



United Utilities Water

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# Water Resources Management Plan 2024

Water Framework Directive compliance assessment

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## Report for

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## Document revisions

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1	Draft issued for comment	18/08/22
2	Final version	26/09/22
3	Minor corrections to final version	23/11/22
4	Updated for revised draft WRMP	26/05/23
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<b>7</b>	Updated in line with Preferred Plan, final WRMP	03/10/24
<b>8</b>	Minor corrections from v7	10/10/24
<b>9</b>	Further updates to address regulator comments	20/11/24

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# 1. Introduction and purpose of report

## 1.1 Background and purpose of report

Water companies in England and Wales have a statutory requirement to prepare a Water Resources Management Plan (WRMP) every five years. The latest Water Resource Planning Guideline (WRPG) produced by the regulatory bodies<sup>1</sup> (Ofwat, The Environment Agency and Natural Resources Wales) advises that it is the water companies' requirement to have to take into account the Water Framework Directive regulations and the River Basin Management Plans (RBMPs) environmental objectives in their WRMPs. This report will demonstrate how United Utilities Water (Uuw) have met this requirement in the assessment of their WRMP24 feasible options and preferred plan options.

### United Utilities Water Resource Management Plan

The Water Act 2003 requires that all water companies in England Wales prepare and maintain Water Resources Management Plans (WRMPs). These plans set out how public water supply (PWS) will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable. The WRMPs must be revised every five years.

United Utilities Water (Uuw) has finalised its Water Resources Management Plan 2024 (WRMP24). The WRMP24 sets out a long-term, best value and sustainable plan for water supplies in the North West. The WRMP24 plans for an adequate supply to meet demand from 2025 to 2050 and beyond, and a supply system that is resilient to drought. WRMPs are reviewed on a rolling five-year basis, with Uuw's most recent plan being published in 2019.

As part of the preparation of WRMP24, Uuw published its Draft Water Resources Management Plan 2024 (Draft WRMP24) for consultation between the 7<sup>th</sup> December 2022 and 15<sup>th</sup> March 2023, following submission to Defra. The Draft WRMP24 set out Uuw's proposals to ensure continued delivery of a secure and reliable supply of water from 2025 to 2050, looking beyond out to the year 2100.

Taking into account the responses received to the consultation on the Draft WRMP24 from regulators, stakeholders and the public, further engagement and environmental assessment, Uuw selected its preferred plan for WRMP24. A Revised Draft Water Resources Management Plan 2024 (Revised Draft WRMP24 or rdWRMP24) was prepared and submitted to the Secretary of State for review and approval (21 June 2023).

The Secretary of State subsequently requested further information on the Revised Draft WRMP (December 2023)<sup>2</sup>, which was provided by Uuw alongside updated environmental reports (February 2024); however, modelling of some options demonstrated issues with Water Framework

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<sup>1</sup> Ofwat, NRW & EA (2023), Water Resources Planning Guideline. Available at: <https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline>  
<https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline>

<sup>2</sup> Letter from Defra Deputy Director – Water Sector Delivery to UU (no reference) dated December 2023

Directive (WFD) compliance, and so Defra’s ‘Direction to Publish’ letter<sup>3</sup> indicated that amendments to the preferred options were required.

UUW’s WRMP24 has been developed within a regional water resources planning framework covering all or part of the operational areas of Dŵr Cymru Welsh Water (DCWW), Hafren Dyfrdwy (HD), Severn Trent Water (STW), South Staffordshire Water (SSW) and United Utilities Water (UUW)<sup>4</sup> that is managed by Water Resources West (WRW). WRW is currently preparing a Regional Plan<sup>5</sup> for the period 2025 to 2085 that will address long-term regional and inter-regional, multi-sectoral water resources management pressures and will draw on water resource options from the member water companies’ WRMP24s, as well as the Strategic Resource Options (SROs) being taken forward by the companies.

### *The Final WRMP24*

Following consultation on the Draft WRMP24, UUW reviewed its best value plan for WRMP24 and as a result, the preferred plan was modified. In particular, the number of supply options which now make up the preferred plan for the Final WRMP24 has significantly reduced compared to the Draft, owing to, in particular, decreased water transfer needs (following the final regional planning reconciliation round).

The Draft WRMP24 included a total of 168 MI/d of exports to STW and Water Resources South East (WRSE) from UUW’s SRZ, starting with a 75 MI/d transfer in 2031. Seven supply options were included in preferred plan to support these transfers. Transfers to WRSE are not selected in the Final WRMP24 (linked to WRSE companies lowering their demand projections following consultation feedback) and the STW need reduced to 25 MI/d. Therefore, fewer supply options are required in WRMP24. When combined with updates to the demand management measures, this also means that improving UUW’s level of service for temporary use bans (TUBs) is no longer reliant on the dual-purposing of water transfer support options.

The final WRMP24 therefore proposes:

- one supply option, to provide 25MI/d of additional resource.
- 33 customer, distribution and production options to provide some 282MI/d.

The preferred portfolio supply-side option (including intended capacity and approximate year by which the option would be required) is summarised in **Table 1.1**.

Table 1.1 Preferred Supply Option included in the Final WRMP24

Option ID	Option name	Capacity (MI/d)	Description	Year selected
WR076	Bollin	25	Option WR076 involves the following construction elements:	2033

<sup>3</sup> Letter from Defra Deputy Director (Floods and Water) to UU (no reference) dated 06 September 2024.

<sup>4</sup> Hafren Dyfrdwy operates in mid-Wales and borders the WRW Regional Plan area; no Hafren Dyfrdwy water resources zones are included in the regional plan and so Hafren Dyfrdwy is an associate rather than core member of WRW.

<sup>5</sup> EA (2020) *Water Resources National Framework: Appendix 2: Regional planning*.

Option ID	Option name	Capacity (MI/d)	Description	Year selected
			<ul style="list-style-type: none"> <li>- A new river abstraction point on the River Bollin near Heatley and associated transfer pumping station;</li> <li>- A new water quality monitoring point upstream of the proposed abstraction point;</li> <li>- A new 25MI/d water treatment works (WTW) on the outskirts of Altrincham;</li> <li>- A new 25MI/d treated water storage reservoir at the same location;</li> <li>- A new raw water transfer main (~5km) from abstraction point to the new WTW;</li> <li>- A new potable water supply main (~2.5km) from the WTW to an existing supply main;</li> <li>- Supply network reinforcements (~2.5km) to a connection point on the existing 302T1 supply main.</li> <li>- The option has a maximum capacity of 25 MI/d. With an average abstraction scenario, the rate of abstraction would peak in July at 22 MI/d, with a minimum of 3 MI/d in winter. With the '1 in 500 year drought' abstraction scenario, use of the option would be sustained at the maximum rate of 25 MI/d for a sustained period through spring, summer and early autumn.</li> </ul>	

The supply option in the preferred plan forms part of the North West Transfer (NWT) Strategic Resource Option (SRO). The NWT SRO is currently being assessed as part of RAPID’s gated process for SROs, which includes assessment of environmental compliance. The NWT environmental compliance assessments, and the supporting investigations, are ongoing, and completed outcomes will not be available until the RAPID Gate 3 submission in 2026. In consequence, the findings have not been available in time for the Final WRMP24 (and its assessment).

As a result, the preferred supply option, and other NWT options, all have residual uncertainties until investigations associated with NWT SRO Gate 3 conclude. Recognising this uncertainty, and consistent with the WRPG requirements<sup>6</sup> and taking into account feedback from several environmental stakeholders including the Environment Agency (EA), Natural England (NE), Natural Resources Wales (NRW) and Mersey Rivers Trust, UuW has identified four alternative ‘WFD compliant’ WRMP options. With a combined output of 21.3 MI/d, they provide sufficient capacity to completely replace the supply option in the preferred plan, or alternative NWT options, in the event that they are required (the supply capacity requirement is 20.4 MI/d).

The options that comprise the reasonable alternative plan are listed in **Table 1.2**.

Table 1.2 Options included in the WRMP Reasonable Alternative

Option ID	Option name	Capacity (MI/d)	Description
WR026c	SWN_ RIVER RIBBLE	4	New abstraction from the River Ribble at Clitheroe; new WTW and treated water transfers to Ribble DMZ service reservoirs [REDACTED]. The scheme would involve; new river abstraction on the River

<sup>6</sup> Section 9.4.3 of the of the WRPG sets out that where due to uncertainty, “Alternatives are included in the plan at company and/or regional level where the avoidance of an adverse effect on integrity of European sites is certain, and these are available, feasible and deliverable”



Option ID	Option name	Capacity (Ml/d)	Description
			Ribble at Clitheroe ( [REDACTED] ); new WTW [REDACTED] treated water to [REDACTED] SR with new PS and new TW mains.
WR065b	RES_WHITEHOLME	2	Raise the top water level of Whiteholme Reservoir by 1m to increase storage and restoration to pre-2015 levels. The option would involve the reinstatement of the reinforced concrete weir section to the previous top water level of 382.86m AOD. This would result in an increase in storage volume of approximately 418,700m3.
WR185	SSO_STOCKPORT PH II	12	Stockport Resilience Ph II: Pump more water from [REDACTED] BSP to [REDACTED] SR and then to [REDACTED] SR. The principal construction elements of this option are a new inline pumping station [REDACTED] a new inline pumping station upstream [REDACTED]; and, analysis equipment at effluent [REDACTED].
WR191	PRO_NORTH LANCASHIRE	4	This option would involve the construction of a new washwater treatment system to treat filter washwater [REDACTED].

## 1.2 The Water Framework Directive

The Water Framework Directive (2000/60/EC) is an EU Directive establishing a framework for Community action in the field of water policy which aims to protect and improve the water environment. The Directive was brought into UK law in 2003 and subsequently revoked by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales. From this point forward “WFD” refers to the legislation applicable to England and Wales, not the EU Directive.

## 1.3 WFD requirements for WRMPs

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

As part of the WRMP, water companies must demonstrate that they have considered a range of environmental legislation, including the WFD regulations. The requirements for a WFD assessment of a water company WRMP are outlined in the 2023 WRPG (Box 1).

