



United Utilities

# Revised Draft Water Resources Management Plan 2019: Water Framework Directive Assessment

Final Report



August 2018

Amec Foster Wheeler Environment  
& Infrastructure UK Limited



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## Report for

Water Resources Team  
Asset Management  
United Utilities  
Haweswater House  
Lingley Mere Business Park  
Great Sankey  
Warrington  
Cheshire  
WA5 3LP

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## Main contributors

Mark Barnett  
Jon Mainhagu  
Victoria Roscoe-Walker  
Rebecca Tumilty

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## Issued by

Rebecca Tumilty

---

## Approved by

Pete Davis

---

## Amec Foster Wheeler

Partnership House  
Regent Farm Road  
Gosforth  
Newcastle upon Tyne NE3 3AF  
United Kingdom  
Tel +44 (0) 191 272 6100

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## Document revisions

No.	Details	Date
1	Draft for UU review	13/11/2017
2	Second draft for UU review	27/11/2017
3	Final report	30/11/2017
4	Final report – security update	26/02/2018
5	Published report	07/03/2018
6	Revised draft report	10/08/2018
7	Final revised report	20/08/2018
8	Final revised report – security update	28/08/2018



# Executive summary

## Introduction

This report presents the Water Framework Directive (WFD) assessment for resource management and Manchester and Pennine Resilience options that have been considered for inclusion in United Utilities' Water Resources Management Plan (WRMP) 2019. The aim of the report is to demonstrate the potential level of WFD impact associated with each WRMP option and, if necessary, the level of further assessment that may be required in order to fully demonstrate WFD compliance. It also includes a review of UU's proposals for how it will operate its existing abstractions to determine whether they meet the criteria for sustainable catchments and comply with the WFD.

The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve good status or potential by 2027 at the latest. Where it is not possible to achieve this (e.g. through disproportionate costs), alternative water body objectives can be set. The current (baseline) status (2015 classification), and the measures required to achieve the 2027 status objective are set out for each water body in the relevant River Basin Management Plans (RBMPs), prepared by the Environment Agency (EA) every six years.

The final WRMP must be able to demonstrate that it would not cause a deterioration in respect of these baseline conditions. Furthermore, for those water bodies that are not currently attaining good status, the WRMP must be able to demonstrate that it would not preclude the delivery of measures to facilitate the improvements needed to attain good status.

## Review of Existing Abstractions

The EA provided guidance that UU should consider the changes to current abstractions to avoid the risk of deterioration under the WFD. For this, UU worked closely with EA representatives to complete a Sustainable Catchments spreadsheet, submitted to the EA on 28 February 2017 which highlighted the abstractions that needed reviewing.

A review of how UU will operate its existing abstractions to determine whether they meet the criteria for sustainable catchments and comply with the WFD has been undertaken on 35 abstraction licences. The 35 abstraction licences have been assessed by the EA to fall within category 1, 2, or 3 as described below:

- ▶ Category 1: based on recent actual abstraction rates – causing serious damage now;
- ▶ Category 2: based on recent actual rates – deterioration likely by 2027;
- ▶ Category 3: based on full use of the abstraction licence – deterioration likely after 2027 and by 2040; and
- ▶ Category 4: based on full use of the abstraction licence – no likelihood of deterioration before 2040.

The aim of the review was to highlight where existing abstractions could impact on WFD objectives and would therefore need mitigation.

The review indicates that when accounting for recommended levels of abstraction licence reduction, confirmed or potential AMP6 (2015-2020 investment period) measures, and an assumption of continuation of current operational activities or abstraction levels, most licences are unlikely to have a significant impact on the WFD objectives of the relevant water bodies. One of UU's groundwater abstractions at Mouldsworth could potentially have a medium impact on a surface water, the Salters Brook. Further work may be required in this water body to either undertake further assessment to reduce the level of impact, or to establish what mitigation should be implemented.

## Approach to the WFD Assessment of WRMP Feasible Options and Manchester and Pennine Resilience Options

The WFD assessment has considered the following key questions in respect of the construction and operational phase of each WRMP option:

- ▶ At the water body scale, would the option result in a deterioration of any of the WFD classification components from one status class to the next, (e.g. from good to moderate), irrespective of whether or not it results in the lowering of overall status?
- ▶ Would the option prevent any water bodies from achieving good overall status or, where relevant, an alternate objective?

