MOTT MACDONALD

SEA Environmental Report ANNEX 5: APPENDIX K

Invasive Non-Native Species (INNS) Risk Assessment

South West Water: Updated Draft Water Resources Management Plan 2024 (dWRMP24)

December 2023

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Issue and Revision Record

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1 Introduction

1.1 Background

The South West Water (SWW) supply area covers Devon, Cornwall, and parts of Dorset, Somerset, Wiltshire and Hampshire, and provides drinking water to a population of 2.2 million. Water resources in the SWW supply area consists of three large reservoirs, a number of smaller reservoirs, river intakes, and some groundwater sources which are predominantly in East Devon.

Water companies have a statutory obligation to produce a Water Resources Management Plan (WRMP), which sets out how a company intends to maintain the balance between supply and demand for water over a minimum 25-year period. In the development of a WRMP, companies must follow the Water Resource Planning Guidelines[1] ('Guidelines'). WRMPs should ensure a secure and sustainable supply of water and focus on efficiently delivering the outcomes that customers want, while reflecting the value that society places on the environment. The Guidelines state that in developing a WRMP in England and Wales, water companies should screen for a Strategic Environmental Assessment (SEA) and carry out a full SEA if required.

An SEA is required for the South West Water WRMP 2024 ('WRMP24') under the *Environmental Assessment of Plans and Programmes Regulations 2004* ('SEA Regulations')[2], which requires an assessment of the effects of certain plans and programmes on the environment.

The SEA also works to inform the decision-making process through the identification and assessment of significant and cumulative effects that a plan or programme may have on the environment. The SEA process is conducted at a strategic level and enables consultation on the potential effects of a plan with a wide range of stakeholders.

One of the objectives for the SWW WRMP24 is to prevent any additional spread of invasive non-native species (INNS) through activities relating to the design and operation of an option.

SWW issued the draft WRMP24 (dWRMP24) for public consultation in February 2023 with the Statement of Response (SoR) published on 15 August 2023 in line with the requirements of the Guidelines. The updated dWRMP24 was submitted in early October 2023 and has been subject to an eight-week public consultation period between October and December 2023.

A number of options were developed or refined during summer 2023 for inclusion in the updated dWRMP24. The SEA and INNS assessments of these options could not be fully completed for integration into the October 2023 consultation documents. This document is an update of the October 2023 consultation version of the report, with full INNS assessments for all required updated dWRMP24 options.

Following consultation on the updated dWRMP24, SWW will update the SoR with inclusion of the changes made in response to feedback received.

[1] EA, NRW, Defra and Ofwat (2021) *Water Resources Planning Guideline*. [online] Available at: <https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline> [Accessed 26th September 2023]

[2] The SEA Regulations were transposed into United Kingdom (UK) law from the European Union Directive 2001/42/EC, more commonly known as the SEA Directive. The SEA Regulations remain UK law following the UK's exit from the EU.

1.2 Plans and adaptive pathways

1.2.1 Overview

There are 75 supply-based options in the WRMP (49 supply option, 20 drought and six Strategic Resource Options (SROs)), including 13 within the preferred Best Value Plan (BVP), Best for Environment and Society and Ofwat Core Pathway, which are identical, and 13 in the alternative Least Cost Plan (LCP).

1.2.2 Adaptive pathways

In compiling the BVP, SWW consider the risk of the future deviating from the baseline forecast using alternative scenarios. This includes scenarios that increase the deficit and those that reduce the risks. SWW's adaptive approach enables a change to the plan in response to different future scenarios. A suite of adaptive pathways have been established to explore how SWW will respond to future scenarios which may have a material impact on their forecast supply-demand balance in a high-uncertainty future.

The adaptive planning used a problem-solving approach to understand, plan and manage risks and uncertainty into the future. The adaptive pathways are investment programmes that supplement the BVP when external drivers impact water available for use (WAFU) or demand. The adaptive pathways assume that demand for water will be higher than SWW has calculated when developing the BVP. The adaptive pathways therefore include all the BVP measures, plus additional options to meet the potential extra demand in the future scenarios.

SWW identified two adaptive pathways, which are:

1. Adaptive Pathway – Medium: Demand management is a key component of SWW's Preferred Plan, especially early in the planning period when there are limited non-SRO supply-side options. As part of SWW sensitivity testing, SWW has modelled scenarios where demand management actions were less successful than planned. These sensitivities form the basis of the medium adaptive pathway. If the benefits from the demand management options were lower than anticipated, SWW is expected to have residual deficits after considering the impact of license reductions. To enable SWW to still make the planned sustainability reductions to abstraction and meet environmental destination requirements, SWW has included an adaptive pathway that introduces additional supply schemes, should the benefits of demand reduction activities be less successful than planned.
2. Adaptive Pathway – High: As part of SWW more extreme scenario sensitivity testing, SWW has tested the plan against higher growth in population (and demand) than the SWW baseline assumptions. This has been the basis of creating a high adaptive pathway. If growth and therefore demand grow in line with the high forecasts, despite SWW's Preferred Plan for demand action, it is assumed there will be deficits that cannot be resolved under the BVP. SWW has created a high adaptive plan scenario, setting out the additional supply options that would be required in this higher growth scenario.

1.2.3 Best Value Plan

The SWW Preferred Plan comprises the combination of options that make up the BVP (Best Environment & Society Plan and Ofwat Core Pathway plan which are identical). This includes a selection of supply, drought and demand options drawn from the Bournemouth, Colliford, Roadford and Wimbleball Water Resource Zones (WRZ). A programme-level assessment has been undertaken to assess the cumulative effects of the BVP.

Table 1.1 below shows the supply and drought options included within the BVP. Table 1.1 also shows which options are in the medium and high adaptive plans, though for there is no difference between these plans in the BVP.

Table 1.1: BVP supply and drought options.

Option ID	Option Name	Option Type	Adaptive Plan (Med)	Adaptive Plan (High)
BNW1	Borehole development, existing borehole remedial works.	Supply	Y	Y
BNW6	Longham Aquifer Recharge	Supply	Y	Y
BNW7	Mendips Quarry raw water transfer and augmentation of the River Stour	Supply	Y	Y
BNW8	Poole Harbour FE-reuse	Supply	Y	Y
BNW14	Ibsley Lake	Supply	Y	Y
COL15	Restormel WTW- increase treatment capacity to 110Ml/d	Supply	Y	Y
ROA21	Roborough to Littlehampton WTW	Supply	Y	Y
WIM14	Whitecross distribution upgrade	Supply	Y	Y
WIM18	Cheddar 2 to Bickham Moor	Supply	Y	Y
dW1	Brampford Speke and Stoke Canon (North Exeter boreholes)	Drought	Y	Y
dW2	Hook Springs licence	Drought	Y	Y
dW3	Wilmington Springs licence	Drought	Y	Y
dW4	Wimbleball not releasing compensation flows when making supply releases	Drought	Y	Y

1.2.4 Least Cost Plan

The SWW Alternative Plan presents the combination of options that make up the LCP. This comprises a selection of supply, drought and demand options drawn from the Bournemouth, Colliford, Roadford and Wimbleball WRZs. A programme-level assessment has been undertaken to assess the cumulative effects of the LCP.

Table 1.2 below shows the supply and drought options included within the LCP under the medium and high adaptive plans – with the high adaptive plan including two additional options (WIM11 and WIM12).

Table 1.2: LCP supply and drought options.

Option ID	Option Name	Option Type	Adaptive Plan (Med)	Adaptive Plan (High)
BNW7	Mendips Quarry raw water transfer and augmentation of the River Stour	Supply	Y	Y
BNW8	Poole Harbour FE-reuse	Supply	Y	Y
dB1	Wimborne borehole	Drought		
dB2	Stanbridge licence	Drought		
ROA21	Roborough to Littlehampton WTW	Supply	Y	Y
WIM11	Couchill Springs - New raw water supply and new onsite treatment	Supply		Y
WIM12	Allers Springs - New raw water supply	Supply		Y
WIM14	Whitecross distribution upgrade	Supply	Y	Y
WIM5	Indirect potable reuse - stream support for Dotton WTW.	Supply	Y	Y

Option ID	Option Name	Option Type	Adaptive Plan (Med)	Adaptive Plan (High)
dW1	Brampford Speke and Stoke Canon (North Exeter boreholes)	Drought	Y	Y
dW2	Hook Springs licence	Drought	Y	Y
dW3	Wilmington Springs licence	Drought	Y	Y
dW4	Wimbleball not releasing compensation flows when making supply releases	Drought	Y	Y

1.3 Scope of this report

The purpose of this report is to present the assessments which have been undertaken to evaluate the potential for supply-side options within the WRMP24 to spread INNS – plants and animals which can spread, and cause harm to the environment and cost to the economy[3].

Of the 75 supply-side options in the WRMP, seven are drought options which have been assessed via Environmental Assessment Reports (EARs) and are not included in this report.

Thus, this report presents the assessment of 68 supply-side options, comprising six Strategic Resource Options (SROs) and 62 non-SRO options. SROs and their related sub-options are assessed in separate studies compiled for Regulators' Alliance for Progressing Infrastructure Development (RAPID) Gate 2 submissions, and the results of these assessments are presented in this report.

Therefore, the aims of this assessment are to:

- Undertake a high-level 'Level 1 screening' of 62 non-SRO options in the WRMP.
- Use the results of the Level 1 screenings to identify options that require a more detailed 'Level 2 assessment'.
- For those options initially screened as having a Low, Moderate, or High risk, undertake a more detailed 'Level 2 assessment'.
- Outline the results of INNS risk assessments for Strategic Resource Options (SROs).
- Evaluate potential in-combination effects of interacting options in the BVP, LCP and Ofwat Plans.

1.4 Option descriptions

Section 2.1 of the SEA for the WRMP24 provides a high-level description of each of the options assessed within this report. The SEA report[4] should be read in conjunction with this document.

[3] GB Non-Native Species Secretariat (2022) *Non-native species.* [online] Available at: <Non-native species » NNS (nonnativespecies.org)> [Accessed 26th September 2023]

[4] SEA report. Document reference: 100107117 | 100107117-MMD-RP-SEA-006-C.

2 Methodology

2.1 Level 1 Screening

2.1.1 Assessment methodology

The Level 1 screening is based on the concept of risk as the product of the frequency and severity of INNS being transferred, as the result of a water resource management option. Therefore, the methodology involves an assessor determining a Frequency of Impact and Severity of Impact, which are combined to give an overall Risk Magnitude.

The Level 1 screening methodology is informed by the Environment Agency's Position Statement on managing the risk of INNS through raw water transfers[5]. The approach to reducing the risk of INNS transfer outlined within this document is focused upon the pathways that transfers create, rather than current INNS distribution. Therefore, the Risk Magnitude rating produced by this Level 1 screening relates to the nature of any pathways created by water resource options and the impacts they are likely to have. Thus, the severity of risk is greater if a transfer links previously unconnected waterbodies, or if it involves the transfer of raw water (rather than treated water or groundwater).

2.1.2 Frequency of Impact rating

Table 2.1: Frequency of Impact risk criteria used to assess INNS risk. below shows the criteria used for determining the Frequency of Impact rating.

Table 2.1: Frequency of Impact risk criteria used to assess INNS risk.

Frequency of Impact	Criteria
None	No additional frequency of impact risk beyond risk associated with existing operations
Infrequent	Only occurs in emergency or during situations not considered part of the normal running of the scheme
Periodical	Will happen during start up or shut down, or periodically during routine maintenance or operation of the option
Regular	Will occur throughout the regular operation of the option

Source: Mott MacDonald, 2023.

2.1.3 Severity of Risk rating

Table 2.2 below shows the criteria used for determining the Severity of Impact rating.

Table 2.2: Severity of Impact risk criteria used to assess INNS risk.

Severity	Criteria
None	No additional severity of impact risk beyond risk associated with existing operations.

[5] Environment Agency (2022). Position Statement. Managing the Risk of Spread of Invasive Non-Native Species Through Raw Water Transfers.

Severity	Criteria
Very Low	Treated water, effluent or groundwater
Low	Existing pathway between waterbodies or treated water/groundwater/effluent with no INNS risk being transferred
Medium	Change in volume of transfer between waterbodies which are already connected
High	New pathway between waterbodies not current connected or potential to introduce new INNS not currently observed in the UK

Source: Mott MacDonald, 2023.

2.1.4 Overall Risk rating

Once Frequency of Impact and Severity of Impact were determined for a WRMP option, the results were combined in the matrix (shown in Table 2.3), in order to generate an overall Risk Magnitude rating. Where 'None' was selected for Frequency of Impact and/or Severity of Impact, 'None' was assigned as the Risk Magnitude rating.

Table 2.3: Calculation matrix for overall INNS risk of option operation.

Frequency/Severity	None	Infrequent	Periodical	Regular
None	0 = None	0 = None	0 = None	0 = None
Very Low	0 = None	1 = Very Low	1 = Very Low	1 = Very Low
Low	0 = None	2 = Low	2 = Low	3 = Low
Medium	0 = None	3 = Low	4 = Moderate	4 = Moderate
High	0 = None	4 = Moderate	5 = High	6 = High

Source: Mott MacDonald, 2023.

2.1.5 Progression to Level 2 assessment

All options initially screened as having a Low, Moderate or High INNS transfer risk were progressed to a Level 2 assessment. The Mendip Quarries and Poole Harbour SROs were not screened at Level 1 as Level 2 assessments are undertaken as standard for all SROs.

2.2 Level 2 assessment

2.2.1 Assessment methodology

The Level 2 assessment methodology utilised the SRO Aquatic INNS Risk Assessment Tool (SAI-RAT) ("the tool") developed by APEM on behalf of the Environment Agency (EA) to quantify the INNS risk associated with all WRMP options (both SRO and non-SRO options), based on the conceptual design information currently available.

Risk assessments are processes by which the level of risk presented by certain hazards can be assessed, where hazards are anything that can cause harm. The level of risk is typically the combination of the chance and extent of the harm which could be caused. In the case of this

tool, the hazard is the potential movement of INNS along key pathways, and the risk is the chance of that movement occurring combined with the extent of the harm this could cause.

The tool takes a pragmatic pathway and source-pathway-receptor model approach to the assessment of INNS risk relating to assets and raw water transfers. A desk-based search for INNS within 1km of the source and pathway is undertaken. The list of High Impact INNS that were cross-referenced for these assessments is detailed within the UKTAG Guidance[6] revised classification of aquatic alien species – this includes aquatic and riparian species.

The SAI-RAT takes the form of a Microsoft Excel spreadsheet, into which data and information about water transfer options are entered by the assessor to automatically generate an Overall Risk Score. Risk Scores are presented as a percentage of the highest potential score, with a higher score signifying an increased risk of introducing and transferring INNS.

For the SRO INNS assessments, the latest environmental assessment results available at the time of writing have been used to inform the INNS assessment. These results are subject to change following any further refinement of the Gate 2 SRO assessments but are unlikely to, given the maturity of the Gate 2 designs. These results will be made available upon publication of the Gate 2 Environmental Assessment Reports for the SROs.

The SAI-RAT requires a significant amount of information about options to be entered in order to assess the level of risk. As WRMP options are in an early stage of conceptualisation, the full range of information was not available for WRMP options. It is likely that a failure to complete fields in the absence of information would result in the general under-estimation of risk; therefore, an alternate approach was adopted for the assessment of INNS risk for non-SRO options WRMP options. This method was adopted to find a consistent way to populate the tool for the non-SRO options with limited information available. This approach uses pre-determined default values for criteria where information is not yet available. Appropriate default ‘assumed values’ were agreed during a workshop in June 2022 (attended by water companies undertaking INNS risk assessments for WRMP24, and assessors working on their behalf). These assumed values are intended to represent the most likely or realistic input values. The use of assumed values in this way gives an estimation of a typical interaction with a pathway or asset, allowing a cautious assessment of risk to be made in the absence of specific information. Assumed values are described and detailed in Appendix A.

The proposed decision process for entering information into the SAI-RAT tool is shown below:

1. For any given criterion, if information is available for the option, then this should be entered into the tool.
2. If information is not available, ‘Unknown’ should be selected if available.
3. If ‘Unknown’ is not available to select, then an assumed value should be entered.

2.2.2 Level 2 non-SRO option input data

Twenty non-SRO options were assessed using the SAI-RAT tool and are listed below in Table 2.4: Non-SRO options subject to a Level 2 assessment and the assessed components.. Full details of input data are available in Appendix B.

[6] UK TAG WFD (2015), UK Technical Advisory Group on the Water Framework Directive Revised classification of aquatic alien species according to their level of impact. [online]. Available at: <https://www.wfduk.org/sites/default/files/Media/Assessing%20the%20status%20of%20the%20water%20environment/UKTAG%20classification%20of%20alien%20species%20working%20paper%20v7.6.pdf> [Accessed 26th September 2023].

Table 2.4: Non-SRO options subject to a Level 2 assessment and the assessed components.

Option name	Level 2 assessment components
BNW6 – Longham Aquifer Recharge	Three new RWTs were assessed at Level 2. No new assets were associated with this option.
COL2 – Colliford PS Stage 2 – River Camel Abstraction	The WTW and transfer to Colliford reservoir in this option is existing infrastructure and therefore only the new water transfer component of the option and pumping station with river intake was assessed.
COL6 – River Hayle Abstraction	This option comprised of one new RWT and WTW. Abstraction is via a disused intake and has therefore been assessed due to new INNS risk associated with abstraction.
COL9 – Leswidden Pool	Two RWTs were assessed. One goes from Balleswidden Pool to Sancreed Stream and the other goes from Sancreed stream to Drift Reservoir. A pumping station asset was assessed.
COL19 – Boswyn stream/Cargenwen Reservoir/Carwynnen stream	This option was comprised of one new WTW asset, two new RWPS assets and one new reservoir asset which were assessed for the Level 2 INNS assessment. Four RWT components were also assessed.
COL20 – River Fal new abstraction	Two assets – one WTW and one RWPS, and one RWT was assessed for this option.
dR2 – Slade Reservoir	One RWT associated with this option which is Slade Reservoir to Horedown WTW.
dR3 – Challacombe Reservoir	One RWT associated with this option which is Challacombe Reservoir to Horedown WTW.
dR4 –Meldon / Vellake to Roadford	One RWT associated with this option which is River West Okemont at Vellake to Roadford Reservoir.
dR5 – Lee Moor unused quarries	One RWT associated with this option which is Lee Moor Quarries to Littlehempston WTW.
ROA2 – River Erme	One RWPS asset and two RWTs were assessed for the Level 2 INNS assessment.
ROA3 – River Yealm	One RWPS and one RWT were assessed for the Level 2 INNS assessment.
ROA4 – Abstraction of Roadford compensation flow at Gunnislake when making supply releases	The WTW and PS associated with this option are existing infrastructure so were not included within this assessment. RWT uses existing pipework but has been assessed at Level 2 to account for changes in flow.
ROA7 – Expansion of Northcombe WTW to 60Ml/d	One asset and one RWT have been assessed for the Level 2 INNS assessment.
ROA12 – Slade and Horedown WTW (GAC)	Two assets and one RWT has been assessed for the Level 2 INNS assessment.
ROA14 – Raise Avon Dam	The reservoir associated with this option is pre-existing but has been assessed to account for the new additional INNS risk associated with the increase in water volume.
ROA15 – Gatherley Phase 2	Reservoir associated with this asset is pre-existing and was not assessed. New RWT was assessed at Level 2. No new assets associated with this option.
ROA21 – Roborough to Littlehempston WTW	One RWT associated with this option which is Roborough Tank at Mayflower Water Treatment Works to Littlehempston Water Treatment Works.

Option name	Level 2 assessment components
WIM1 – Abstraction of Wimbleball compensation flow at Northbridge when making supply releases	One RWT associated with this option which is the River Exe abstraction at Northbridge RWPS to Pynes WTW.
WIM11 – Couchill Springs, Seaton	Two assets and one RWT has been assessed for the Level 2 INNS assessment.