**Box 1: WRP 2023****Section 8.2.2 Assessing environmental constraints***"A. River Basin Management Plan and Water Framework Directive*

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

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

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

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

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

These WRP requirements reflect Defra's Guiding Principles for Water Resources Planning<sup>7</sup> (May 2016), which state that companies should take account of the government's objectives for the environment "including the appropriate parts of the EU Water Framework Directive". Defra also expects that companies will:

- Have regard to River Basin Management Plans (RBMPs) and their objectives when making decisions that could affect the condition of the water environment.
- Ensure that **current** abstractions and operations, as well as future plans, support the achievement of environmental objectives and measures set out in RBMPs.
- Ensure plans:
  - ▶ prevent deterioration in water body status;
  - ▶ support the achievement of protected area and species objectives;
  - ▶ support the achievement of water body status objectives.

<sup>7</sup> Defra (2016) Guiding Principles for Water Resources Planning. May 2016

- Continue working with the Environment Agency to take a proportionate and evidence-based approach to identify the changes needed to current abstraction licences to meet environmental requirements.

Both WRPG and the Defra Guiding Principles refer to ensuring 'no deterioration' of water body status. A European Court of Justice (ECJ) ruling<sup>8</sup> clarified that 'no deterioration' means a deterioration **between** a whole 'status class' (e.g., 'good', 'moderate', etc.) of one or more of the relevant 'quality elements' (e.g., biological, physico-chemical, etc.). This definition applies equally to Artificial Water Bodies and Heavily Modified Water Bodies in respect of the relevant quality elements that relate to the defined uses of these water bodies. The ECJ ruling further states that if the quality element concerned is already in the lowest class, any deterioration of that element constitutes a deterioration of the status. References to 'no deterioration' in this WFD methodology align to this ECJ ruling.

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<sup>8</sup> ECJ Case C-461/13: Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland <http://curia.europa.eu/juris/document/document.jsf?docid=178918&mode=req&pageIndex=1&dir=&occ=first&part=1&text=&doclang=EN&cid=175124> [accessed 30.6.16]

## 2. WFD Compliance Assessment Methodology

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

The assessment approach presented here has been applied to the feasible list of options, the Preferred Plan, and the Reasonable Alternative Plan. All options have been through a form of high-level WFD screening prior to being included in the Refined Feasible List of options. As a result, any options where there are any unalterable WFD constraints, therefore not suitable for promotion, are either not included or are flagged in the Revised Feasible List.

All assessments will be undertaken for the reporting unit of a WFD water body. The appropriate baseline information for water bodies status and targets is as set out using 2019 WFD status, as available on the Catchment Data Explorer<sup>9</sup> for the third cycle of RBMPs (RBMP3).

### 2.1 WFD Assessment Objectives for testing compliance

This section provides the WFD Assessment Objectives used as a test of constraint when testing WFD compliance at an individual potential option-level as set out in WRPG (2023). This section also provides the additional, progressive WFD Assessment Objectives that have been assessed at a plan-level.

#### Option-level WFD Assessment Objectives

Principally, the WFD acts as an indicator of constraint and determines where the WRMP or constituent options do not meet WFD Objectives set out in Regulation 13 of the WFD Regulations. In line with WRPG (2023) and UKWIR (2021) guidance the principle WFD Assessment Objectives that the WRMP (both feasible options and programmes) has been tested against are:

1. To prevent deterioration of any WFD element of any water body - in line with Regulation 13(2)(a) and 13(5)(a)<sup>10</sup>.
2. To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body in line with Regulation 13(2)(b) and 13(5)(c)<sup>11</sup>.

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<sup>9</sup> Catchment Data Explorer <https://environment.data.gov.uk/catchment-planning>

<sup>10</sup> The no deterioration baseline for each water body and element is the status reported in the RBMP and is taken to be the third cycle RBMP (RBMP3), using waterbody-specific information as reported on the Catchment Data Explorer.

<sup>11</sup> WRPG (2023) states that this a test to identify any options that 'prevent the achievement of the water body status objectives in the river basin management plan'. At present this is RBMP2. Discussion with EA and through review of EA internal guidance#1 identified that the EA consider 'less stringent objectives are not permanent and the assessment of any new activity or project must take into account the need to continue to aim for good status. The new activity or

3. To ensure that the planned programme of water body measures in RBMP2 to protect and enhance the status of water bodies are not compromised.

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

If an option is assessed to potentially not comply with the WFD Assessment Objectives set out above, then the option has been reported as 'potentially WFD non-compliant'. If an option is reported as 'potentially WFD non-compliant' it has remained in the WRMP process as it may be appropriate to consider the option further where it is considered that additional evidence to improve confidence in the assessment and/or licence design could mitigate the potentially WFD non-compliant issues. Any risks of WFD non-compliance would be investigated as part of a licence application, and mitigation requirements agreed with the Environment Agency.

### **Plan-level WFD Assessment Objectives**

The WFD Assessment Objectives presented above are the fundamental WFD Assessment Objectives that have been tested against at both the option-level and plan-level.

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

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

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

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

- If a plan is reported as potentially WFD non-compliant it may be appropriate to consider an adaptive plan where it is considered that additional evidence to improve confidence in assessment and enhanced design could mitigate the potentially WFD non-compliant issues.

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project must not jeopardise the achievement of good status in the future, irrespective of whether a less stringent objective was set in RBMP2'.

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

- Where a plan is assessed as WFD non-compliant, in circumstances where there is an over-riding public interest or the benefits of achieving the WFD Assessment Objectives are outweighed by benefits to human health, human safety or sustainable development there is scope to apply for a Regulation 19 exemption as to why these WFD Assessment Objectives are not achieved.

## 2.2 Proportionate level of detail for assessments

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

- Stage 1 Option-level Assessment – this is a full assessment that covers the feasible list of options.
- Stage 2 Programme-level assessment – the cumulative effects of the options that make up any Programmes have been assessed.
- Stage 3 Preferred WRMP programme assessment –the preferred WRMP programme for United Utilities has been assessed for impacts with other water companies' WRMPs, regional WRMPs and impacts with any WRMPs for other water resource zones within their own company.

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

### Stage1 Option-level assessment

As advocated in the UKWIR (2021) guidance, each option has gone through a process to determine if it is compliant with the three principal WFD Assessment Objectives (as set out in Section 2.1). For proportionality of option assessment there are four steps, with each step becoming increasingly detailed. Where there is sufficient confidence in an assessment's conclusions the option has not progressed onto the next step. The four steps are summarised in the bullet points below, and further described in the subsequent sections:

- *Step 1 Screening based on activities* - to either exclude options from further assessment where it can be reasonably expected that the option would not have an influence on any WFD status elements or supporting elements, or identify which activities require progressing to Steps 2 or 3 assessment and in which water bodies.
- *Step 2 Screening based on magnitude of hydrogeological/hydrological impact and water body context*- to either exclude options from assessment where they are negligible or low impact, or identify which activities require progressing to Step 3 assessment and in which water bodies.
- *Step 3 Impact assessment* – either using existing assessments or an expert judgement approach based on source-pathway-receptor to establish likelihood of compliance with agreed WFD Assessment Objectives in all relevant water bodies. A confidence rating has been given to all assessments to reflect the amount of uncertainty in the design, environmental baseline and magnitude of impact.

- *Step 4 Detailed impact assessment* - specific to the option using measured baseline data, including additional bespoke collected evidence, and detail on design and operating pattern.

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

### Step 1: Screening based on activities

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

- Demand management activities;
- Supply options which have passed a sustainability assessment<sup>12</sup> at an abstraction rate up to the proposed option rate;
- Network constraint (i.e., improving infrastructure to achieve greater deployable output) options that do not result in additional abstraction (in comparison to recent abstraction rates), or where that additional abstraction has been identified as sustainable; provided the construction does not affect WFD protected areas or increase the risk of the transfer of INNS.

At this stage, the majority of construction activities can be screened out of further assessment with these activities being mitigatable assuming best practice construction techniques, and only involving short-term impacts (i.e., will not cause deterioration over the 6-year RBMP cycle).

Where an option is concluded as potentially being non-compliant with the WFD Assessment Objectives after Step 1 screening, the option has been progressed to Step 2 screening.

### Step 2: Screening based on magnitude of hydrogeological/hydrological impact and water body context

Step 2 screening identifies the water body name, ID and type of any water bodies that could potentially be impacted. The potential impacts are determined by the type of option. The UKWIR (2021) guidance identifies a range of option types and their potential impacts (**Table 2.1**).

Table 2.1 Potential effects to screen in to WFD assessment by option type

Option type	Impact type to test
<b>New groundwater abstraction, or increase in license rate</b>	<ul style="list-style-type: none"> <li>• Change in groundwater quantity</li> <li>• Impact on groundwater dependent terrestrial ecosystems</li> <li>• Impact on connected surface waters (flow change effects on ecology and water quality dilution)</li> </ul>

<sup>12</sup> e.g., Surface water options WRGIS Band 1, 2 and 3 pass at fully licensed; groundwater options passing WFD groundwater tests; WINEP investigation are identified as sustainable by EA (UKWIR, 2021).



Option type	Impact type to test
	<ul style="list-style-type: none"> <li>• Likelihood of saline ingress into aquifer</li> </ul>
<b>Aquifer recharge/ aquifer storage and recovery</b>	Effects specific to source water used for recharge
<b>Reservoir</b>	Impact on connected surface waters (flow change effects on ecology and water quality dilution)
<b>Run-of river abstraction</b>	Flow change effects on ecology and water quality dilution
<b>River regulation</b>	Flow change effects on ecology and water quality dilution in regulated reach
<b>Reuse</b>	<ul style="list-style-type: none"> <li>• Flow and water quality change effects on ecology and chemical status in receiving watercourse</li> <li>• Flow and water quality change effects on ecology and chemical status in water course previously receiving discharge</li> </ul>
<b>Desalination</b>	Hydrodynamic changes on ecology in abstracted water body, including through pathways of salinity and sedimentation pattern change
<b>Inter-basin transfer</b>	<ul style="list-style-type: none"> <li>• Flow change effects on ecology and water quality dilution in donor watercourse</li> <li>• Direct ecological effects from introduction of invasive non-native species</li> <li>• Flow and water quality change effects on ecology and chemical status in receiving watercourse</li> </ul>

At this stage, the context of the water body will be considered to identify any additional constraints e.g., any protected areas, or any planned water body measures in RBMP2.

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

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

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

- Review the regulatory position<sup>13</sup> on water available for abstraction in an aquifer, reach or catchment. The available quantity can be compared with the increase in abstraction

<sup>13</sup> Environment Agency Abstraction Licensing Strategy datasets:

<https://data.gov.uk/dataset/b1f5c467-ed41-4e8f-89d7-f79a76645fd6/water-resource-availability-and-abstraction-reliability-cycle-2> (April 2021)



associated with an option. These assessments often include an indication of water availability under different flow conditions, which adds specificity to potential operational considerations such as hands-off flow conditions.

