures. Under these circumstances the assessment also considers WFD compliance impacts to physico-chemical water quality, particularly sanitary and nutrient quality which are the main supporting water quality elements to ecological quality, as well as the associated biological status elements to nutrient and water quality pressures. In exceptional circumstances, where there are known discharges of specific pollutants or substances regulated through WFD chemical status, the dilution change of these has been included in the assessment.

Water quality changes are often associated with river flow reductions as a result of the change of dilution of water quality pressures. Existing known pressures are listed by the Environment Agency Reasons for Not Achieving Good (RNAG) datasets and these are reviewed for their level of influence.

The impact assessments have been undertaken using expert judgement by a hydroecologist, working with any other appropriate disciplines required, which is considered to be the most appropriate Step 3 impact assessment, utilising a level of confidence indicator.

For groundwater bodies, a hydrogeologist has advised on the outcome of the four quantitative tests and the relevant linked surface water bodies, as well as any of the qualitative tests screened into the assessment. These assessments utilise existing reports or modelling (including regulators regional groundwater models) where readily available or, failing that, expert judgement (noting that no additional modelling has been conducted at this step).

### 2.2.2 Stage 2: Programme level assessment

In order to support programme development, the potential for cumulative effects of different combinations of constrained options has been highlighted. The programme level assessment of WFD compliance contains a list of the options included in the programme, their construction start date and implementation date (to define overlaps in the construction period). Informed through the option-level assessment which already have been set out per water body, a list of all WFD water bodies assessed for the individual options was assimilated. Where more than one option was assessed for the same water body a cumulative assessment has been undertaken of the multiple options, against the agreed set of WFD Assessment Objectives using the methodologies for the option-level assessment. This required the revision of the high level hydrological and/or hydrogeological assessment which underpins the testing of the WFD Assessment Objectives. It is noted that the programme level assessments include any additional linked water bodies which are impacted by the cumulative effect of options (in addition to those that are identified in the option-level assessment) – either downstream surface water bodies, or additional surface water bodies linked to groundwater bodies.

An overall WFD compliance statement for each programme has been prepared setting out compliance with each of the agreed WFD Assessment Objectives and the level of confidence in the assessment.

The results from this level of WFD assessment have been used to inform the preferred water resource plan.

### **2.2.3 Stage 3: Assessment of the preferred draft WRMP24**

The cumulative impact of the whole draft WRMP24, regional plan and with draft WRMPs for other water companies has been assessed following a similar process to that identified in **Section 2.2.2**.

A compliance statement of the preferred plan has been presented. This sets out compliance with each of the agreed WFD Assessment Objectives and the level of confidence in the assessment.

## **2.3 CONSULTATION**

Natural England and the Environment Agency were consulted on the SEA Scoping Report in April 2022 along with the WFD methodology. Further consultation will be undertaken with both stakeholders as necessary between the draft and final plan and this section will be updated accordingly.

### 3. OPTION-LEVEL (STAGE 1) WFD ASSESSMENT OUTCOMES

This section outlines:

- The options in the feasible list for Cambridge Water's draft WRMP24
- The final outcomes of the WFD assessment at an option-level for each of the options in the feasible list for Cambridge Water's draft WRMP24.

#### 3.1 FEASIBLE OPTIONS INCLUDED IN THE WFD COMPLIANCE ASSESSMENT

Through an extensive optioneering process, considering a wide range of potential options to balance future supply and demand, Cambridge Water have selected the most suitable options to make up the feasible options list. This list includes both demand side and supply side options, of which only the latter require a WFD Compliance Assessment. The 18 supply side options, which are the subject of the WFD Compliance Assessment are presented in **Table 3-1**.

Table 3-1 List of Cambridge Water's draft WRMP24 feasible options which have been subject to a WFD Compliance Assessment

dWRMP24 Ref.	Option Name
CW2401A	Combined Ouse gravel sources - Fenstanton to St Ives 01A
CW2401B	Combined Ouse Gravel sources - Fenstanton to St Ives 01B
CW2437Ai	Northstowe greywater reuse or similar growth large storage
CW2437Aii	Northstowe greywater reuse or similar growth small storage
CW2438A	Northstowe rainwater harvest or similar growth large storage
CW2438B	Northstowe rainwater harvest or similar growth small storage
CW2457	River Cam abstraction & treatment works
CW2471	AWS Milton WWTW effluent discharge reuse
CW2473A	Fens Reservoir internal potable water transfer Chatteris
CW2475Ai	AWS potable transfer through CAM area 5Mld
CW2475Aii	AWS potable transfer through CAM area 5Mld with main cost
CW2475Aiii	AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant
CW2475Bi	AWS potable transfer through CAM area 10Mld
CW2475Bii	AWS potable transfer through CAM area 10Mld with main cost
CW2475Biii	AWS potable transfer through CAM area 10Mld with main cost and 0.4ha blending plant
CW2475Ci	AWS potable transfer through CAM area 15Mld
CW2475Cii	AWS potable transfer through CAM area 15Mld with main cost
CW2475Ciii	AWS potable transfer through CAM area 15Mld with main cost and 0.5ha blending plant

#### 3.2 OPTION LEVEL WFD COMPLIANCE ASSESSMENT

This section presents a summary of the option level WFD Compliance Assessment for all options included in the feasible list. It is the outcome of methodological Stage 1; a summary of the screening (methodological Step 1 and Step 2) and impact assessment (methodological Step 3) which are reported in **APPENDIX A** and **APPENDIX B** respectively. The option level WFD Compliance Assessment summary is presented in **Table 3-2**. The summary includes those options screened as without risk of deterioration in WFD status and without risk to achieving WFD objectives (as identified in **APPENDIX A**) together with results of the assessment of those options passed forward to Step 3 (as assessed in **APPENDIX B**).