2.2.3 BNW7 Mendips Quarry Raw water transfer and augmentation of the River Stour

This SAI-RAT assessment of this option is documented in a separate Gate 2 INNS report[7]. The report describes the scenarios tested and includes the input data used in the tool. Two raw water transfers and three assets were included in the assessment. A summary of the results is presented within this report.

2.2.4 BNW8 Poole Harbour FE-reuse

This SAI-RAT assessment of this option is documented in a separate Gate 2 INNS report[8]. The report describes the scenarios tested and includes the input data used in the tool. Two raw water transfers were included in the assessment. A summary of the results is presented within this report.

2.2.5 BNW17 Cheddar 2 new strategic regional reservoir and transfer

This SAI-RAT assessment of this option is documented in a separate Gate 2 INNS report[9]. The report describes the scenarios tested and includes the input data used in the tool. Three raw water transfers and one asset were included in the assessment. A summary of the results is presented within this report.

2.2.6 ROA19 Cheddar 2 to Prewley – New strategic regional reservoir, treatment and transfer

This option includes the raw water asset and transfer components in the option BNW17 which are associated with the development of the new Cheddar 2 reservoir and the treatment of water at Honeyhurst WTW. This SAI-RAT assessment of this option is documented in a separate Gate 2 INNS report[9]. There will then be a treated water transfer to Prewley which is not expected to result in an increased INNS transfer risk.

2.2.7 WIM13 Cheddar 2 to Parsonage – New strategic regional reservoir, treatment and transfer

This option includes the raw water asset and transfer components in the option BNW17 which are associated with the development of the new Cheddar 2 reservoir and the treatment of water at Honeyhurst WTW. This option's Level 2 INNS assessment is documented in a separate Gate 2 INNS report[9]. The treated water will then be transferred to Parsonage and this water transfer is not expected to result in INNS risk.

[7] South West Water and Wessex Water (2023) Strategic Regional Water Resource Solutions. Gate Two Submission. Mendip Quarries.

[8] South West Water, Southern Water and Wessex Water (2022) Strategic Regional Water Resource Solutions: Poole Effluent Recycling and Transfers Gate Two Submission. Appendix 5.4: Invasive Non-Native Species Assessment.

[9] Bristol Water, Southern Water and Wessex Water (2022) Strategic Regional Water Resource Solutions: Cheddar 2 Source and Transfer Standard Gate Two Submission. Appendix 5.4: Invasive Non-Native Species Assessment.

2.2.8 WIM18 Cheddar 2 to Bickham Moor – New strategic regional reservoir, treatment and transfer

This option includes the raw water asset and transfer components in the option BNW17 which are associated with the development of the new Cheddar 2 reservoir and the treatment of water at Honeyhurst WTW. This option's Level 2 INNS assessment is documented in a separate Gate 2 INNS report[9]. This will then be transferred as treated water to Bickham Moor and this transfer is not expected to result in INNS risk.

2.3 In-combination effects

Potentially, in-combination effects relating to INNS transfer risk could arise from the interaction of individual options – for example through connectivity between successive raw water transfers. As such, supply-side options within the BVP, LCP and Ofwat plans were assessed for potential in-combination effects. The overall assessment process comprised the following four stages:

1. **Initial option screening** – Screening out of options assessed as being of None or Very Low risk during Level 1 assessment – as such options would not involve the movement of raw water likely to contain INNS to a new site.
2. **Connectivity screening** – Spatial analysis of all remaining options to determine connectivity between them, and to derive a list of connected option combinations requiring further assessment.
3. **Qualitative screening** – Qualitative assessment of the additional risk presented by any connected option combinations identified, to identify those options requiring a combined quantitative assessment using SAI-RAT.
4. **SAI-RAT assessment** – Amalgamation of individual SAI-RAT assessments to generate an assessment for each connected option combination, where a risk of in-combination effects was identified.

2.4 Limitations and assumptions

These assessments are based on operational INNS transfer risk in accordance with the focus on pathways outlined within the EA position statement on raw water transfers[10]. Construction-phase impacts are best evaluated and mitigated on a case-by-case basis and at a more advanced stage in option design and implementation. It is therefore assumed that construction-phase impacts will be assessed at the appropriate phase of option design, that any construction-phase impacts will be appropriately mitigated, and that biosecurity best practice will be followed.

2.4.1 Level 1 screening

In accordance with the EA position statement on raw water transfers[5], the Level 1 screening does not account for INNS distribution and other specific local considerations. By progressing all options screened as Low, Moderate or High risk to a Level 2 assessment, all options which may be affected by local issues such as important nature conservation sites or high impact INNS will be subject to this more detailed risk assessment. By their nature, it is unlikely that those options initially screened as presenting No additional risk or Very Low risk would be affected by such local issues, as they will not involve the transfer of raw water likely to contain INNS.

Where no information was available regarding the frequency of water transfers for these options, it was assumed transfer frequency would be Regular, which may not provide a true

[10] Environment Agency (2022). Position Statement. Managing the Risk of Spread of Invasive Non-Native Species Through Raw Water Transfers.

reflection of the overall frequency of risk within the risk assessment but represents a cautionary approach.

Desalination options were treated with the same methodology as for freshwater options, as saline or brackish environments may harbour invasive species with a tolerance for different salinity levels. The use of saline boreholes was not specifically accounted for in the Severity of Risk details, and therefore these options were considered as seawater. This is because due to the location and type of saline water source, it is possible that these water sources harbour species associated with saline habitats.

Water abstraction, transfer and discharge have the potential to alter INNS habitat suitability or dispersal. Such risks are not accounted for within the screening methodology, which focuses on the pathways which an option may create or exacerbate. Such impacts may need to be assessed at a later stage in option development.

2.4.2 Level 2 assessment

Several input values within the risk assessment tool were not known at this stage of the design and therefore the value 'Unknown' was selected (see Appendix A). Selecting Unknown within the tool results in a median risk score being added for that criterion which is not an accurate reflection of the risk.

As described in section 2.1.1, 'assumed values' (detailed in Appendix A) were used where 'Unknown' was not available as an option within the tool.

The overall level of risk indicated may be subject to change as further information about options become available and more representative input data can be entered.

Water abstraction, transfer and discharge have the potential to alter INNS habitat suitability or dispersal. Such risks are not accounted for within SAI-RAT, which focuses on the pathways which an option may create or exacerbate. Such impacts may need to be assessed at a later stage in option development.

Recommendations for operational biosecurity measures are not being considered at this stage due to the limited information available for the non-SRO options. Biosecurity recommendations for SROs may be discussed within their respective reports.

Cumulative effects from the combined risks of additional interacting options, such as from successive transfer pathways outside of the region, have not been included in these assessments. It is noted however, that as options are taken forward and more information is available, that the potential for further cumulative effects should be considered.

Mitigation is not being considered at this stage due to the limited information available for the non-SRO options. Mitigation for the SROs is discussed within their respected reports. Mitigation should be considered at later stages of the scheme.

Waterbodies initially classified as High Status under WFD will be reclassified to Good Status if populations of 'High Impact' INNS (according to the current aquatic alien species list produced by WFD UKTAG) are introduced. Significant changes to water quality or flow could change INNS habitat suitability or dispersal, which could impact WFD biological status. These risks are beyond the scope of the INNS risk assessment tool commissioned by the EA but are assessed as part of the WFD assessments.

For the option WIM11 no waterbody ID was available for both the source and receptor, due to this the scores may not accurately reflect the risk of this option as 'N/A' was used for both receptor and source.

2.4.3 In-combination effects assessment

The in-combination effects assessments described in this report are based on options within the SWW WRMP. Potential interactions with other water company options are not included within this report and should be considered as a part of regional planning.

The determination of option combinations for assessment, and the assessment of risk may be limited by the information available at the time of assessment. As such, results may only be indicative of additional INNS transfer risk. This is considered proportionate to the strategic stage of planning that the WRMP represents and will be developed further as options are progressed through further stages of design.

The methodology assumes treatment standards are met at treatment works, and broadly categorises water into raw or partially treated water (which may contain INNS), and treated water or effluent (assumed unlikely to contain INNS). The effects of partial treatment, such as for the purposes of reducing INNS risk, is therefore not accounted for within this assessment.

The results of such screening assessments may exclude the impact of mitigation, if this has not yet been determined.

Water abstraction, transfer and discharge have the potential to alter INNS habitat suitability or dispersal. Such risks are not accounted for within the in-combination effects assessment methodology, which focuses on the pathways which an option may create or exacerbate. Such impacts may need to be assessed at a later stage in option development.

3 Results

3.1 Level 1 screening results – all options

results. Table below summarises the results from the INNS risk Level 1 screening assessment of the WRMP24 supply-side options. Of the 62 options subject to a Level 1 screening, 14 were assessed with a Risk Magnitude of 'None', 28 were assessed as Very Low risk, 14 at Low risk, three at Moderate risk and three at High risk. This excludes the six SRO options which were subject to separate assessments for the RAPID Gate 2 process and seven drought options which have been assessed as EARs. Thus, 20 non-SRO options and six SRO options were subject to a Level 2 assessment.

Table 3.1: Summary of WRMP24 INNS Level 1 screening results.

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
BNW1*	Borehole development, existing borehole remedial works	Very limited risk as the source water is likely to be entirely free of INNS. Assumed that groundwater is free of INNS, and that abstraction will not cause or increase INNS transfer risk; water transfer will occur throughout regular operation of the option.	Very Low	No
BNW6*	Longham Aquifer Recharge	Physical transfer of untreated water between two locations assumed currently already connected. Assumed that recharge is over short term and/or intermittent according to conditions, and that water will be re-extracted for use at a later date.	Moderate	Yes
BNW7	Mendips Quarry Raw water transfer and augmentation of the River Stour	N/A	N/A	SRO – Level 1 assessment not required
BNW8	Poole Harbour FE-reuse	N/A	N/A	SRO – Level 1 assessment not required
BNW14	Ibsley Lake	Bankside boreholes not direct intake from lake. Filtration through gravel. Pipeline transfer to WTW. Existing intake for WTW. Unlikely to spread INNS as not directly abstracting from the lake and abstracted water will be filtered through substrate.	Very Low	No
BNW16	Christchurch and Holdenhurst WWTW IPR 3 – further treatment and transfer to Knapp Mill WTW	Very limited risk as the source water (treated effluent) is likely to be entirely free of INNS. Assumed that sources and destinations are currently unconnected, and that water transfer will occur throughout the regular operation of the option.	Very Low	No
BNW17	Cheddar 2 new strategic regional reservoir and transfer	N/A	N/A	SRO – Level 1 assessment not required

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
BNW18	Alderney WTW – Reduce Treatment Losses	Option only involves improvements to increase WTW efficiency, no risk of transfer/movement of invasive or non-native species with this option type.. Assumed that no water transfers would be directly affected.	None	No
BNW19	Knapp Mill WTW – Reduce Treatment Losses	Option only involves improvements to increase WTW efficiency, no risk of transfer/movement of invasive or non-native species with this option type.. Assumed that no water transfers would be directly affected.	None	No
COL2	Colliford PS Stage 2 – River Camel Abstraction	River Camel to Restormel WTW – physical transfer of untreated water between two locations assumed currently unconnected. Restormel WTW to Colliford Reservoir - . physical transfer of treated water between two locations assumed currently unconnected. No INNS risk within this component of option as treated water will be free from INNS. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at water treatment facility (Restormel WTW).	Low	Yes
COL3	Abstraction of Colliford compensation flows when making supply releases	Increase in WTW abstraction and capacity. No additional infrastructure/construction. No risk of transfer/movement of invasive or non-native species with this option type.	None	No
COL4	Abstraction of Siblyback compensation flow when making supply releases	Increase in WTW abstraction and capacity. No additional infrastructure/construction. No risk of transfer/movement of invasive or non-native species with this option type.	None	No
COL5	Increase Wendron annual license and de-couple from Stithians	Redevelopment of existing resources with increased yields. No additional risk of transfer/movement of invasive or non-native species with this option type.	None	No
COL6	River Hayle Abstraction	Physical transfer of untreated water between two locations assumed currently unconnected. Assumed any transferred INNS would be treated/removed at water treatment facility.	Low	Yes
COL9	Leswidden Pool	Physical transfer of untreated water between two locations assumed currently unconnected.	High	Yes
COL15	Restormel WTW-increase treatment capacity to 110Ml/d	Increase WTW capacity (additional treatment and conventional Use)/ increased efficiency. Assumed no new connections between waterbodies or new infrastructure; transferred water will be treated (and unlikely to contain INNS) as water abstracted from River Fowey on the WTW site and not transferred off site.	Very Low	No

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
COL16	College WTW Improvements – treatment and distribution system	Increase Water Treatment Works capacity (additional treatment and conventional Use). No additional risk of transfer/movement of invasive or non-native species with this option type Assumed any transferred INNS would be treated/removed at water treatment facility, the source and destination are currently connected, and all water transferred will be within a closed pipeline.	None	No
COL19	Boswyn stream/ Cargenwen Reservoir/ Carwynnen stream	Physical transfer of untreated water between two locations which have not been connected in 20 years. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Reduced water flows downstream of the abstraction points at Boswyn Stream and Carwynnen Stream. Reduction in water at Cargenwen Reservoir. Assumed water transfer will occur throughout regular operation of the option. Risk assessment excludes potential changes to INNS suitability and dispersal resulting from changes in flow.	High	Yes
COL20*	River Fal new abstraction	Physical transfer of untreated water between two locations assumed currently unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal Assumed any transferred INNS would be treated/removed at water treatment facility.	Low	Yes
COL21	South Crofty & Wheal Jane – Mine Water Reclamation	Very limited risk as the source water is likely to be entirely free of INNS. Assumed that minewater is a form of groundwater and likely to be free of INNS, and that abstracting it will not increase the risk of INNS spread.	Very Low	No
COL22	Roadford to Colliford via Saltash	Additional physical transfer of treated water between two locations assumed currently connected. No INNS risk as treated water will be free from INNS. Assumed that any INNS would be removed prior to transfer at the source WTW facility, the source and destination are currently connected, all water transfer will be within a closed pipeline, all transfers are treated water unlikely to contain INNS, and water transfer will occur throughout the regular operation of the option.	Very Low	No

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
COL23	Mayflower WTW to Kit Hill (St. Cleer)	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water will be free from INNS. Assumed any INNS would be removed prior to transfer at the source WTW facility, source and destination are currently unconnected; all water transfer will occur within a closed pipeline; all transfers are treated water unlikely to contain INNS, and that water transfer will occur throughout the regular operation of the option.	Very Low	No
COL24	Northcombe WTW to Launceston	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water will be free from INNS. Assumed any INNS would be removed prior to transfer at the source WTW facility, source and destination are currently unconnected; all water transfer will occur within a closed pipeline; all transfers are treated water unlikely to contain INNS, and water transfer will only occur under drought conditions.	Very Low	No
COL25	Brent Tor to Launceston	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water will be free from INNS. Assumed any INNS would be removed prior to transfer at the source WTW facility, source and destination are currently unconnected, all water transfer will occur with a closed pipeline, all transfers are treated water unlikely to contain INNS, water transfer will occur throughout the regular operation of the option.	Very Low	No
COL26	Restormel WTW to East Cornwall	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water will be free from INNS. Assumed any INNS would be removed prior to transfer at the source WTW facility, source and destination are currently unconnected, all water transfer will occur with a closed pipeline, all transfers are treated water unlikely to contain INNS, water transfer will occur throughout the regular operation of the option.	Very Low	No
COL28	Desalination Plant at Par	Physical transfer of untreated water between two locations assumed currently unconnected. Assumed all water transfer will be within closed pipelines, no risks associated with pipe bursts as raw water will only be transferred to the treatment works adjacent to the sea, any transferred INNS would be treated/removed at desalination facility and therefore no transferred onwards to Restormel WTW, and water transfer will occur throughout the regular operation of the option	Very Low	No

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
COL29	Restormel WTW - Increase Treatment Capacity to 120Ml/d	Increase Water Treatment Works capacity (Additional Treatment and Conventional Use)/ increased efficiency. No risk of transfer/movement of invasive or non-native species with this option type. Assumed no new connections between waterbodies or new infrastructure.	one	No
dB1	Wimborne Borehole	Very limited risk as the source water is likely to be entirely free of INNS. Assumed source and destination are currently unconnected as borehole is currently disused, all water transfer will occur with closed pipelines, groundwater will be free of INNS, and accessing it will not increase INNS transfer risk, and water transfer will only occur under drought conditions.	Very Low	No
dB2	Stanbridge Licence	Very limited risk as the source water is likely to be entirely free of INNS. Assumed source and destination are currently unconnected as borehole is currently disused, all water transfer will occur with closed pipelines, groundwater will be free of INNS, and accessing it will not increase INNS transfer risk, and water transfer will only occur under drought conditions.	Very Low	No
dCS1/E	Colliford not releasing compensation flows when making supply releases	Increased abstraction of raw water from the Restormel River, but very limited additional risk as abstracted water would be treated at point of abstraction (at Restormel WTW). Assumed source and destination are already connected, additional abstracted water will be untreated, but will be treated at Restormel WTW before onwards transfer, and water transfer will only occur periodically.	Very Low	No
dCS11/E	Siblyback not releasing compensation flows when making supply releases	Reduced physical transfer of untreated water between two locations assumed currently connected. Due to the transfer being a reduction in the physical transfer of raw water there is not considered to be any additional risk of INNS transfer with this option. Assumed source and destination are already connected, all water transfers involve untreated water, and water transfer will only occur periodically.	Very Low	No

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
dR2	Slade Reservoir	Physical transfer of untreated water between two locations assumed currently connected but existing connection not in use. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal Assumed any transferred INNS would be removed at water treatment facility, all water transfer would occur within a closed pipeline, transferred water would be untreated, source and destination are currently connected via pipeline although not currently in use, and water transfer will occur throughout the regular operation of the option.	Low	Yes
dR3	Challacombe Reservoir	Physical transfer of untreated water between two locations assumed currently connected but existing connection not in use. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be removed at water treatment facility, all water transfer would occur within a closed pipeline, transferred water would be untreated, source and destination are currently connected via pipeline although not currently in use, and water transfer will occur throughout the regular operation of the option.	Low	Yes
dR4	Meldon / Vellake to Roadford	Physical transfer of untreated water between two locations assumed currently unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed all water transfer will occur within a closed pipeline, transferred water will be untreated, the source and destination are currently unconnected, and water transfer will only occur under drought conditions.	Moderate	Yes
dR5	Lee Moor unused quarries	Physical transfer of untreated water between locations assumed currently unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumes water transfer will occur within closed pipelines, and water transfer will only occur under drought conditions.	Low	Yes
dRS15/E	Roadford not releasing compensation flows when making supply releases	This option does not involve the movement of raw water and therefore is it is assumed that there is not an increase in INNS risk associated with it. Assumed that Roadford is not releasing compensation flows when making supply releases, and no increase in abstraction at Gunnislake or increase in the transfer of raw water which may contain INNS.	None	No

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
dW1	Brampford Speke and Stoke Canon (North Exeter Boreholes)	Very limited risk as the source water is likely to be entirely free of INNS. Assumed no additional abstraction at Pynes WTW associated with this option, water transfer will only occur under drought conditions, groundwater is free of INNS, and that accessing it will increase INNS transfer risk.	Very Low	No
dW2	Hook Springs Licence	Very localised (~100m) additional physical transfer of untreated water. Risk of pipe burst but due to localised nature of transfer this would not be regarded as a risk of transfer of INNS to a new location. Assumed all transferred water as part of the option is untreated, any transferred INNS would be treated/removed at water treatment facility, source and destination assumed to be already connected, all transfers will be in a closed pipeline, water transfer will occur throughout the regular operation of the option.	Very Low	No
dW3	Wilmington Springs Licence	Localised (~100m) physical transfer of untreated water between two locations assumed currently connected. Risk of pipeline bursts, but due to very localised transfer this presents a very limited risk of transferring INNS to new locations. Assumed all transferred water would be untreated, any transferred INNS would be treated/removed at water treatment facility, source and destination assumed to be already connected, all transfers will be in a closed pipeline, water transfer will occur throughout the regular operation of the option.	Very Low	No
dW4	Wimbleball not releasing compensation flows when making supply releases	This option does not involve the transfer of raw water from one location to another therefore there is not expected to be any INNS risk associated with it. Assumed that Wimbleball is not releasing compensation flows when making supply releases.	None	No
ROA2	River Erme	Physical transfer of untreated water (between two locations assumed to be previously unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at a water treatment facility.	Low	Yes
ROA3	River Yealm	Physical transfer of untreated water (between two locations assumed to be previously unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at a water treatment facility	Low	Yes