- Review the regulatory position on WFD hydrology, including the pass-forward flow from rivers to transitional waters.
- Review the regulatory position on the extent of influence of flow on status elements failing their targets, including biological status elements, physico-chemical status elements, hydro-morphology and groundwater quantitative status.
- For surface waters, review the likely changed river flow regime against measured river flows from the long-term records of nearby gauging stations held on the National River Flow Archive<sup>14</sup>, to inform the magnitude of change in flow.

Where the hydrogeological/hydrological appraisal identifies operational activities that are considered with confidence to be low impact these will be concluded as WFD compliant, subject to review of local WFD protected areas.

### Step 3: Impact assessment

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

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

For each option, a source-pathway-receptor approach to identifying effects on WFD Assessment Objectives has been undertaken. In this approach, the source of change is the construction or operational activity, the pathway is any physical environment changes such as in water levels, flow velocities, morphology or water quality, and the receptor is the WFD status element or the WFD protected area. All relevant WFD status elements have been considered, according to the water body type:

- Groundwater bodies: Quantitative tests including dependent surface water body status, groundwater dependent terrestrial ecosystems (GWDTE), saline intrusion and water balance. Chemical tests including dependent surface water body status, GWDTEs, drinking water protected areas, saline intrusion and general quality.
- River water bodies: fish, invertebrates, macrophytes, physico-chemical water quality, chemicals;

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<https://data.gov.uk/dataset/54181453-b5bd-4694-96b2-a1b5d40985b5/groundwater-management-units-coloured-according-to-water-resource-availability-colours> (September 2020)

<sup>14</sup> <https://nrfa.ceh.ac.uk/data/search>

- Transitional water bodies: phytoplankton, angiosperms, macroalgae, invertebrates, fish, physico-chemical water quality, chemicals.

Each element is assessed individually, and the worst-case compliance conclusion is taken as the overall conclusion for the water body (i.e., if one element is non-compliant, then the water body will be identified as being non-compliant), in line with Environment Agency (2011)<sup>15</sup>.

A confidence rating has been assigned to all assessments to reflect the amount of uncertainty in the option design, environmental baseline, and magnitude of impact. The confidence level categories that have been used are presented in **Table 2.2**.

Table 2.2 WFD compliance assessment confidence level categories

Confidence category	Description
<b>Low</b>	Known WFD compliance risks/ failures and potential pathways from option's activities - where assessment based on expert judgement alone
<b>Medium</b>	Reasonable levels of evidence for at risk activities. Some assumptions and expert opinion required around risk areas.
<b>High</b>	Good level of evidence with minimal assumptions or low risk activity

#### Step 4: Detailed impact assessment

The UKWIR (2021) guidance identifies that where there remains low confidence as to whether an option is compliant with the WFD Assessment Objectives and the option is included in the preferred or alternative plan, a more detailed impact assessment (which may include bespoke groundwater modelling) is required.

In the case of UU's WRMP development, a number of the options are included in the North West Transfer (NWT) Strategic Resource Option (SRO) at Gate 2. All of those options are subject to more detailed assessment at the individual option level, which can therefore be considered to constitute the first stages of a Step 4 assessment, as presented in Wood (2022a and 2022b) at Gate 2, and most recently WSP (2024) for a Checkpoint assessment between Gates 2 and 3. This more detailed evidence collection and assessment is continuing and will allow quantitative assessments with greater levels of confidence at later stages in the NWT programme.

Within this WFD compliance assessment report, the findings of the NWT assessments are presented within the Step 3 framework, for simplicity of reporting. For these options, the 'confidence' rating has been used to reflect a precautionary approach based on the stage of NWT assessment. Where assessments are still ongoing, in some cases "Potentially non-compliant (low confidence)" has been used this WRMP assessment, for options that may be ultimately concluded to be compliant but the NWT assessments have not yet been completed.

The NWT assessments have included detailed quantitative assessments of flow impacts, across the full flow duration curve. In general, the impacts are greater at low flows and negligible at higher

<sup>15</sup> Environment Agency (2011) Method statement for the classification of surface water bodies

flows, due to the nature of the options, so the flow summaries carried across to this report have focussed on low flows.

## **Stage 2: Programme level cumulative assessment**

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

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

## **Stage 3: Assessment of the Preferred WRMP against other plans and projects**

The potential in-combination impact of the whole WRMP, regional WRMP and with WRMPs for other water companies has been considered. If assessment were to be necessary, then a similar process to that identified above for the individual options would be used.

## **2.3 Consultation on methodology**

A draft WFD compliance assessment methodology report was issued to the regulators (the Environment Agency and Natural England) on 8th April 2021 to set out the method for completing the WFD compliance assessments for the water companies in the WRW region. A meeting was held with regulators on 28 April 2021 and comments on the report were received to get regulatory feedback on the draft methodology report. These comments were addressed and a Final WFD compliance assessment methodology report and comment log were issued to the regulators on 16th July 2021.

## 3. Option-level (Stage 1) WFD Assessment outcomes

This section outlines the outcomes of the WFD compliance assessment at an option-level for each of the options in the feasible list.

### 3.1 Options included in the WFD Compliance Assessment

Through an extensive optioneering process, considering a wide range of potential options to balance future supply and demand, United Utilities have selected the most suitable options to make up the feasible and constrained options<sup>16</sup> lists. This list includes both demand side and supply side options, of which only the latter require a WFD Compliance Assessment. The supply side options are presented in **Table 3.1** (this includes all constrained options, as well as some feasible options that were considered at the time of the draft plan but have since been removed for various reasons).

For clarity, a “final step” column has been included, to identify to which step the assessment has been taken. In summary:

- All options that have been assessed as part of the North West Transfer have been taken to Step 4, in the sense that (as discussed in Section 2) they have been subject to a more detailed level of assessment. The assessments for these options have been updated for the final plan in Table 3.1, in line with the most recent NWT assessments (WSP, 2024<sup>17</sup>);
- All other options have been taken to Step 1, 2 or 3, depending on the nature of the option (as set out in the methodology in Section 2). The assessment outcome presented for these options is as concluded at the time of the feasible options assessments. The assessments for these options have not been updated since the draft plan, since no more recent information was available.

Additional columns have been added to the right-hand side of the table to confirm the likely final outcome of a WFD Compliance Assessment for each option individually. Some options that are shown as “Potentially non-compliant” have been concluded as such due to limited information about the scheme and potential environmental impacts, some of which could be addressed through further design and assessment. The “Likelihood of final WFD non-compliance” column and accompanying “Justification” column therefore sets out whether it is likely that an assessment of that option will ultimately be able to conclude compliance<sup>18</sup>.

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<sup>16</sup> Constrained options are feasible options that have passed through secondary screening (environmental and cost effectiveness)

<sup>17</sup> WSP (2024) North West Transfer SRO: Priority Action 3 Checkpoint- Environmental Assessments of Sub-Options.

<sup>18</sup> For options where the feasible options assessment concluded “potentially non-compliant”, the likelihood of final non-compliance is Low, Medium or High. For options where the feasible options assessment concluded “compliant”, the

## 3.2 Option level WFD Compliance Assessment

This section presents a summary of the option level WFD Compliance Assessment for all options included in the constrained list. It is the outcome of methodological Stage 1, which includes a summary of the screening (methodological Step 1 and Step 2) and impact assessment (methodological Step 3). These are reported in full in **Appendix A** and **Appendix B** respectively, with a summary in **Table 3.1**.

In summary, the list of constrained options includes:

- 17 options that are anticipated to be compliant with the WFD;
- 40 options that are potentially non-compliant (with low confidence);
- 37 options that are potentially non-compliant (with medium confidence);
- 4 options that are expected to be non-compliant (with high confidence).

Note that this total included two options (WR159 and WR160) that were subsequently combined during the revised feasible options development process.

The assessment for the majority of constrained options is as presented in the draft plan in 2022. The exception is for options that have also been assessed as part of the NWT SRO, where the evidence base has developed further since the draft plan: the assessments for these options have been updated to be in line with the assessments undertaken for the NWT Gate 3 Priority Action 3 Checkpoint Report (issued to regulators in May 2024).

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likelihood of final non-compliance is None or Very Low, depending on whether the abstraction involves any changes to the water environment.

Table 3.1 Summary of WFD Compliance Assessment of Feasible Options

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
Run-of-river abstraction	ICT_WIRRAL	STT019	Compliant (Step 2)		Step 2		None	No new/increased abstraction from the water environment.
Groundwater abstraction	IGA_CROASDALE	STT022	Potentially non-compliant (low conf.)	A potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Requires quantified assessment of impact on aquifer and dependent surface water bodies, but current status of relevant elements is Good or High (except for persistent Priority Substances).
Run-of-river abstraction	SWN_RIVER LUNE	STT029	Potentially non-compliant (med. conf.)	New river abstraction could cause a major hydrological impact due to 34.2% decrease in flows at Q95 and due to restricted water available across the flow regime. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	Potential for a HOF to be agreed that would avoid non-compliance, although potentially at a relatively high flow. Requires assessment of potential impacts on in-river ecology and water quality.
Reservoir (new abstraction)	RES_HOLLINGWORTH	STT034	Potentially non-compliant (med. conf.)	Hollingworth Lake is understood to provide compensation flow to the River Roch and Rochdale Canal. Further detail would be required to confirm whether the option could reduce those flows, with subsequent potential to cause water quality deterioration through reduced dilution. Water discharged to [REDACTED] Reservoir could cause changes to the water quality and transfer of INNS are possible.	Step 3		Medium	Risks to INNS and chemicals associated with transfer of water between water bodies. Requires assessment of potential impacts on ecology and water quality.
Run-of-river abstraction	SWN_RIVER ROCH	STT041	Potentially non-compliant (med. conf.)	New river abstraction could reduce Q95 flows in the River Roch by 14% with limited water availability. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Option impact would be in line with STT041b (the Roch component only), which was assessed for NWT Gate 2. See Option STT041b for details.
Run-of-river abstraction	SWN_RIVER IRWELL_ROCH	STT041b	Potentially non-compliant (low conf.)	The NWT Gate 2 assessment calculated that on the Roch, the new abstraction is anticipated to reduce Q95 flows by up to 10.3% compared to gauged in the 'all years' utilisation scenario, and 15.3% in the 1 in 500-year utilisation. Below the Irwell abstraction, the Q95 impact could reach up to 10% in the 'all years' scenario, and 17% in the 1 in 500-year scenario. The catchment is discharge-rich, with discharges supporting flows above natural at low flows. The Environment Agency's water availability summary from March 2022 stated that water would be available for the Roch and Irwell abstractions individually.  Potential non-compliance is identified in NWT Gate 2 assessment, recognising the need for further assessments to come, including in relation to fish passage and water quality.	Step 4		Low	Would require further assessments to understand potential risks to ecology and water quality, including fish barrier surveys and water quality modelling, in line with NWT Gate 2 recommendations (this option has not been included in NWT beyond Gate 2, with WR015a2 being progressed in preference, involving abstraction only from the Irwell).  Both rivers are discharge rich. It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Enabling works	STTA1 NWT_VYRNWY 1	STTA1	Compliant (Step 1)		Step 1		None	No new/increased abstraction from the water environment.
Enabling works	STTA1 NWT_VYRNWY 2	STTA2	Compliant (Step 1)		Step 1		None	No new/increased abstraction from the water environment.
Enabling works	STTA1 NWT_VYRNWY 3	STTA3	Compliant (Step 1)		Step 1		None	No new/increased abstraction from the water environment.
Enabling works	STTA1 NWT_VYRNWY 4	STTA4	Compliant (Step 1)		Step 1		None	No new/increased abstraction from the water environment.
Run-of-river abstraction	SWN_GLAZE BROOK	WR006	Potentially non-compliant (med. conf.)	New river abstraction could reduce Q95 flows in Glaze Brook by up to 22%. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	Existing failures of biological and water quality elements, and ALS indicates restricted water available. Although there is potential for a HOF to be agreed, the risk of introducing impediments remains.



Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
Run-of-river abstraction	SWN_RIVER GRETA	WR010	Potentially non-compliant (med. conf.)	New river abstractions could reduce Q95 flows by 40% in the River Wenning. Potential impacts are flow change effects on ecology and water quality dilution, with specific impacts on fish noted for the River Wenning and Lune.	Step 3		Medium	Potential for a HOF to be agreed that would avoid non-compliance, although potentially at a relatively high flow. Requires assessment of potential impacts on in-river ecology and water quality.
Run-of-river abstraction	SWN_RIVER IRWELL	WR015a1	Potentially non-compliant (low conf.)	A HOF would be applied to the abstraction, which is currently assumed to be at Q98. This would reduce the impacts of abstraction as flows approach Q98, and avoid any impact at all from Q98 and below. The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that, without a HOF, impacts at Q95 could be up to 11% of gauged flow, but with a HOF this would be reduced to 4%. The catchment is discharge-rich. The assessment currently considers that the option could potentially be non-compliant (low confidence) in relation to water quality elements.	Step 4		Low	Further assessments will be carried out as part of the NWT SRO process to quantify potential risks to ecology and water quality.  It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Run-of-river abstraction	SWN_RIVER IRWELL	WR015a2	Potentially non-compliant (low conf.)	A HOF would be applied to the abstraction, which is currently assumed to be at Q98. This would reduce the impacts of abstraction as flows approach Q98, and avoid any impact at all from Q98 and below. The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that, without a HOF, impacts at Q95 could be up to 17% of gauged flow, but with a HOF this would be reduced to 6%. The catchment is discharge-rich. The assessment currently considers that the option could potentially be non-compliant (low confidence) in relation to water quality and biological elements.	Step 4		Low	Further assessments will be carried out as part of the NWT SRO process to quantify potential risks to ecology and water quality.  It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Run-of-river abstraction	SWN_RIVER GOYT	WR017	Potentially non-compliant (low conf.)	Point source water quality pressures and effected diatoms could be further impacted by a 7% decrease in Q95 flows as a result of the new river abstraction.	Step 3		Low	Limited proportional impact on flow, and potential for a HOF to be agreed that would avoid any non-compliance. Possible need for assessment of potential impacts on ecology and water quality.
Run-of-river abstraction	SWN_RIVER RIBBLE 26a	WR026a	Potentially non-compliant (med. conf.)	New river abstraction could reduce Q95 flows in the River Ribble by up to 10%. Potential impacts are flow change effects on ecology and water quality dilution. Water discharged to [REDACTED] Reservoir could cause changes to the water quality and transfer of INNS are possible.	Step 3		Low	Limited proportional impact on flow, and potential for a HOF to be agreed that would avoid any non-compliance. Possible need for assessment of potential impacts on ecology and water quality, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	SWN_RIVER RIBBLE 26ab	WR026b	Potentially non-compliant (low conf.)	New river abstraction could reduce Q95 flows in the River Ribble by up to 7%. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Limited proportional impact on flow, and potential for a HOF to be agreed that would avoid any non-compliance. Possible need for assessment of potential impacts on ecology and water quality.
Run-of-river abstraction	SWN_RIVER RIBBLE 26c	WR026c	Compliant (low conf.)			Reasonable Alternative Plan	Very Low	Review of the regulatory position of water availability and magnitude of flow change indicates the abstraction would be WFD compliant (potentially with a HOF).
Reservoir (raise height)	RES_HAWESWATER a	WR037a	Potentially non-compliant (low conf.)	Raising the top water level of Haweswater Reservoir by 0.5m could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats. It could also impact the downstream watercourse by altering the reservoir over-topping regime and river high flows.	Step 3		Low	Limited change to hydrology of reservoir and downstream watercourse.
Reservoir (raise height)	RES_HAWESWATER ab	WR037b	Potentially non-compliant (low conf.)	Raising the top water level of Haweswater Reservoir by 1m could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting	Step 3		Low	Limited change to hydrology of reservoir and downstream watercourse.

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
				impacts on ecological populations, particularly shoreline habitats. It could also impact the downstream watercourse by altering the reservoir over-topping regime and river high flows.				
Run-of-river abstraction	SWN_RIVER EAMONT	WR038	Potentially non-compliant (low conf.)	Restricted/no water availability at medium-high flows due to Ullswater located upstream. Low confidence as abstraction at bottom of catchment and water available in the River Eden catchment, so any impacts will be localised.	Step 3		Low	Limited proportional impact on flow, and potential for a HOF to be agreed that would avoid any non-compliance. Low retained due to Eden designation as SAC.
Run-of-river abstraction	SWN_RIVER IRTHING	WR041	Compliant (med. conf.)	Concluded to be compliant based on low proportional impact on flow and water being available in the ALS.	Step 3		Very low	Although concluded to be 'compliant', further consideration may need to be given to potential for impact on River Eden SAC downstream.
Run-of-river abstraction	SWN_RIVER ESK	WR042	Compliant (Step 2)		Step 2		Very Low	Review of the regulatory position of water availability and magnitude of flow change indicates the abstraction would be WFD compliant (potentially with a HOF).
Run-of-river abstraction	SWN_RIVER PETTERIL	WR043	Potentially non-compliant (med. conf.)	New river abstraction could reduce Q95 flows in the River Petteril by up to 26%. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	Potential for a HOF to be agreed that would avoid non-compliance, although potentially at a relatively high flow. Requires assessment of potential impacts on in-river ecology and water quality.
Run-of-river abstraction	SWN_RIVER RIBBLE 49a	WR049a	Compliant (low conf.)		Step 3		Very Low	Review of the regulatory position of water availability and magnitude of flow change indicates the abstraction would be WFD compliant (potentially with a HOF).
Run-of-river abstraction	SWN_RIVER RIBBLE 49b	WR049b	Potentially non-compliant (med. conf.)	Flows in the River Ribble could be reduced by 8% at Q95. Potential impacts are flow change effects on ecology and water quality dilution. Water discharged to ██████████ Reservoir could cause changes to the water quality and transfer of INNS are possible.	Step 3		Medium	Limited proportional impact on flow, and potential for a HOF to be agreed that would avoid any non-compliance. Possible need for assessment of potential impacts on ecology and water quality, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	SWN_RIVER RIBBLE 49bc	WR049c	Potentially non-compliant (med. conf.)	Flows in the River Ribble could be reduced by 11% at Q95. Potential impacts are flow change effects on ecology and water quality dilution. Water discharged to ██████████ Reservoir could cause changes to the water quality and transfer of INNS are possible.	Step 3		Medium	Limited proportional impact on flow, and potential for a HOF to be agreed that would avoid any non-compliance. Possible need for assessment of potential impacts on ecology and water quality, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	SWN_RIVER RIBBLE 49d	WR049d	Compliant (low conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that the proposed abstraction (maximum capacity 40 MI/d) could reduce flows by up to 9% at Q95 without a HOF, but this would be avoided by the anticipated HOF at Q95. The assessment currently considers that the option should be compliant (low confidence) with the WFD as a result of the low proportional impact on flows (although this does not discount the possibility of some localised impacts).  (Earlier iterations of this WRMP assessment presented this option as potentially non-compliant (low conf.). This has been revised following further work undertaken for the Gate 3 Checkpoint.)	Step 4		Low	Impacts on flow are modest, and protected by a Q95 HOF. Further assessments will be carried out as part of the NWT SRO process to increase confidence in the conclusions in relation to ecology and water quality.  It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Run-of-river abstraction	SWN_RIVER RIBBLE 49d	WR049e	Potentially non-compliant (low conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that the proposed abstraction (maximum capacity 60 MI/d) could reduce flows by up to 13% at Q95 without a HOF, but this would be avoided by the anticipated HOF at Q95. Due to the higher rate of abstraction compared to WR049d, there is slightly less certainty around potential impacts on biological elements,	Step 4		Low	Impacts on flow are relatively modest, and protected by a Q95 HOF. Further assessments will be carried out as part of the NWT SRO process to increase confidence in the conclusions in relation to ecology and water quality.



Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
				hence the precautionary conclusion of potentially non-compliant.				It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Run-of-river abstraction	SWE_NORTH CUMBRIA	WR055	Compliant (Step 2)		Step 2		Very low	Review of the regulatory position of water availability and magnitude of flow change indicates the abstraction would be WFD compliant (potentially with a HOF). However further consideration may need to be given to potential for impact on River Eden SAC downstream.
Reservoir (increase abstraction)	RES_WORTHINGTON a	WR062a	Compliant (Step 1)		Step 1		None	Utilisation of existing raw water intake system from existing reservoir.
Reservoir (increase abstraction)	RES_WORTHINGTON b	WR062b	Compliant (Step 2)		Step 2		None	Utilisation of existing raw water intake system from existing reservoir.
Reservoir (raise height)	RES_WATERGROVE	WR065a	Potentially non-compliant (low conf.)	Raising the top water level of Watergrove Reservoir by 1m could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats. It could also impact the downstream watercourse by altering the reservoir over-topping regime and river high flows.	Step 3		Low	Assume that an agreed reservoir release regime would be agreed as part of licensing. Limited change to hydrology of reservoir and downstream watercourse.
Reservoir (raise height)	RES_WHITEHOLME	WR065b	Compliant (med. conf.)		Step 3	Reasonable Alternative Plan	Very Low	Option is reinstating the reservoir to its previous condition as of approx. 2015.
Run-of-river abstraction	SWN_RIVER DARWEN	WR074	Potentially non-compliant (med. conf.)	Flows in the River Darwen could be reduced by between 10-38% at Q95 (depending on abstraction location). Potential impacts are flow change effects on ecology and water quality dilution. Water discharged to ██████ Reservoir could cause changes to the water quality and transfer of INNS are possible.	Step 3		Medium	Potential for a HOF to be agreed that would avoid any non-compliance, although potentially at a relatively high flow (depending on abstraction location). Possible need for assessment of potential impacts on ecology and water quality, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	SWN_RIVER BOLLIN	WR076	Potentially non-compliant (low conf.)	A HOF would be applied to the abstraction, which is currently assumed to be at Q98. This would reduce the impacts of abstraction as flows approach Q98, and avoid any impact at all from Q98 and below. The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that, without a HOF, impacts at Q95 could be up to 21% of gauged flow, but with a HOF this would be reduced to 2%. The catchment is discharge rich, with low flows elevated above natural. The assessment currently considers that the option could potentially be non-compliant (low confidence) in relation to water quality and fish elements. Other elements are assessed as compliant (low confidence).	Step 4		Low	Further assessments will be carried out as part of the NWT SRO process leading up to Gate 3, to quantify potential risks to ecology and water quality.  It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Reservoir (raise height)	RES_DOVESTONE	WR077a	Potentially non-compliant (low conf.)	Raising the top water level of Dovestone Reservoir by 1m could change the hydrological regime and morphological conditions within the reservoir and impact the downstream watercourse by altering the reservoir over-topping regime and river high flows.	Step 3		Low	Assume that an agreed reservoir release regime would be agreed as part of licensing. Limited change to hydrology of reservoir and downstream watercourse.
Reservoir (raise height)	RES_ERRWOOD	WR077b	Potentially non-compliant (low conf.)	Raising the top water level of Errwood Reservoir by 1m could change the hydrological regime and morphological conditions within the reservoir and impact the downstream watercourse by altering the reservoir over-topping regime and river high flows.	Step 3		Low	Assume that an agreed reservoir release regime would be agreed as part of licensing. Limited change to hydrology of reservoir and downstream watercourse.
Reservoir (raise height)	RES_FERNILEE	WR077c	Potentially non-compliant (low conf.)	Raising the top water level of Fernilee Reservoir by 1m could change the hydrological regime and morphological conditions	Step 3		Low	Assume that an agreed reservoir release regime would be agreed as part of licensing. Limited

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
				within the reservoir and impact the downstream watercourse by altering the reservoir over-topping regime and river high flows.				change to hydrology of reservoir and downstream watercourse.
Reservoir (increase abstraction)	RES_APPLETON a	WR079a	Potentially non-compliant (low conf.)	Reinstatement of surface water abstraction of 3 MI/d from Appleton Reservoir (currently used for fire-fighting supply only) could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats	Step 3		n/a	Further investigations subsequent to the feasible options assessment determined that there is insufficient yield in the reservoir for the option to proceed.
Reservoir (increase abstraction)	RES_APPLETON b	WR079b	Potentially non-compliant (low conf.)	Reinstatement of surface water abstraction of 6 MI/d from Appleton Reservoir (currently used for fire-fighting supply only) could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats	Step 3		n/a	Further investigations subsequent to the feasible options assessment determined that there is insufficient yield in the reservoir for the option to proceed.
Reservoir (increase abstraction)	RES_APPLETON c	WR079c	Potentially non-compliant (low conf.)	Reinstatement of surface water abstraction of 9 MI/d from Appleton Reservoir (currently used for fire-fighting supply only) could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats	Step 3		n/a	Further investigations subsequent to the feasible options assessment determined that there is insufficient yield in the reservoir for the option to proceed.
Reservoir (increase abstraction)	RES_APPLETON d	WR079d	Potentially non-compliant (low conf.)	Reinstatement of surface water abstraction of 12.5 MI/d from Appleton Reservoir (currently used for fire-fighting supply only) could change the hydrological regime and morphological conditions within the reservoir, and water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats	Step 3		n/a	Further investigations subsequent to the feasible options assessment determined that there is insufficient yield in the reservoir for the option to proceed.
Treated water transfer	ITC_CARLISLE	WR084	Compliant (Step 2)		Step 2		None	No new/increased abstraction from the water environment.
Groundwater abstraction	GWE_ROUGHTON GILL	WR095	Potentially non-compliant (low conf.)	A new abstraction of 2.2 MI/d from Roughton Gill Mine, which is assumed to discharge into Whelpo (Cald) Beck, is assessed as a decreased river discharge, where the ALS indicates restricted water availability at Q95. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Given the relatively small size of the abstraction, and its indirect impact on surface water, it is relatively unlikely to remain non-compliant. However, more detailed investigation and understanding is required to draw a conclusion.
Groundwater abstraction	GWE_BURNLEY a	WR099a	Potentially non-compliant (med. conf.)	A change in water balance status of the groundwater body from good to poor between 2015 and 2019 suggests that there are potential issues that may be exacerbated by abstraction. The water discharged to the River Brun may have an impact on the water quality of the watercourse as it may be of different phys-chem composition.	Step 3		Medium	Option within existing licence, although water balance status of aquifer is Poor, and licence changes would need to be discussed with the EA for use as a compensation borehole. Assessment required of impact on receiving watercourse, to establish baseline hydrological and ecological conditions.
Groundwater abstraction	GWE_BURNLEY b	WR099b	Potentially non-compliant (med. conf.)	A change in water balance status of the groundwater body from good to poor between 2015 and 2019 suggests that there are potential issues that may be exacerbated by abstraction. Water discharged to ██████████ Reservoir could cause changes to the water quality and transfer of INNS are possible (although not likely as groundwater source).	Step 3		Low	Option within existing licence, although water balance status of aquifer is Poor, and licence changes would need to be discussed with the EA (for use as a transfer licence). Assessment required of impact on receiving waterbody, but considered relatively low risk since it is an existing reservoir.
Groundwater abstraction	GWE_BURNLEY c	WR099c	Potentially non-compliant (med. conf.)	A change in water balance status of the groundwater body from good to poor between 2015 and 2019 suggests that there are potential issues that may be exacerbated by abstraction.	Step 3		Low	Option within existing licence, although water balance status of aquifer is Poor.
Groundwater abstraction	GWE_THORNCLIFFE	WR100	Potentially non-compliant (med. conf.)	Although the 2019 water balance status is good, the ALS indicates restricted water availability for the North Furness aquifer (0 MI/d available; reason - over licensed on water balance), therefore an increase in abstraction volume of 4.5 MI/d has the potential to cause deterioration.	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
Groundwater abstraction	GWE_FRANKLAW	WR101	Potentially non-compliant (med. conf.)	The ALS indicates there is no water available for the groundwater body. A potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with fully licensed abstraction. This could result in this option being concluded to be non-compliant.
Groundwater abstraction	GWE_WIDNES	WR102b	Potentially non-compliant (med. conf.)	NWT Gate 2 assessment: The Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone groundwater body is potentially non-compliant for dependent surface water body status, saline intrusion, water balance and chemical status. Of these, saline intrusion and water balance have been assigned medium confidence of non-compliance, based on classification information at the GWMU level. The Environment Agency has indicated that there is insufficient water available for the proposed option capacity based on current evidence. Therefore, additional abstraction could lead to deterioration in quantitative water balance of the aquifer. The proposed option is within existing abstraction licence but would increase recent actual levels of abstraction.	Step 4		Medium	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. Groundwater balance and impacts on surface water body flow will be quantified and revised based on outcomes of the updated Lower Mersey & North Merseyside groundwater model (for NWT Gate 3), and further work will be undertaken in relation to saline intrusion risks. The likely outcomes are uncertain at this stage. (This option has not been included in NWT beyond Gate 2, due to WR102f being progressed in preference, involving only abstraction from [REDACTED])
Groundwater abstraction	GWE_BOLD HEATH	WR102e	Potentially non-compliant (med. conf.)	The ALS indicates that there is limited/restricted water availability in the aquifer, therefore, additional abstraction could lead to deterioration in quantitative water balance of the aquifer. There is historic saline intrusion in the area.	Step 3		Medium	Option requires new licence to be agreed, and EA's water availability assessment indicates that restricted water is available. Assessment would need to be updated based on outcomes of the updated Lower Mersey & North Merseyside groundwater model.
Groundwater abstraction	GWE_WIDNES	WR102f	Potentially non-compliant (low conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is potentially non-compliant (low confidence) for dependent surface water body status, saline intrusion and water balance. This conclusion is subject to further planned refinements of the Lower Mersey Basin groundwater model and saline intrusion studies. The proposed option is within the existing abstraction licence but would increase recent actual levels of abstraction.	Step 4		Medium	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. Groundwater balance and impacts on surface water body flow will be quantified and revised based on outcomes of the updated Lower Mersey & North Merseyside groundwater model (for NWT Gate 3), and further work will be undertaken in relation to saline intrusion risks. The likely outcomes are uncertain at this stage.
Groundwater abstraction	GWE_LYMM a1	WR105a1	Potentially non-compliant (med. conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is potentially non-compliant (low confidence) for saline intrusion. This conclusion is subject to further planned refinements of the Lower Mersey Basin groundwater model and saline intrusion studies. The proposed option is within the existing abstraction licence but would increase recent actual levels of abstraction.	Step 4		Medium	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. Revised groundwater balance and impacts on surface water body flow will be quantified and revised based on outcomes of the updated Lower Mersey & North Merseyside groundwater model (for NWT Gate 3), and further work will be undertaken in relation to saline intrusion risks. The likely outcomes are uncertain at this stage.
Groundwater abstraction	GWE_LYMM a2	WR105a2	Potentially non-compliant (med. conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is potentially non-compliant (low confidence) for saline intrusion. This conclusion is subject to further planned refinements of the Lower Mersey Basin groundwater model and saline intrusion studies. The proposed option is within the existing abstraction licence but would increase recent actual levels of abstraction.	Step 4		Medium	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. Revised groundwater balance and impacts on surface water body flow will be quantified and revised based on outcomes of the updated Lower Mersey & North Merseyside groundwater model (for NWT Gate 3), and further work will be