Following the assessment of each WRMP option, an assessment was made of the following for each of the Preferred Plan options:

- ▶ Would the cumulative effects of multiple WRMP options impact on the objectives of individual WFD water bodies?
- ▶ Would the cumulative effects of multiple WRMP options impact on the objectives of multiple water bodies that are hydrologically linked (i.e. operational catchments)?
- ▶ Would the cumulative effects of multiple WRMP options affect protected areas and their associated objectives?

If the answer to all of the above five questions is 'no' then the option can be considered to be WFD compliant.

The possible future decommissioning of WRMP options is beyond the scope of this assessment, but impacts arising from decommissioning are likely to be similar to those associated with construction.

## WFD Assessment Process

The WFD assessment has been undertaken on 115 confirmed options (81 supply-demand feasible options and 34 Manchester and Pennine resilience options). The assessment for each option was based on the engineering scope information provided by UU. The assessment for each option comprised two stages, a 'Level 1' screening, followed by a more detailed 'Level 2' assessment for those water bodies that may be subject to medium or high impacts. The results of both levels of assessment are then combined to create a final impact assessment for all options. Both levels of assessment use the definitions of impacts described in **Table 1**.

Table 1 Impact Classification Categories

Level of impact	Description of impact
No or minimal impacts	No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved.
Minor level of impact	Impacts from the option when taken on their own have the potential to lead to a minor localised, short-term and fully reversible effect on the quality of the water environment that would not result in the lowering of WFD status.  Impacts would be very unlikely to prevent any target WFD objectives from being achieved.
Medium level of impact	Impacts when taken on their own have the potential to lead to a widespread or prolonged effect on the quality of the water environment that may result in the temporary lowering of WFD status.  Impacts have the potential to prevent target WFD objectives from being achieved.
High level of impact	Impacts when taken on their own have the potential to lead to a significant effect and permanent deterioration of WFD status.  Impacts have a high risk of preventing target WFD objectives from being achieved.

The assessments were based on available data and evidence as far as possible. However, due to the limited engineering and baseline information available, expert opinion and a number of assumptions have been employed in most cases (refer to **Section 3.3**). Where there was uncertainty over an option (e.g. the exact route of a pipeline is not known) a worst-case scenario approach has been used (e.g. the assessments have assumed that the pipeline has watercourse crossings rather than not).

A confidence rating has been given to the Level 2 assessments, according to the confidence categories in **Table 2**. The confidence rating assigned to each assessment is a reflection on the amount of uncertainty in the option design (e.g. uncertainty over the location and quantity of a new groundwater abstraction would lower the level of confidence in the assessment), and the amount and quality of evidence upon which the impact level has been based (e.g. existing investigations into the impacts of reservoirs by UU and the EA increase the confidence level in the assessment). All the assessments that have only been subject to a Level 1 assessment are assigned a high confidence by default.

**Table 2** Confidence Level Categories

Confidence category	Description of confidence
<b>Low</b>	Very limited evidence, high risk activity or assessment solely based on expert judgement.
<b>Medium</b>	Reasonable levels of evidence for some aspects of the assessment. Some assumptions and expert opinion required.
<b>High</b>	Good level of evidence with minimal assumptions required or low risk activity.

Where two or more Preferred Plan options are located in the same water body or operational catchment, a high level cumulative assessment has been undertaken to determine the potential for combined effects on WFD objectives, should all the options be implemented. Assessments have also been undertaken on protected areas related to the protection of habitats and species that are identified in the EA's Catchment Data Explorer as being linked to a water body that may be impacted by a Preferred Plan option. The cumulative and protected area assessments followed the same approach as the Level 1 and Level 2 assessments for the individual options.

## Results of the WFD Assessment of WRMP Supply-Demand Feasible Options

The Level 1 screening identified 328 WFD water bodies that may be impacted by the 81 supply-demand<sup>1</sup> feasible options. Many of these water bodies could be impacted by more than one option, resulting in a total number of 584 option-water body combinations.

The Level 1 screening exercise was undertaken for each option and its related water bodies. This identified 69 options that may have a medium or high level of impact on one or more water bodies and these were subjected to the more detailed Level 2 assessment.

The results of the Level 2 assessment were combined with the results of the Level 1 assessment to produce a combined assessment result which is summarised in **Table 3** and presented in full in **Appendix B**. The individual Level 2 assessment spreadsheets are presented in **Appendix C**.