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
ROA4	Abstraction of Roadford compensation flow at Gunnislake when making supply releases	Physical transfer of untreated water (between two locations assumed to be previously unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at a water treatment facility	Low	Yes
ROA6	Upper Tamar Lake increasing annual license	Increase Water Treatment Works capacity (Additional Treatment and Conventional Use). No risk of transfer/movement of invasive or non-native species with this option type	None	No
ROA7*	Expansion of Northcombe WTW to 60Ml/d	Physical transfer of untreated water (between two locations assumed to be previously unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at a water treatment facility	Low	No
ROA12	Slade and Horedown WTW (GAC)	Physical transfer of untreated water (between two locations assumed to be previously unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at a water treatment facility.	Low	Yes
ROA13	Duckaller and Vennbridge	Redevelopment of existing resources with increased yields. No risk of transfer/movement of invasive or non-native species with this option type.	None	No
ROA14	Raise Avon Dam	This is not a new reservoir, however there is a risk that increased water levels could change the habitat suitability for any INNS present or functionality as a reservoir with respect to usage and connectivity, which could facilitate INNS spread to other waterbodies. Reservoirs represent habitats for birds and mammals which can transfer INNS propagules between waterbodies. Periodical has been chosen as the most representative description of frequency within the methodology, as the additional risk would come from potential periodical transfers with the wider environment associated with recreation or wildlife. Reservoirs may create new recreational usage increasing the risk of INNS transfer to other waterbodies via recreational equipment (e.g. kayaking, fishing etc.). Potential Operational risks include overflows, sludge disposal etc. This represents a precautionary assessment which may reduce on further investigation.	High	Yes

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
ROA15*	Gatherley Phase 2	Physical transfer of untreated water between two locations assumed currently connected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed water transfer will occur throughout operation of the option (Regular Frequency).	Moderate	Yes
ROA17	Littlehempston WTW	Physical transfer of treated water (between two locations assumed currently connected) (no INNS risk as treated water will be free from INNS)	Very Low	No
ROA19	Cheddar 2 to Prewley - New Strategic Regional Reservoir, Treatment and Transfer	N/A	N/A	SRO – Level 1 assessment not required
ROA20	Mayflower WTW to Littlehempston WTW	Additional physical transfer of treated (potable) water between two locations assumed currently unconnected. No INNS risk as treated water will be free from INNS. Assumed all transferred water as part of the option is treated to potable standard, all water transfer will occur within a closed pipeline, water transfer will occur throughout regular operation of the option.	Very Low	No
ROA21	Roborough to Littlehempston WTW	Physical transfer of untreated water between two locations assumed currently connected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed water transferred for this option is untreated and could contain INNS, water transfer would occur within a closed pipeline, water transfer will occur throughout regular operation of the option, any transferred INNS would be treated/removed at destination water treatment facility.	Low	Yes
WIM1	Abstraction of Wimbleball compensation flow at Northbridge when making supply releases	Physical transfer of untreated water between two locations assumed currently connected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumed any transferred INNS would be treated/removed at water treatment facility, option would involve increased abstraction and transfer of raw water at Northbridge RWPS, raw water transfer from Northbridge RWPS to Pynes WTW would be within a sealed pipeline.	Low	Yes
WIM2	Sidford borehole commissioning	Very limited risk as the source water is likely to be entirely free of INNS. It is assumed that groundwater is free of INNS, and that accessing increase the risk of INNS spread.	Very Low	No
WIM4	Wilmington springs annual abstraction increase	Severity classed as 'None' as option does not appear to involve change in connectivity. Assumes as stated that no new infrastructure will be needed. Assessment excludes potential increase in raw water transfer volume is this information is not available.	None	No

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
WIM5	Indirect potable reuse – stream support for Dotton WTW	Physical transfer of treated water (between two locations assumed currently unconnected) (no INNS risk as treated water will be free from INNS).	Very Low	No
WIM6*	Increase Allers WTW capacity	Increase Water Treatment Works capacity (Additional Treatment and Conventional Use). No risk of transfer/movement of invasive or non-native species with this option type.	None	No
WIM7*	Increase Pynes to licence limit 66.46Ml/d	Increase Water Treatment Works capacity (Additional Treatment and Conventional Use). No risk of transfer/movement of invasive or non-native species with this option type.	None	No
WIM8	Brampford Speke borehole	Very limited risk as the source water is likely to be entirely free of INNS. Assumed that groundwater is free of INNS, and that accessing it will not permit any additional inputs of INNS, water transfer will occur throughout regular operation of the option.	Very Low	No
WIM9	Stoke Canon borehole	Very limited risk as the source water is likely to be entirely free of INNS. Assumed that groundwater is free of INNS, and that accessing it will not permit any additional inputs of INNS, water transfer will occur throughout regular operation of the option.	Very Low	No
WIM11	Couchill Springs, Seaton	Physical transfer of untreated water from Couchill Springs to Bovey Lane WTW via a new pipeline two locations assumed currently unconnected. Additional risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal. Assumes option would be operated on a regular basis, source and receptor are currently unconnected, any transferred INNS would be treated/removed at water treatment facility.	Low	Yes
WIM12	Allers Springs	Physical transfer of untreated water between two locations assumed currently unconnected. Risks from pipeline washout, pipeline bursts, washwater discharge, overflows and sludge disposal are negligible as water will be treated on site and only treated water will be transferred off site. Assumes any transferred INNS would be treated/removed at water treatment facility and source is located within footprint of treatment facility.	Very Low	No
WIM13	Cheddar 2 to Parsonage – New strategic reservoir, treatment and transfer	N/A	N/A	SRO – Level 1 assessment not required

Option ID	Option name	Description of Risks/impacts and key assumptions	Level 1 Risk Magnitude	Level 2 assessment required
WIM14	Whitecross distribution upgrade	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water will be free from INNS. Assumed all transferred water as part of the option is treated and unlikely to contain INNS, all water transfer will occur within a sealed pipeline, water transfer will occur throughout regular operation of the option.	Very Low	No
WIM15	Northcombe WTW to Allers WTW	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water us assumed to be free of INNS. Assumed any transferred INNS would be treated/moved at water treatment facility, source and receptor are currently unconnected, all water transfers will occur within a closed pipeline, water transfer will occur throughout regular operation of the option.	Very Low	No
WIM16	FE Countess Wear and Maer Lane WwTW to River Exe	Physical transfer of treated water between two locations assumed currently unconnected. No INNS risk as treated water us assumed to be free of INNS. Assumed any transferred INNS would be treated/removed at water treatment facility, source and receptor are currently unconnected, all water transfers will occur within a closed pipeline, water transfer will occur throughout regular operation of the option.	Very Low	No
WIM18	Cheddar 2 to Bickham Moor – New strategic regional reservoir, treatment and transfer	N/A	N/A	SRO – Level 1 assessment not required

Note: Options with an asterisk (*) symbol are listed as priority options. Source: Mott MacDonald, 2023.

The following options have EARs and have not been assessed as part of the Level Screening assessment:

- dC1: Restormel Licence
- dC2: Stannon Lake Licence
- dC3: Porth Reservoir and Rialton intake
- dCS2/E: Park Lake Licence
- dCS3/E: Blackpool Pit
- dCS6/E: Hawks Tor Pit
- dRS1/E: River Lyd (Summer)

3.2 Level 2 assessment results – all options

As detailed in section 0, Level 1 screenings and Level 2 assessments differ in methodology and risk level scoring, with Level 2 assessments based on a more detailed understanding of each option. The additional details used in a Level 2 assessment may therefore mean that the more detailed assessment results in an apparent lower or higher risk than indicated by the initial screening. Furthermore, the Level 2 assessment produces an Overall Risk Score based on the average of its constituent RWT and asset components. Therefore, the Risk Score generated by individual components may be masked by this averaging; for example, the relatively high-risk

score associated with a reservoir may be averaged with lower risk infrastructure (e.g. pipelines and sealed service reservoirs). In understanding the risk presented by an option, the Risk Scores of individual components should be examined alongside the Overall Risk Score.

The Level 2 INNS risk assessment results for the 26 options evaluated at this level are summarised in

Table 3.2: Level 2 INNS risk assessments results. below. It should be noted that these scores do not consider any engineering interventions that may be required as mitigation to prevent the spread of INNS.

Table 3.2: Level 2 INNS risk assessments results.

Option ID	Option Name	Level 1 Risk Magnitude	Asset component	Asset score	RWT component	RWT score	Overall Risk Score
BNW6	Longham Aquifer Recharge	Moderate	N/A	N/A	River Stour to Longham Lakes	44.13%	45.07%
					River Avon to Aquifer	45.1%	
					Longham Lakes to Aquifer	45.98%	
BNW7	Increase Pynes to licence limit 66.46 Ml/d[11]	N/A (SRO)	Newton Meadow WTW-PS	28.31%	River Avon to Torr Reservoir	48.00%	35.48%
			Torr Quarry WTW-PS	26.50%	Torr Reservoir to the River Stour	38.75%	
			Torr reservoir	51.56%			
BNW8	Poole Harbour FE-reuse[12]	N/A (SRO)	N/A	N/A	25 Ml/d River Stour Longham Lakes connection	41.25%	42.25%[13]
					Sweetening flow (7.5 Ml/d) River Stour Longham Lakes connection	43.25%	
BNW17	Cheddar 2 new strategic regional reservoir and transfer	N/A (SRO)	Cheddar 2 Reservoir	72.54%	Cheddar Springs to Cheddar 2 transfer	37.13%	43.25%[13]
					Axbridge WTW to Cheddar 2 transfer	27.48%	
					Cheddar 2 to Honeyhurst WTW transfer	35.85%	

[11] Mott MacDonald (2022). Mendip Quarries SRO. Invasive and Non-Native Species Risk Assessment. Document reference: 100106586 A

[12] Stantec and Ricardo (2022). Strategic Regional Water Solutions: Poole Effluent Recycling and Transfers. Standard Gate Two Submission. Appendix 5.4: Invasive Non-Native Species Assessment

[13] Not originally reported but calculated here as an average value of assets and raw water transfers.

Option ID	Option Name	Level 1 Risk Magnitude	Asset component	Asset score	RWT component	RWT score	Overall Risk Score
COL2	Colliford PS Stage 2 – River Camel Abstraction	Low	Pumping station	16.05%	River Camel to Restormel WTW pipeline	50.35%	33.2%
COL6	River Hayle Abstraction	Low	Pumping station	15.44%	River Hayle to new WTW pipeline	48.70%	35.23%
			WTW	28.06%			
COL9	Leswidden Pool	High	Balles-widden Pool	16.05%	Balles-widden Pool to Discharge point	50.48%	35.39%
					Sancreed Stream Discharge point to Drift	58.98%	
COL19	Boswyn stream/ Cargenwen Reservoir/ Carwynnen stream	High	Carwynnen Stream Botetoe Bridge	16.05%	Cargenwen to Boswyn Reservoir pipeline	52.98%	36.41%
			Cargenwen Reservoir Pumping Station	13.64%	Cargenwen Stream (Botetoe Bridge) to Boswyn Reservoir pipeline	52.98%	
			Boswyn Reservoir Water Treatment Works	29.21%	Cargenwen Stream (Botetoe Bridge) to Boswyn Reservoir pipeline	53.60%	
COL20	River Fal new abstraction	Low	Grampound Road WTW	26.80%	River Fal to Grampound Road WTW	41.98%	31.70%
			Raw water pumping stations	16.05%			
dR2	Slade Reservoir	Low	N/A	N/A	Slade Reservoir to Horedown WTW	44.45%	44.45%
dR3	Challacombe Reservoir	Low	N/A	N/A	Challacombe Reservoir to Horedown WTW	41.08%	41.08%
dR4	Meldon / Vellake to Roadford	Moderate	N/A	N/A	River West Okemont at Vellake to Roadford Reservoir	53.73%	53.73%
dR5	Lee Moor unused quarries	Low	N/A	N/A	Lee Moor Quarries to Littlehempston WTW	32.58%	32.58%

Option ID	Option Name	Level 1 Risk Magnitude	Asset component	Asset score	RWT component	RWT score	Overall Risk Score
ROA2	River Erme	Low	River Erme RWPS	13.64%	River Erme abstraction to existing pipe network pipeline via new pumping station	42.10%	29.68%
					Existing South Devon Spine Main to Littlehempston WTW	49.35%	
ROA3	River Yealm	Low	River Yealm RWPS	16.05%	River Yealm to South Devon Spine Main pipeline	52.10%	33.29%
					South Devon Spine Main to Littlehempston WTW	49.35%	
ROA4	Abstraction of Roadford compensation flow at Gunnislake when making supply releases	Low	N/A	N/A	River Tamar to Mayflower WTW via existing pipeline	46.58%	46.58%
ROA7	Expansion of Northcombe WTW to 60Ml/d	Low	Northcombe WTW	29.21%	Roadford reservoir to Northcombe WTW	56.60%	42.90%
ROA12	Slade and Horedown WTW (GAC)	Low	Slade Reservoir RWPS	17.25%	Slade Reservoir to Horedown WTW pipeline	47.58%	32.41%
ROA14	Raise Avon Dam	High	Avon Dam Reservoir	69.29%	N/A	N/A	69.29%
ROA15	Gatherley Phase 2	Moderate	N/A	N/A	River Lyd to Roadford Reservoir pipeline	46.25%	46.25%
ROA19	Cheddar 2 to Prewley - New Strategic Regional Reservoir, Treatment and Transfer	N/A (SRO)	Cheddar 2 Reservoir	72.54%	Cheddar Springs to Cheddar 2 transfer	37.13%	43.25%[13]
					Axbridge WTW to Cheddar 2 transfer	27.48%	
					Cheddar 2 to Honeyhurst WTW transfer	35.85%	

Option ID	Option Name	Level 1 Risk Magnitude	Asset component	Asset score	RWT component	RWT score	Overall Risk Score
ROA21	Roborough to Littlehempston WTW	Low	N/A	N/A	Roborough Tank at Mayflower WTW to Little-hempston WTW	38.23%	38.23%
WIM1	Abstraction of Wimbleball compensation flow at Northbridge when making supply releases	Low	N/A	N/A	River Exe abstraction at Northbridge RWPS to Pynes WTW	42.45%	42.45%
WIM11	Couchill Springs, Seaton	Low	Couchill Spring Collection Chamber and Pumping Station	19.53%	Couchill Springs to Bovey Lane WTW	34.08%	29.82%
			Bovey Lane WTW	31.61%			
WIM13	Cheddar 2 to Parsonage Mayflower WTW to Littlehempston WTW	N/A (SRO)	Cheddar 2 Reservoir	72.54%	Cheddar Springs to Cheddar 2 transfer	37.13%	43.25%[13]
					Axbridge WTW to Cheddar 2 transfer	27.48%	
					Cheddar 2 to Honeyhurst WTW transfer	35.85%	
WIM18	Cheddar 2 to Bickham Moor – New strategic regional reservoir, treatment and transfer	N/A (SRO)	Cheddar 2 Reservoir	72.54%	Cheddar Springs to Cheddar 2 transfer	37.13%	43.25%[13]
					Axbridge WTW to Cheddar 2 transfer	27.48%	
					Cheddar 2 to Honeyhurst WTW transfer	35.85%	

Source: Mott MacDonald, 2023.

The principal risk associated with the RWTs assessed is the release of raw water into adjacent waterbodies in the event of a pipeline burst or leak, which could functionally create a new link for INNS transfer.

Options COL2, COL6, ROA2, ROA3, ROA4 and WIM1 involve the abstraction of water from rivers, which may also increase INNS risk at the source, as a reduction in flow may impact the habitat suitability for INNS in the surrounding environment. However, as the receptors for these transfers are WTWs, the risk of INNS transfer is limited to potential pipe bursts, washout or sludge disposal, and is therefore deemed to be relatively low. Similarly, dR2, dR3, dR5 and

ROA21 are raw water transfers within sealed pipelines and terminating at a WTW; therefore, INNS transfer risk is limited to potential pipe bursts, washout or sludge disposal, and is deemed to be relatively low.

Options ROA15, COL19, dR4 and part of BNW6 also involve the abstraction of river water and so presents the same risks as the previously discussed options. However, as the receptor of each of these transfers is an open reservoir, any INNS transferred from the source rivers could be introduced into the reservoir. As a result, there is additional risk off INNS spread beyond this point as a result of transference via wildlife, boats, or safety and recreational equipment entering the water and transferring INNS to or from this waterbody.

A transfer of INNS risk is also associated with option COL9 as there is a possibility that INNS are present in the source waterbodies (depending on waterbody use and maintenance activities).

COL9 poses an additional risk as this option discharges from an offline waterbody into an adjacent stream. This means there is a risk that any INNS present in the source waterbody may be transferred into the stream, and also that additional flows in the receiving stream during operation may spread both introduced and existing INNS further downstream.

As option ROA12 transfers water from a reservoir to a WTW, the main risk associated with this option is likely to be pipeline bursts as INNS will be removed before further transfer within the network. Similarly, the second RWT associated with BNW6 involves the transfer of water to groundwater and although would not likely directly spread INNS to new habitats, the option still has a risk of potential for pipeline bursts.

While there are no new raw water inputs or transfers into the reservoir associated with ROA14, the increase in water capacity – and therefore surface area of the dam – theoretically creates a greater likelihood of INNS being transferred via wildlife or equipment. This increase in volume may also create additional habitat for INNS. The risk associated with the original reservoir is not available and so an assessment of the entire reservoir was undertaken. Therefore, the risk score does not reflect the true INNS risk for ROA14 which would only reflect the increase in capacity of reservoir.

BNW17 is an SRO which include the development of a new reservoir which has requires two raw water transfers from a springs and river to feed it. There is also a raw water transfer from the option to a WTWs where the water will be treated. The option WIM18 is a part of the Cheddar 2 SRO and it includes the reservoir and the transfer of raw water to the Honeyhurst WTW which is assessed at Level 2 in the BNW17 risk assessment. This is the same for the options WIM13 and ROA19 which include the INNS risk associated with the development of the reservoir in BNW17.

3.3 Best Value Plan

3.3.1 Level 1 screening

The BVP includes 13 supply and drought options, which are identical for both the medium and high adaptive plans. Following a Level 1 screening, one drought option (dW4) was assessed as having a Risk Magnitude of None. There were also three drought options and four supply options assessed as being Very Low risk (BNW1, BNW14, COL15, WIM14, dW1, dW2, and dW3). These options were therefore screened out of for requiring a Level 2 assessment.

Five supply options were progressed to a Level 2 assessment, comprising two options screened as Moderate and Low Risk Magnitude respectively (BNW6 and ROA21), and three SROs (BNW7, BNW8 and WIM18).

The options that were not progressed to a Level 2 assessment did not present a risk of increased INNS associated with them. This was due various factors such as the options either involving a groundwater source which is assumed to be free of INNS or not involving an increase in the amount of raw water transferred. Also, there are options where the transfer distance is relatively small (~ 100m) so the spread of INNS would only be localised not to a new location. Other options involved treated water being transferred and this was treated via either a filtration method or WTWs.

The options which require a Level 2 assessment will involve the transfer of raw, untreated water from one location to another.

3.3.2 Level 2 assessment summary

Of the five options included in the BVP three were SROs (BNW7, BNW8 and WIM18) and were assessed only at Level 2. The three SROs involve creating a new connection between waterbodies.