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
								undertaken in relation to saline intrusion risks. The likely outcomes are uncertain at this stage.
Groundwater abstraction	GWE_LYMM b1	WR105b1	Potentially non-compliant (med. conf.)	The ALS indicates that there is limited/restricted water availability in the aquifer, therefore, additional abstraction could lead to deterioration in quantitative water balance of the aquifer. There is historic saline intrusion in the area.	Step 3		Medium	Option impact would be in line with WR105a1, which has been assessed for NWT Gate 3 checkpoint. See Option WR105a1 for details.
Groundwater abstraction	GWE_LYMM b2	WR105b2	Potentially non-compliant (med. conf.)	The ALS indicates that there is limited/restricted water availability in the aquifer, therefore, additional abstraction could lead to deterioration in quantitative water balance of the aquifer. There is historic saline intrusion in the area.	Step 3		Medium	Option impact would be in line with WR105a1, which has been assessed for NWT Gate 3 checkpoint. See Option WR105a1 for details.
Groundwater abstraction	GWE_WALTON_1	WR106a	Potentially non-compliant (med. conf.)	The ALS indicates that there is limited/restricted water availability in the aquifer, therefore, additional abstraction could lead to deterioration in quantitative water balance of the aquifer. There is suspected saline intrusion. The proximity of surface watercourses and restricted surface water availability means any drawdown may have an impact.	Step 3		Medium	Option impact would be in line with WR106b, which has been assessed for NWT Gate 3 checkpoint. See Option WR106b for details.
Groundwater abstraction	GWE_WALTON_2	WR106b	Potentially non-compliant (med. conf.)	<p>The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is potentially non-compliant (low confidence) for dependent surface water bodies and saline intrusion. This conclusion is subject to further planned refinements of the Lower Mersey Basin groundwater model and saline intrusion studies.</p> <p>The proposed option is within the existing abstraction licence but would increase recent actual levels of abstraction.</p>	Step 4		Medium	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. Revised groundwater balance and impacts on surface water body flow will be quantified and revised based on outcomes of the updated Lower Mersey & North Merseyside groundwater model (for NWT Gate 3), and further work will be undertaken in relation to saline intrusion risks. The likely outcomes are uncertain at this stage.
Groundwater abstraction	GWE_AUGHTON PARK a1	WR107a1	Non-compliant (high conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that option WR107a2 is non-compliant (high confidence) for groundwater balance and dependent surface water bodies. The same conclusion would be expected for this option.	Step 4		High	Option impact would be in line with WR107a2, which has been assessed for NWT Gate 2. See Option WR107a2 for details.
Groundwater abstraction	GWE_AUGHTON PARK a2	WR107a2	Non-compliant (high conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is non-compliant (high confidence) for groundwater balance and dependent surface water bodies. This option would require a new abstraction licence.	Step 4		High	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. It is not expected that planned refinements to the groundwater model will make a significant difference to the conclusions. No further work is proposed for this option as part of NWT, and it is not considered to be a feasible WRMP option.
Groundwater abstraction	GWE_RANGLES BRIDGE	WR107b	Non-compliant (high conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is non-compliant (high confidence) for groundwater balance and dependent surface water bodies.	Step 4		High	Outputs from the Lower Mersey & North Merseyside groundwater model have provided quantified evidence. It is not expected that planned refinements to the groundwater model will make a significant difference to the conclusions. No further work is proposed for this option as part of NWT, and it is not considered to be a feasible WRMP option.
Groundwater abstraction	GWE_WOODFORD	WR111	Potentially non-compliant (high conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is non-compliant (high conf.) for groundwater balance and potentially non-compliant (low conf.) for dependent surface water bodies.	Step 4		High	Outputs from the East Cheshire groundwater model have provided quantified evidence. No further work is proposed for this option as part of NWT.
Groundwater abstraction	GWE_TYThERINGTON	WR113	Potentially non-compliant (high conf.)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) concluded that this option is non-compliant (high conf.) for groundwater balance and potentially non-compliant (low conf.) for dependent surface water bodies.	Step 4		High	Outputs from the East Cheshire groundwater model have provided quantified evidence. No further work is proposed for this option as part of NWT.



Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
Groundwater abstraction	GWE_CROSS HILL_1	WR120a	Potentially non-compliant (med. conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution. Also, Poor status Chemical drinking water protected area	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.
Groundwater abstraction	GWE_CROSS HILL_2	WR120b	Potentially non-compliant (med. conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution. Also, Poor status Chemical drinking water protected area	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.
Groundwater abstraction	GWE_EATON a	WR121a	Potentially non-compliant (med. conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.
Groundwater abstraction	GWE_EATON b	WR121b	Potentially non-compliant (med. conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.
Groundwater abstraction	GWE_NEWTON HOLLOWS	WR122	Potentially non-compliant (med. conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	This source has been subject to AMP7 WINEP investigation, which has identified risks of WFD non-compliance associated with the abstraction. Investigation due March 2023.
Groundwater abstraction	GWE_NORTH SHROPSHIRE	WR125	Potentially non-compliant (med. conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with fully licensed abstraction. This could result in this option being concluded to be non-compliant.
Groundwater abstraction	GWE_FAIRHILL	WR127	Potentially non-compliant (low conf.)	Potential connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Option within existing licence, and there is currently water available in the aquifer and connected surface water.
Groundwater abstraction	GWN_TARN WOOD	WR128	Potentially non-compliant (low conf.)	Potential connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Option within existing licence, and there is currently water available in the aquifer and connected surface water.
Run-of-river abstraction	EFR_HORWICH	WR140	Potentially non-compliant (med. conf.)	Flows in the River Douglas could be reduced by 14.3% at Q95. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Impacts on flow are relatively modest. It is likely that risks associated with low flows (including any potential consequences for ecology or water

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
								quality) could be mitigated by a HOF being applied.
Run-of-river abstraction	EFR_ROSENDALE	WR141	Potentially non-compliant (med. conf.)	Flows in the River Irwell could be reduced by 16% at Q95. Potential impacts are flow change effects on ecology and water quality dilution.	Step 3		Low	Impacts on flow are relatively modest. It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) could be mitigated by a HOF being applied.
Run-of-river abstraction	SWN_RIVER TAME	WR144	Potentially non-compliant (low conf.)	A HOF would be applied to the abstraction, which is currently assumed to be at Q98. This would reduce the impacts of abstraction as flows approach Q98, and avoid any impact at all from Q98 and below. The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that impacts at Q95 would be 4.6% of gauged flow. The catchment is discharge-rich. The assessment currently considers that the option could potentially be non-compliant (low confidence) in relation to water quality elements, as a result of baseline water quality constraints.	Step 4		Low	Flow impacts are relatively limited. It is possible that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied, although further mitigation may be needed in relation to water quality.
Groundwater abstraction	GWN_NORTH CUMBRIA	WR148	Potentially non-compliant (low conf.)	Potential strong connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows due to reductions in baseflow or increased losses to ground resulting from the new groundwater abstraction. Potential impacts are flow change effects on ecology and water quality dilution. Also, Poor status Chemical drinking water protected area	Step 3		Low	There is currently water available in the aquifer and connected surface water.
Groundwater abstraction	ITC_WIGAN	WR149**	Potentially non-compliant (med. conf.)	NWT Gate 2 assessment: The Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone groundwater body is potentially non-compliant for dependent surface water body status, GWDEs, saline intrusion, water balance and chemical status. Of these, saline intrusion and water balance have been assigned medium confidence of non-compliance, based on classification information at the GWMU level. Gate 2 assessment concluded that the latest EA water availability update indicates that the GWMU is over-licensed, with insufficient water available for option based on current evidence. The Environment Agency has indicated that there is insufficient water available for the proposed capacity, and there are known salinity issues.  [note that the feasible options assessment had initially assigned Non-compliant (high conf.) to this option. Based on subsequent work for NWT, the conclusion has now been set at Medium confidence for consistency with the Gate 2 Groundwater options report (Wood, 2002). This does not necessarily reflect a reduced level of concern, but provides consistency in assessment approach between options. This will be reviewed with an updated groundwater model]	Step 4		Medium	Groundwater balance and impacts on surface water body flow will be quantified and revised based on outcomes of the new Lower Mersey & North Merseyside groundwater model (for Gate 3). The likely outcome is uncertain at this stage.  Further evidence collection will be undertaken in the connected surface water body/bodies, to inform impact assessment.  Option may require licence variation to be agreed. Likelihood of variation being agreed is uncertain at this stage.
Groundwater abstraction	ITC_WEST CHESHIRE 1	WR153	Potentially non-compliant (low conf.)	ALS indicates limited groundwater availability (although abstraction within licence limit) and potential connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows.	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.
Groundwater abstraction	ITC_WEST CHESHIRE 2	WR154	Potentially non-compliant (med. conf.)	ALS indicates limited groundwater availability and potential connectivity between the aquifer and surface watercourses due to geology and proximity of surface watercourses to borehole could reduce river flows. Also, close proximity to GWDE (SAC)	Step 3		Medium	This source has been subject to AMP7 WINEP, which has identified risks of WFD non-compliance associated with the abstraction. As a result, the decision was made not to progress this option for NWT.