Table 3-2 Option-level WFD Compliance Assessment Summary

Option Name	dWRMP24 Ref.	Outcome	Reason, if not assessed as compliant
Combined Ouse gravel sources Fenstanton to St Ives 01A	CW2401A	Compliant (med conf.)	
Combined Ouse gravel sources Fenstanton to St Ives 01B	CW2401B	Compliant (med conf.)	
Northstowe greywater reuse or similar growth large storage	CW2437Ai	Compliant (high conf.)	
Northstowe greywater reuse or similar growth small storage	CW2437Aii	Compliant (high conf.)	
Northstowe rainwater harvest or similar growth large storage	CW2438A	Non-compliant (low conf.)	<p>The capture of rainwater would reduce flows in an area where there are existing flow pressures (as indicated by the Cam and Ely Ouse abstraction licensing strategy). The WFD assessment for this option has reviewed that there is the potential for deterioration of the fish, invertebrates and macrophytes &amp; phytobenthos status elements within the Cherry Hinton Brook surface water body (GB105033042670). There is also the potential for deterioration of the fish, invertebrates macrophytes &amp; phytobenthos and physico-chemical status elements (particularly phosphate) within the Bottisham Lode – Quay Water surface water body (GB105033042700).</p> <p>To improve confidence in the assessment, a better understanding of the interaction between the intercepted rainfall and river flows is required in order to identify the hydrological impacts in these water bodies.</p>
Northstowe rainwater harvest or similar growth small storage	CW2438B	Non-compliant (low conf.)	<p>The capture of rainwater would reduce flows in an area where there are existing flow pressures (as indicated by the Cam and Ely Ouse abstraction licensing strategy). The WFD assessment for this option has reviewed that there is the potential for deterioration of the fish, invertebrates and macrophytes &amp; phytobenthos status elements within the Cherry Hinton Brook surface water body (GB105033042670). There is also the potential for deterioration of the fish, invertebrates macrophytes &amp; phytobenthos and physico-chemical status elements (particularly phosphate) within the Bottisham Lode - Quay Water surface water body (GB105033042700).</p> <p>To improve confidence in the assessment, a better understanding of the interaction between the intercepted rainfall and river flows is required in order to identify the hydrological impacts in these water bodies.</p>
River CAM abstraction & treatment works	CW2457	Compliant (low conf.)	
AWS Milton WWTW effluent discharge reuse	CW2471	Compliant (low conf.)	
Fens Reservoir internal potable water transfer Chatteris	CW2473A	Compliant (high conf.)	
AWS potable transfer through CAM area 5Mld	CW2475Ai	Compliant (high conf.)	

Option Name	dWRMP24 Ref.	Outcome	Reason, if not assessed as compliant
AWS potable transfer through CAM area 5Mld with main cost	CW2475Aii	Compliant (high conf.)	
AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant	CW2475Aiii	Compliant (high conf.)	
AWS potable transfer through CAM area 10Ml/d	CW2475Bi	Compliant (high conf.)	
AWS potable transfer through CAM area 10Ml/d with main cost	CW2475Bii	Compliant (high conf.)	
AWS potable transfer through CAM area 10Mld with main cost and 0.4ha blending plant	CW2475Biii	Compliant (high conf.)	
AWS potable transfer through CAM area 15Mld	CW2475Ci	Compliant (high conf.)	
AWS potable transfer through CAM area 15Mld with main cost	CW2475Cii	Compliant (high conf.)	
AWS potable transfer through CAM area 15Mld with main cost and 0.5ha blending plant	CW2475Ciii	Compliant (high conf.)	

Out of the 18 supply side options that make up the feasible list of options, only options CW2438A and CW2438B have been identified as potentially non-compliant against the three core WFD Assessment Objectives, albeit with a low confidence rating. To improve confidence in the assessment, a better understanding of the interaction between the intercepted rainfall and river flows is required in order to identify the hydrological impacts in these water bodies and, therefore, pathway to impact on the water quality and biological status elements in the impacted water bodies.

Two options have been found to be compliant against the three core WFD Assessment Objectives but with a low confidence. The low confidence rating is also aligned with the lack of hydrological data to establish the baseline flows in which to be able to assess a flow change against. The assumption has been made that, with each of these options, a suitable hands-off-flow condition will be implemented in order to protect the sensitive low flows in the impacted water bodies.

## 4. PROGRAMME-LEVEL (STAGE 2) WFD ASSESSMENT

In determining the draft WRMP24 preferred plan of options, Cambridge Water used the findings of the option-level assessments to inform the programme appraisal process and to determine the preferred plan. Further details on options appraisal process and development of programmes can be found in the main draft WRMP24 documentation. The options and implementation dates for the options within Cambridge Water's preferred plan are as follows, in order of implementation:

- CW2401A – Combined Ouse gravel sources Fenstanton to St Ives 01A – implementation 2030
- CW2401B – Combined Ouse gravel sources Fenstanton to St Ives 01B – implementation 2030
- CW2475Aiii – AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant – implementation 2030
- CW2475Biii – AWS potable transfer through CAM area 10Mld with main cost and 0.4ha blending plant – implementation 2030
- CW2475Ciii – AWS potable transfer through CAM area 15Mld with main cost and 0.5ha blending plant – implementation 2030
- CW2437Aii – Northstowe greywater reuse or similar growth small storage – implementation 2035
- CW2438B – Northstowe rainwater harvest or similar growth small storage – implementation 2035
- CW2471 – AWS Milton WWTW effluent discharge reuse – implementation 2035
- CW2473A – Fens Reservoir internal potable water transfer Chatteris – implementation 2035
- CW2457 – River Cam abstraction and treatment works – implementation 2040

Of these options, the implementation dates mean that five would be implemented in the AMP9 period with an additional four being implemented within the AMP10 plan period. One option would be implemented in AMP11.

At the option-level, this plan includes seven options that were assessed as WFD compliant with medium/high confidence, two options that were assessed as WFD compliant with a low confidence and one option that was assessed as non-compliant with low confidence. In order to understand the WFD compliance of the draft WRMP24, a cumulative assessment has been undertaken of the options within the preferred plan. The option-level assessments (Section 3) have been used to inform this cumulative assessment. For each WFD water body that is impacted by multiple options within the plan, a WFD assessment has been undertaken to understand the cumulative impact on the receptors within that water body as a result of all of the options being in operation.

**Table 4-1** displays the options that make up the preferred plan and highlights the water bodies that are impacted by more than one option. Two water bodies have been identified as being impacted cumulatively:

- GB105033047921 - Ouse (Roxton to Earith) – associated with impacts from options CW2401A and CW2401B (Cumulative PP1)
- GB105033042750 – Cam – associated with impacts from options CW2438B, CW2471 and CW2457 (Cumulative PP2).

No additional water bodies have been assessed as a result of the cumulative impact that are not identified in the option-level assessment.

Through review of the cumulative impacts and option-level impacts, the preferred plan has been identified to be potentially WFD non-compliant in two water bodies, both with low confidence. Each of these water bodies are associated with impacts from Option CW2438B which would capture water from the catchment of these water bodies. A water body by water body summary of WFD compliance of the draft WRMP24 preferred plan is set out in Table 4-2 which explains these non-compliant issues further. The table also provides summary where a water body has been identified as compliant with a low confidence rating and outlines reason for the low confidence rating and steps that could be taken to improve confidence.