BNW7 included three new assets and two new RWTs. The three new assets were two WTWs/Pumping Stations and a new reservoir. The RWTs were from a river to the new reservoir and from the new reservoir to a river. BNW8 involves two RWTs from different rivers to Longham Lakes. WIM18 includes the creation of a new reservoir which is fed from both a springs and a river with the water then transferred onto a WTW from the new reservoir.

The fourth option BNW6, was a supply option which resulted in a Level 1 risk of Moderate and therefore required a further Level 2 assessment. This option also included the movement of raw water between waterbodies via a new connection.

The fifth option ROA21, was another supply option which resulted in a Level 1 risk of Low and also required a Level 2 assessment. This option involves the movement of raw water from Roborough tank to a WTW.

Of these five options, the option with the highest overall risk score was BNW6 at 45.07%, whilst BNW7 had the lowest at 35.48%. However, WIM18 had an asset which had the highest component score of the four options – which was Cheddar 2 Reservoir with a score of 72.54%.

3.3.1 In-combination effects assessment

Of the thirteen options in the BVP, all were subject to a Level 1 and/or Level 2 assessment and were therefore included in the in-combination effects assessment process.

- BNW1 (Borehole development, existing borehole remedial works)
- BNW6 (Longham Aquifer Recharge)
- BNW7 (SRO – Mendips Quarry raw water transfer and augmentation of the River Stour)
- BNW8 (SRO – Poole Harbour FE-reuse)
- BNW14 (Ibsley Lake)
- COL15 (Restormel WTW- increase treatment capacity to 110Ml/d)
- ROA21 (Roborough to Littlehempston WTW)
- WIM14 (Whitecross distribution upgrade)
- WIM18 (SRO – Cheddar 2 to Bickham Moor – New Strategic Regional Reservoir, Treatment and Transfer)
- dW1 (Brampford Speke and Stoke Canon (North Exeter Boreholes))
- dW2 (Hook Springs Licence)
- dW3 (Wilmington Springs Licence)

- dW4 (Wimbleball not releasing compensation flows when making supply releases)

The results of stage 1 of the in-combination effects assessment process (initial option screening) are shown in Table 3.3 below. Of the 13 options which were included, two non-SRO option and three SROs were progressed to stage 2, whilst four supply options and four drought options were screened out.

Table 3.3: Results of in-combination effects assessment stage 1 (initial option screening).

Option ID	Options name	Option type	Level 1 screening result	In-combination effects stage 1 result
BNW1	Borehole development, existing borehole remedial works	Supply side	Very low	No additional risk, not progressed to stage 2
BNW6	Longham Aquifer Recharge	Supply side	Moderate	Progressed to stage 2
BNW7	Mendips Quarry raw water transfer and augmentation of the River Stour	SRO	N/A as assessed at Level 2 within respective SRO report	Progressed to stage 2
BNW8	Poole Harbour FE-reuse	SRO	N/A as assessed at Level 2 within respective SRO report	Progressed to stage 2
BNW14	Ibsley Lake	Supply side	Very low	No additional risk, not progressed to stage 2
COL15	Restormel WTW- increase treatment capacity to 110Ml/d	Supply side	Very low	No additional risk, not progressed to stage 2
ROA21	Roborough to Littlehempston WTW	Supply side	Low	Progressed to stage 2
WIM14	Whitecross distribution upgrade	Supply side	Very low	No additional risk, not progressed to stage 2
WIM18	Cheddar 2 to Bickham Moor – New strategic regional reservoir,	Supply side	N/A as assessed at Level 2 within respective SRO report	Progressed to stage 2

Option ID	Options name	Option type	Level 1 screening result	In-combination effects stage 1 result
	treatment and transfer			
dW1	(Brampford Speke and Stoke Canon (North Exeter Boreholes))	Drought	Very low	No additional risk, not progressed to stage 2
dW2	(Hook Springs Licence)	Drought	Very low	No additional risk, not progressed to stage 2
dW3	(Wilmington Springs Licence)	Drought	Very low	No additional risk, not progressed to stage 2
dW4	(Wimbleball not releasing compensation flows when making supply releases)	Drought	None	No additional risk, not progressed to stage 2

Following the spatial analysis undertaken during stage 2 (connectivity screening), the following three option combinations were identified as having potential for connectivity, and therefore requiring a more detailed stage 3 qualitative assessment.

- BNW6 (Longham Aquifer Recharge) and BNW8 (SRO – Poole Harbour FE-reuse)
- BNW6 (Longham Aquifer Recharge) and BNW7 (SRO – Mendips Quarry raw water transfer and augmentation of the River Stour)
- BNW7 (SRO – Mendips Quarry raw water transfer and augmentation of the River Stour) and BNW8 (SRO – Poole Harbour FE-reuse)

Of the three options combinations progressed to stage 3, one option combination – BNW6 (Longham Aquifer Recharge) and BNW7 (Mendips Quarry raw water transfer and augmentation of the River Stour) – was determined to present potential additional risk of in-combination effects. The remaining two option combinations were determined not to interact in a way which would present an additional INNS transfer risk and were therefore screened out. The results are shown in Table 3.4.

Table 3.4: Option combinations identified in stage 2 (connectivity screening) and the stage 3 (qualitative analysis) results.

Option combination	Description of interactions and potential additional risk	Assumptions	Stage 3 results
BNW6 (Longham Aquifer Recharge) and BNW8 (Poole Harbour FE-reuse)	Option BNW6 includes a water transfer from the River Stour to Longham Lakes and then to a borehole. Under the BNW6 option water from Longham Lakes will be pumped into the underlying aquifer during winter and extracted during summer. Option BNW8 will discharge recycled water into the River Stour upstream of Longham Lakes, via a pipeline, treatment plant and wetland. As BNW8 discharges treated water into the River Stour, it is considered that the option combination would not create additional INNS transfer risk.	For option BNW6 an assumption has been made that the option involves the physical transfer of untreated water between two locations currently already connected. It is assumed that abstracted groundwater would not contain INNS. Water supplying Longham Lakes is assumed to come from the River Stour or River Avon. For option BNW8 it is assumed that untreated water will be abstracted from the lakes and transferred to Alderney WTW.	No likely additional risk from in-combination effects, not progressed to stage 4
BNW6 (Longham Aquifer Recharge) and BNW7 (Mendips Quarry raw water transfer and augmentation of the River Stour)	Option BNW7 discharges water from the River Avon, which is stored in Torr Reservoir and discharged into the River Stour. Option BNW6 involves transfer of water from the River Stour to Longham Lakes and water storage in an aquifer. In combination the options BNW7 and BNW6 may create connectivity between the River Avon (Bristol Avon), Torr Reservoir, the River Stour and Longham Lakes. Therefore it is considered that in combination the options could cause a greater INNS transfer risk than the individual options.	For option BNW6 an assumption has been made that the option involves the physical transfer of untreated water between two locations currently already connected. It also assumed that abstracted groundwater would not contain INNS. The water supplying Longham Lakes is assumed to come from the River Stour or River Avon (Hampshire Avon).	Potential additional risk from in combination effects identified, progressed to stage 4
BNW7 (Mendips Quarry raw water transfer and augmentation of the River Stour) and BNW8 (Poole Harbour FE-reuse)	BNW7 and BNW8 both discharge into the River Stour. The two sources would not be connected in a way which would enable INNS movement between them, therefore these options present no additional risk in combination then individually.	Assumes that the discharge of water into the River Stour for BNW7 and BNW8 is one way only i.e. water flows into the from a discharge point into the River Stour and cannot flow operate in reverse.	No likely additional risk from in-combination effects, not progressed to stage 4

The following option combination was therefore progressed to stage 4, the SAI-RAT assessment:

- BNW6 (Longham Aquifer Recharge) and BNW7 (Mendips Quarry raw water transfer and augmentation of the River Stour)

Within SAI-RAT, this option combination involved four asset components and six RWT components. The highest RWT score was associated with the River Avon to Torr Reservoir pipeline (46.00%), whilst the highest asset and highest component score was generated by the Torr Reservoir (51.56%). The Overall Risk Score for this option combination was 36.06%.

The details of this stage 4 (SAI-RAT) assessment are shown in Table 3.5 below.

Table 3.5: Results of in-combination effects assessment stage 4 (SAI-RAT assessment).

Option ID	Option Name	Asset component	Asset score (%)	RWT component	RWT score %	Overall Risk Score (%)
BNW6	Longham Aquifer Recharge	No asset components identified	No asset components identified	River Stour to Longham Lakes pipeline	44.13	45.07
				River Avon to Longham Lakes pipeline	45.10	
				Longham Lakes to aquifer	45.98	
BNW7	Mendips Quarry raw water transfer and augmentation of the River Stour	Torr Reservoir	51.56	River Avon to Torr Reservoir pipeline	46.00	35.05
		Avon WTW	22.78	Torr Reservoir to River Stour pipeline	36.75	
		Torr WTW	20.97			
		Matchams PS	20.97	River Stour to Knapp Mill	40.35	
Maximum Asset Score (%) (Torr Reservoir)						51.56
Average Asset Score (%)						29.07
Maximum RWT Score (%) (River Avon to Torr Reservoir pipeline)						46.00
Average RWT Score (%)						43.05
Combined Overall Risk Score (%)						**36.06**

3.4 Least Cost Plan

3.4.1 Level 1 screening summary

The LCP comprises 13 supply and drought options, including two SRO options (BNW7 and BNW8). One option (dW4 was screened with a Risk Magnitude of None, and five drought options (dB1, dB2, dW1, dW2, and dW3) were assessed as Very Low risk. Three supply options (WIM12, WIM14, and WIM5) were also assessed as Very Low. Two more supply options (WIM11 and ROA21) were assessed as Low. The two SRO options are assessed at Level 2 as a part of the RAPID Gate 2 process and therefore bypassed the Level 1 screening.

The total number of relevant options varies according to the adaptive pathway – options dB1 and dB2 are not included in either of the medium or high adaptive pathways, whilst WIM11 and WIM12 are only included in the high adaptive pathway. WIM11 is the only option requiring a Level 2 assessment which differentiates these pathways, as it is only included in the high adaptive pathway.

The options that were not progressed to a Level 2 assessment did not involve the transfer of water which has the risk of containing INNS as the water was either treated or from a groundwater source. The options which required a Level 2 assessment will involve the transfer of raw, untreated water from one location to another.

3.4.2 Level 2 assessment summary

There are four options included in the LCP that were assessed at Level 2 – two were SROs (BNW7 and BNW8) and two were non-SRO option (WIM11 and ROA21) which were both given a risk rating of Low at Level 1. Both of these options involved the movement of raw water to a WTW.

The option WIM11 is not included in the Adaptive Plan (med).

WIM11 had the lowest overall risk score of 29.82%. The option BNW7 had an asset component which had the highest component score of the four options which was the Torr Reservoir with a score of 51.56%.

3.3.2 In-combination effects assessment

Of the thirteen options in the LCP, all were subject to a Level 1 and/or Level 2 assessment and were therefore included in the in-combination effects assessment process.

- BNW7 (SRO - Mendips Quarry raw water transfer and augmentation of the River Stour)
- BNW8 (SRO - Poole Harbour FE-reuse)
- dB1 (Wimborne Borehole)
- dB2 (Stanbridge Licence)
- dW1 (Brampford Speke and Stoke Canon (North Exeter Boreholes))
- dW2 (Hook Springs Licence)
- dW3 (Wilmington Springs Licence)
- dW4 (Wimbleball not releasing compensation flows when making supply releases)
- ROA21 (Roborough to Littlehempston WTW)
- WIM11 (Couchill Springs, Seaton)
- WIM12 (Allers Springs)
- WIM14 (Whitecross distribution upgrade)
- WIM5 (Indirect potable reuse - stream support for Dotton WTW.)

The results of stage 1 of the in-combination effects assessment process (initial option screening) are shown in Table 3.3 below. Of the 13 options which were included, two supply side option and two SROs were progressed to stage 2, whilst three supply side options and six drought options were screened out.

Table 3.6: Results of in-combination effects assessment stage 1 (initial option screening).

Option ID	Options name	Option type	Level 1 screening result	In-combination effects stage 1 result
BNW7	Mendips Quarry raw water transfer and augmentation of the River Stour	SRO	N/A as assessed at Level 2 within respective SRO report	Progressed to stage 2
BNW8	Poole Harbour FE-reuse	SRO	N/A as assessed at Level 2 within respective SRO report	Progressed to stage 2
dB1	(Wimborne Borehole)	Drought	Very low	No additional risk, not progressed to stage 2
dB2	(Stanbridge Licence)	Drought	Very low	No additional risk, not progressed to stage 2

Option ID	Options name	Option type	Level 1 screening result	In-combination effects stage 1 result
ROA21	Roborough to Littlehempston WTW	Supply side	Low	Progressed to stage 2
WIM11	(Couchill Springs, Seaton)	Supply side	Low	Progressed to stage 2
WIM12	(Allers Springs)	Supply side	Very low	No additional risk, not progressed to stage 2
WIM14	Whitecross distribution upgrade	Supply side	Very low	No additional risk, not progressed to stage 2
WIM5	Indirect potable reuse - stream support for Dotton WTW.	Supply side	Very low	No additional risk, not progressed to stage 2
dW1	(Brampford Speke and Stoke Canon (North Exeter Boreholes))	Drought	Very low	No additional risk, not progressed to stage 2
dW2	(Hook Springs Licence)	Drought	Very low	No additional risk, not progressed to stage 2
dW3	(Wilmington Springs Licence)	Drought	Very low	No additional risk, not progressed to stage 2
dW4	(Wimbleball not releasing compensation flows when making supply releases)	Drought	None	No additional risk, not progressed to stage 2

Following the spatial analysis undertaken during stage 2 (connectivity screening), the following option combination was identified as having potential for connectivity, and therefore requiring a more detailed stage 3 qualitative assessment. The remaining two option combinations were determined not to interact in a way which would present an additional INNS transfer risk and were therefore screened out.

- BNW7 (SRO - Mendips Quarry raw water transfer and augmentation of the River Stour) and BNW8 (SRO - Poole Harbour FE-reuse)

When this option combination was progressed to stage 3 it was not was determined to present a potential additional risk of in-combination effects and was screened out of further assessment. The results are shown in Table 3.4. Therefore, no options were taken to stage 4 of the in-combination assessment for the LCP and in conclusion, no options were identified as potential presenting an additional in-combination effect, in either the medium or high adaptive pathways.

Table 3.7: Option combinations identified in stage 2 (connectivity screening) and the stage 3 (qualitative analysis) results.

Option combination	Description of interactions and potential additional risk	Assumptions	Stage 3 results
BNW7 (Mendips Quarry raw water transfer and augmentation of the River Stour) and BNW8 (Poole Harbour FE-reuse)	BNW7 and BNW8 both discharge into the River Stour. The two sources would not be connected in a way which would enable INNS movement between them, therefore these options present no additional risk in combination then individually.	Assumes that the discharge of water into the River Stour for BNW7 and BNW8 is one way only i.e. water flows into the from a discharge point into the River Stour and cannot flow operate in reverse.	No likely additional risk from in-combination effects, not progressed to stage 4

4 Conclusions and recommendations

4.1 Conclusions

4.1.1 Overview

Of all 62 non-SRO options subject to a Level 1 screening, 14 were assessed with a Risk Magnitude of 'None', 28 were assessed as Very Low risk, 14 at Low risk, three at Moderate risk and three at High risk. The six SRO options were not subject to a Level 1 screening as they were assessed at Level 2 as part of the RAPID Gate 2 process.

Thus, 20 non-SRO options and six SRO options were subject to a Level 2 assessment. The results are summarised in Table 4.1 below, alongside the Level 1 screening results for these options.

Table 4.1: Level 2 INNS assessment summary results.

Option ID	Level 1 Risk Magnitude	Maximum component Risk Score	Overall Risk Score
BNW6	Moderate	45.98% (Longham Lakes to Aquifer RWT)	45.07%
BNW7	N/A (SRO)	51.56% (Torr Reservoir)	35.48%
BNW8	N/A (SRO)	43.25% (Sweetening flow (7.5 Ml/d) River Stour Longham Lakes connection RWT)	42.25%
BNW17	N/A (SRO)	Cheddar 2 Reservoir (72.54%)	43.25%
COL2	Low	50.35% (River Camel to Restormel WTW pipeline RWT)	33.20%
COL6	Low	48.6% (River Hayle to new WTW pipeline RWT)	35.23%
COL9	High	58.98% (Sancreed Stream Discharge point to Drift RWT)	35.39%
COL19	High	53.60% (Cargenwen Stream (Botetoe Bridge) to Boswyn Reservoir pipeline RWT)	36.41%
COL20	Low	41.98% (River Fal to Grampound Road WTW RWT)	31.70%
dR2	Low	44.45% (Slade Reservoir to Horedown WTW RWT)	44.45%
dR3	Low	41.08% (Challacombe Reservoir to Horedown WTW RWT)	41.08%
dR4	Moderate	53.73% (River West Okemont at Vellake to Roadford Reservoir RWT)	53.73%
dR5	Low	32% (Lee Moor Quarries to Littlehempston WTW RWT)	32.58%
ROA2	Low	49.35% (Existing South Devon Spine Main to Littlehempston WTW RWT)	29.68%
ROA3	Low	52.10% (River Yealm to South Devon Spine Main pipeline RWT)	33.29%
ROA4	Low	46.58% (River Tamar to Mayflower WTW via existing pipeline RWT)	46.58%
ROA7	Low	56.50% (Roadford reservoir to Northcombe WTW RWT)	42.90%
ROA12	Low	47.58% (Slade Reservoir to Horedown WTW pipeline RWT)	32.41%
ROA14	High	69.29% (Avon Dam Reservoir)	69.29%
ROA15	Moderate	46.25% (River Lyd to Roadford Reservoir pipeline RWT)	46.25%

Option ID	Level 1 Risk Magnitude	Maximum component Risk Score	Overall Risk Score
ROA19	N/A (SRO)	72.54% (Cheddar 2 Reservoir)	43.25%
ROA21	Low	37.33% (Roborough Tank at Mayflower WTW to Littlehempston WTW RWT)	38.23%
WIM1	Low	42.45% (River Exe abstraction at Northbridge RWPS to Pynes WTW RWT)	42.45%
WIM11	Low	34.08% (Couchill Springs to Bovey Lane WTW RWT)	29.82%
WIM13	N/A (SRO)	72.54% (Cheddar 2 Reservoir)	43.25%
WIM18	N/A (SRO)	72.54% (Cheddar 2 Reservoir)	43.25%

4.1.2 Best Value Plan

Eight of the 13 options in the BVP were screened out of requiring a Level 2 assessment, having been assessed at Level 1 with a Risk Magnitude of None (one option) or Very Low (seven options). The five options which were progressed to Level 2 comprised two non-SRO options which had a Level 1 Risk Magnitude of Moderate and of Low, and three SRO options.

The five options included in the BVP which underwent Level 2 assessments were BNW6, BNW7 BNW8, ROA21 and WIM18. The option with the greatest Overall Risk Score risk was BNW6. However, WIM18 included the component with the highest Risk Score – the Cheddar 2 Reservoir asset with a score of 72.54%.

The in-combination effects assessment concluded there was potential for in-combination effects between the two options BNW6 and BNW7. Within the SAI-RAT, this option combination involved four asset components and six RWT components. The highest RWT score was associated with the River Avon to Torr Reservoir pipeline (46.00%), whilst the highest asset and highest component score was generated by the Torr Reservoir (51.56%). The Overall Risk Score for this option combination was 36.06%. Therefore, at the plan stage, in-combination effects that would increase the risk of INNS transfer are expected for the BVP presented in SWW's WRMP24.

Within the BVP, the medium and high adaptive pathways comprise the same options; therefore, the results

4.1.3 Least Cost Plan

Nine of the 13 options in the LCP were screened out of requiring a Level 2 assessment, having been assessed at Level 1 with a Risk Magnitude of None (one option) or Very Low (eight options). The three options which were progressed to Level 2 comprised two non-SRO options which both had a Level 1 Risk Magnitude of Low.

