Cambridge Water

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INVASIVE NON-NATIVE SPECIES ASSESSMENT

Draft Water Resources Management Plan 2024

Cambridge Water

Ricardo ref. ED16326 Issue: 3 16/01/2023

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Customer:
CAMBRIDGE WATER PLC
(Cambridge Water)

Customer reference:
Cambridge Water (CW): Water Resource Management Plan 2024 (WRMP24) Environmental Assessment

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Ricardo reference:
ED16326

Date:
16/01/2023

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Linton Water tower, Rivey Hill, Cambridge Water

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1. INTRODUCTION

1.1 BACKGROUND

Like all water companies in England and Wales, Cambridge Water (CW) is required[1] to prepare, maintain and publish a Water Resource Management Plan (WRMP). A WRMP sets out the strategy for water resource and demand management to ensure supplies of safe, clean drinking water are maintained to customers throughout the relevant company's region in a way that is economically, socially, and environmentally sustainable.

WRMPs are reviewed on a rolling five year basis; Cambridge Water published their most recent WRMP (WRMP19) in 2019. The next cycle of WRMPs (WRMP24) covers the period 2025 to 2050 and beyond. Cambridge Water is now reviewing and updating their draft WRMP24 for submission in December 2022[2]. Section 5.14 of the Water Resource Planning Guidelines (WRPG) published in 2021[3] states that water companies must review whether current abstraction operations and future solutions will risk spreading Invasive non-native species (INNS) or create pathways which increase the risk of spreading INNS.

INNS of flora and fauna are considered the second biggest threat after habitat loss and destruction of biodiversity worldwide. The annual cost of INNS to the Great Britain economy was estimated in 2010 to be £1.7 billion per year, of which around £5 million was attributed to the water industry management of INNS. New and existing INNS also pose a threat to achieving Water Framework Directive (WFD) objectives. The UKWIR project completed by Ricardo Energy & Environment (Ricardo)[4], provided further evidence of the implications of INNS to the water industry.

Subsequently, the EA in 2017 and 2022, set out position papers on the assessment of the risks of the spread of INNS posed by new and existing water transfers. The 2017 position papers set out the scope, outcomes and timelines expected for the raw water transfer risk assessments and options appraisal that water companies should deliver in Asset Management Plan (AMP) 7. The 2022 paper sets out the levels of assurance required to prevent the spread of INNS during new and existing water transfers.

As a result, INNS became a new "driver" within Price Review 2019 (PR19). In previous price reviews, there was some scope for limited INNS work, justified within the biodiversity drivers. Having a separate driver recognised the increasing evidence and understanding of the risks posed by INNS. The guidance supporting this driver is explicit in stating that "the most cost beneficial and least damaging way to manage invasive species is to prevent their arrival and spread."[5]

This highlights the need to understand the *pathways* by which INNS can be transferred and hence spread. Furthermore, the EA has specifically identified raw water transfers (RWTs) as a subgroup of pathways that should have priority risk assessments (RAs) of INNS spread[6].

The INNS guidance indicates that all water companies will need to consider:

- Pathways of spread (understanding and reducing the risk from different pathways),
- Preventing spread (controlling, eradicating or managing INNS to prevent spread where this will contribute to WFD prevention of deterioration), and
- Action on INNS to achieve conservation objectives of SSSI and Habitats Directive sites.

This has led to INNS being considered in the Water Industry National Environmental Programme across the water industry with a particular focus on investigating the risks of spreading INNS through options appraisal for mitigation and companywide biosecurity plans to reduce the risk of distributing INNS through existing activities and operations.