The River Cam water body (GB105033042750) is currently at Poor phosphate status due to point source pollution from continuous sewage discharges (confirmed in the RNAG<sup>14</sup>). The reduction in discharge from Milton WwTW associated with option CW2471 would assist with reducing the release of pollutants into the River Cam. This may assist the attainment of WFD Assessment Objective 6, as set out in **Section 2.1.2**.

<sup>14</sup> Reasons for Not Achieving Good

Table 4-1 Identification of impacts on water bodies associated with the Cambridge Water draft WRMP preferred plan.

WFD water body		Option ID									
Type	ID and Name	CW2401A	CW2401B	CW2475Aiii	CW2475Biii	CW2475Ciii	CW2437Aii	CW2438B	CW2471	CW2473A	CW2457
River	GB105033047921 - Ouse (Roxton to Earith)	✓	✓								
	GB105033042670 - Cherry Hinton Brook							✓			
	GB105033042700 - Bottisham Lode - Quy Water							✓			
	GB105033042750 - Cam							✓	✓		✓

Table 4-2 Overall WFD compliance of the water bodies impacted by the preferred plan

Water body	Option(s) impacting water body	WFD compliance outcome	Summary
<b>GB105033047921 - Ouse (Roxton to Earith)</b>	CW2401A CW2401B (Cumulative PP1)	Compliant (med conf.)	The cumulative impact of both Option CW2401A and CW2401B has been assessed on this water body. The flow reduction as a result of the two options in this water body is only expected to be minor (2.9% of Q95 flows). This hydrological change is insufficient to act as a pathway to impact the aquatic ecology and water quality in this water body. More confidence can be achieved in the assessment through a better understanding of the groundwater and surface water interaction in this water body.
<b>GB105033042670 - Cherry Hinton Brook</b>	CW2438B	Non-compliant (low conf.)	Option CW2438B would intercept rainwater in the Cherry Hinton Brook catchment, potentially reducing the flow in the Cherry Hinton Brook. There is limited hydrological baseline data in this water body to be able to assess the magnitude of flow reduction however the CAMS (Catchment Abstraction Management Strategy) for this water body designated it as a water body where there is no water available for abstraction under Q90 and Q70 conditions and a restricted amount in Q50 and Q30 conditions. Based on this, the water body is assumed to be under flow stress and any reduction in flow could have significant impacts on the water environment. As such, there may be deterioration in the biological status element in this water body.  As highlighted, greater confidence in this assessment may be achieved through developing the hydrological baseline understanding of the water body. As a result, the magnitude of hydrological change can then be used to determine whether there is a significant pathway to impacting the biological elements in this water body.
<b>GB105033042700 - Bottisham Lode - Quy Water</b>	CW2438B	Non-compliant (low conf.)	Option CW2438B would intercept rainwater in the Bottisham Lode catchment, potentially reducing the flow in the Bottisham Lode. As with the Cherry Hinton Brook, there is limited hydrological baseline data in this water body to be able to assess the magnitude of flow reduction however the CAMS for this water body designated it as a water body where there is no water available for abstraction under Q90 and Q70 conditions and a restricted amount in Q50 and Q30 conditions. Based on this, the water body is assumed to be under flow stress and any reduction in flow could have significant impacts on the water environment. As such, there may be deterioration in the biological status elements in this water body.  There are also point source phosphate pressures in this water body that could be exacerbated as a result of the flow reduction. As such, there may also be deterioration and the impediment of Good phosphate status in this water body.  As highlighted, greater confidence in this assessment may be achieved through developing the hydrological baseline understanding of the water body. As a result, the magnitude of hydrological change can then be used to determine whether there is a significant pathway to impacting the biological elements and water quality elements in this water body.
<b>GB105033042750 - Cam</b>	CW2438B CW2471 CW2457 (Cumulative PP2)	Compliant (low conf.)	The cumulative impact on this water body is assessed as WFD compliant with a low confidence rating. Further confidence can be achieved in this assessment through a better understanding of both the operational regime (including HOF conditions) of Options CW2471 and CW2457 along with a developed understanding of the hydrological baseline within the River Cam.

## 5. WFD ASSESSMENT OF PREFERRED PLAN AGAINST OTHER PLANS AND PROJECTS (STAGE 3)

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This section provides an overview of the WFD compliance for Cambridge Water's draft WRMP24 in combination with other water companies' draft WRMPs.

The Water Resources East draft Regional Plan WFD assessment<sup>15</sup> identified the water bodies that are impacted by options within any of the water company draft WRMP24 within the Water Resources East regional group<sup>16</sup>. There were several options identified in the draft Regional Plan that could impact the same water bodies as those that could be impacted by the options within the Cambridge Water draft WRMP24 preferred plan (outlined in **Section 4**).

Firstly, along with Option CW2401A and Option CW2401B, the draft Regional Plan has identified that the Fens Reservoir SRO (Option FND21) and Option SWC10, each in the Anglian Water draft best value plan, impact the Ouse (Roxton to Earith) river water body (GB105033047921). The impacts of Option for SWC10 were screened as WFD compliant on this water body and did not require impact assessment in the Water Resources East draft Regional Plan and, as such, would not lead to any additional risks to WFD compliance in this water body further than those identified in this report (**Section 4**). Alternatively, the Fens Reservoir SRO has been identified as potentially causing deterioration to the biological status elements in this water body with low confidence and further investigation required to improve this confidence. With this option being part of the SRO process, the option has been subject to a more detailed assessment through the SRO gated process. It is possible that, operated cumulatively, the Fens Reservoir SRO, Option CW2401A and CW2401B could pose a combined risk to WFD compliance in this water body. This risk will require further investigation prior to the implementation of any of these options and discussions are required within the Water Resources East regional group as to the pathway for undertaking these further investigations.

Further, potential inter-water company cumulative impacts were also identified on the Cam water body (GB105033042750) between Option CW2471 and three Anglian Water Options (CAM7, CAM11 and SWC10). Each of the Anglian Water options impacting this water body were screened as WFD compliant in this water body so would not pose any additional risk to WFD compliance above those identified for the Cambridge Water options in this report.

This was also found to be the case in the Cherry Hinton Brook water body (GB105033042670), impacted by three Anglian Water options (CAM7, CAM11 and SWC10), and the Bottisham Lode - Quay Water (GB105033042700) water body, impacted by two Anglian Water options (CAM7 and SWC10). The impacts of the Anglian Water options on these water bodies were all screened as WFD compliant so there would be no additional WFD compliance risks other than those identified for Option CW2438B in **Section 4**.

A review of the water companies draft WRMPs outside of the Water Resources East regional group identified no further options with cumulative impacts on the water bodies impacted by the Cambridge Water draft WRMP24 preferred plan.