The four options which progressed to Level 2 in the LCP were the two non-SRO options ROA21 and WIM11 (which is only in the high adaptive pathway), and the SRO options BNW7 and BNW8. The option with the highest Overall Risk Score at Level 2 was BNW8; however, the option which had the highest Risk Score associated with a component of was BNW7.

The in-combination assessment concluded that there are no potential in-combination effects associated with the options in this plan, and therefore no difference between the medium and high adaptive pathways.

4.1.4 Ofwat Plan

As the Ofwat Plan and BVP comprise the same options, the results of all levels of assessment are the same between both plans. Therefore, the results of the BVP as summarised above (section 4.1.2) also applies to the Ofwat Plan, with no difference between the medium and high adaptive pathways.

4.2 Recommendations

It is recommended that the Level 2 INNS risk assessments are revised using the SAI-RAT for options which are taken forward, as more information becomes available.

Appropriate mitigation of INNS risk should be considered for all options which are progressed, with a greater emphasis on those options which have been progressed to Level 2 and which have generated a higher risk score. The SAI-RAT could be used to highlight those biosecurity and mitigation options of which there is the most confidence of effectiveness.

For options which are likely to be implemented, the INNS risks associated with the construction phase should also be considered and mitigated through best practice measures at an appropriate stage.

For options being implemented, it is recommended that further consideration is given on a case-by-case basis regarding the potential for cumulative effects of options being progressed, as more detailed option information becomes available. It is anticipated that regional plans will consider the potential for in-combination effects between regions.

The potential impacts of all options progressed to a Level 2 assessment should be evaluated as appropriate through a suitable INNS monitoring plan. This plan should consider current and future potential INNS distribution and management, considering the potential for climate change to affect species distribution and spread.

A. Appendix A: Assumed Values for SAI-RAT

With respect to staff visits and maintenance activities at assets, the SAI-RAT requires an estimate of frequency to be entered. The options are the same for each criterion, as follows:

- 0 – never
- 0.5 – rarely (once every 2 years)
- 1 – annually
- 1.5 – monthly
- 2 – weekly

It is likely that the frequency of such visits would vary according to asset type; therefore the 'assumed value' for each activity and asset type within the SAI-RAT is shown in Table A. 1 below.

Table A. 1: Assumed values for staff visit and maintenance activities at assets.

Asset type	Visit or maintenance activity	Assumed value (frequency)	Comment/rationale
Reservoir	Staff site visit (not entering water)	2 (weekly)	Assumes visit frequency should be at least weekly
	Staff site visit entering or in contact with raw water	2 (weekly)	Assumes visit frequency should be at least weekly
	Road vehicle site visit	2 (weekly)	Aligned with staff visits, assuming arrival is most likely to be by road vehicle
	Maintenance not entering water	1 (annually)	Assumes maintenance visits would be relatively infrequent
	Maintenance in water	1 (annually)	Assumes maintenance visits within water would be relatively infrequent
	Transfer of waste sludge to land	0 (never)	Sludge removal not associated with this asset type
Water treatment works	Staff site visit (not entering water)	2 (weekly)	Assumes visit frequency should be at least weekly
	Staff site visit entering or in contact with raw water	2 (weekly)	Assumes visit frequency should be at least weekly
	Road vehicle site visit	2 (weekly)	Aligned with staff visits, assuming arrival is most likely to be by road vehicle
	Maintenance not entering water	2 (weekly)	Assumes maintenance would need to be at least weekly
	Maintenance in water	2 (weekly)	Assumes maintenance would need to be at least weekly

Asset type	Visit or maintenance activity	Assumed value (frequency)	Comment/rationale
	Transfer of waste sludge to land	1 (annually)	Sludge removal occasionally likely to be needed
Sealed water tank	Staff site visit (not entering water)	1.5 (monthly)	Assumes visit frequency should be at least monthly
	Staff site visit entering or in contact with raw water	0 (never)	Sealed water tanks are likely to be used to store treated rather than raw water
	Road vehicle site visit	1.5 (monthly)	Aligned with staff visits, assuming arrival is most likely to be by road vehicle
	Maintenance not entering water	1.5 (monthly)	Assumes relatively frequent maintenance
	Maintenance in water	0 (never)	Maintenance should not involve contact with treated water
	Transfer of waste sludge to land	0 (never)	Asset type should not generate sludge
Wastewater treatment site	Staff site visit (not entering water)	2 (weekly)	Assumes visit frequency should be at least weekly
	Staff site visit entering or in contact with raw water	2 (weekly)	Assumes visit frequency should be at least weekly
	Road vehicle site visit	2 (weekly)	Aligned with staff visits, assuming arrival is most likely to be by road vehicle
	Maintenance not entering water frequency	2 (weekly)	Assumes maintenance would need to be at least weekly
	Maintenance in water frequency	2 (weekly)	Assumes maintenance would need to be at least weekly
	Transfer of waste sludge to land frequency	0.5 (rarely)	Sludge removal occasionally likely to be needed
Sewerage treatment works	Staff site visit (not entering water) frequency	2 (weekly)	Assumes visit frequency should be at least weekly
	Staff site visit entering or in contact with raw water frequency	2 (weekly)	Assumes visit frequency should be at least weekly
	Road vehicle site visit frequency	2 (weekly)	Aligned with staff visits, assuming arrival is most likely to be by road vehicle
	Maintenance not entering water frequency	2 (weekly)	Assumes maintenance would need to be at least weekly
	Maintenance in water frequency	2 (weekly)	Assumes maintenance would need to be at least weekly
	Transfer of waste sludge to land frequency	0.5 (rarely)	Sludge removal occasionally likely to be needed

Source: Mott MacDonald, 2023.

Assets also require assessment for recreational use within the SAI-RAT. In practice, four of the five asset types included (water treatment works, sealed water tank, wastewater treatment site, sewerage treatment works) are unlikely to be accessible for recreational use or by wildlife. Therefore, these asset types should be assigned a value of 0 ('never') for all recreational activities.

Reservoirs are frequently host to recreational activities and accessible by wildlife, though the extent of this is likely to be variable. In the potential absence of available information, the assumed values for activities relating to recreation or wildlife are shown in Table A. 2 below.

Table A. 2: Assumed values for recreational activities at assets.

Asset	Asset recreational or associated activity	Assumed value (frequency)	Comment/rationale
Reservoir	Angling equipment	2 (weekly)	Angling is a relatively common activity at reservoirs. If permitted at a reservoir, likely to occur frequently
	Live bait	0 (never)	Live bait is not typically allowed at reservoirs
	Fish stocking	1 (annually)	Considered a typical stocking frequency
	Large vessels (over 28ft)	0.5 (rarely)	Vessels of this generous size are rarely likely to be brought onto a reservoir
	Small vessels (under 28ft)	2 (weekly)	Boating is a relatively common activity at reservoirs. If permitted at a reservoir, likely to occur frequently
	Water sports equipment (Stand-up paddleboards, canoe, kayaks)	2 (weekly)	Boating is a relatively common activity at reservoirs. If permitted at a reservoir, likely to occur frequently
	Water safety equipment (temporary moorings, jetties, inflatables, buoys)	0.5 (rarely)	It is considered that such equipment is rarely brought to a reservoir
	Mammals/waterfowl on-site	2 (weekly)	If a reservoir is accessible to mammals and waterfowl, they are likely to access the asset frequently
	Recreational walker/jogger/runner	2 (weekly)	Relatively common activities at reservoirs. If reservoir is accessible for this purpose, likely to occur frequently
Water treatment works Sealed water tank Wastewater Treatment site Sewerage Treatment works	Angling equipment	0 (never)	Angling not expected at these asset types
	Live bait	0 (never)	Angling not expected at these asset types
	Fish stocking	0 (never)	Angling not expected at these asset types
	Large vessels (over 28ft)	0 (never)	Boating not expected at these asset types
	Small vessels (under 28ft)	0 (never)	Boating not expected at these asset types
	Water sports equipment (SUPs, Canoe, Kayaks)	0 (never)	Water sports not expected at these asset types

Asset	Asset recreational or associated activity	Assumed value (frequency)	Comment/rationale
	Water safety equipment (temporary moorings, jetties, inflatables, buoys)	0 (never)	Associated activities not expected at these asset types
	Mammals/waterfowl on-site	0 (never)	Mammals/waterfowl unlikely to access these asset types
	Recreational walker/jogger/runner	0 (never)	Walking/jogging/running not expected at these asset types

Source: Mott MacDonald, 2023.

B. Appendix B: SAI-RAT input values for non-SRO options

B.1 BNW6

Option description: This scheme assumes the development of an aquifer storage and recovery operation that will deliver a deployable output of approximately 10Ml/d.

Abstraction will occur for three months at a rate of 10Ml/d, followed by a recharge phase injecting approximately 1,500Ml/d, infiltration of a pre-treated blend of water from the Stour and Avon rivers would take place up to 9 months per year. This would be at a rate of up to 5,000m^3 per day (208 m3 per hour) - totalling 1,458,000m^3 over the 9 months. Achievable infiltration rate per well would be 75 m^3 per hour. During the abstraction phase, stored water would be recovered during 3 months per year at a rate of 10,000m^3 per day (417 m3 per hour) - totalling 900,000m^3 over the 3 months. The achievable abstraction rate per well would be 150m^3 per hour. The abstraction rate is likely to require at least three wells to achieve 10Ml/d, particularly if the wells are near one another. Borehole location will need careful consideration at an early stage in the investigation.

For option BNW6, three RWT components were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.1

Table B.1: BNW6 RWT SAI-RAT input data.

SAI-RAT criterion	Stour to Longham Lakes	Avon to Aquifer	Longham Lakes to Aquifer	Assumptions/ comments
Source Name	River Stour	River Avon	Longham Lakes	N/A
Source Management Catchment	Dorset Management Catchment	Avon Hampshire Management Catchment	Dorset Management Catchment	N/A
Source Operational Catchment	Stour Dorset Operational Catchment	Avon Hampshire Operational Catchment	Stour Dorset Operational Catchment	N/A
Source Waterbody ID	GB108043011040	GB108043015842	GB108043011040	N/A
Source Type	River	River	Offline waterbody	N/A
Number of RWT inputs into source	Unknown	Unknown	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	Pipeline	Pipeline	N/A
Receptor Name	Longham Lakes	Aquifer	Aquifer	N/A
Receptor Management Catchment	Dorset Management Catchment	South West GW Management Catchment	South West GW Management Catchment	N/A
Receptor Operational Catchment	Stour Dorset Operational Catchment	Stour Lower Dorset and Avon Lower Hampshire Operational Catchment	Stour Lower Dorset and Avon Lower Hampshire Operational Catchment	N/A
Receptor Waterbody	GB108043011040	GB40802G805800	GB40802G805800	N/A
Receptor Type	Offline waterbody	Ground water	Ground water	N/A

SAI-RAT criterion	Stour to Longham Lakes	Avon to Aquifer	Longham Lakes to Aquifer	Assumptions/ comments
Isolated Receptor Catchment	No	No	No	N/A
Volume of Water (Ml/day)	51-100 Ml/d	51-100 Ml/d	51-100 Ml/d	N/A
Frequency of Operation	Year round - intermittent	Year round - intermittent	Year round - intermittent	N/A
Transfer Distance (km)	<1	5.1-10	<1	N/A
Washout/maintenance points outside of catchments	Unknown	Unknown	Unknown	Input value not known at time of assessment
Details of washout/maintenance points	N/A	N/A	N/A	Input value not known at time of assessment
Source Navigable	Yes	Unknown**	No	*Information taken from River Stour Trust[14] **Unclear if River Avon is navigable at this location
Pathway Navigable	No	No	No	N/A
Angling at Source	Members only, no matches*	Members and day ticket holders, national events**	Members only, no matches***	*Assumed most likely value[15] **Assumed worst case scenario [16] ***Assumed most likely scenario[17]
Angling on Pathway	No	No	No	Input value not known at time of assessment
Water sports at Source	Casual use by individuals/clubs	Unknown	Unknown	Dorset Stour has evidence of casual

[14] River Stour Trust, n.d. Paddling the River Stour. Available at: < https://www.riverstourtrust.org/boat-trips/paddling-the-river-stour/> [Date accessed: 28/10/2022]

[15] Live4Fishing, 2022. *River Stour Longham.* [online] Available at:<https://www.live4fishing.com/river-stour-longham-2/>. [Accessed 28/10/2022].

[16] R&DAA, n.d. *Welcome to Ringwood & District Anglers Association*. [online]. Available at <https://www.ringwoodfishing.co.uk/about-us.html>. [Accessed 28/10/2022].

[17] SW Lakes, n.d. *Coarse Fishing*. [online]. Available at: <https://www.swlakestrust.org.uk/longham-lake>. [Accessed 28/10/2022].

SAI-RAT criterion	Stour to Longham Lakes	Avon to Aquifer	Longham Lakes to Aquifer	Assumptions/ comments
				use[18], other input values not known at time of assessment
Water sports on Pathway	No	No	No	N/A
Presence of high priority INNS Source	Known to be present	Not recorded	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	Not recorded	Known to be present	N/A
Details of INNS present	*Himalayan balsam*	Not recorded	Himalayan balsam	N/A
Highest order site designation Receptor	Local	Local	Local	N/A
Presence of priority habitat pathway	Not known to be present	Not known to be present	Not known to be present	N/A
Presence of priority habitat receptor	Known to be present	Known to be present	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)Priority Habitat Inventory - Deciduous Woodland	Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)Priority Habitat Inventory - Deciduous Woodland	Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)Priority Habitat Inventory - Deciduous Woodland	N/A
Other existing connections between source and receptor	Unknown	Unknown	Unknown	N/A
Details of other existing connections	N/A	N/A	N/A	N/A

Source: Mott MacDonald, 2023.

B.2 COL2

Option description: This option is to take water (up to 90Ml/d in periods of high flows) from the Lower River Camel via a new raw-water intake structure comprised of a weir, fish passing point, eel screen, raw water pumping stations, and a new pump pipeline discharging into a gravity pipeline connected to Restormel WTW. The new location for abstracting raw water will protect the impounded water at Colliford Reservoir during a period of drought and protect the St Neot stream from the negative effects of water release from the reservoir. This scheme shares a significant interface with the planned reversal of flow in the Restormel WTW to Colliford Impounding Reservoir raw-water pipeline scheme. As part of the combined scheme, 2no. 1-

[18] SVCC, 2022. *Stour Valley Canoe Club*. [online]. Available at: <https://stourvalleycanoe.club/>. [Accessed 28/10/22].

megawatt turbines are proposed to recover energy from the pipeline at Restormel water treatment works (Colliford pipeline WINEP24 (AMP8)

For option COL2 one RWPS asset and one RWT were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.2 and Table B.3.

Table B.2: COL2 RWT SAI-RAT input data.

SAI-RAT criterion	COL2 RWT River Camel to Restormel WTW pipeline	Assumptions/comments
Source Name	River Camel	N/A
Source Management Catchment	North Cornwall Seaton Looe and Fowey Management Catchment	N/A
Source Operational Catchment	Camel Operational Catchment	N/A
Source Waterbody ID	GB108049000190	N/A
Source Type	River	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	N/A
Receptor Name	Restormel WTW	N/A
Receptor Management Catchment	North Cornwall Seaton Looe and Fowey Management Catchment	N/A
Receptor Operational Catchment	Fowey Operational Catchment	N/A
Receptor Waterbody ID	GB108048001420	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	No	N/A
Volume of Water (Ml/day)	51-100 Ml/d	N/A
Frequency of Operation	Year round - intermittent	Winter months only
Transfer Distance (km)	5.1-10	N/A
Washout/maintenance points outside of catchments	Unknown	Input value not known at time of assessment
Details of washout/maintenance points	N/A	N/A
Source Navigable	Unknown	Input value not known at time of assessment
Pathway Navigable	No	N/A
Angling at Source	Unknown	Input value not known at time of assessment
Angling on Pathway	No	N/A
Water sports at Source	Unknown	Input value not known at time of assessment
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	N/A
Details of INNS present	*Himalayan balsam, Japanese knotweed.*	N/A
Highest order site designation Receptor	International	N/A

SAI-RAT criterion	COL2 RWT River Camel to Restormel WTW pipeline	Assumptions/comments
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Deciduous Woodland (England) Priority Habitat Inventory - Traditional Orchards (England)Priority Habitat Inventory - Lowland Heathland (England)Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)River Camel Valley and Tributaries SSSI River Camel SAC Bodmin Beacon LNR	N/A
Other existing connections between source and receptor	None	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

Table B.3: COL2 asset SAI-RAT input data.

SAI-RAT criterion	COL2 Nanstallon RWPS	Assumptions/comments
Asset Type	Pumping station	N/A
Asset Size (m^2)	Unknown	Input value not known at time of assessment
Asset Location	Nanstallon	N/A
Existing high impact INNS records on site/area of proposed site	Not recorded	N/A
Details of high impact INNS present	N/A	N/A
Existing Priority Habitats on Site	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Deciduous Woodland (England) Priority Habitat Inventory - Traditional Orchards (England)River Camel Valley and Tributaries SSSI River Camel SAC	N/A
Highest order site designation of asset	International	N/A
Staff site visit (not entering water) frequency	1.5	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	Assumed value
Road Vehicle site visit frequency	1.5	Assumed value
Maintenance not entering water frequency	1.5	Assumed value
Maintenance in contact with raw water frequency	0.5	Assumed value
Angling equipment frequency	0	Assumed value

SAI-RAT criterion	COL2 Nanstallon RWPS	Assumptions/comments
Live bait frequency	0	Assumed value
Fish stocking frequency	0	Assumed value
Large vessels (over 28ft) frequency	0	Assumed value
Small vessel (under 28ft) frequency	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	Assumed value
Mammals/waterfowl on site frequency	0	Assumed value
Transfer of waste sludge to land frequency	0	Assumed value
Recreational walker/jogger/runner frequency	0	Assumed value

Source: Mott MacDonald, 2023.

B.3 COL6

Option description: This option is to take up to 2 Ml/d of water from the River Hayle at St. Erth via an existing raw water intake structure and transfer it by a new pumping station to a new 2 Ml/d package plant water treatment works (WTW).It includes reusing the existing raw water main by locating the WTW adjacent to the site of the historic water treatment works or at a new site within the St. Erth wastewater treatment site (WWTW) where the existing raw water main would need to be extended by 325m.The option would also reuse the existing water intake structure, located just above the normal tidal limit (NTL). The intake structure would have to be made compliant with the Eels (England and Wales) Regulations 2009. Treated water would then be injected into the Cornwall Spine Main.

For option COL6 one RWT and two assets were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.4 and Table B.5.

Table B.4: COL6 asset SAI-RAT input data.

SAI-RAT criterion	COL6 River Hayle RWPS and intake	COL6 new WTW	Assumptions/comments
Asset Type	Raw Water Pumping Station	Water Treatment Works	N/A
Asset Location	Tredrea Lane	St Erth Waste Water Treatment Works	N/A
Asset Size (m^2)	Unknown*	1856	*Input value not known at time of assessment
Existing high impact INNS records on site/area of proposed site	Not recorded	Not recorded	N/A
Details of high impact INNS present	N/A	N/A	N/A
Existing Priority Habitats on Site	Known to be present	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat	N/A

SAI-RAT criterion	COL6 River Hayle RWPS and intake	COL6 new WTW	Assumptions/comments
	Inventory - Traditional Orchards (England) St. Erth Sand Pits SSSI	Inventory - Traditional Orchards (England)Priority Habitat Inventory - Coastal Saltmarsh (England) Priority Habitat Inventory - Mudflats (England) Hayle Estuary & Carrack Gladden SSSI, St Erth Sand Pits SSSI	
Highest order site designation of asset	National	National	N/A
Staff site visit (not entering water) frequency	1.5	2	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	2	Assumed value
Road Vehicle site visit frequency	1.5	2	Assumed value
Maintenance not entering water frequency	1.5	2	Assumed value
Maintenance in contact with raw water frequency	0.5	2	Assumed value
Angling equipment frequency	0	0	Assumed value
Live bait frequency	0	0	Assumed value
Fish stocking frequency	0	0	Assumed value
Large vessels (over 28ft) frequency	0	0	Assumed value
Small vessel (under 28ft) frequency	0	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	0	Assumed value
Mammals/waterfowl on site frequency	0	0	Assumed value
Transfer of waste sludge to land frequency	0	0.5	Assumed value
Recreational walker/jogger/runner frequency	0	0	Assumed value

Source: Mott MacDonald, 2023.