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
Reservoir (optimise compensation release)	WR159 RWL_COMPENSATION GP 1&2	WR159 and WR160	Potentially non-compliant (low conf.)	The proposed reductions in compensation flows from the reservoirs by improvements to flow control structures and operations, will reduce the amount of flow in the receiving downstream watercourse. Potential impacts could include effects on ecology and water quality dilution	Step 3		Low	Optimising compensation releases could notably reduce flow downstream at some locations. Further assessment would be required for individual compensation releases.
Network resilience	SSO_STOCKPORT PH II	WR185	Compliant (Step 1)		Step 1	Reasonable Alternative Plan	None	No new/increased abstraction from the water environment.
Network resilience	SSO_STOCKPORT PH III	WR186	Compliant (Step 1)		Step 1		None	No new/increased abstraction from the water environment.
Run-of-river abstraction	SWE_DAMAS GILL	WR187	Potentially non-compliant (low conf.)	Due to the size of the abstraction from a relatively small stream, there is the potential for significant impacts on the in-river habitat with the potential to completely dry section of the water course. Low confidence due to the lack of hydrological information.	Step 3		Medium	Limited detail is available about this option, leaving uncertainty about the impacts: further assessment of hydrological impacts and resulting potential for impacts on ecology would be required.
Run-of-river abstraction	NIT_THIRD PARTY_21a	WR188a1	Potentially non-compliant (med. conf.)	Flows in the River Goyt could be reduced by 10.5% at Q95. Potential impacts are flow change effects on ecology and water quality dilution (particular issue for phosphate and diatoms). Transfer of raw water to Peak Forest / Macclesfield Canal has potential to transfer INNS and change water quality/chemical status.	Step 3		Low	Flow impacts are relatively limited. It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied. Possible need for assessment of potential impacts on ecology and water quality in the river and canal, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	NIT_THIRD PARTY_21b	WR188a2	Potentially non-compliant (med. conf.)	Flows in the River Goyt could be reduced by 10.5% at Q95. Potential impacts are flow change effects on ecology and water quality dilution (particular issue for phosphate and diatoms). Transfer of raw water to Peak Forest/Macclesfield Canal has potential to transfer INNS and change water quality/chemical status.	Step 3		Low	Flow impacts are relatively limited. It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied. Possible need for assessment of potential impacts on ecology and water quality in the river and canal, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	NIT_THIRD PARTY_21c	WR188b1	Potentially non-compliant (low conf.)	Abstraction may change the hydrological regime and water quality of the canal and could impact on the ecological status of the water body - low confidence due to lack of hydrological information.	Step 3		Low	Flow impacts are likely to be relatively limited due to small abstraction volume (2 Ml/d). It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Run-of-river abstraction	NIT_THIRD PARTY_21d	WR188b2	Potentially non-compliant (low conf.)	Abstraction may change the hydrological regime and water quality of the canal and could impact on the ecological status of the water body - low confidence due to lack of hydrological information.	Step 3		Low	Flow impacts are likely to be relatively limited due to small abstraction volume (2 Ml/d). It is likely that risks associated with low flows (including any potential consequences for ecology or water quality) can be mitigated by a HOF being applied.
Process losses (washwater treatment)	PRO_NORTH LANCASHIRE	WR191	Compliant (Step 1)		Step 1	Reasonable Alternative Plan	None	No new/increased abstraction from the water environment.
Run-of-river abstraction	NIT_THIRD PARTY_1	WR800	Compliant (Step 2)		Step 2		Very low	No increased abstraction from the water environment as the new abstraction would be balanced by abstraction trading.
Run-of-river abstraction	WIT_THIRD PARTY_4a	WR810a	Potentially non-compliant (low conf.)	Changes in reservoir water level could affect the water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats (SSSI and SPA/SAC status). Changes to the water quality of the receiving reservoir and transfer of INNS are possible, which could impact on the	Step 3		Medium	Limited detail is available about this option, leaving significant uncertainty about the impacts, which include potential impacts on designated sites. Likely need for assessment of potential impacts on ecology and water quality, including

Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
				ecological status of the water body as well as pose a risk of adverse effects on the River Eden SAC.				risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	WIT_THIRD PARTY_4b	WR810b	Potentially non-compliant (low conf.)	Changes in reservoir water level could affect the water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats (SSSI and SPA/SAC status).	Step 3		Low	Limited detail is available about this option, leaving significant uncertainty about the impacts, which include potential impacts on designated sites. However, this option (in comparison to WR810a) does not involve transfer between water bodies, which reduces the likelihood of a 'non-compliant' conclusion.
Run-of-river abstraction	WIT_THIRD PARTY_5	WR811	Potentially non-compliant (low conf.)	Changes in reservoir water level could affect the water edge conditions with resulting impacts on ecological populations, particularly shoreline habitats (SSSI and SPA/SAC status). Changes to the water quality of the receiving waterbody and transfer of INNS are possible, which could impact on the ecological status of the water body as well as pose a risk of adverse effects on the River Eden SAC.	Step 3		Medium	Limited detail is available about this option, leaving significant uncertainty about the impacts, which include potential impacts on designated sites. Likely need for assessment of potential impacts on ecology and water quality, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	WIT_THIRD PARTY_6a	WR812a	Potentially non-compliant (low conf.)	Changes to the water quality of the Haweswater Reservoir and transfer of INNS are possible, which could impact on the ecological status of the water body as well as pose a risk of adverse effects on the River Eden SAC.	Step 3		Medium	Limited detail is available about this option, leaving significant uncertainty about the impacts, which include potential impacts on designated sites. Likely need for assessment of potential impacts on ecology and water quality, including risks to INNS and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	WIT_THIRD PARTY_6b	WR812b	Compliant (Step 2)		Step 2		Very low	Regulator review of SRO Gate 1 options indicates resource available from Kielder Water. Assume no change to releases from Kielder to downstream watercourses.
Run-of-river abstraction	WIT_THIRD PARTY_6c	WR812c	Compliant (Step 2)		Step 2		Very low	Regulator review of SRO Gate 1 options indicates resource available from Kielder Water. Assume no change to releases from Kielder to downstream watercourses.
Run-of-river abstraction	WIT_THIRD PARTY_7	WR813	Potentially non-compliant (high conf.)	Abstraction from Scammonden Water is assessed as compliant. The transfer of raw water to Huddersfield Narrow Canal could cause changes to the water quality of the receiving water body and transfer of INNS, as well as the transfer of priority hazardous chemicals (PFOS) to the water environment within the canal, where they are not currently found.	Step 3		Medium	Need for assessment of potential impacts on ecology and water quality, including risks to chemicals (notably PFOS) and chemicals associated with transfer of water between water bodies.
Run-of-river abstraction	WIT_THIRD PARTY_8a	WR814a	Compliant (Step 1)		Step 1		None	Option involves a reduction in abstraction from the River Dee.
Run-of-river abstraction	WIT_THIRD PARTY_8c	WR814c	Potentially non-compliant (low conf.)	The proposed abstraction location could have significant effects on the River Dee (since flows will be reduced from a point higher in the catchment than the current abstraction). Could have significant effects on ecology and water quality dilution in the upper catchment, which may impact on the River Dee SSSI and Bala Lake SAC	Step 3		Medium	Limited detail is available about this option, leaving uncertainty about the impacts, which include potential impacts on designated sites. Although it may be possible to mitigate impacts from abstracting further up the catchment, e.g., with a HOF, the Abstraction Licensing Strategy has no water available in the Dee catchment.
Run-of-river abstraction	NIT_THIRD PARTY_9I	WR815	Potentially non-compliant (low conf.)	Increased releases from the reservoir to support the new canal abstraction could impact the hydrological regime and water quality within the reservoir, which in turn could impact the ecological status. Flows in the Peasey Beck could be reduced by up to 32% at Q95. Low confidence as further investigation is required to understand the hydrological interaction between Lancaster canal, Peasey Beck, and Killington Reservoir.	Step 3		Medium	Limited detail is available about this option, leaving significant uncertainty about the impacts. Initial view suggests [REDACTED] flow, although this could be revised following further investigation of the hydrological interaction between the scheme elements. Potential for a HOF to be agreed that would avoid



Option Type	Option Name	Option ID	Outcome*	Reason, if not confirmed as compliant*	Final step	Preferred Plan option?	Likelihood of final WFD non-compliance	Justification
								non-compliance, although potentially at a relatively high flow.
Run-of-river abstraction	NIT_THIRD PARTY_11	WR817	Potentially non-compliant (low conf.)	It is assumed that the St Helens Canal is supplied with water from Carr Mill Dam, however, due to lack of detail on the exact source of the water, there could be changes to the hydrological regime and water quality of the canal. Black Brook may also be hydrologically connected and experience the same impacts - low confidence reflects lack of detail on hydrological connectivity.	Step 3		Low	Limited detail is available about this option, leaving significant uncertainty about the impacts. However, on the basis of the assumptions applied to the assessment, it is likely that risks associated with low flows could be managed/ mitigated.
Run-of-river abstraction	NIT_THIRD PARTY_12	WR820	Compliant (low conf.)		Step 3		Very Low	Low confidence assigned due to assumed compensation flow from an existing supporting waterbody – this will require confirmation.
Run-of-river abstraction	NIT_THIRD PARTY_13	WR821	Potentially non-compliant (low conf.)	Abstraction from the Shropshire Union Canal (via the Llangollen Canal) may cause flow change effects on ecology and water quality dilution, which may impact on the River Dee SSSI and Bala Lake SAC as a result of increased abstraction. Low confidence as additional information / investigation is required.	Step 3		Medium	Limited detail is available about this option, leaving uncertainty about the impacts, which include potential impacts on designated sites. The Abstraction Licensing Strategy has no water available in the Dee catchment, leading to a higher likelihood of non-compliance if abstraction from the Dee is included as part of the option.
Run-of-river abstraction	NIT_THIRD PARTY_15	WR824	Potentially non-compliant (low conf.)	Abstraction from Blenkinsopp Mine, which is assumed to discharge into Tipalt burn ordinarily, therefore has been assessed as a decreased river discharge - potential impacts are flow change effects on ecology and water quality dilution. Low confidence due to a more detailed investigation of the hydrological functioning of the local water environment required.	Step 3		Low	Given the relatively small size of the abstraction, its indirect impact on surface water, it is relatively unlikely to remain non-compliant. However, more detailed investigation and understanding is required to draw a conclusion.
Run-of-river abstraction	NIT_THIRD PARTY_16	WR825	Potentially non-compliant (low conf.)	Abstraction from Bridgewater Canal Mine, which is assumed to discharge into the Folly Brook and Salteye Brook ordinarily, therefore has been assessed as a decreased river discharge – potential impacts are flow change effects on ecology and water quality dilution. Low confidence due to a more detailed investigation of the hydrological functioning of the local water environment required.	Step 3		Low	Given the relatively small size of the abstraction, and its indirect impact on surface water, it is relatively unlikely to remain non-compliant. However, more detailed investigation and understanding is required to draw a conclusion.