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<sup>15</sup> <https://wre.org.uk/wp-content/uploads/2022/12/Sub-Report-B-WFD.pdf>

<sup>16</sup> Based on the Affinity Water (Brett resource zone), Anglian Water, Cambridge Water and Essex and Suffolk Water draft WRMP24s



## 6. WFD COMPLIANCE SUMMARY OF THE CAMBRIDGE WATER DRAFT WRMP24

This section summarises the plan level WFD compliance for the Cambridge Water draft WRMP24.

**Table 6-1** provides a summary of the WFD compliance of the Cambridge Water draft WRMP24 preferred programme against the 3 core WFD Assessment Objectives (Objectives 1-3) and the three progressive Assessment Objectives (Objectives 4-6).

The programme level assessment in **Section 4** identified that the preferred plan for the draft WRMP24 includes 10 supply options, each of which, individually and collectively, have been the subject of this assessment. One of these options has been found to be potentially non-compliant in two water bodies, both with a low confidence rating. This is due to rainwater being intercepted in the catchment of these water bodies which are currently designated as having no water available for abstraction. There is limited baseline hydrological understanding for the basis of this assessment, hence the low confidence rating. Through a better hydrological understanding, the magnitude of hydrological impact can be understood and a more confident assessment of the impact on the WFD elements in these water bodies can be achieved.

The remaining two water bodies have been assessed as WFD compliant, noting that one of these assessments is low confidence. The low confidence is associated with uncertainty around how the options that impact the water body will operate, including the hands-off flow condition that will be set for the abstraction and cessation of the WwTW discharge to the water body. There is also limited baseline hydrological data in the water body in which to assess the magnitude of impact against.

The potential for cumulative impact between the Cambridge Water draft WRMP24 preferred plan and other water companies draft WRMP24s is reviewed in **Section 5**. The review identified no potential additional cumulative impacts on any water bodies impacted by the Cambridge Water draft WRMP24 preferred plan other than on the Ouse (Roxton to Earith) water body (GB105033047921) which is impacted by the Fens Reservoir SRO (Option FND21 in the Anglian Water draft WRMP24 best value plan) along with Option CW2401A and Option CW2401B. Though the impact on this water body is assessed as compliant (medium confidence) based on the options within the Cambridge Water preferred plan, the Anglian Water draft WRMP24 best value plan identifies the impacts on this water body as a result of the Fens Reservoir SRO to have the potential for deterioration to the biological status elements in this water body with low confidence and advocates further investigations to improve this confidence. It is possible that, operated cumulatively, the Fens Reservoir SRO, Option CW2401A and CW2401B could pose a combined risk to WFD compliance in this water body. This risk will require further investigation prior to the implementation of any of these options and discussions are required within the Water Resources East regional group as to the pathway for undertaking these further investigations.

The diversion of the WwTW discharge from Milton WwTW associated with Option CW2471 may assist with the achievement of Assessment Objective 6 with there being less WwTW effluent discharge into the water environment. The options in the preferred plan would not assist with the attainment of Assessment Objective 4 or Assessment Objective 5.

**Table 6-1 Summary of plan level WFD compliance for the Cambridge Water draft WRMP24**

WFD Assessment Objective	Summary of WFD compliance	Explanation
1) To prevent deterioration of any WFD element of any water body - in line with Regulation 13(2)a and 13(5)a	Potentially non-compliant	There are two water bodies impacted by the activities within the Cambridge Water draft WRMP24 preferred plan that have been assessed as potentially non-compliant against this WFD Assessment Objective. It is worth noting that these assessments are low confidence. There are also options contained within the draft WRMP preferred programme that have been assessed as compliant with a low confidence rating that require further design information and

WFD Assessment Objective	Summary of WFD compliance	Explanation
		investigation to improve confidence on their impact.
2) To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body -in line with Regulation 13(2)b and 13(5)c.	Potentially non-compliant	<p>There is one water body impacted by the activities within the Cambridge Water draft WRMP24 preferred plan that have been assessed as potentially non-compliant against this WFD Assessment Objective. It is worth noting that the assessment is low confidence.</p> <p>There are also options contained within the draft WRMP preferred plan that have been assessed as compliant with a low confidence rating that require further design information and investigation to improve confidence on their impact.</p>
3) To ensure that the planned programme of water body measures in RBMP2 to protect and enhance the status of water bodies are not compromised.	Compliant	None of the activities associated with the Cambridge Water draft WRMP24 preferred plan have been assessed as having the potential to compromise any planned programme of water body measures as set out in RBMP2.
4) To assist the attainment of the WFD objectives for the water body – in line with Regulation 13(2)b and 13(2)c	Does not assist attainment	None of the options contained within the Cambridge Water draft WRMP24 preferred plan would help attain the WFD objectives for any water bodies or WFD protected areas.
5) To assist the attainment of the WFD objectives for associated WFD protected areas – in line with Regulation 13(6)	Does not assist attainment	
6) To progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment	May assist the attainment	Option CW2471 would, at times, divert the discharge from Milton WwTW from the River Cam which would assist with reducing the release of pollutants into the aquatic environment. This may assist the attainment of this objective.

# APPENDICES

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## APPENDIX A OPTION-LEVEL SCREENING

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This appendix presents the results of the WFD compliance assessment screening outcomes (methodological Step 1 and Step 2) the 10 options included in the feasible list and indicates whether they were screened in for an impact assessment (methodological Step 3) based on the potential risk of deterioration of WFD status. Where an option has been screened in for an impact assessment, the water bodies that were screened in have also been identified. The outcomes of the screening steps are displayed in **Table A-1**. The impact assessment for the options and water bodies scoped in for further assessment are presented in **APPENDIX A**.

Table A-1 Option-level WFD screening outcomes

Option Name	dWRMP24 Ref.	Water body Name	WBID	Type	Screened as WFD compliant	Reason for screening as WFD compliant
Combined Ouse gravel sources Fenstanton to St Ives 01A	CW2401A	Ouse (Roxton to Earith)	GB105033047921	River	No	n/a
Combined Ouse gravel sources Fenstanton to St Ives 01B	CW2401B	Ouse (Roxton to Earith)	GB105033047921	River	No	n/a
Northstowe greywater reuse or similar growth large storage	CW2437Ai	n/a	n/a		Yes	This option involves the capture of greywater from a new housing development and transferring this water to a new reservoir. There are no pathways for this option to operationally impact any WFD water bodies.
Northstowe greywater reuse or similar growth small storage	CW2437Aii	n/a	n/a		Yes	This option involves the capture of greywater from a new housing development and transferring this water to a new reservoir. There are no pathways for this option to operationally impact any WFD water bodies.
Northstowe rainwater harvest or similar growth large storage	CW2438A	Cherry Hinton Brook; Bottisham Lode - Quy Water; Cam	GB105033042670 GB105033042700 GB105033042750	River River River	No	n/a
Northstowe rainwater harvest or similar growth small storage	CW2438B	Cherry Hinton Brook; Bottisham Lode - Quy Water; Cam	GB105033042670 GB105033042700 GB105033042750	River River River	No	n/a
River CAM abstraction & treatment works	CW2457	Cam	GB105033042750	River	No	n/a
AWS Milton WWTW effluent discharge reuse	CW2471	Cam	GB105033042750	River	No	n/a
Fens Reservoir internal potable water transfer Chatteris	CW2473A	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.