Table B.5: COL6 RWT SAI-RAT input data.

SAI-RAT criterion	COL6 River Hayle intake to new WTW via RWPS	Assumptions/comments
Source Name	River Hayle	N/A
Source Management Catchment	Cornwall West and the Fal Management Catchment	N/A
Source Operational Catchment	Hayle Red River and Northern Streams Operational Catchment	N/A
Source Waterbody ID	GB108049000380	N/A
Source Type	River	N/A
Number of RWT inputs into source	Unknown	N/A
Pathway Type	Pipeline	N/A
Receptor Name	St Erth Water Treatment Works	N/A
Receptor Management Catchment	Cornwall West and the Fal Management Catchment	N/A
Receptor Operational Catchment	Hayle Red River and Northern Streams Operational Catchment	N/A
Receptor Waterbody	N/A	No waterbody ID at receptor.
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Year round - continuous, full flow	It is assumed the option will be utilised continuously.
Transfer Distance (km)	<1	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	Unknown	Input value not known at time of assessment
Pathway Navigable	No	N/A
Angling at Source	Unknown	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Not recorded	N/A
Presence of high priority INNS Pathway	Not recorded	N/A
Details of INNS present	*N/A*	N/A
Highest order site designation Receptor	National	N/A
Presence of priority habitat pathway	Known to be present	N/A

SAI-RAT criterion	COL6 River Hayle intake to new WTW via RWPS	Assumptions/comments
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Traditional Orchards (England)Priority Habitat Inventory - Coastal Saltmarsh (England) Priority Habitat Inventory - Mudflats (England)St. Erth Sand Pits SSSI, Hayle Estuary & Carrack Gladden SSSI	N/A
Other existing connections between source and receptor	None	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.4 COL9

Option description: This option will abstract 5.46 Ml/D from the pontoon arrangement on Leswidden pool to a Braithewaite-type tank located on the shore of Leswidden pool via new raw water pumps and flexi-rising main. The raw water will then be pump from the Braithwaite-type tank to Sancreed Stream that drains into Drift reservoir for treatment, via a new 1.5km pipeline

For option COL9, one asset and two RWTs were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.6 and Table B.7.

Table B.6: COL9 assets SAI-RAT input data.

SAI-RAT criterion	COL9 Balleswidden Pool Pumping station	Assumptions/comments
Asset Type	Pumping Station	N/A
Asset Size (m^2)	9	N/A
Asset Location	Balleswidden Pool	N/A
Existing high impact INNS records on site/area of proposed site	Not recorded	N/A
Details of high impact INNS present	N/A	N/A
Existing Priority Habitats on Site	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England) Priority Habitat Inventory - Lowland Heathland (England)Priority Habitat Inventory - Deciduous Woodland (England) Penwith Moors SSSI Lower Bostraze and Leswidden SSSI Lower Bostraze and Leswidden SAC	N/A
Highest order site designation of asset	International	N/A
Staff site visit (not entering water) frequency	1.5	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	Assumed value
Road Vehicle site visit frequency	1.5	Assumed value

SAI-RAT criterion	COL9 Balleswidden Pool Pumping station	Assumptions/comments
Maintenance not entering water frequency	1.5	Assumed value
Maintenance in contact with raw water frequency	0.5	Assumed value
Angling equipment frequency	0	Assumed value
Live bait frequency	0	Assumed value
Fish stocking frequency	0	Assumed value
Large vessels (over 28ft) frequency	0	Assumed value
Small vessel (under 28ft) frequency	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	Assumed value
Mammals/waterfowl on site frequency	0	Assumed value
Transfer of waste sludge to land frequency	0	Assumed value
Recreational walker/jogger/runner frequency	0	Assumed value

Table B.7: COL9 RWT SAI-RAT input data.

SAI-RAT criterion	Balleswidden Pool to Discharge point	Sancreed Stream Discharge point to Drift	Assumptions/ comments
Source Name	Balleswidden Pool	Sancreed Stream	N/A
Source Management Catchment	Cornwall West and the Fal Management Catchment	Cornwall West and the Fal Management Catchment	N/A
Source Operational Catchment	Penwith Peninsula Operational Catchment	Penwith Peninsula Operational Catchment	N/A
Source Waterbody ID	N/A*	GB108048002090	*No waterbody ID at source
Source Type	Offline waterbody	River	N/A
Number of RWT inputs into source	Unknown	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	River	N/A
Receptor Name	Sancreed Stream	Drift Reservoir	N/A
Receptor Management Catchment	Cornwall West and the Fal Management Catchment	Cornwall West and the Fal Management Catchment	N/A
Receptor Operational Catchment	Penwith Peninsula Operational Catchment	Penwith Peninsula Operational Catchment	N/A
Receptor Waterbody ID	GB108048002090	GB30846547	N/A
Receptor Type	River	Online waterbody	N/A
Isolated Receptor Catchment	Yes	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	0-5 Ml/d	N/A

SAI-RAT criterion	Balleswidden Pool to Discharge point	Sancreed Stream Discharge point to Drift	Assumptions/ comments
Frequency of Operation	Year round - continuous, full flow	Year round - continuous, full flow	Input value not known at time of assessment
Transfer Distance (km)	1.1-5	1.1-5	N/A
Washout/maintenance points outside of catchments	Unknown	Unknown	Input value not known at time of assessment
Details of washout/maintenance points	N/A	N/A	N/A
Source Navigable	No	No	N/A
Pathway Navigable	No	No	N/A
Angling at Source	No	No	No evidence of fishing clubs operating in waterbody
Angling on Pathway	No	No*	*No evidence of fishing clubs operating in waterbody
Water sports at Source	No	No	No evidence of water sports clubs operating in waterbody
Water sports on Pathway	No	No*	*No evidence of water sports clubs operating in waterbody
Presence of high priority INNS Source	Not recorded	Known to be present	N/A
Presence of high priority INNS Pathway	Not recorded	Known to be present	N/A
Details of INNS present	N/A	Himalayan balsam, Japanese knotweed, New Zealand pygmyweed and Canadian waterweed	N/A
Highest order site designation Receptor	International	National	N/A
Presence of priority habitat pathway	Known to be present	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England) Priority Habitat Inventory - Lowland Heathland (England)Priority Habitat Inventory - Deciduous Woodland (England) Penwith Moors SSSI, Lower Bostraze and Leswidden SSSI, Lower Bostraze and Leswidden SAC	Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England) Habitat Inventory - Deciduous Woodland (England) Penwith Moors SSSI	N/A
Other existing connections between source and receptor	None	None	N/A
Details of other existing connections	N/A	River discharges to reservoir.	N/A

Source: Mott MacDonald, 2023.

B.5 COL19

Option Description: This option involves the following, a new pumped abstraction at the Carwynnen Stream transferring raw water to Boswyn Reservoir via a new 2.4km pipeline, a pumped abstraction at Cargenwen Reservoir transferring water to Boswyn Reservoir via a new 1.7km pipeline, a new 5.1Ml/d capacity water treatment works at Boswyn Reservoir, and a treated water pumping station and a new 3.9km pipeline to Trevu service reservoir. In 2022 we gave up our existing abstraction licence for this location. Further environmental work is required to confirm the sustainable operating parameters for this scheme and a new licence will need to be granted.

For option COL19 one WTW asset, two RWPS assets and one reservoir asset were assessed for the Level 2 INNS assessment. Four RWT components were also assessed. The SAI-RAT input values are outlined below in Table B.8 and Table B.9.

Table B.8: COL19 asset SAI-RAT input data.

SAI-RAT criterion	Carwynnen Stream Botetoe Bridge	Boswyn Reservoir Water Treatment Works	Cargenwen Reservoir Pumping Station	Assumptions /comments
Asset Type	Pumping Station	Water Treatment Works	Pumping Station	N/A
Asset Location	Botetoe Bridge	Boswyn Reservoir	Cargenwen Reservoir	N/A
Asset Size (m^2)	Unknown*	2250	Unknown*	*Input value not known at time of assessment.
Existing high impact INNS records on site/area of proposed site	Known to be present	Known to be present	Not recorded	N/A
Details of high impact INNS present	Himalayan balsam	Japanese Knotweed	N/A*	*No EA records of INNS
Existing Priority Habitats on Site	Known to be present	Known to be present	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Lowland Heathland (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)	N/A
Highest order site designation of asset	None	None	None	N/A
Staff site visit (not entering water) frequency	1.5	2	1.5	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	2	0.5	Assumed value
Road Vehicle site visit frequency	1.5	2	1.5	Assumed value

SAI-RAT criterion	Carwynnen Stream Botetoe Bridge	Boswyn Reservoir Water Treatment Works	Cargenwen Reservoir Pumping Station	Assumptions /comments
Maintenance not entering water frequency	1.5	2	1.5	Assumed value
Maintenance in water frequency	0.5	2	0.5	
Angling equipment frequency	0	0	0	Assumed value
Live bait frequency	0	0	0	Assumed value
Fish stocking frequency	0	0	0	Assumed value
Large vessels (over 28ft) frequency	0	0	0	Assumed value
Small vessel (under 28ft) frequency	0	0	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	0	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	0	0	Assumed value
Mammals/waterfowl o sit frequency	0	0	0	Assumed value
Transfer of waste sludge to land frequency	0	1	0	Assumed value
Recreational walker/jogger/runner frequency	0	0	0	Assumed value

Source: Mott MacDonald, 2023.

Table B.9: COL19 RWT SAI-RAT input data.

SAI-RAT Criterion	Cargenwen Reservoir to Boswyn Reservoir	Cargenwen Stream (Botetoe Bridge) to Boswyn Reservoir	Boswyn Stream to Boswyn Reservoir	Assumptions/ comments
Source Name	Cargenwen Reservoir	Carwynnen Stream	Boswyn Stream	N/A
Source Management Catchment	Cornwall West and the Fal	Cornwall West and the Fal	Cornwall West and the Fal	N/A
Source Operational Catchment	Hayle Red River and Northern Streams	Hayle Red River and Northern Streams	Hayle Red River and Northern Streams	N/A
Source Waterbody ID	GB30846509	GB108049000560	GB108049000560	N/A
Source Type	Offline waterbody	River	River	N/A
Number of RWT inputs into source	Unknown	Unknown	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	Pipeline	Pipeline	N/A

SAI-RAT Criterion	Cargenwen Reservoir to Boswyn Reservoir	Cargenwen Stream (Botetoe Bridge) to Boswyn Reservoir	Boswyn Stream to Boswyn Reservoir	Assumptions/ comments
Receptor Name	Boswyn Reservoir and WTW	Boswyn Reservoir and WTW	Boswyn Reservoir and WTW	N/A
Receptor Management Catchment	Cornwall West and the Fal	Cornwall West and the Fal	Cornwall West and the Fal	N/A
Receptor Operational Catchment	Hayle Red River and Northern Streams	Hayle Red River and Northern Streams	Hayle Red River and Northern Streams	N/A
Receptor Waterbody	GB108049000560	GB108049000560	GB108049000560	N/A
Receptor Type	Offline waterbody	Offline waterbody	Offline waterbody	N/A
Isolated Receptor Catchment	Yes	Yes	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	0-5 Ml/d	0-5 Ml/d	N/A
Frequency of Operation	Year round - continuous, full flow	Year round - continuous, full flow	Year round - continuous, full flow	N/A
Transfer Distance (km)	1.1-5	1.1-5	<1	N/A
Washout/maintenance points outside of catchments	Unknown	Unknown	Unknown	N/A
Details of washout/maintenance points	N/A	N/A	N/A	N/A
Source Navigable	Unknown	Unknown	Unknown	N/A
Pathway Navigable	No	No	No	N/A
Angling at Source	Unknown	Unknown	Unknown	N/A
Angling on Pathway	No	No	No	N/A
Water sports at Source	Unknown	Unknown	Unknown	N/A
Water sports on Pathway	No	No	No	N/A
Presence of high priority INNS Source	Not recorded	Known to be present	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	Known to be present	Known to be present	N/A
Details of INNS present	*Japanese Knotweed*	Japanese Knotweed, Himalayan balsam	Japanese Knotweed	N/A
Highest order site designation Receptor	None	None	None	N/A
Presence of priority habitat pathway	Known to be present	Known to be present	Known to be present	N/A

SAI-RAT Criterion	Cargenwen Reservoir to Boswyn Reservoir	Cargenwen Stream (Botetoe Bridge) to Boswyn Reservoir	Boswyn Stream to Boswyn Reservoir	Assumptions/ comments
Presence of priority habitat receptor	Known to be present	Known to be present	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Lowland Heathland (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)	N/A
Other existing connections between source and receptor	None	None	None	N/A
Details of other existing connections	N/A	N/A	N/A	N/A

Source: Mott MacDonald, 2023.

B.6 COL20

Option description: To abstract raw water (25Ml/D) from the River Fal at Grampound and transfer via a new raw water screened intake structure and pumping station to a new 25Ml/d water treatment works (WTW) at Grampound Road. The raw water abstraction would have to be made compliant with The Eels (England and Wales) Regulations 2009 with the addition of 1mm to 2mm size eel screens and of a suitable area to control intake velocity to 0.1-0.2 m/s. Treated flows are to be distributed both locally by transfer into 2 Nr. Local distribution service reservoirs (DSR) north and south of the proposed WTW site and by Injection into the treated water Cornwall Spine Main via a new 500mm diameter trunk main.

For Option COL20 two asset and one RWT components were assessed for the Level 2 INNS. The SAI-RAT input values are outlined below in Table B.10 and Table B.11 below.

Table B.10: COL20 RWT SAI-RAT input data.

SAI-RAT criterion	COL20 Fiver Fal to Grampound WTW	Assumptions/comments
Source Name	Fal River	N/A
Source Management Catchment	Cornwall West and the Fal Management Catchment	N/A
Source Operational Catchment	Fal Operational Catchment	N/A
Source Waterbody ID	GB108048001270	N/A
Source Type	River	N/A
Number of RWT inputs into source	Unknown	N/A
Pathway Type	Pipeline	N/A
Receptor Name	Grampound Road WTW	N/A
Receptor Management Catchment	Cornwall West and the Fal Management Catchment	N/A
Receptor Operational Catchment	Fal Operational Catchment	N/A

SAI-RAT criterion	COL20 Fiver Fal to Grampound WTW	Assumptions/comments
Receptor Waterbody ID	GB108048001270	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	6-50 Ml/d	N/A
Frequency of Operation	Unknown	N/A
Transfer Distance (km)	1.1-5km	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	Unknown	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	N/A
Details of INNS present	Japanese knotweed, Himalayan balsam	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Deciduous Woodland (England), Priority Habitat Inventory - Traditional Orchards (England)	N/A
Other existing connections between source and receptor	None	N/A
Details of other existing connections	N/A	N/A

Table B.11: COL20 asset SAI-RAT input data.

SAI-RAT criterion	COL20 Grampound Road WTW	COL20 RWPS	Assumptions/comments
Asset Type	WTW	RWPS	N/A
Asset Location	Grampound Road	River Fal	N/A
Asset Size (m^2)	30,000	Unknown	N/A
Existing high impact INNS records on site/area of proposed site	Not recorded	Known to be present	N/A
Details of high impact INNS present	N/A	Japanese knotweed, Himalayan balsam	N/A
Existing Priority Habitats on Site	Known to be present	Known to be present	N/A

SAI-RAT criterion	COL20 Grampound Road WTW	COL20 RWPS	Assumptions/comments
Details of existing priority habitats present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Traditional Orchards (England)	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Traditional Orchards (England)	N/A
Highest order site designation of asset	None	None	N/A
Staff site visit (not entering water) frequency	2	1.5	Assumed values
Staff site visit entering or in contact with raw water frequency	2	0.5	Assumed value
Road Vehicle site visit frequency	2	1.5	Assumed value
Maintenance not entering water frequency	2	1.5	Assumed value
Maintenance in water frequency	2	0.5	
Angling equipment frequency	0	0	Assumed value
Live bait frequency	0	0	Assumed value
Fish stocking frequency	0	0	Assumed value
Large vessels (over 28ft) frequency	0	0	Assumed value
Small vessel (under 28ft) frequency	0	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	0	Assumed value
Mammals/waterfowl o sit frequency	0	0	Mammals/waterfowl unlikely to access these asset types
Transfer of waste sludge to land frequency	1	0	Assumed value
Recreational walker/jogger/runner frequency	0	0	Assumed value

B.7 dR2

Option description: The scheme entails re-introducing a disused, licensed raw water source at Slade reservoir, installing pumps to abstract the water (during drought conditions) and transferring the abstracted water to Horedown WTW via an existing pipeline. This is subject to an approved drought permit from the EA because the source has been disused for a long period of time.

For option dR2 one RWT component was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.12.

Table B.12: dR2 RWT SAI-RAT input data.

SAI-RAT criterion	dR2 Slade Reservoir to Horedown WTW	Assumptions/comments
Source Name	Slade Reservoir	N/A
Source Management Catchment	North Devon Management Catchment	N/A
Source Operational Catchment	Taw and North Devon Streams Operational Catchment	N/A
Source Waterbody ID	GB30843764	N/A
Source Type	Online waterbody	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	N/A
Receptor Name	Horedown WTW	N/A
Receptor Management Catchment	North Devon Management Catchment	N/A
Receptor Operational Catchment	Taw and North Devon Streams Operational Catchment	N/A
Receptor Waterbody	N/A	N/A
Receptor Type	Water treatment Works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Unknown	Assumption
Transfer Distance (km)	1.1-5	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	Members only, no matches	N/A
Angling on Pathway	No	N/A
Water sports at Source	Unknown	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	Pipeline route assumed to be straight line between source and receptor.
Details of INNS present	Reynoutria japonica, Lagarosiphon major	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A

SAI-RAT criterion	dR2 Slade Reservoir to Horedown WTW	Assumptions/comments
Details of priority habitat present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Traditional Orchards (England)	N/A
Other existing connections between source and receptor	None	N/A
Details of other existing connections	None	N/A

Source: Mott MacDonald, 2023.

B.8 dR3

Option description: The scheme entails re-introducing a disused, previously licensed raw water source, and transferring the abstracted water, under drought conditions, to Horedown WTW via an existing raw water pipeline. This is subject to an approved drought permit from the EA.

For option dR3 one RWT component was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.13.

Table B.13: dR3 RWT SAI-RAT input data.

SAI-RAT criterion	dR3 Challacombe Reservoir to Horedown WTW	Assumptions/comments
Source Name	Bray/ Challacombe Reservoir	N/A
Source Management Catchment	North Devon Management Catchment	N/A
Source Operational Catchment	Taw and North Devon Streams Operational Catchment	N/A
Source Waterbody ID	GB108050019950	N/A
Source Type	Online waterbody	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	N/A
Receptor Name	Horedown WTW	N/A
Receptor Management Catchment	North Devon Management Catchment	N/A
Receptor Operational Catchment	Taw and North Devon Streams Operational Catchment	N/A
Receptor Waterbody	N/A	N/A
Receptor Type	Water Treatment Works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Unknown	Assumption
Transfer Distance (km)	15.1-20	N/A

SAI-RAT criterion	dR3 Challacombe Reservoir to Horedown WTW	Assumptions/comments
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	Members only, no matches	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	Pipeline route assumed to be straight line between source and receptor.
Details of INNS present	Reynoutria japonica, Impatiens glandulifera	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Upland Heathland (England) Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)	N/A
Other existing connections between source and receptor	None	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.9 dR4

Option description: The scheme entails abstracting from an existing river intake on the river West Okemont at Vellake and laying a new pipeline to transfer the abstracted raw water from

Vellake to Roadford Reservoir during drought conditions. This is subject to an approved drought permit from the EA.