<sup>1</sup> These are options to meet dry year supply-demand drivers, as opposed to improve water supply resilience to non-drought hazards

Table 3 Summary of Combined Assessment Results for Feasible Options

	No of option– water body combinations	No of water bodies	No of options
<b>Total</b>	584	328	81
<b>High level of impact</b>	4	4	4
<b>Medium level of impact</b>	53	39	35
<b>Minor level of impact</b>	336	198	68
<b>No or minimal impact</b>	191	134	38

Note that a water body may have varying levels of impact from different options, and an option may have differing levels of impact on different water bodies. This means that some water bodies and options are counted more than once in the values in this table.

## Results of the WFD Assessment of WRMP Resilience Options and Solutions

The results of the assessment for the water supply resilience solutions<sup>2</sup> are presented for each individual resilience option, and then for each resilience solution. The results of the assessment for each solution are based on a consideration of the impacts for each of the individual options within that solution.

The results of the Level 1 and Level 2 assessments indicate that:

- ▶ 22 resilience options have a no or minimal level of potential impact;
- ▶ 7 resilience options have a minor level of potential impact; and
- ▶ 5 resilience options have a medium level of potential impact.

Further details on the results are summarised in **Table 6.1**, and described by solution in Sections **Error! Reference source not found.** to **Error! Reference source not found.**. The assessments are presented in full in Appendices D and E.

The five resilience options that have been assigned a medium level of potential impact are:

- ▶ 37-38: Manchester and Pennine Aqueduct section T05 to T06;
- ▶ 37-42: Manchester and Pennine sections T01 to T06;
- ▶ 215: Alternative Supply: Raw water transfer and water treatment works (WTW) at Martholme bulk supply point (BSP);
- ▶ 296: T05 targeted repair 2025; and
- ▶ 297: T06 targeted repair 2025.

The five resilience options with a medium level of impact occur in four out of the five resilience solutions (**Table 3**) and pose a potential risk of widespread or prolonged impacts on the status of WFD water bodies.

<sup>2</sup> This relates to resilience to hazards other than drought

Table 3 Summary of Resilience Option and Solutions Assessment

Solution	Total No. of Options	Number of options (and water bodies in brackets) at each impact level				Overall Impact	Confidence
		No or Minimal	Minor	Medium	High		
A	6	3	1	2 (2)	0	Medium level of impact	Low
B	16	15	0	1 (8)	0	Medium level of impact	Low
C	8	4	4	0	0	Minor level of impact	High
D	2	1	0	1 (21)	0	Medium level of impact	Low
E	6	1	3	2 (22)	0	Medium level of impact	Low

**Note:**

Some resilience options are included in more than one resilience solution.

For options assigned a no or minimal or minor level of impact in the Level 1 screening, individual water bodies were not identified.

## Results of the WFD Assessment of the Revised Draft WRMP 'Preferred Plan'

The Preferred Plan includes one resilience solution, Solution D, which comprises two resilience options. The Level 1 screening identified 21 WFD water bodies that may be impacted by the two options that are included in Solution D. It should be noted that the supply-demand preferred options that comprise the Preferred Plan do not include resource management measures (i.e. they comprise of demand management measures including leakage reduction and water efficiency only) and are therefore not expected to have impacts on WFD water bodies.

The Level 1 screening exercise was undertaken for each option and its related water bodies. This identified a single option that may have a medium level of impact on one or more water bodies, and this was subjected to the more detailed Level 2 assessment.

The results of the Level 2 assessment were combined with the results of the Level 1 assessment to produce a combined assessment result which is summarised in **Table 4** and presented in full in **Appendix J**. The individual Level 2 assessment spreadsheets are presented in **Appendix E**.

Table 4 Summary of Combined Assessment Results for Options that form the Preferred Plan

	No of option–water body combinations	No of water bodies	No of options
<b>Total</b>	21	21	2
<b>High level of impact</b>	0	0	0
<b>Medium level of impact</b>	21	21	1
<b>Minor level of impact</b>	0	0	0
<b>No or minimal impact</b>	0	0	0

Following the individual option assessments, the Preferred Plan options were subject to cumulative and protected area assessments. The combined results of all three assessments are summarised in **Table 5**.

Table 5 Summary of Assessment Results for the Preferred Plan Options

	Result of Individual assessment	Result of cumulative assessment	Result of Protected Area assessment	Overall result	Confidence level
Option 112: Manchester and Pennine Aqueduct Outage	No or minimal impact	n/a	n/a	No or minimal impact	High
Option 37 – 42 (Manchester and Pennine Aqueduct)	Medium level of impact	Medium level of impact	Medium level of impact	Medium level of impact	Low

One of the two resilience options has been assigned a medium level of potential impact on account of the risk to the quantitative and chemical status of groundwater bodies and changes to the hydrological regime (and therefore ecological status) of rivers.