Option Name	dWRMP24 Ref.	Water body Name	WBID	Type	Screened as WFD compliant	Reason for screening as WFD compliant
AWS potable transfer through CAM area 5MI/d	CW2475Ai	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 5MI/d with main cost	CW2475Aii	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 5MI/d with main cost and 0.3ha blending plant	CW2475Aiii	n/a	n/a	n/a	Yes	This option involves the transfer and treatment of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 10MI/d	CW2475Bi	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 10MI/d with main cost	CW2475Bii	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 10MI/d with main cost and 0.4ha blending plant	CW2475Biii	n/a	n/a	n/a	Yes	This option involves the transfer and treatment of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 15MI/d	CW2475Ci	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.



Option Name	dWRMP24 Ref.	Water body Name	WBID	Type	Screened as WFD compliant	Reason for screening as WFD compliant
AWS potable transfer through CAM area 15Mld with main cost	CW2475Cii	n/a	n/a	n/a	Yes	This option involves the transfer of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.
AWS potable transfer through CAM area 15Mld with main cost and 0.5ha blending plant	CW2475Ciii	n/a	n/a	n/a	Yes	This option involves the transfer and treatment of potable water. It is assumed that no additional surface of groundwater or surface water abstraction is required to support this transfer. As such, there are no operational pathways to impacting any WFD water bodies.

## APPENDIX B OPTION-LEVEL IMPACT ASSESSMENTS

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This appendix presents the impact assessment (methodological Step 3) for the options that were screened in for more detailed assessment through the screening steps (as set out in **APPENDIX A**). An impact assessment table has been completed for each water body for each option that has been identified through the screening process.

Option	CW2401A - Combined Ouse gravel sources - Fenstanton and St Ives 01A	Sources & pathways of potential effect: Recommission unused groundwater abstraction source (gravels) at Fenstanton BH (borehole). Creating two new 25m deep BHs with pumps and building for DO of 0.44MI/d DYAA. Although a BH, the source is a superficial aquifer (likely river bank filtration) and is not located in a GW WB (underlying Oxford Clay is an aquiclude). Abstraction has the potential for flow reductions in River Ouse around and downstream of the borehole due to likely connectivity between river and underlying superficial deposits.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033047921	
Water body name	Ouse (Roxton to Earith)	

Status element	Baseline Status						Reasons for not achieving good status		Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments		
Fish							Flow measurements taken at NRFA 33001 - Bedford Ouse at Brownhill Staunch (~14km upstream of the BH site) indicates a Q50 of 533.3MI/d and a Q95 of 85.6MI/d. The abstraction is ~0.25% of the Q95. The BH abstractions are located on River Terrace Deposits of sand and gravel (BGS data) and are located between 0.17km and 1.1km from the right bank of the River Ouse. There is likely to be hydrological connectivity between the river and the superficial material (NRFA data for adjacent flow gauges indicate GW abstraction impacts on flows). Underlying bedrock is the Oxford Clay Formation, an aquiclude which contains no appreciable and abstractable water supplies. BGS boreholes (e.g. TL36NW2 and TL37SW51) indicate thickness of the superficial material (and depth to bedrock) of ~7.1m with rest water levels around 3.5m.  Given the abstraction there is the potential for a downstream reduction in flow around and immediately downstream of the boreholes when in operation. However, the small scale of the abstraction suggests that there are unlikely to be any significant effects on the adjacent WFD status elements.	Compliant (med. conf.)	n/a		
Invertebrates								Compliant (med. conf.)	n/a		
Macrophytes/ phytobenthos	Not assessed							Compliant (med. conf.)	n/a		
Phys-chem water quality (in support of ecological status)		Phosphate (poor). RNAGs indicate sources of P are diffuse (poor livestock and poor nutrient management) and point (sewage discharge).					Potential changes in flow may reduce dilution potential, however, given potential reductions (~0.25% of Q95) this is unlikely to have any significant downstream impact.	Compliant (med. conf.)	Compliant (med. conf.)		
Chemicals		Perfluorooctane sulphonate (PFOS) (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail)					Flow changes may reduce the dilution of pollutants though may partially remove these pollutants. These effects are considered to be insignificant.	Compliant (med. conf.)	Compliant (med. conf.)		
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)		
Overall assessment of WFD Regulations compliance of the option in this water body								Compliant (med. conf.)			

Option	CW2401B - Combined Ouse gravel sources Fenstanton to St Ives 01B	Sources & pathways of potential effect: Recommission unused groundwater abstraction source at Fenstanton BH (borehole) allowing for a DO of 2.0Ml/d DYAA. Flow augmentation of River Ouse to allow for increased abstraction at Fenstanton. Although a BH, the source is a superficial aquifer (likely river bank filtration) and is not located in a GW WB (underlying Oxford Clay is an aquiclude). Abstraction has the potential for flow reductions in River Ouse around and downstream of the BH due to likely connectivity between river and underlying superficial deposits. Possible impacts of high flows due to augmentation.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033047921	
Water body name	Ouse (Roxton to Earith)	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish							Flow measurements taken at NRFA 33001 - Bedford Ouse at Brownhill Staunch (~14km upstream of the BH site) indicates a Q50 of 533.3Ml/d and a Q95 of 85.6Ml/d. The abstraction is ~1.1% of the Q95). The BH abstractions are located on River Terrace Deposits of sand and gravel (BGS data) and are located between 0.17km and 1.1km from the right bank of the River Ouse. There is likely to be hydrological connectivity between the river and the superficial material (NRFA data for adjacent flow gauges indicate GW abstraction impacts on flows). Underlying bedrock is the Oxford Clay Formation, an aquiclude which contains no appreciable and abstractable water supplies. BGS boreholes (e.g. TL36NW2 and TL37SW51) indicate thickness of the superficial material (and depth to bedrock) of ~7.1m with rest water levels around 3.5m.  Given the abstraction there is the potential for a downstream reduction in flow around and immediately downstream of the boreholes when in operation. The small scale of the flow augmentation and abstraction suggests that there are unlikely to be any significant effects on the adjacent WFD status elements.	Compliant (med. conf.)	n/a			
Invertebrates								Compliant (med. conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Compliant (med. conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (poor). RNAGs indicate sources of P are diffuse (poor livestock and poor nutrient management) and point (sewage discharge).					Potential changes in flow may reduce dilution potential, however, given potential reductions (~1.1% of Q95) this is unlikely to have any significant downstream impact.	Compliant (med. conf.)	Compliant (med. conf.)			
Chemicals		Perfluorooctane sulphonate (PFOS) (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail)					Flow changes may reduce the dilution of pollutants though may partially remove these pollutants. These effects are considered to be insignificant.	Compliant (med. conf.)	Compliant (med. conf.)			
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)			
Overall assessment of WFD Regulations compliance of the option in this water body								Compliant (med. conf.)				