In April 2022 the EA set out a further INNS position paper in relation to the management of risk during new and existing raw water transfers. The position paper set out the levels of assurance required to prevent the spread of INNS during new and existing transfers between isolated and connected catchments. The paper

[1] Ofwat (2021). Water resources planning guideline Draft update November 2021

[2] draft WRMP24 will be submitted to Defra in early October 2022 for permission to publish

[3] Ofwat (2021). Water resources planning guideline Draft update November 2021

[4] UKWIR (2016). Invasive and Non-Native Species (Inns) Implications on The Water Industry. Report produced by Ricardo Energy & Environment. Report Number 16/DW/02/82. October 2016

[5] EA. 2017. PR19 Driver Guidance, Driver Name: Invasive Non-Native Species (INNS)

[6] EA. 2017. PR19 - Assessing the risks of spread of Invasive non-native species posed by existing water transfers - OFFICIAL

states that mitigation between watercourses "be fail safe, resilient and completely effective for all life stages (large fragments/animals/microscopic organisms and larval stages)".

1.2 PURPOSE OF THIS REPORT

This report sets out the approach taken in reviewing the INNS risk and the outcomes of the INNS risk assessment. This information supported Cambridge Water's selection of preferred options by identifying higher-risk options (from an INNS distribution perspective) and which may require further mitigation.

2. SCREENING OF INNS FOR THE WRMP

2.1 HIGH-LEVEL SCREENING

To ensure that INNS were sufficiently considered as part of the assessment of the feasible options, a high-level risk assessment approach was developed. The outcomes of the high-level risk assessment informed both SEA process and options / scheme design.

We note that the Environment Agency have developed a risk assessment tool for the next stage (Gate-2) of the gated process for the assessments of Strategic Resource Options (SROs), but this tool provides a more detailed assessment of potential INNS pathways. The high-level risk assessment approach was, therefore, developed in view of the Environment Agency's guidelines for INNS assessment to provide a consistent, rapid approach to identifying INNS risks.

The high-level risk assessment was based on a simple questionnaire which was informed by the descriptions and scheme design information of each feasible option (and the associated components). The questionnaires cover three major aspects of each feasible option (see **Table 2.1**):

- The construction of the option / element
- The operation of the option / element
- The maintenance of the option / element

Table 2.1: Summary of the questionnaire used in the high-level risk assessment (excluding mitigation measures)

Construction Questionnaire			
Q1	Does the option require the construction of new infrastructure	**YES = Q2**	**NO = NO Risk**
Q2	Are construction activities limited to within the confines of existing infrastructure? (e.g Improvements to an existing WTW).	**Yes = Q4**	**NO = Q3**
Q3	Are construction activities likely to involve the transport of materials such as transport of soils, vegetation or raw water.	**Yes = High Risk**	**No = Medium Risk**
Q4	Are construction activities likely to involve the transport of materials such as soils, vegetation or raw water to/from outside of the existing site.	**Yes = Med**	**NO = Low Risk**
Operation Questionnaire			
Q1	Does the option/element involve the transfer/abstraction of raw water?	**YES = Q2**	**NO = Q3**
Q2	Does the option/element utilise an open-channel transfer mechanism (eg. river, canal) AND/OR does the option terminate at an open reservoir/channel?	**Yes = High Risk**	**No = Low Risk**
Q3	Does the option/element utilise an open-channel transfer mechanism (eg transfer channel) AND/OR does the option terminate at an open reservoir?	**Yes = Medium Risk**	**No = No Risk**
Maintenance Questionnaire			
Q1	Does the maintenance activity require the movement of machinery, eg dredging, excavators, haulage?	**YES = Q2**	**NO = Q3**
Q2	Does the maintenance activity require the removal/transport of biological material? (e.g. screen debris, pipeline fouling)	**Yes = High Risk**	**No = Medium Risk**
Q3	Does the maintenance activity require the removal/transport of biological material? (e.g. screen debris, pipeline fouling)	**Yes = High Risk**	**No = Low Risk**