For option dR4 one RWT component was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.14.

Table B.14: dR4 RWT SAI-RAT input data.

SAI-RAT criterion	dR4 River West Okemont at Vellake to Roadford Reservoir	Assumptions/comments
Source Name	River West Okemont at Vellake	N/A
Source Management Catchment	North Devon	N/A
Source Operational Catchment	Torridge	N/A
Source Waterbody ID	GB108050008080	N/A
Source Type	River	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	N/A
Receptor Name	Roadford Reservoir	N/A
Receptor Management Catchment	Tamar	N/A
Receptor Operational Catchment	Thrushel Wolf and Lyd	N/A
Receptor Waterbody	GB30847000	N/A
Receptor Type	Online waterbody	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Occasional i.e. infrequent, regulatory compliance	Assumption
Transfer Distance (km)	10.1-15	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	Unknown	N/A
Source Navigable	Unknown	N/A
Pathway Navigable	No	N/A
Angling at Source	Unknown	N/A
Angling on Pathway	No	N/A
Water sports at Source	Unknown	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Not surveyed - unknown	Pipeline route assumed to be straight line between source and receptor. Transfer pathway too long to assess INNS records.

SAI-RAT criterion	dR4 River West Okemont at Vellake to Roadford Reservoir	Assumptions/comments
Details of INNS present	No high priority species identified	N/A
Highest order site designation Receptor	Local	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Receptor: Lowland meadows, purple moor grass and rush pasture, ancient woodland, deciduous woodland, traditional orchards, no main habitat but additional habitat exists. Pathway: Purple moor grass and rush pasture, lowland heathland, ancient woodland, deciduous woodland, no main habitat but additional habitat exists	N/A
Other existing connections between source and receptor	Unknown	N/A
Details of other existing connections	Unknown, new pipeline to be laid.	N/A

Source: Mott MacDonald, 2023.

B.10 dR5

Option description: The scheme entails abstracting from three quarries (Lee Moor pit, Whitehill Yeo pit & Cholwichtown pit), during drought conditions. The option involves the construction of a new pipeline adjacent to the Devon spine main from Lee Moor to Littlehempston WTW for treatment.

For option dR5 one RWT component was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.15.

Table B.15: dR5 RWT SAI-RAT input data.

SAI-RAT criterion	dR5 Lee Moor Quarries to Littlehempston WTW	Assumptions/comments
Source Name	Lee Moor Quarries	N/A
Source Management Catchment	Tamar Management Catchment	N/A
Source Operational Catchment	Yealm Operational Catchment	N/A
Source Waterbody ID	GB108047004020	N/A
Source Type	Offline waterbody	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	N/A

SAI-RAT criterion	dR5 Lee Moor Quarries to Littlehempston WTW	Assumptions/comments
Receptor Name	Littlehempston WTW	N/A
Receptor Management Catchment	Tamar Management Catchment	N/A
Receptor Operational Catchment	Yealm Operational Catchment	N/A
Receptor Waterbody	GB108047004020	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	No	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Unknown	Assumption
Transfer Distance (km)	1.1-5	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points		N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	No	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Not recorded	N/A
Presence of high priority INNS Pathway	Known to be present	Pipeline route assumed to be straight line between source and receptor. Transfer pathway too long to assess INNS records.
Details of INNS present	Japanese knotweed	N/A
Highest order site designation Receptor	International	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Deciduous Woodland (England)Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)Priority Habitat Inventory - Lowland Heathland (England)Priority Habitat Inventory - Upland Heathland (England) South Dartmoor SSSI Dartmoor SAC	N/A

SAI-RAT criterion	dR5 Lee Moor Quarries to Littlehempston WTW	Assumptions/comments
Other existing connections between source and receptor	Unknown	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.11 ROA2

Option description: This option looks to increase the amount of water available by moving the existing intake on the River Erme to a location where there is a higher flowrate, through the following:

• Construction of a new intake approximately 7.6-8.1km downstream of the existing intake on the River Erme.
• A new raw-water pumping station on a vacant plot of land within the sewage treatment works that is approximately 80m from the new abstraction point
• A new reception shaft approximately 3-4m deep.
• A new raw water connection to the South Devon Spine Main -approximately 910m.
• Transfer raw water to Littlehempston WTW
• A new abstraction licence in conjunction with the EA and WINEP Investigations

For option ROA2 one RWPS asset and two RWT components were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.16 and Table B.17Table B.17: ROA2 RWT SAI-RAT input data..

Table B.16: ROA2 asset SAI-RAT input data.

SAI-RAT criterion	ROA2 RWPS	Assumptions/comments
Asset Type	Pumping station	N/A
Asset Location	South of Ivybridge, South Devon.	N/A
Asset Size (m^2)	Unknown	Unknown value
Existing high impact INNS records on site/area of proposed site	Not recorded	N/A
Details of high impact INNS present	N/A	N/A
Existing Priority Habitats on Site	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Deciduous Woodland (England)	N/A
Highest order site designation of asset	None	N/A
Staff site visit (not entering water) frequency	1.5	Assumes visit frequency should be at least monthly
Staff site visit entering or in contact with raw water frequency	0.5	Assumes sealed structure with regular access to water unlikely
Road Vehicle site visit frequency	1.5	Aligned with staff visits, assuming
Maintenance not entering water frequency	1.5	Assumes relatively frequent maintenance
Maintenance in contact with raw water frequency	0.5	Assumes sealed structure with regular access to water unlikely

SAI-RAT criterion	ROA2 RWPS	Assumptions/comments
Angling equipment frequency	0	Associated activities not expected at these asset types
Live bait frequency	0	Associated activities not expected at these asset types
Fish stocking frequency	0	Associated activities not expected at these asset types
Large vessels (over 28ft) frequency	0	Associated activities not expected at these asset types
Small vessel (under 28ft) frequency	0	Associated activities not expected at these asset types
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	Associated activities not expected at these asset types
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	Associated activities not expected at these asset types
Mammals/waterfowl on site frequency	0	Mammals/waterfowl unlikely to access these asset types
Transfer of waste sludge to land frequency	0	Asset type should not generate sludge
Recreational walker/jogger/runner frequency	0	Associated activities not expected at these asset types

Source: Mott MacDonald, 2023.

Table B.17: ROA2 RWT SAI-RAT input data.

SAI-RAT criterion	ROA2 River Erme to existing pipe network pipeline	ROA2 South Devon Spine Main pipeline to Littlehempston WTW	Assumptions/comments
Source Name	River Erme	South Devon Spine main	N/A
Source Management Catchment	Devon South	Devon South	N/A
Source Operational Catchment	Erme	Erme	N/A
Source Waterbody ID	GB108046005200	GB108046005200	N/A
Source Type	River	River	N/A
Number of RWT inputs into source	Unknown	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	Pipeline	N/A
Receptor Name	South Devon spine main	Littlehempston WTW	N/A
Receptor Management Catchment	Devon South	Devon South	N/A
Receptor Operational Catchment	Erme	Dart Start Bay and Torbay	N/A
Receptor Waterbody	GB108046005200	GB108046008350	N/A
Receptor Type	Water treatment works	Water treatment works	N/A
Isolated Receptor Catchment	Yes	Yes	N/A
Volume of Water (Ml/day)	6-50 Ml/d	6-50 Ml/d	N/A
Frequency of Operation	Year round - continuous, full flow	Year round - continuous, full flow	Assumption

SAI-RAT criterion	ROA2 River Erme to existing pipe network pipeline	ROA2 South Devon Spine Main pipeline to Littlehempston WTW	Assumptions/comments
Transfer Distance (km)	<1	25.1-30	N/A
Washout/maintenance points outside of catchments	None	Unknown	N/A
Details of washout/maintenance points	N/A	N/A	N/A
Source Navigable	No	No	N/A
Pathway Navigable	No	No	N/A
Angling at Source	Unknown	No	N/A
Angling on Pathway	No	No	N/A
Water sports at Source	Unknown	No	N/A
Water sports on Pathway	No	No	N/A
Presence of high priority INNS Source	Not recorded	Known to be present	N/A
Presence of high priority INNS Pathway	Not recorded	Known to be present	N/A
Details of INNS present			N/A
Highest order site designation Receptor	None	None	N/A
Presence of priority habitat pathway	Known to be present	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England) Priority Habitat Inventory - Deciduous Woodland (England)	Within 1km of receptor and pathway: Ancient Woodland Priority Habitat Inventory - Deciduous Woodland Priority Habitat Inventory - No main habitat but additional habitat exists Priority Habitat Inventory - Traditional Orchards Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England) Wood pasture and Parkland BAP Priority Habitat	N/A
Other existing connections between source and receptor	Unknown	Unknown	N/A
Details of other existing connections	N/A	N/A	N/A

Source: Mott MacDonald, 2023.

B.12 ROA3

Option description: This option looks to increase the amount of water available by moving the existing intake on the River Yealm to a location where there is a higher flowrate. It involves the following:

• Construction of a new intake approximately 6.3km downstream of the existing intake on the River Yealm

• A new raw-water pumping station on a vacant plot of land that is approximately 25m from the new abstraction point
• A new reception shaft approximately 3-4m deep
• A new raw water connection to the South Devon Spine Main (raw water main) - approximately 230m
• A new licence in conjunction with the EA

For option ROA3 one asset and two RWT components were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.18 and Table B.19.

Table B.18: ROA3 asset SAI-RAT input data.

SAI-RAT criterion	ROA3 River Yealm RWPS	Assumptions/comments
Asset Type	Pumping station	N/A
Asset Location	Lee Mill, South Devon	N/A
Asset Size (m^2)	Unknown	N/A
Existing high impact INNS records on site/area of proposed site	Known to be present	N/A
Details of high impact INNS present	Impatiens glandulifera	N/A
Existing Priority Habitats on Site	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Good quality semi-improved grassland Priority Habitat Inventory - Purple Moor Grass and Rush Pasture Priority Habitat Inventory - Deciduous Woodland Priority Habitat Inventory - Traditional Orchards	N/A
Highest order site designation of asset	None	N/A
Staff site visit (not entering water) frequency	1.5	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	Assumed value
Road Vehicle site visit frequency	1.5	Assumed value
Maintenance not entering water frequency	1.5	Assumed value
Maintenance in contact with raw water frequency	0.5	Assumed value
Angling equipment frequency	0	Assumed value
Live bait frequency	0	Assumed value
Fish stocking frequency	0	Assumed value
Large vessels (over 28ft) frequency	0	Assumed value
Small vessel (under 28ft) frequency	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	Assumed value
Mammals/waterfowl on site frequency	0	Assumed value

SAI-RAT criterion	ROA3 River Yealm RWPS	Assumptions/comments
Transfer of waste sludge to land frequency	0	Assumed value
Recreational walker/jogger/runner frequency	0	Assumed value

Source: Mott MacDonald, 2023.

Table B.19: ROA3 RWT SAI-RAT input data.

SAI-RAT criterion	ROA3 River Yealm to South Devon Spine Main pipeline	ROA3 South Devon Spine Main pipeline to Littlehempston WTW	Assumptions/comments
Source Name	River Yealm	South Devon Spine main	N/A
Source Management Catchment	Tamar	Tamar	N/A
Source Operational Catchment	Yealm	Yealm	N/A
Source Waterbody ID	GB108047004010	GB108047004010	N/A
Source Type	River	Online waterbody	N/A
Number of RWT inputs into source	Unknown	Unknown	N/A
Pathway Type	Pipeline	Pipeline	N/A
Receptor Name	South Devon spine main	Littlehempston WTW	N/A
Receptor Management Catchment	Tamar	Devon South	N/A
Receptor Operational Catchment	Yealm	Dart Start Bay and Torbay	N/A
Receptor Waterbody	GB108047004010	GB108046008350	N/A
Receptor Type	Water treatment works	Water treatment works	N/A
Isolated Receptor Catchment	Yes	Yes	N/A
Volume of Water (Ml/day)	6-50 Ml/d	6-50 Ml/d	N/A
Frequency of Operation	Year round - continuous, full flow	Year round - continuous, full flow	N/A
Transfer Distance (km)	<1	25.1-30	N/A
Washout/maintenance points outside of catchments	None	Unknown	N/A
Details of washout/maintenance points	N/A	N/A	N/A
Source Navigable	No	No	N/A
Pathway Navigable	No	No	N/A
Angling at Source	Unknown	No	N/A
Angling on Pathway	No	No	N/A
Water sports at Source	Unknown	No	N/A
Water sports on Pathway	No	No	N/A
Presence of high priority INNS Source	Known to be present	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	Known to be present	N/A

SAI-RAT criterion	ROA3 River Yealm to South Devon Spine Main pipeline	ROA3 South Devon Spine Main pipeline to Littlehempston WTW	Assumptions/comments
Details of INNS present	*Impatiens glandulifera*	N/A*	*No EA records of INNS
Highest order site designation Receptor	None	None	N/A
Presence of priority habitat pathway	Known to be present	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	Known to be present	N/A
Details of priority habitat present	Present within 1km of receptor and pathway: Priority Habitat Inventory - Good quality semi-improved grassland Priority Habitat Inventory - Purple Moor Grass and Rush Pasture Ancient Woodland Priority Habitat Inventory - Deciduous Woodland Priority Habitat Inventory - Traditional Orchards	Present within 1km of receptor and pathway: Ancient Woodland Priority Habitat Inventory - Deciduous Woodland Priority Habitat Inventory - No main habitat but additional habitat exists Priority Habitat Inventory - Traditional Orchards Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England) Wood pasture and Parkland BAP Priority Habitat	N/A
Other existing connections between source and receptor	Unknown	Unknown	N/A
Details of other existing connections	N/A	N/A	N/A

Source: Mott MacDonald, 2023.

B.13 ROA4

Option description: The current operating practice is that a flow of water from the reservoir feeds into the downstream river continuously in order to minimise the environmental impact on the river. This compensation release is a 'passive' activity which happens regardless of whether water is being abstracted downstream. At present, if water is required for abstraction downstream of the reservoir we actively release water in addition to that from the compensation flow. This option will require a change to the existing abstraction licence at the River Tamar, specifically reducing the compensation flow when large water supply releases are made from Roadford reservoir for downstream abstraction. The active supply release delivers the benefits of the compensation flow between the reservoir and the abstraction point. This will need to be agreed with the EA in conjunction with environmental investigations and hydrological modelling.

For option ROA4 one RWT was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.20.

Table B.20: ROA4 RWT SAI-RAT input data.

SAI-RAT criterion	ROA4 Gunnislake intake to Mayflower reservoir via existing pipeline	Assumptions/comments
Source Name	River Tamar	N/A
Source Management Catchment	Tamar	N/A
Source Operational Catchment	Tamar Lower and Inny	N/A
Source Waterbody ID	GB108047007860	N/A
Source Type	River	N/A

SAI-RAT criterion	ROA4 Gunnislake intake to Mayflower reservoir via existing pipeline	Assumptions/comments
Number of RWT inputs into source	Unknown	N/A
Pathway Type	Pipeline	Existing pipeline infrastructure
Receptor Name	Mayflower WTW	N/A
Receptor Management Catchment	Tamar	N/A
Receptor Operational Catchment	Plym	N/A
Receptor Waterbody ID	GB108047004040	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	No	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Year round - intermittent	Only used when making supply releases
Transfer Distance (km)	10.1-15	This distance is assumed based on the distance between the source and receptor
Washout/maintenance points outside of catchments	Unknown	Input value not known at time of assessment
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	Unknown	N/A
Angling on Pathway	No	N/A
Water sports at Source	Casual use by individuals/clubs	Value based on known water sports activities
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	The exact pathway was unknown at the time of the survey. A 1km buffer around a direct route between the source and receptor was assessed.
Details of INNS present	Within 1km of Source: Potamopyrgus antipodarum, Elodea canadensis, Fallopia japonica, Impatiens glandulifera, Heracleum mantegazzianum.	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	The exact pathway was unknown at the time of the survey. A 1km buffer around a direct route between the source and receptor was assessed.
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Good quality semi-improved grassland Priority Habitat Inventory - Lowland Dry Acid Grassland Priority Habitat Inventory - Lowland Heathland Priority Habitat Inventory - Deciduous Woodland (England), including ancient woodland	N/A

SAI-RAT criterion	ROA4 Gunnislake intake to Mayflower reservoir via existing pipeline	Assumptions/comments
	Priority Habitat Inventory - No main habitat but additional habitat exists	
Other existing connections between source and receptor	None	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.14 ROA7

Option description: This option is centred on constructing new and repurposing existing treatment works processes, specifically, new parallel inlet works, new flocculation tanks, conversion of manganese filters to flocculation filters, GAC contactors upgrades, Manganese contactor upgrades, conversion of water tank into chlorination tank, Thickener upgrades, and all necessary ancillaries/pipework. This will enable Northcombe WTW to treat raw water up to the licence maximum of 60Ml/d.

For option ROA7 one asset and one RWT component were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in asset and RWT components in Table B.21 and Table B.22.

Table B.21: ROA7 RWT SAI-RAT input data.

SAI-RAT criterion	ROA 7 Northcombe WTW	Assumptions/comments
Asset Type	WTW	N/A
Asset Location	Broadbury	N/A
Asset Size (m^2)	Unknown	Unknown
Existing high impact INNS records on site/area of proposed site	Not surveyed - unknown	N/A
Details of high impact INNS present	N/A	N/A
Existing Priority Habitats on Site	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England) Priority Habitat Inventory - Deciduous Woodland (England)	N/A
Highest order site designation of asset	Local	N/A
Staff site visit (not entering water) frequency	2	Assumed value
Staff site visit entering or in contact with raw water frequency	2	Assumed value
Road Vehicle site visit frequency	2	Assumed value
Maintenance not entering water frequency	2	Assumed value
Maintenance in water frequency	2	Assumed value
Angling equipment frequency	0	Assumed value
Live bait frequency	0	Assumed value
Fish stocking frequency	0	Assumed value

SAI-RAT criterion	ROA 7 Northcombe WTW	Assumptions/comments
Large vessels (over 28ft) frequency	0	Assumed value
Small vessel (under 28ft) frequency	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	Assumed value
Mammals/waterfowl o sit frequency	0	Mammals/waterfowl unlikely to access these asset types
Transfer of waste sludge to land frequency	1	Assumed value
Recreational walker/jogger/runner frequency	0	Assumed value

Table B.22: ROA7 RWT SAI-RAT input data.

SAI-RAT criterion	ROA 7 Roadford reservoir to Northcombe Water Treatment Works	Assumptions/comments
Source Name	Roadford Reservoir	N/A
Source Management Catchment	Tamar Management Catchment	N/A
Source Operational Catchment	Thrushel Wolf and Lyd Operational Catchment	N/A
Source Waterbody ID	GB30847000	N/A
Source Type	Online waterbody	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	N/A
Receptor Name	Northcombe WTW	N/A
Receptor Management Catchment	North Devon Management Catchment	N/A
Receptor Operational Catchment	Torridge Operational Catchment	N/A
Receptor Waterbody ID	GB108050008160	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	51-100 Ml/d	N/A
Frequency of Operation	Year round - continuous, full flow	Input value not known at time of assessment
Transfer Distance (km)	5.1-10	N/A
Washout/maintenance points outside of catchments	Unknown	Input value not known at time of assessment
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	Members and day ticket holders, local matches	N/A
Angling on Pathway	No	No evidence of fishing clubs operating in waterbody

SAI-RAT criterion	ROA 7 Roadford reservoir to Northcombe Water Treatment Works	Assumptions/comments
Water sports at Source	National events	N/A
Water sports on Pathway	No	No evidence of water sports clubs operating in waterbody
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	N/A
Details of INNS present	New Zealand Pigmyweed, Japanese Knotweed	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)Priority Habitat Inventory - Lowland Dry Acid Grassland (England)Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)Priority Habitat Inventory - Lowland Meadows (England)Priority Habitat Inventory - Deciduous Woodland (England)	N/A
Other existing connections between source and receptor	Unknown	Input value not known at time of assessment
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.15 ROA12

Option description: This option is centred on supplying additional raw water from Slade reservoir to Horedown WTW via a new raw water pumping station and an existing 3.5km pipeline as well as improving the water treatment quality at Horedown WTW via a new ozone/ granular activated carbon plant, increased chemical dosing, process wastewater treatment.