\* The "Outcome" and "Reason" columns present the assessment as at the time of the Feasible Options Assessment, unless stated otherwise.

\*\* Option WR149 has since been discounted due to concerns re water quality deterioration in the wider groundwater unit, difficult to treat water quality issues and limited water availability. It was assessed as part of the NWT at Gate 2.

## 4. Programme-level (Stage 2) WFD Assessment

In order to understand the WFD compliance of the final WRMP as a whole, a cumulative assessment has been undertaken of the options within the Preferred Plan, and also of the Reasonable Alternative Plan. This makes use of the individual option-level assessments (as presented in **Section 3**), but also recognises that when considered as a whole Plan, some water bodies could be impacted by more than one option. If a WFD water body may be impacted by one or more options within the plan, then an impact assessment has been undertaken to understand the cumulative impact on the receptors within that water body as a result of all of the options being in operation. This section then provides an overall assessment of all options and all water bodies associated with the Preferred Plan (**Section 4.1**) and the Reasonable Alternative Plan (**Section 4.2**).

### 4.1 Cumulative Assessment of the Preferred Plan

The Preferred Plan involves only a single supply option (WR076). As a result, no cumulative effects with other options can occur.

**Table 4.1** and **Figure 4.1** show the single supply option that makes up the Preferred Plan, and identifies the downstream water bodies that have potential to be impacted. All downstream waterbodies have been identified in this table for completeness, to the bottom of the catchment.

Table 4.1 Summary of water bodies downstream of individual options (Preferred Plan)

Type	Waterbody ID	WR 076
River	GB112069061382 - Bollin (Ashley Mill to Manchester Ship Canal)	✓
	GB112069061012 - Mersey (Bollin confluence to Howley Weir) including Padgate Brook	✓
Canal	GB71210004 - Manchester Ship Canal	✓
Transitional	GB531206908100 - MERSEY	✓

The assessment of the preferred option and associated water bodies is summarised in **Table 4.2**, with further detail provided in **Appendix B**.

Table 4.2 Cumulative Assessment of the Preferred Plan (WR076 only)

Catchment	Water body	Options contributing to cumulative effect	Risk of WFD non-compliance	Comments
<b>Bollin and Mersey</b>	GB112069061382 - Bollin (Ashley Mill to Manchester Ship Canal)	WR076	Potentially non-compliant (low confidence)	<p>A HOF would be applied to the abstraction, which is expected to be at Q98. This would reduce the impacts of abstraction as flows approach Q98, and avoid any impact at all from Q98 and below. The NWT Gate 3 Checkpoint assessment (WSP, 2024) calculated that, without a HOF, impacts at Q95 could be up to 21% of gauged flow, but with a HOF this would be reduced to 2%. A full assessment across the Flow Duration Curve is available in WSP (2024, NWT Priority Action 3 Checkpoint Report).</p> <p>The catchment is discharge-rich, meaning that flows are higher than natural at low flows, due to the influence of discharges. The draft Upper Mersey ALS (Environment Agency, 2021) indicates that there is water available for abstraction at the proposed rate.</p> <p>The assessment undertaken to date for NWT (WSP, 2024) has concluded that the abstraction is unlikely to impact the WFD status of macroinvertebrates and macrophytes, but further assessment is required for fish. Further work is being undertaken through the ongoing NWT workstream, to quantify the impacts of reduced flows on physical habitat availability and water quality. Therefore, on a precautionary basis the option is considered to be potentially non-compliant in this water body, awaiting the outcome of the NWT Gate 3 investigations.</p>

Catchment	Water body	Options contributing to cumulative effect	Risk of WFD non-compliance	Comments
	GB112069061012 - Mersey (Bollin confluence to Howley Weir) including Padgate Brook	WR076	Compliant (low confidence)	The NWT Gate 3 Checkpoint assessment (WSP, 2024) has calculated the impacts on flow in the Manchester Ship Canal at its confluence with the Bollin, immediately before the Lower Mersey diverges from the MSC. The impact at Q95 would be only 2% even without a HOF, and reduced to 0.3% with a HOF. At Q98 and below, impacts would be avoided entirely by the HOF.
	GB71210004 - Manchester Ship Canal	WR076	Compliant (med. confidence)	This change in flow is negligible and would not be distinguishable from influences of canal operation and the divergence of the Lower Mersey and MSC. Therefore, no impacts on biological or physico-chemical elements would be expected in either of these water bodies.
	GB531206908100 – Mersey estuary	WR076	Compliant (med. confidence)	Totals flows into the estuary have not been calculated due to the uncertainties surrounding the split between the Lower Mersey and MSC, and the numerous locations of freshwater flows entering the estuary. The impacts calculated above in relation to the Mersey and MSC (0.3% at Q95, with a HOF from Q98) would reduce further by the time the River Mersey reaches the Estuary, due to other non-impacted flows including the Dane and Gowy, and the impacts of tidal mixing. These negligible impacts are highly unlikely to result in non-compliance of biological, physico-chemical or chemical elements in the estuary.

## 4.2 Cumulative Assessment of the Reasonable Alternative Plan

**Table 4.3** and **Figure 4.2** show the options that make up the Reasonable Alternative Plan, and associated water bodies. These are informed through the option-level assessments and have also considered whether it is necessary to look further downstream, where the individual option assessments did not extend to the coast. Only two of the four options have potential for impact on a WFD water body, and those two options are located in different catchments. Hence there are no water bodies that are impacted by more than one option in the Reasonable Alternative Plan.

The cumulative assessment is summarised in **Table 4.4**, showing all water bodies that could be impacted by the Reasonable Alternative Plan. **Appendix B** should be referred to for water bodies that would only be impacted by a single option. No separate assessment is shown for water bodies impacted by more than one option, since there are none.

Table 4.3 Summary of water bodies impacted by individual options (Reasonable Alternative Plan)

Type	Waterbody ID	WR026c	WR065b	WR185	WR191
River	GB112071065612 River Ribble d/s Stock Beck	√			
	GB112071065500 Ribble- Conf Calder to tidal	√			
	GB104027062610 Cragg Brook from Source to River Calder		√		
Lake	GB30431104 White Holme Reservoir		√		
<b>(options with no impact on WFD water bodies)</b>				√	√

Table 4.4 Cumulative Assessment of the Reasonable Alternative Plan

Type	Water body	Options contributing to cumulative effect	Risk of WFD non-compliance	Comments
River	GB112071065612 River Ribble d/s Stock Beck	WR026c	Compliant (low conf.)	This option could reduce flows in the River Ribble by up to a maximum of 4% at Q95 at the abstraction point, with decreasing impacts downstream towards the tidal limit. The River Ribble ALS (2013) indicates that water is available within the catchment across the flow regime, and a July 2023 update from the EA for the Lower Ribble (for the NWT project) indicated that this was still the case. Therefore, this level of flow reduction is unlikely to result in deterioration of status or impede improvements, for any classification elements.
	GB112071065500 Ribble- Calder to tidal	WR026c	Compliant (med conf.)	
	GB104027062610 Cragg Brook from Source to River Calder	WR065b	Compliant (high conf.)	
Lake	GB30431104 White Holme Reservoir	WR065b	Compliant (high conf.)	This option would restore Whiteholme Reservoir to its previous state (pre-2015), after which water levels were reduced due to safety concerns. As a result, it is assumed that the option would have no impact on WFD compliance.

## **5. Preferred WRMP (Stage 3) WFD Assessment against other plans and projects**

The potential for combined impacts of UU's Preferred Plan (or Reasonable Alternative Plan) with other water companies' WRMPs has been considered. No potential in-combination impacts have been identified.

## 6. WFD compliance summary of United Utilities WRMP24

A summary of the assessment is provided in **Table 6.1**, which considers the overall compliance of the Preferred Plan and the Reasonable Alternative Plan.

The assessments shown in this report currently conclude potential non-compliance of the Preferred Plan, with low confidence. This is considered a relatively precautionary assessment, with potential for a final compliant conclusion, but requires further assessment that is being gathered through the NWT SRO programme of work.

The Reasonable Alternative plan is concluded to be compliant with respect to the WFD Assessment Objectives. This therefore represents an alternative that could be pursued, should the assessments being progressed through the NWT programme conclude that the Preferred Plan, or any alternative NWT options, are not compliant with the WFD.

Table 6.1 Summary of plan level WFD compliance for the United Utilities WRMP24

WFD Assessment Objective	Summary of WFD compliance (Preferred Plan)	Summary of WFD compliance (Reasonable Alternative Plan)	Explanation
<b>1) To prevent deterioration of any WFD element of any water body - in line with Regulation 13(2)(a) and 13(5)(a)</b>	Potentially non-compliant	Compliant	The Preferred Plan remains potentially non-compliant at this stage, with low confidence. This recognises the risks to compliance that are subject to ongoing assessment through the NWT programme of work. However, it is considered feasible that the option may be concluded to be compliant following further assessment.
<b>2) To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body -in line with Regulation 13(2)(b) and 13(5)(c).</b>	Potentially non-compliant	Compliant	The options in the Reasonable Alternative Plan have been assessed as being compliant.
<b>3) To ensure that the planned programme of water body measures in RBMP3 to protect and enhance the status of water bodies are not compromised.</b>	Compliant	Compliant	No planned water body measures, as identified in the RBMP3, have been identified as being compromised.
<b>4) To assist the attainment of the WFD objectives for the water body – in line with Regulation 13(2)(b) and 13(2)(c)</b>	Neutral	Neutral	The assessment as presented here does not show that the plan would assist in attainment of the WFD objectives for any water bodies. However, this may be possible through delivery of BNG



WFD Assessment Objective	Summary of WFD compliance (Preferred Plan)	Summary of WFD compliance (Reasonable Alternative Plan)	Explanation
<b>5) To assist the attainment of the WFD objectives for associated WFD protected areas – in line with Regulation 13(6)</b>	Compliant	Compliant	or other enhancements, once those are further developed. Demand and leakage management options could also assist.
<b>6) To progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment</b>	Compliant	Compliant	The HRA for the WRMP concludes that, based on the currently available data, neither the Preferred or Reasonable Alternative plans will adversely affect the integrity of any European sites, alone or in combination.
			None of the options in the Preferred Plan or Reasonable Alternative Plan involve the deliberate release of pollutants to the aquatic environment.

# Appendix A

## Option-level screening

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

**REDACTED**

# Appendix B

## Option-level impact assessment

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

**REDACTED**