2.2 CONSIDERATION OF MITIGATION MEASURES

The outcomes of risk assessment were then reviewed / updated to reflect the residual risk after the implementation of mitigation measures. In updating / reviewing the risk assessment in view of available mitigation measures, standard (best practice) mitigation measures were considered. This included those measures that can reduce the spread and distribution of INNS and limit the pathways of distribution during construction, operation and maintenance of the feasible options. These standard measures include (for example):

- Pre-construction considerations:
    - Ensuring detailed checks and risk assessments are carried out for INNS within initial site feasibility assessments and surveys.
    - Where any INNS are present, ensuring contractors understand the risks and implications of managing it, as well as your legal requirements.
    - Where any INNS are identified as a risk of being introduced, spread within, or moved off site, ensure mitigation measures are considered at the early planning stage, and ensure enough time is given to implement them.
    - Consider phasing construction to allow time to deal with the presence and/or risk of spread of INNS.
    - Ensure INNS and locations (mapped) are incorporated within all relevant site method statements, including the site Ecological Protection Plan and Species Protection Plans, where appropriate.
    - Where a species requires long-term management (e.g. Japanese knotweed), ensuring a site management plan is put together that addresses all issues associated with it
    - Nominating a designated Clerk of Works/ecologist to manage the issue of INNS on your site from an early stage.
- Equipment / machinery used in construction or maintenance of options
    - Clear signs/markings should be used to warn staff working there that a site/area contains INNS (where known).
    - Where contaminated soil, materials or water are located, signage should be erected to indicate them.
    - Personnel working on or between sites should ensure their clothing and footwear are cleaned where appropriate to prevent spread
    - Tracked vehicles should not be used within areas known to contain INNS (especially where plan fragments are known to be present).
    - All vehicles leaving the construction and or operational sites and / or transporting infested soil/materials must be thoroughly pressure-washed in a designated wash-down area before being used for other work.
    - Where cross-contamination is possible (i.e. from one site to another), consider designating vehicles or machinery to specific sites where possible to prevent spread.
    - Material / water left after vehicles have been pressure-washed must be contained, collected and disposed of appropriately
    - All wash facilities including wastewater from washing vehicles, equipment or personnel should be managed in a responsible way so as not to not cause harm to the environment

In addition to those standard measures listed above, it is noted that Cambridge Water delivers company-wide biosecurity protocols and standard operating procedures to ensure that operations are tied to biosecurity practices.

It is also recognised that any soil or plant material contaminated with INNS can cause ecological damage and may be classified as controlled waste. This includes any waste material generated at either Water Treatment Works or Wastewater Treatment Works (in relation to effluent re-use options) including waste from the treatment process and from any intake screens. It's an offence to keep, treat or dispose of waste that could harm the environment and human health. It has, therefore, been assumed that any waste during construction, operation and maintenance will be disposed of at an authorised landfill site or suitable disposal site and that such waste will be transported by a registered waste carrier.

It has been assumed that any construction, operational or maintenance waste containing INNS would not be composted. It has also been assumed that, where waste (including soils) has been treated for INNS using any chemical process such waste would be treated as hazardous waste (due to the persistent nature of the chemical) and should be disposed of at a suitable hazardous waste site.

For the review of the feasible and preferred list of options, only standard (best practice) mitigation measures have been considered (as listed above). Where an option will result in a significant risk of INNS distribution and this risk cannot be mitigated in consideration of best practice measures, the risk assessment for that option has not been amended to reflect mitigation measures. This approach was adopted to identify where the design of the scheme will require further consideration and the risk can be reviewed once more information on the mitigation / treatment measures is available.

This includes, for example, options that include a raw water transfer where a new pathway/connection is established, and the scheme may require physical and or chemical treatment to reduce the risk. This approach was adopted to identify where the design of the scheme will require further consideration and the risk can be reviewed once more information on the mitigation / treatment measures is available.

2.3 ASSESSMENT OUTPUTS

The draft INNS screening has been completed for the list of feasible. As stated above, the assessment has considered best practice mitigation measures and or embedded measures that already form part of the scheme design.