For option ROA12 two assets and one RWT were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.23 and Table B.24.

Table B.23: ROA12 asset SAI-RAT input data.

SAI-RAT criterion	ROA12 Slade Reservoir pumping station	Assumptions/comments
Asset Type	Pumping station	N/A
Asset Location	North of Lower Slade reservoir, North Devon	N/A
Asset Size (m^2)	Unknown	Input value not known at time of assessment
Existing high impact INNS records on site/area of proposed site?	Known to be present	N/A
Details of high impact INNS present	Cherry Laurel Three cornered garlic Canadian waterweed	N/A

SAI-RAT criterion	ROA12 Slade Reservoir pumping station	Assumptions/comments
	Fallopia japonica and Lagarosiphon major also recorded (NBN).	
Existing Priority Habitats on Site?	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Maritime cliffs and slopes Priority Habitat Inventory - deciduous woodland (including ancient replanted woodland) Priority Habitat Inventory - Traditional orchards Priority Habitat Inventory - no main habitat but additional habitat exists	N/A
Highest order site designation of asset	Local	N/A
Staff site visit (not entering water) frequency	1.5	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	Assumed value
Road Vehicle site visit frequency	1.5	Assumed value
Maintenance not entering water frequency	1.5	Assumed value
Maintenance in contact with raw water frequency	0.5	Assumed value
Angling equipment frequency	0	Assumed value
Live bait frequency	0	Assumed value
Fish stocking frequency	0	Assumed value
Large vessels (over 28ft) frequency	0	Assumed value
Small vessel (under 28ft) frequency	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	Assumed value
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	Assumed value
Mammals/waterfowl on site frequency	0	Mammals/waterfowl unlikely to access these asset types
Transfer of waste sludge to land frequency	0	Asset type should not generate sludge
Recreational walker/jogger/runner frequency	0	Associated activities not expected at these asset types

Source: Mott MacDonald, 2023.

Table B.24: ROA12 RWT SAI-RAT input data.

SAI-RAT criterion	Slade Reservoir to Horedown WTW pipeline	Assumptions/comments
Source Name	Slade Reservoir	N/A
Source Management Catchment	North Devon	N/A

SAI-RAT criterion	Slade Reservoir to Horedown WTW pipeline	Assumptions/comments
Source Operational Catchment	Taw and North Devon Streams	N/A
Source Waterbody ID	N/A	No waterbody ID at this source.
Source Type	Offline waterbody	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	N/A
Receptor Name	Horedown WTW	N/A
Receptor Management Catchment	North Devon	N/A
Receptor Operational Catchment	Taw and North Devon Streams	N/A
Receptor Waterbody	GB108050020050	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Year round - continuous, full flow	It is assumed the option will be utilised continuously.
Transfer Distance (km)	1.1-5	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	Unknown	N/A
Angling on Pathway	No	N/A
Water sports at Source	Unknown	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	N/A
Details of INNS present	*Fallopia japonica, Lagarosiphon major, Impatiens glandulifera*	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Present within 1km of receptor: Priority Habitat Inventory - deciduous woodland (including ancient replanted woodland) Present within 1km of pathway: Priority Habitat Inventory - Maritime Cliffs and Slopes Ancient Woodland	N/A

SAI-RAT criterion	Slade Reservoir to Horedown WTW pipeline	Assumptions/comments
	Priority Habitat Inventory - Deciduous Woodland Priority Habitat Inventory - Traditional Orchards Priority Habitat Inventory - No main habitat but additional habitat exists	
Other existing connections between source and receptor	Unknown	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.16 ROA14

Option description: The preferred option is for the dam to be raised approximately 4m subject to structural engineering approval and flood risk assessments for heavily modified waterbodies. It is acknowledged that, due to the time limitation, no studies and/ or analysis has been undertaken involving a detailed review of the available project information and verification of the project parameters (including dam stability, etc). A review of the original project design information suggests that the Avon dam was provisioned for raising to a limited height. Both the design and the dam are now over 60 years old. There will need to be significant studies and investigatory work to establish the condition of the dam and surrounding geology before any view on the height-raising methodology can be established and accurately costed. A high-level schedule of quantities and method statement (as envisaged in the original design) has been produced at this stage in order to estimate a potential order-of-cost for raising the dam. This schedule and method statement is provisional pending further investigations which will include full environmental impact assessments, planning and public consultation. It is envisaged that the initial AMP period will be concerned with addressing these areas as well as the engineering methodology.

For option ROA14, one asset was assessed for the Level 2 INNS assessment. This option will require (permanent) additional land around the edge of the reservoir. The SAI-RAT input values are outlined below in Table B.25.

Table B.25: ROA14 asset SAI-RAT input data.

SAI-RAT criterion	Avon Dam Reservoir	Assumptions/comments
Asset Type	Reservoir	N/A
Asset Location	Dartmoor National Park, North of Shipley Bridge	N/A
Asset Size (m^2)	146000	Approximate area of the reservoir surface.
Existing high impact INNS records on site/area of proposed site	Known to be present	N/A
Details of high impact INNS present	SWW provided a record of Impatiens glandulifera	N/A
Existing Priority Habitats on Site	Known to be present	N/A
Details of existing priority habitats present	Priority Habitat Inventory - Upland Heathland Priority Habitat Inventory - Blanket Bog Priority Habitat Inventory - Upland Flushes, Fens and Swamps Priority Habitat Inventory -	N/A

SAI-RAT criterion	Avon Dam Reservoir	Assumptions/comments
	Deciduous Woodland Priority Habitat Inventory - Grass Moorland (non-priority)	
Highest order site designation of asset	National	One Site of Special Scientific Interest within 1km of the site.
Staff site visit (not entering water) frequency	2	Assumed value
Staff site visit entering or in contact with raw water frequency	2	Assumed value
Road Vehicle site visit frequency	2	Assumed value
Maintenance not entering water frequency	1	Assumed value
Maintenance in contact with raw water frequency	1	Assumed value
Angling equipment frequency	2	Assumed value
Live bait frequency	0	Assumed value
Fish stocking frequency	1	Assumed value
Large vessels (over 28ft) frequency	0.5	Assumed value
Small vessel (under 28ft) frequency	2	Boating is a relatively common activity at reservoirs. If permitted at a reservoir, likely to occur frequently
Water sports equipment (SUPs, Canoe, Kayaks) frequency	2	Associated activities not expected at these asset types
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0.5	Boating is a relatively common activity at reservoirs. If permitted at a reservoir, likely to occur frequently
Mammals/waterfowl on site frequency	2	If a reservoir is accessible to mammals and waterfowl, they are likely to access the asset frequently
Transfer of waste sludge to land frequency	0	Asset type should not generate sludge
Recreational walker/jogger/runner frequency	2	Relatively common activities at reservoirs. If reservoir is accessible for this purpose, likely to occur frequently

Source: Mott MacDonald, 2023.

B.17 ROA15

Option description: The completion of this scheme will require the construction of an additional raw water main to provide water supply resilience through a dual main between the River Lyd abstraction point and Roadford Reservoir, allowing the full 148Ml/d to be transferred to Roadford Reservoir. This option is dependent on the successful application of an aggregate abstraction licence in AMP7 of Gunnislake, Lyd, and Gatherley.

For option ROA15 one RWT was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.26Table B.26: ROA15 RWT SAI-RAT input data..

Table B.26: ROA15 RWT SAI-RAT input data.

SAI-RAT criterion	Gatherly Phase 2	Assumptions/comments
Source Name	River Lyd	N/A

SAI-RAT criterion	Gatherly Phase 2	Assumptions/comments
Source Management Catchment	Tamar Management Catchment	N/A
Source Operational Catchment	Thrushel Wolf and Lyd Operational Catchment	N/A
Source Waterbody ID	GB108047007731	N/A
Source Type	River	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	N/A
Receptor Name	Roadford Lake Reservoir	N/A
Receptor Management Catchment	Tamar Management Catchment	N/A
Receptor Operational Catchment	Thrushel Wolf and Lyd Operational Catchment	N/A
Receptor Waterbody	GB30847000	N/A
Receptor Type	Online waterbody	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	101-150 Ml/d	N/A
Frequency of Operation	Unknown	Input value not known at time of assessment
Transfer Distance (km)	5.1-10	N/A
Washout/maintenance points outside of catchments	Unknown	Input value not known at time of assessment
Details of washout/maintenance points	N/A	Input value not known at time of assessment
Source Navigable	No	Information taken from Canal and River Trust
Pathway Navigable	No	N/A
Angling at Source	Members and day ticket holders, local matches	Assumed most likely based on available information[19]
Angling on Pathway	No	N/A
Water sports at Source	None	No evidence of clubs
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Not recorded	N/A
Presence of high priority INNS Pathway	Not surveyed - unknown	N/A
Details of INNS present	N/A	N/A
Highest order site designation Receptor	Local	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Not known to be present	N/A

SAI-RAT criterion	Gatherly Phase 2	Assumptions/comments
Details of priority habitat present	Priority Habitat Inventory - Lowland Meadows (England)Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)Priority Habitat Inventory - Traditional Orchards (England)Priority Habitat Inventory - Deciduous Woodland (England)	N/A
Other existing connections between source and receptor	Unknown	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.18 ROA21

Option description: This is an alternative solution to Mayflower WTW to South Devon Treated, consisting of a 37km raw water transfer. There is already an existing raw water main that enables the transfer of raw water between Mayflower WTW and Littlehempston WTW. However, a duplication of the raw water main would add flexibility to the network.

For option ROA21 one RWT component was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.27

Table B.27: ROA21 RWT SAI-RAT input data.

SAI-RAT criterion	ROA21 Roborough Tank at Mayflower Water Treatment Works to Littlehempston Water Treatment Works	Assumptions/comments
Source Name	Roborough Tank at Mayflower Water Treatment Works	N/A
Source Management Catchment	Tamar	N/A
Source Operational Catchment	Plym	N/A
Source Waterbody ID	GB108047004040	N/A
Source Type	Sealed Water Tank	This has been assumed as most appropriate source type based on information available at the time of assessment.
Number of RWT inputs into source	None	Input value not known at time of assessment.
Pathway Type	Pipeline	N/A
Receptor Name	Littlehempston Water Treatment Works	N/A
Receptor Management Catchment	Devon South	N/A
Receptor Operational Catchment	Dart Start Bay and Torbay	N/A
Receptor Waterbody	GB108046008350	N/A
Receptor Type	Water treatment Works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	6-50 Ml/d	N/A

SAI-RAT criterion	ROA21 Roborough Tank at Mayflower Water Treatment Works to Littlehempston Water Treatment Works	Assumptions/comments
Frequency of Operation	Year round - continuous, full flow	Assumption
Transfer Distance (km)	>30	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	Unknown	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	No	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Not recorded	N/A
Presence of high priority INNS Pathway	Not surveyed - unknown	Pipeline route assumed to be straight line between source and receptor. Transfer pathway too long to assess INNS records.
Details of INNS present	No records identified	N/A
Highest order site designation Receptor	None	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	"Pathway: Deciduous woodland, good quality semi-improved grassland, Grass moorland, Lowland dry acid grassland and no main habitat but additional habitats present.	N/A
Other existing connections between source and receptor		N/A
Details of other existing connections	Receptor: Coastal and floodplain grazing marsh, good quality semi-improved grassland, ancient woodland, deciduous woodland, traditional orchards. and no main habitat but additional habitat exists.	N/A

Source: Mott MacDonald, 2023.

B.19 WIM1

Option description: The current operating practice is that a flow of water from the reservoir feeds into the downstream river continuously in order to minimise the environmental impact on the river. This compensation release is a 'passive' activity which happens regardless of whether water is being abstracted downstream. At present, if water is required for abstraction downstream of the reservoir, we actively release water in addition to that from the compensation flow. This option will require a change to the existing abstraction licence at the Northbridge River, specifically reducing the compensation flow when large water supply releases are made from Wimbleball reservoir for downstream abstraction. The active supply release delivers the benefits of the compensation flow between the reservoir and the abstraction point. This will need to be agreed upon with the EA in conjunction with environmental investigations and hydrological modelling.

For option WIM1 one RWT component was assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.28.

Table B.28: WIM1 RWT SAI-RAT input data.

SAI-RAT criterion	WIM1 River Exe abstraction at Northbridge RWPS to Pynes WTW	Assumptions/comments
Source Name	River Exe	N/A
Source Management Catchment	Devon East Management Catchment	N/A
Source Operational Catchment	Exe Main Operational Catchment	N/A
Source Waterbody ID	GB108045015050	N/A
Source Type	River	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment.
Pathway Type	Pipeline	N/A
Receptor Name	Pynes WTW	N/A
Receptor Management Catchment	Devon East Management Catchment	N/A
Receptor Operational Catchment	Creedy and West Exe Operational Catchment	N/A
Receptor Waterbody	GB108045009070	N/A
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Year round - intermittent	Assumption
Transfer Distance (km)	1.1-5	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A

SAI-RAT criterion	WIM1 River Exe abstraction at Northbridge RWPS to Pynes WTW	Assumptions/comments
Angling at Source	Members only, no matches	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Not recorded	N/A
Presence of high priority INNS Pathway	Not recorded	Pipeline route assumed to be straight line between source and receptor. Transfer pathway too long to assess INNS records.
Details of INNS present	N/A	N/A
Highest order site designation Receptor	National	N/A
Presence of priority habitat pathway	Known to be present	N/A
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Brampford Speke SSSI, Stoke Woods SSSI	N/A
Other existing connections between source and receptor	Unknown	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.

B.20 WIM11

Option description: This option involves the transfer of water from Couchill Springs to Bovey Lane WTW. A new pumping station at Couchill Springs is required along with new assets at Bovey Lane including a break tank, filters & UV disinfection. The solution would also utilise existing high lift pumps for treated water distribution.

For option WIM11 two asset and one RWT components were assessed for the Level 2 INNS assessment. The SAI-RAT input values are outlined below in Table B.29 and Table B.30.

Table B.29: WIM11 asset SAI-RAT input data.

SAI-RAT criterion	WIM11 Couchill Springs Collection Chamber and Pumping Station	WIM11 Bovey Lane WTW	Assumptions/comments
Asset Type	Collection chamber and pumping station	WTW	N/A
Asset Location	Couchill Springs	Bovey Lane	N/A
Asset Size (m^2)	Unknown	Unknown	Input value not known at time of assessment
Existing high impact INNS records on site/area of proposed site	Known to be present	Known to be present	N/A

SAI-RAT criterion	WIM11 Couchill Springs Collection Chamber and Pumping Station	WIM11 Bovey Lane WTW	Assumptions/comments
Details of high impact INNS present	Japanese knotweed (Fallopia japonica) Himalayan balsam (Impatiens glandulifera	Japanese knotweed (Fallopia japonica) Himalayan balsam (Impatiens glandulifera	N/A
Existing Priority Habitats on Site	Known to be present	Known to be present	N/A
Details of existing priority habitats present	Beer Quarry and Caves SSSI Beer Quarry and Caves SAC Sidmouth to Beer Coast SSSI & GWDTE Sidmouth to West Bay SAC Lyme Bay and Torbay SAC Lowland calcareous grassland (Priority habitat) Good quality semi-improved grassland (Priority habitat) No main habitat but additional habitats present Deciduous woodland (Priority habitat) Maritime cliff and slope (Priority habitat)	Beer Quarry and Caves SSSI Beer Quarry and Caves SAC Sidmouth to Beer Coast SSSI & GWDTE Sidmouth to West Bay SAC Lyme Bay and Torbay SAC Lowland calcareous grassland (Priority habitat) Good quality semi-improved grassland (Priority habitat) No main habitat but additional habitats present Deciduous woodland (Priority habitat) Maritime cliff and slope (Priority habitat)	N/A
Highest order site designation of asset	International	International	N/A
Staff site visit (not entering water) frequency	1.5	2	Assumed value
Staff site visit entering or in contact with raw water frequency	0.5	2	Assumed value
Road Vehicle site visit frequency	1.5	2	Assumed value
Maintenance not entering water frequency	1.5	2	Assumed value
Maintenance in contact with raw water frequency	0.5	2	Assumed value
Angling equipment frequency	0	0	Assumed value
Live bait frequency	0	0	Assumed value
Fish stocking frequency	0	0	Assumed value
Large vessels (over 28ft) frequency	0	0	Assumed value
Small vessel (under 28ft) frequency	0	0	Assumed value
Water sports equipment (SUPs, Canoe, Kayaks) frequency	0	0	Assumed value

SAI-RAT criterion	WIM11 Couchill Springs Collection Chamber and Pumping Station	WIM11 Bovey Lane WTW	Assumptions/comments
Water Safety Equipment Temporary moorings, jetties, inflatables, buoys) frequency	0	0	Assumed value
Mammals/waterfowl on site frequency	0	0	Mammals/waterfowl unlikely to access these asset types
Transfer of waste sludge to land frequency	1	1	Asset type should not generate sludge
Recreational walker/jogger/runner frequency	0	0	Associated activities not expected at these asset types

Source: Mott MacDonald, 2023.

Table B.30: WIM11 RWT SAI-RAT input data.

SAI-RAT criterion	WIM11 Couchill Springs to Bovey Lane WTW	Assumptions/comments
Source Name	Couchill Springs	N/A
Source Management Catchment	Devon East Management Catchment	N/A
Source Operational Catchment	Lim and Axe Operational Catchment	N/A
Source Waterbody ID	N/A	No Waterbody ID at source
Source Type	Spring, natural springs	N/A
Number of RWT inputs into source	Unknown	Input value not known at time of assessment
Pathway Type	Pipeline	N/A
Receptor Name	Bovey Lane WTW	N/A
Receptor Management Catchment	Devon East Management Catchment	N/A
Receptor Operational Catchment	Lim and Axe Operational Catchment	N/A
Receptor Waterbody	N/A	No waterbody ID at receptor
Receptor Type	Water treatment works	N/A
Isolated Receptor Catchment	Yes	N/A
Volume of Water (Ml/day)	0-5 Ml/d	N/A
Frequency of Operation	Unknown	Input value not known at time of assessment.
Transfer Distance (km)	1.1-5	N/A
Washout/maintenance points outside of catchments	Unknown	N/A
Details of washout/maintenance points	N/A	N/A
Source Navigable	No	N/A
Pathway Navigable	No	N/A
Angling at Source	No	N/A
Angling on Pathway	No	N/A
Water sports at Source	No	N/A

SAI-RAT criterion	WIM11 Couchill Springs to Bovey Lane WTW	Assumptions/comments
Water sports on Pathway	No	N/A
Presence of high priority INNS Source	Known to be present	N/A
Presence of high priority INNS Pathway	Known to be present	N/A
Details of INNS present	Japanese knotweed (Fallopia japonica) Himalayan balsam (Impatiens glandulifera)	N/A
Highest order site designation Receptor	International	N/A
Presence of priority habitat pathway	Known to be present	N/A.
Presence of priority habitat receptor	Known to be present	N/A
Details of priority habitat present	Beer Quarry and Caves SSSI Beer Quarry and Caves SAC Sidmouth to Beer Coast SSSI & GWDTE Sidmouth to West Bay SAC Lyme Bay and Torbay SAC Lowland calcareous grassland (Priority habitat) Good quality semi-improved grassland (Priority habitat) No main habitat but additional habitats present Deciduous woodland (Priority habitat) Maritime cliff and slope (Priority habitat)	N/A
Other existing connections between source and receptor	Unknown	N/A
Details of other existing connections	N/A	N/A

Source: Mott MacDonald, 2023.