Option	CW2438A - Northstowe rainwater harvest or similar growth large storage	Sources & pathways of potential effect: Install a rainwater harvesting system in the housing development diverting 0.9Ml/d of rainwater away from the water body (Cherry Hinton Brook) and into a 245.7Ml/y storage reservoir. The diversion of rainwater has the potential for flow reductions in the Cherry Hinton Brook. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042670	
Water body name	Cherry Hinton Brook	

Status element	Baseline Status						Reasons for not achieving good status		Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments		
Fish	Not assessed							The CAMS suggests that water is not available for abstraction from the Cherry Hinton Brook during Q95 and Q70 conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. Though this option would not lead to additional abstraction from this water body, this indicates that there is a flow pressure in the Cherry Hinton Brook. Reduction in flow will potentially lead to significant impacts on in-channel habitats. This could lead to deterioration in biological status elements.	Non-compliant (low conf.)	n/a	
Invertebrates		Suspected	Confirmed	Confirmed	Suspected			It is worth noting that low flows will not, however, be impacted as there would be no rainfall interception on those days.	Non-compliant (low conf.)	n/a	
Macrophytes/ phytobenthos									Non-compliant (low conf.)	n/a	
Phys-chem water quality (in support of ecological status)			Phosphate (moderate). RNAGs indicate sources of P are diffuse (confirmed - urban development and transport drainage).					Reduction in flows is not likely to deteriorate the phys-chem status elements of this water body as the diffuse sources of Phosphate are confirmed to have derived from urban development and transport drainage. The capture of runoff may improve the water quality.	Compliant (low conf.)	Compliant (low conf.)	
Chemicals			Fail for PFOS, PBDE, Benzo(g-h-i)perylene and Benzo(b)fluoranthene					The reduction in flow and runoff may remove these chemical pollutants to some degree, as such there would be no deterioration.	Compliant (low conf.)	Compliant (low conf.)	
RBMP2 water body measures	<b>None</b>							There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)	
<b>Overall assessment of WFD Regulations compliance of the option in this water body</b>									Non-compliant (low conf.)		

Option	CW2438A - Northstowe rainwater harvest or similar growth large storage	Sources & pathways of potential effect: Install a rainwater harvesting system in the housing development diverting 0.9MI/d of rainwater away from the water body and into a 245.7MI/y storage reservoir. The diversion of rainwater has the potential for flow reductions in the Bottisham Lode. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042700	
Water body name	Bottisham Lode - Quy Water	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						The CAMS suggests that water is not available for abstraction from the Bottisham Lode - Quy during Q95 and Q70 conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. Though this option wouldn't lead to additional abstraction from this water body, this indicates that there is a flow pressure in the Bottisham Lode. Reduction in flow will potentially lead to significant impacts on in-channel habitats. This could lead to deterioration in biological status elements.  It is worth noting that low flows will not, however, be impacted as there would be no rainfall interception on those days.	Non-compliant (low conf.)	n/a			
Invertebrates								Non-compliant (low conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Non-compliant (low conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).					Reduction in rainfall runoff and therefore flows may exacerbate the point source water quality pressures in this water body due to a decreased dilution potential.	Non-compliant (low conf.)	Non-compliant (low conf.)			
Chemicals		Fail for PFOS and PBDE					The reduction in flow and runoff may remove these chemical pollutants to some degree, as such there would be no deterioration.	Compliant (med. conf.)	Compliant (med. conf.)			
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)			
Overall assessment of WFD Regulations compliance of the option in this water body								Non-compliant (low conf.)				



Option	CW2438A - Northstowe rainwater harvest or similar growth large storage	Sources & pathways of potential effect: Reduction of flow into the Cam water body from Cherry Hinton Brook and Bottisham Lode as a result of rainwater harvesting. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042750	
Water body name	Cam	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						In the context of the River Cam the interception of flow in the Cherry Hinton Brook and Bottisham Lode would result in a negligible flow change. As such there is no risk of deterioration in the biological status elements in this water body.	Compliant (med. conf.)	n/a			
Invertebrates								Compliant (med. conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Compliant (med. conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (Poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).						In the context of the River Cam the interception of flow in the Cherry Hinton Brook and Bottisham Lode would result in a negligible flow change. As such there is no risk of deterioration in the phys-chem water quality status elements in this water body.	Compliant (med. conf.)	Compliant (med. conf.)		
Chemicals		Failed for PFOS and PBDE						There is no risk of deterioration in the chemical water quality status elements in this water body.	Compliant (med. conf.)	Compliant (med. conf.)		
RBMP2 water body measures	None							There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)		
Overall assessment of WFD Regulations compliance of the option in this water body								Compliant (med. conf.)				

Option	CW2438B - Northstowe rainwater harvest or similar growth small storage	Sources & pathways of potential effect: Install a rainwater harvesting system in the housing development diverting 0.9MI/d of rainwater away from the water body (Cherry Hinton Brook) and into a 46.8MI/y storage reservoir. The diversion of rainwater has the potential for flow reductions in the Cherry Hinton Brook. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042670	
Water body name	Cherry Hinton Brook	