The risk assessment is, therefore, subject to review as more information is available regarding the measures that will be adopted to reduce control and/or eradicate INNS during the operation of an option. The current assessments have been used to help inform Cambridge Water's selection of their preferred options list.

The INNS risk assessment is presented in a table provided in **APPENDIX A** and is listed by option, with the following headings considered for each:

1. Component: WRMP24 component number reference.
2. Name: WRMP24 name
3. Description: WRMP24 option description, taken from the overarching tracker with descriptions having been reviewed by Atkins.
4. Raw water transfer: Yes or no for whether raw water is being transferred.
5. Construction required: Yes or no for whether construction is required
6. Maintenance required: Yes or no for whether maintenance is required.
7. RAG Score: a red-amber-green rating has been included to easily highlight to CW those options of greatest concern regarding INNS distribution
8. Option Description: Detailed description of the option
9. Pre-mitigation Construction Summary: Description of the outcome of the pre-mitigation construction questionnaire.
10. Pre-mitigation Construction Risk: a red-amber-green risk rating outcome of the pre-mitigation construction questionnaire.
11. Post-mitigation Construction Summary: Description of the outcome of the post-mitigation construction summary.
12. Post-mitigation Construction Risk: a red-amber-green risk rating outcome of INNS risk if mitigation is implemented during construction.
13. Pre-mitigation Operational Summary: Description of the outcome of the pre-mitigation operational summary.
14. Pre-mitigation Operational Risk: red-amber-green risk rating outcome of the pre-mitigation operation questionnaire.
15. Post-mitigation Operational Summary: Description of the outcome of the post-mitigation operational summary.
16. Post-mitigation Operational Risk: a red-amber-green risk rating outcome of INNS risk if mitigation is implemented during operation.

17. Pre-mitigation Maintenance summary: Description of the outcome of the pre-mitigation maintenance summary.
18. Pre-mitigation Maintenance Risk: red-amber-green risk rating outcome of the pre-mitigation operation questionnaire.
19. Post-mitigation Maintenance summary: Description of the outcome of the pre-mitigation maintenance summary.
20. Post-mitigation Maintenance Risk: a red-amber-green risk rating outcome of INNS risk if mitigation is implemented during maintenance.

3. FEASIBLE OPTIONS INNS ASSESSMENT OUTCOMES

This section outlines:

- The options in the feasible list for CW draft WRMP24 that have been subject to INNS assessment.
- A summary of the final outcomes of the INNS assessment for each of the options in the feasible list for CW draft WRMP24.

3.1 FEASIBLE OPTIONS INCLUDED IN THE INNS ASSESSMENT

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 requires an INNS Risk Assessment. The 18 supply-side options, which are the focus of the INNS assessments, are presented in **Table 3.1**.

Table 3.1 List of CW draft WRMP24 feasible options which have been subject to an INNS Assessment

Option type	Draft WRMP24 Ref.	Option Name
Groundwater enhancement	CW2401A	Combined Ouse gravel sources Fenstanton to St Ives 01A
New groundwater	CW2401B	Combined Ouse gravel sources Fenstanton to St Ives 01B
Water re-use	CW2437Ai	Northstowe greywater reuse or similar growth large storage
Water re-use	CW2437Aii	Northstowe greywater reuse or similar growth small storage
Water re-use	CW2438A	Site-scale rainwater harvesting (Northstowe or similar growth)
Water re-use	CW2438B	Northstowe rainwater harvest or similar growth small storage
New surface water abstraction	CW2457	River CAM abstraction & treatment works
Water reuse	CW2471	AWS Milton WWTW effluent discharge reuse
External potable bulk supply/transfer	CW2473A	Fens Reservoir internal potable water transfer Chatteris
External potable bulk supply/transfer	CW2475Ai	AWS potable transfer through CAM area 5Mld
External potable bulk supply/transfer	CW2475Aii	AWS potable transfer through CAM area 5Mld with main cost
External potable bulk supply/transfer	CW2475Aiii	AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant
External potable bulk supply/transfer	CW2475Bi	AWS potable transfer through CAM area 10Ml/d
External potable bulk supply/transfer	CW2475Bii	AWS potable transfer through CAM area 10Ml/d with main cost
External potable bulk supply/transfer	CW2475Biii	AWS potable transfer through CAM area 10Mld with main cost and 0.3ha blending plant