In this case, further WFD assessment is required to be provide greater clarity and confidence in respect of requirements, if relevant, for bespoke mitigation in order to ensure that WFD objectives are not compromised. In reality, on consideration of further information and dialogue with the EA on proposed bespoke mitigation measures, this option is unlikely to result in significant or long-term potential impacts. Therefore, WFD compliance is unlikely to be an issue in respect of regulatory permitting once the further assessment provides the appropriate level of confidence for presentation to the regulator.

The assessments typically have a low level of confidence, which reflects the high-level nature of the WFD assessments undertaken at this time. The lack of detailed design or environmental baseline information has necessitated a precautionary approach to the assessments, which relies on assumptions (e.g. that changes to the groundwater flow regime will impact on surface water courses), and results in a worst-case level of impact. Further assessment and dialogue with the EA during the consultation and project stages would likely result in a reduction of the level of impact, and an increase in the level of confidence.

Further project-stage detailed WFD assessment should therefore be undertaken in respect of Option 37 – 42 as this option has been assigned a medium level of impact in the individual, cumulative and protected area assessments. Further assessment should include consideration of more detailed design information, investigation of the water environment associated with the option (in particular links between the groundwater and surface water environments), detailed impact assessments, and more detailed review of WFD objectives to ensure that the impacts highlighted in this report are appropriately accounted for.

## Statement of Compliance with the WFD

The assessments of the data provided by the EA and UU regarding current abstraction licences indicate that although there is some residual risk, overall the operation of the licences, the reductions noted by the EA and the schemes identified for AMP6 should be enough to mitigate against any significant risks to the WFD water bodies and they are **therefore compliant with the requirements of the WFD**.

The assessments for the preferred options that comprise the Preferred Plan for WRMP19 indicate that one option (Option 37 – 42) could have a medium level of impact against WFD objectives. Further WFD assessment is therefore required at the project stage to be more conclusive in respect of requirements, or otherwise, for bespoke mitigation in order to ensure that WFD objectives are not compromised.

In reality, on consideration of further information and dialogue with the EA on proposed bespoke mitigation measures, this option is unlikely to result in significant or long-term potential impacts. Therefore, WFD compliance is unlikely to be an issue in respect of regulatory permitting once the further assessment provides the appropriate level of confidence for presentation to the regulator.

Based on the assessments in this report, **there is currently no requirement to implement Article 4.7 for either current abstractions or the preferred options**. However, this is based on the assumptions detailed in this report, the need to implement reductions on some of the current licences, and the assumption that additional investigations and mitigation will be implemented for the preferred options.





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# 1. Introduction

## 1.1 Overview

- 1.1.1 United Utilities (UU) is currently finalising its Water Resources Management 2019 (WRMP19). Once approved, the WRMP will set out the strategy for water resource and demand management to ensure supplies of safe, clean drinking water are maintained to customers throughout the company's region over the period 2020 to 2045 and beyond.
- 1.1.2 As part of the preparation of WRMP19, UU published its Draft Water Resources Management Plan (Draft WRMP) for consultation between 2<sup>nd</sup> March and 25<sup>th</sup> May 2018, following submission to Defra in December 2017. The Draft WRMP set out UU's Preferred Plan for WRMP19, including preferred resource management and demand management options designed to enhance leakage reduction, improve levels of service for drought permits and orders and support water trading. This Preferred Plan additionally sought to address the risk associated with the regional aqueduct system that supplies water from the Lake District to the Greater Manchester and Pennine areas including parts of Lancashire and south Cumbria (Manchester and Pennine Resilience).
- 1.1.3 In developing the Preferred Plan for the Draft WRMP, UU undertook a comprehensive assessment of future available water supplies and the demand for water, extensive stakeholder engagement and a rigorous process of options identification and appraisal. In this context, Amec Foster Wheeler Environment and Infrastructure UK Ltd (Amec Foster Wheeler, now Wood) was commissioned by UU to undertake a Water Framework Directive (WFD) assessment of the Draft WRMP, the findings of which were presented in a report<sup>3</sup> that was published alongside the plan for consultation. A further report<sup>4</sup> presenting an assessment of potential Manchester and Pennine Resilience solutions was also prepared.
- 1.1.4 Taking into account the responses received to the consultation on the Draft WRMP from regulators, stakeholders and the public, further engagement and environmental assessment, UU has selected its preferred Manchester and Pennine Resilience Solution and modified the Preferred Plan for WRMP19. A Revised Draft WRMP has subsequently been prepared and is being submitted to the Secretary of State for approval. This includes further increases to the leakage reductions contained within the plan. However, potential importing companies have not selected imports from the North West in their preferred plans within the core 25-year period of the planning horizon (which defines the 'needs' in the United Utilities plan, albeit the plans are tested out to the 2080s). Therefore, to align the plan with others, water trading no longer forms part of United Utilities' Preferred Plan, even though it remains the company's preference to continue to work with others on water trading beyond WRMP19 towards the WRMP24 planning round. The strategy to facilitate a potential future trade has therefore been retained within an adaptive pathway, which could form a future preferred plan if water trading was subsequently required in future.
- 1.1.5 To ensure that the Preferred Plan as proposed has been fully assessed in terms of its potential impacts on WFD water bodies, the WFD assessment of the Draft WRMP has been reviewed and updated. This report presents the findings of this assessment.