Status element	Baseline Status						Reasons for not achieving good status		Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments		
Fish	Not assessed							The CAMS suggests that water is not available for abstraction from the Cherry Hinton Brook during Q95 and Q70 conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. Though this option would not lead to additional abstraction from this water body, this indicates that there is a flow pressure in the Cherry Hinton Brook. Reduction in flow will potentially lead to significant impacts on in-channel habitats. This could lead to deterioration in biological status elements.	Non-compliant (low conf.)	n/a	
Invertebrates		Suspected	Confirmed	Confirmed	Suspected			It is worth noting that low flows will not, however, be impacted as there would be no rainfall interception on those days.	Non-compliant (low conf.)	Non-compliant (low conf.)	
Macrophytes/ phytobenthos									Non-compliant (low conf.)	n/a	
Phys-chem water quality (in support of ecological status)			Phosphate (moderate). RNAGs indicate sources of P are diffuse (confirmed - urban development and transport drainage).					Reduction in flows is not likely to deteriorate the phys-chem status elements of this water body as the diffuse sources of Phosphate are confirmed to have derived from urban development and transport drainage. The capture of runoff may improve the water quality.	Compliant (low conf.)	Compliant (low conf.)	
Chemicals			Fail for PFOS, PBDE, Benzo(g-h-i)perylene and Benzo(b)fluoranthene					The reduction in flow and runoff may remove these chemical pollutants to some degree, as such there would be no deterioration.	Compliant (low conf.)	Compliant (low conf.)	
RBMP2 water body measures	<b>None</b>							There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)	
<b>Overall assessment of WFD Regulations compliance of the option in this water body</b>									Non-compliant (low conf.)		

Option	CW2438B - Northstowe rainwater harvest or similar growth small storage	Sources & pathways of potential effect: Install a rainwater harvesting system in the housing development diverting 0.9MI/d of rainwater away from the water body and into a 46.8MI/y storage reservoir. The diversion of rainwater has the potential for flow reductions in the Bottisham Lode. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042700	
Water body name	Bottisham Lode - Quy Water	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						The CAMS suggests that water is not available for abstraction from the Bottisham Lode - Quy during Q95 and Q70 conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. Though this option wouldn't lead to additional abstraction from this water body, this indicates that there is a flow pressure in the Cherry Hinton Brook. Reduction in flow will potentially lead to significant impacts on in-channel habitats. This could lead to deterioration in biological status elements.  It is worth noting that low flows will not, however, be impacted as there would be no rainfall interception on those days.	Non-compliant (low conf.)	n/a			
Invertebrates								Non-compliant (low conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Non-compliant (low conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).					Reduction in rainfall runoff and therefore flows may exacerbate the point source water quality pressures in this water body due to a decreased dilution potential.	Non-compliant (low conf.)	Non-compliant (low conf.)			
Chemicals		Fail for PFOS and PBDE					The reduction in flow and runoff may remove these chemical pollutants to some degree, as such there would be no deterioration.	Compliant (med. conf.)	Compliant (med. conf.)			
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)			
Overall assessment of WFD Regulations compliance of the option in this water body								Non-compliant (low conf.)				

Option	CW2438B - Northstowe rainwater harvest or similar growth small storage	Sources & pathways of potential effect: Reduction of flow into the Cam water body from Cherry Hinton Brook and Bottisham Lode as a result of rainwater harvesting. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042750	
Water body name	Cam	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						In the context of the River Cam the interception of flow in the Cherry Hinton Brook and Bottisham Lode would result in a negligible flow change. As such there is no risk of deterioration in the biological status elements in this water body.	Compliant (med. conf.)	n/a			
Invertebrates								Compliant (med. conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Compliant (med. conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (Poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).						In the context of the River Cam the interception of flow in the Cherry Hinton Brook and Bottisham Lode would result in a negligible flow change. As such there is no risk of deterioration in the phys-chem water quality status elements in this water body.	Compliant (med. conf.)	Compliant (med. conf.)		
Chemicals		Failed for PFOS and PBDE						There is no risk of deterioration in the chemical water quality status elements in this water body.	Compliant (med. conf.)	Compliant (med. conf.)		
RBMP2 water body measures	None							There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)		
Overall assessment of WFD Regulations compliance of the option in this water body								Compliant (med. conf.)				

Option	CW2457 - River Cam abstraction & treatment works		Sources & pathways of potential effect: Install a new abstraction point on the River Cam +- 2km downstream of the AWS Milton WwTW to abstract 22MI/day for 120 days a year. Abstraction has the potential for flow reductions in River Cam. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River		
Hydromorph designation	HMWB		
Water body ID	GB105033042750		
Water body name	Cam		

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						The CAMS suggests that water is not available for abstraction from the River Cam during Q95 and Q70 conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. This indicates that there is a flow pressure in the River Cam potentially leading to significant impacts on in-channel habitats.	Compliant (low conf.)	n/a			
Invertebrates							For a new abstraction to be licensed a suitable hands-off-flow would be required to protect the River Cam from abstraction under low flow conditions. Assuming this, it is unlikely that deterioration between status classes for fish, invertebrates or macrophytes and phytobenthos will occur.	Compliant (low conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed						The hands-off flow condition must take into account the pressures in this water body and ensure that any reduction in flow does not lead to significant changes in water quality, in-channel habitats and geomorphological processes.	Compliant (low conf.)	n/a			
Phys-chem water quality (in support of ecological status)			Phosphate (Poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).				Reduction in flows may exacerbate the point source water quality pressures in this water body. A suitable hands-off-flow would be required in the abstraction license to ensure no deterioration in the phys-chem water quality status elements.	Compliant (low conf.)	Compliant (low conf.)			
Chemicals		Failed for PFOS and PBDE					Flow changes may reduce the dilution of pollutants though may partially remove these pollutants. These effects are considered to be insignificant.	Compliant (med. conf.)	Compliant (med. conf.)			
RBMP2 water body measures	None							There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)		
Overall assessment of WFD Regulations compliance of the option in this water body								Compliant (low conf.)				

Option	CW2471 - AWS Milton WWTW Effluent reuse	Sources & pathways of potential effect: Capturing final effluent (22Ml/d for 120 days a year) from Milton Wastewater Treatment Works (WwTW) which currently discharges into the River Cam. Abstraction has the potential for flow reductions in River Cam. This could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033042750	
Water body name	Cam	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of option		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						The CAMS suggests that water is not available for abstraction from the River Cam during Q95 and Q70 flow conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. The option would only transport effluent when river flows are above a HoF, therefore sensitive low flows would still be protected. As such it is unlikely that there will be a significant impact on in-channel habitats and thus no deterioration in biological status elements. Water quality improvements may benefit the biological status elements.	Compliant (low conf.)	n/a			
Invertebrates								Compliant (low conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Compliant (low conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (Poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).					Reduction in sewage discharge would reduce the water quality pressures in this water body potentially improving the water quality.	Compliant (med. conf.)	Compliant (med. conf.)			
Chemicals		Failed for PFOS and PBDE					Changes in flow may have an impact in reducing dilution of pollutants. The abstraction may also remove these pollutants to some degree. Neither of these effects are considered to be significant.	Compliant (med. conf.)	Compliant (med. conf.)			
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)			
Overall assessment of WFD Regulations compliance of the option in this water body								Compliant (low conf.)				