Option type	Draft WRMP24 Ref.	Option Name
External potable bulk supply/transfer	CW2475Ci	AWS potable transfer through CAM area 15Mld
External potable bulk supply/transfer	CW2475Cii	AWS potable transfer through CAM area 15Mld with main cost
External potable bulk supply/transfer	CW2475Ciii	AWS potable transfer through CAM area 15Mld with main cost and 0.3ha blending plant

3.2 FEASIBLE OPTION INNS ASSESSMENT SUMMARY

This section presents a summary of the INNS assessment completed for all options included in the feasible list. The feasible option INNS assessment summary is presented in **Table 3.2**.

Table 3.2 Feasible option INNS assessment summary

Option Name	Draft WRMP24 Ref.	Construction		Operation		Maintenance	
		Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation
Combined Ouse gravel sources Fenstanton to St Ives 01A	CW2401A	Major	Minor	Negligible	Negligible	Minor	Negligible
Combined Ouse gravel sources Fenstanton to St Ives 01B	CW2401B	Major	Minor	Negligible	Negligible	Minor	Negligible
Northstowe greywater reuse or similar growth large storage	CW2437Ai	Major	Minor	Negligible	Negligible	Major	Negligible
Northstowe greywater reuse or similar growth small storage	CW2437Aii	Major	Minor	Negligible	Negligible	Major	Negligible
Site-scale rainwater harvesting (Northstowe or similar growth)	CW2438A	Major	Minor	Negligible	Negligible	Major	Negligible
Northstowe rainwater harvest or similar growth small storage	CW2438B	Major	Minor	Negligible	Negligible	Major	Negligible
River CAM abstraction & treatment works	CW2457	Major	Minor	Major	Moderate	Major	Negligible
AWS Milton WWTW effluent discharge reuse	CW2471	Major	Minor	Negligible	Negligible	Minor	Negligible
Fens Reservoir internal potable water transfer Chatteris	CW2473A	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 5Mld	CW2475Ai	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 5Mld with main cost	CW2475Aii	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant	CW2475Aiii	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 10Ml/d	CW2475Bi	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 10Ml/d with main cost	CW2475Bii	Major	Minor	Negligible	Negligible	Minor	Negligible

Option Name	Draft WRMP24 Ref.	Construction		Operation		Maintenance	
		Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation
AWS potable transfer through CAM area 10Mld with main cost and 0.3ha blending plant	CW2475Biii	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 15Mld	CW2475Ci	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 15Mld with main cost	CW2475Cii	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 15Mld with main cost and 0.3ha blending plant	CW2475Ciii	Major	Minor	Negligible	Negligible	Minor	Negligible

Option CW2457 within the feasible list is identified as presenting a Moderate post mitigation operational INNS transfer risks. A summary taken from the excel assessment outputs provided within a separate appendix to this report (**APPENDIX A**) is provided in **Table 3.3** below.

Table 3.3 Post mitigation risk assessment summary for schemes within the feasible list which are deemed to present a Moderate or Major INNS transfer risk.

Scheme	Post-mitigation operational risk	Risk assessment summary
CW2457	Moderate	The construction of a new reservoir fed by raw water abstraction from the River Cam will establish new habitat and transfer pathway for INNS. Additionally the reservoir will provide new secondary pathways for the distribution of INNS. The scheme is assessed as "Moderate" risk on account of the proposed reservoir being located on the banks of the River Cam, therefore, reducing the potential of spread to separate waterbodies or catchments. Best practice biosecurity measures (such as signs, wash-down facilities for recreational users, etc) may reduce secondary transfer risks at the proposed reservoir.