## 1.2 Purpose of this Report

- 1.2.1 This report has been produced for the purpose of presenting the WFD assessment for resource management and Manchester and Pennine Resilience options that have been considered for inclusion in WRMP19. The aim of the report is to demonstrate the potential level of WFD impact associated with each WRMP option and, if necessary, the level of further assessment that may be required in order to fully demonstrate WFD compliance. It also includes a review of UU's proposals

<sup>3</sup> Amec Foster Wheeler (2017) Draft Water Resources Management Plan 2019: Water Framework Directive Assessment. Final Report.

<sup>4</sup> Amec Foster Wheeler (2018) *Water Framework Directive Assessment of the Draft Water Resources Management Plan 2019: Supplementary Information – Draft Resilience Options*.

for how it will operate its existing abstractions to determine whether they meet the criteria for sustainable catchments and comply with the WFD.

- 1.2.2 In England and Wales, whilst the responsibility for ensuring that the WFD is implemented lies with the Secretary of State for Environment, Food and Rural Affairs, the Environment Agency (EA) and Natural Resources Wales (NRW), as well as other public bodies, have a duty to 'have regard' to the objectives of the WFD in exercising their functions.
- 1.2.3 Failure to take account of WFD requirements could provide grounds for a challenge to regulatory decisions on any options that progress into the final WRMP. Therefore, assessment of the relative levels of WFD compliance risk amongst the suite of potential options is a necessary part of WRMP optioneering that should facilitate effective and efficient regulatory decision making.

## 1.3 United Utilities' Revised Draft Water Resources Management Plan 2019

### Draft Water Resources Management Plan 2019

- 1.3.1 In developing the Draft WRMP, UU forecast the future demand for water and available supply (the supply-demand balance) for the 25-year period from 2020 to 2045. The baseline demand forecast was calculated using the latest data, tools and methods including the current population and local authority growth forecasts, and accounted for the potential impacts of climate change. Taking into account this baseline demand forecast, alongside water availability, dry weather demand and target headroom, UU determined that there would be a surplus in all three of the company's water resource zones (WRZs) in a dry year over the planning horizon of WRMP19 (the Strategic Zone, North Eden Zone, and Carlisle Zone).
- 1.3.2 Whilst there was forecast to be enough water to meet demand over the period of WRMP19, following the Water Resources Planning Guideline<sup>5</sup>, consideration was given to using the forecast surplus, with possible new source or demand management investment, to explore strategic choices for the WRMP.
- 1.3.3 UU's Preferred Plan for WRMP19 set out in the Draft WRMP incorporated four strategic choices, as follows:
- ▶ Enhance leakage reduction by a total of 80 megalitres per day (MI/d) over the planning period;
  - ▶ Improve levels of service for drought permits and orders from 1 in 20 years to 1 in 40 years (moving from 5% to 2.5% annual risk);
  - ▶ Increase resilience, through the Manchester and Pennine Resilience solution; and
  - ▶ Commitment to continue to explore national water trading.
- 1.3.4 The Draft WRMP Preferred Plan comprised a combination of resource management and demand management options designed to achieve these four strategic choices and maintain and enhance the supply-demand balance. To identify these measures, UU first considered an unconstrained list of options. These options were deliberately selected to cover as wide a range of option types as possible and represented all of the ways in which UU could manage supply and demand. These unconstrained options were subject to preliminary (Primary) screening to identify a list of feasible options, i.e. options that could realistically be implemented in the next 25 years. The feasible options were then assessed in terms of their financial, environmental and social costs. These costs were compared using a standard water industry method that allows quantified information about environmental and social effects of options to be compared with financial data. The feasible options were then ranked based on their combined costs. Informed by this assessment, ongoing discussion with stakeholders, and the outcomes of the Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA) and WFD assessment, this list was refined through an