## APPENDIX C PROGRAMME-LEVEL SCREENING

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This appendix presents the results of the WFD compliance assessment screening outcomes for the cumulative impacts associated with the preferred programme and alternative programmes. Where an option has been screened in **Section 4** for an impact assessment, the water bodies that were screened in have also been identified. The cumulative reference convention is presented in **Section 4**. The outcomes of the screening steps are displayed in **Table C-1**. The impact assessment for the cumulative and water bodies scoped in for further assessment are presented in **APPENDIX D**.



Table C-1 Programme-level WFD screening outcomes

Cumulative number	Water body name	Water body ID	Type	Screened as WFD compliant	Reason screened as compliant
Cumulative PP1	Ouse (Roxton to Earith)	GB105033047921	River	No	n/a
Cumulative PP2	Cam	GB105033042750	River	No	n/a

## APPENDIX D PROGRAMME-LEVEL IMPACT ASSESSMENTS

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This appendix presents the impact assessment for the water bodies that were screened in **Section 4** for more detailed assessment through the cumulative impact screening step. An impact assessment table has been completed for each water body for each cumulative impact that has been identified through the screening process. The cumulative reference convention is presented in **Section 4**.

Cumulative	PP1	Sources & pathways of potential effect: Both option CW2401A and CW2401B rely on the recommissioning of groundwater abstraction at the Fenstanton BH for a combined yield of 2.44MI/d DYAA. Although a BH, the source is a superficial aquifer (likely river bank filtration) and is not located in a GW WB (underlying Oxford Clay is an aquiclude). Abstraction has the potential for flow reductions in River Ouse around and downstream of the BH due to likely connectivity between river and underlying superficial deposits. Possible impacts of high flows due to augmentation.
Water body type	River	
Hydromorph designation	HMWB	
Water body ID	GB105033047921	
Water body name	Ouse (Roxton to Earith)	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of cumulative impact		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish							Flow measurements taken at NRFA 33001 - Bedford Ouse at Brownhill Staunch (~14km upstream of the BH site) indicates a Q50 of 533.3MI/d and a Q95 of 85.6MI/d. The abstraction is ~2.9% of the Q95). The BH abstractions are located on River Terrace Deposits of sand and gravel (BGS data) and are located between 0.17km and 1.1km from the right bank of the River Ouse. There is likely to be hydrological connectivity between the river and the superficial material (NRFA data for adjacent flow gauges indicate GW abstraction impacts on flows). Underlying bedrock is the Oxford Clay Formation, an aquiclude which contains no appreciable and abstractable water supplies. BGS boreholes (e.g. TL36NW2 and TL37SW51) indicate thickness of the superficial material (and depth to bedrock) of ~7.1m with rest water levels around 3.5m.  Given the abstraction there is the potential for a downstream reduction in flow around and immediately downstream of the boreholes when in operation. The small scale of the flow augmentation and abstraction suggests that there are unlikely to be any significant effects on the adjacent WFD status elements.	Compliant (med. conf.)	n/a			
Invertebrates								Compliant (med. conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Compliant (med. conf.)	n/a			
Phys-chem water quality (in support of ecological status)		Phosphate (poor). RNAGs indicate sources of P are diffuse (poor livestock and poor nutrient management) and point (sewage discharge).					Potential changes in flow may reduce dilution potential, however, given potential reductions (~2.9% of Q95) this is unlikely to have any significant downstream impact.	Compliant (med. conf.)	Compliant (med. conf.)			
Chemicals		Perfluorooctane sulphonate (PFOS) (Fail) and Polybrominated diphenyl ethers (PBDE) (Fail)					Flow changes may reduce the dilution of pollutants though may partially remove these pollutants. These effects are considered to be insignificant.	Compliant (med. conf.)	Compliant (med. conf.)			
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)			
Overall assessment of WFD Regulations compliance of the cumulative impact in this water body								Compliant (med. conf.)				

Cumulative	PP2	Sources & pathways of potential effect:
Water body type	River	This water body would be impacted by each option CW2438B, CW2457 and CW2471. CW2438B would reduce the pass forward flow into this water body from the Bottisham Lode and Cherry Hinton Brook. CW2457 would abstract water from this water body at a new abstraction point and CW2471 would reduce the discharge into this water body from Milton Brook WwTW. Each of these option would reduce the flow in this water body which could lead to in-channel habitat changes, changes in water quality, flow velocities and geomorphological features.
Hydromorph designation	HMWB	
Water body ID	GB105033042750	
Water body name	Cam	

Status element	Baseline Status						Reasons for not achieving good status			Assessment of cumulative impact		
	Draft RBMP3 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments			
Fish	Not assessed						The CAMS suggests that water is not available for abstraction from the River Cam during Q95 and Q70 conditions and there is a restricted amount of water available during Q50 and Q30 flow conditions. The reduction in pass forward flow from those sources associated with option CW2438B is expected to be negligible in the context of the River Cam and is unlikely to have a significant cumulative with the other options.	Compliant (low conf.)	n/a			
Invertebrates							For a new abstraction (CW2457) to be licensed a suitable hands-off-flow would be required to protect the River Cam from abstraction under low flow conditions. Option CW2471 also highlights that water will only be diverted from the River Cam when flows are above a HOF. The hands-off flow condition must take into account the pressures in this water body and ensure that any reduction in flow does not lead to significant changes in water quality, in-channel habitats and geomorphological processes. Assuming this, it is unlikely that deterioration between status classes for fish, invertebrates or macrophytes and phytobenthos will occur.	Compliant (low conf.)	n/a			
Macrophytes/ phytobenthos	Not assessed							Compliant (low conf.)	n/a			
Phys-chem water quality (in support of ecological status)			Phosphate (Poor). RNAGs indicate sources of P are point source (confirmed - continuous sewage discharge).				Reduction in flows may exacerbate the point source water quality pressures in this water body. A suitable hands-off-flow would be required in the abstraction license to ensure no deterioration in the phys-chem water quality status elements.	Compliant (low conf.)	Compliant (low conf.)			
Chemicals		Failed for PFOS and PBDE				Flow changes may reduce the dilution of pollutants though the reduction in WwTW discharge may partially remove these pollutants. These effects are considered to be insignificant.	Compliant (med. conf.)	Compliant (med. conf.)				
RBMP2 water body measures	None						There are no RBMP2 water body measures for this water body	n/a	Compliant (high conf.)			
Overall assessment of WFD Regulations compliance of the cumulative in this water body								Compliant (low conf.)				



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