4. PREFERRED OPTIONS INNS ASSESSMENT OUTCOMES

This section outlines:

- The options in the preferred options list for Cambridge Water's draft WRMP24 that have been subject to INNS assessment.
- The final outcomes of the INNS assessment for each of the options in the preferred plan for Cambridge Water's draft WRMP24.

4.1 PREFFERED OPTIONS INCLUDED IN THE INNS ASSESSMENT

In determining the draft WRMP24 preferred plan of options, Severn Trent used the findings of the feasible options assessments to inform the programme appraisal process and to determine the preferred programme. Further details on options appraisal process and development of programmes can be found in the main draft WRMP24 documentation.

The preferred programme is made up of 10 supply-side options. The options included within the preferred programme along with a summary of the INNS assessments is presented in **Table 4.1**.

Table 4.1 Preferred option INNS assessment summary

Option Name	Draft WRMP24 Ref.	Construction		Operation		Maintenance	
		Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation
Combined Ouse gravel sources Fenstanton to St Ives 01A	CW2401A	Major	Minor	Negligible	Negligible	Minor	Negligible
Combined Ouse gravel sources Fenstanton to St Ives 01B	CW2401B	Major	Minor	Negligible	Negligible	Minor	Negligible
Northstowe greywater reuse or similar growth small storage	CW2437Aii	Major	Minor	Negligible	Negligible	Major	Negligible
Northstowe rainwater harvest or similar growth small storage	CW2438B	Major	Minor	Negligible	Negligible	Major	Negligible
River CAM abstraction & treatment works	CW2457	Major	Minor	Major	Moderate	Major	Negligible
AWS Milton WWTW effluent discharge reuse	CW2471	Major	Minor	Negligible	Negligible	Minor	Negligible
Fens Reservoir internal potable water transfer Chatteris	CW2473A	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 5Mld with main cost and 0.3ha blending plant	CW2475Aiii	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 10Mld with main cost and 0.3ha blending plant	CW2475Biii	Major	Minor	Negligible	Negligible	Minor	Negligible
AWS potable transfer through CAM area 15Mld with main cost and 0.3ha blending plant	CW2475Ciii	Major	Minor	Negligible	Negligible	Minor	Negligible

A detailed summary of the risk assessment for options within the preferred options list is provided with option assessment sheet in **APPENDIX A**. As can be seen in **Table 4.1**, all the options assessed are scored as presenting a minor or negligible post-mitigation risk for scheme ***construction and maintenance*** activities respectively, with the assumption that best practice mitigation will be in place. Post mitigation risk scores for

the operation of the schemes are all negligible except on option. Option CW2457 within the preferred list is identified as presenting a Moderate post mitigation operational INNS transfer risks. A summary taken the excel assessment outputs (provided within a separate appendix to this report) is provided in **Table 4.2** below.

Table 4.2 Post mitigation risk assessment summary for schemes within the preferred list which are deemed to present a Moderate or Major INNS transfer risk.

Scheme	Post-mitigation operational risk	Risk assessment summary
CW2457	Moderate	The construction of a new reservoir fed by raw water abstraction from the River Cam will establish new habitat and transfer pathway for INNS. Additionally the reservoir will provide new secondary pathways for the distribution of INNS. The scheme is assessed as "Moderate" risk on account of the proposed reservir being located on the banks of the River Cam therefore reducing the potential of spread to seperate waterbodies or catchments. Best practice biosecurity measures (such as signs, wash down facilities for recreational users, etc) may reduce secondary transfer risks at the proposed reservoir.

APPENDICES

APPENDIX A INNS RISK ASSESSMENT OUTPUTS FOR FEASIBLE LIST

A separate table of the INNS risk assessment results for each of the feasible has been provided as a separate Appendix.

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