<sup>5</sup> Environment Agency and Natural Resources Wales (2018) *Water Resources Planning Guideline*. Available at: <https://cdn.naturalresources.wales/media/686174/interim-wrpg-update-july18-final-changes-highlighted.pdf> [Accessed August 2018]

additional round of (secondary) screening from which the Preferred Plan options that comprised the Draft WRMP were identified.

## Revised Draft Water Resources Management Plan 2019

- 1.3.5 As set out in **Section 1.1**, following consultation on the Draft WRMP, UU has reviewed its Preferred Plan for WRMP19 and as a result, the Preferred Plan contained in the Draft WRMP has been modified. In particular, in response to consultation responses, additional customer research, further exploration of leakage options and innovations, and a tightening of the supply-demand balance (showing a very small deficit forecast in the Strategic Resources Zone at the end of the planning horizon), United Utilities has further enhanced its leakage reduction aspirations. United Utilities has also confirmed the proposed solution for water supply resilience to non-drought hazards. UU has also confirmed the proposed solution for water supply resilience.
- 1.3.6 The revised Preferred Plan includes the following strategic choices:
- ▶ Adopt an enhanced leakage reduction comprising a total of 190 MI/d over the planning period, a reduction of just over 40% from the baseline position of 448MI/d. By the end of 2024/25 UU plans to reduce leakage by at least 67 MI/d, or 15%;
  - ▶ Improve level of service for drought permits and orders to augment supply from 1 in 20 years to 1 in 40 years (moving from 5% to 2.5% annual average risk);
  - ▶ Increase resilience to other hazards, specifically for the regional aqueduct system associated with Manchester and Pennines Resilience. This involves completing Solution D, which involves rebuilding all single line sections of the relevant aqueduct.
- 1.3.7 It should be noted that the revised Preferred Plan does not include a water trading component. This is because a water trade from the North West is not included in the preferred plans of other water companies at this stage. However, water trading remains UU's preference and the company will continue to work with others on water trading beyond WRMP19 towards the WRMP24 planning round.
- 1.3.8 This WFD assessment considers all the feasible resource management and Manchester and Pennine Resilience options. The demand management options identified for WRMP19 have not been assessed because either they do not directly impact on the water environment (demand management and network metering options) or are not possible to assess within the framework of the WFD (leakage reduction).
- 1.3.9 The options identification and appraisal process is described further in the Revised Draft WRMP and supporting documentation<sup>6,7</sup>.

## 1.4 The Legislative Context – Water Framework Directive

- 1.4.1 The WFD<sup>8</sup> came into force in 2000 in the European Union (EU) and was transposed into UK law in 2003 with the principal aims of protecting and improving the water environment and promoting the sustainable use of water. Environmental Quality Standards (EQSs) for priority substances have been set by so-called 'daughter' directives to the WFD, in the form of the EQS Directive<sup>9</sup> and

<sup>6</sup> United Utilities (2018) Revised *Draft Water Resources Management Plan 2019 Technical Report – Options identification*.

<sup>7</sup> United Utilities (2018) Revised *Draft Water Resources Management Plan 2019 Technical Report – Options appraisal*.

<sup>8</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (the Water Framework Directive).

<sup>9</sup> Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council (the Priority Substances Directive).

subsequent amendments (EQSD)<sup>10</sup> and the Groundwater Directive (GWD)<sup>11</sup>. The environmental objectives of the WFD and its daughter directives are to:

- ▶ Prevent deterioration of aquatic ecosystems;
- ▶ Protect, enhance and restore water bodies to good status; which is based on ecology (with its supporting hydromorphological and physico-chemical factors) and chemical factors for surface water, and water quantity and chemical status for groundwater;
- ▶ Comply with water related standards and objectives for environmentally protected areas established under other EU legislation, e.g. The Habitats Directive 92/43/EEC;
- ▶ Progressively reduce pollution from priority substances and cease or phase out discharges from priority hazardous substances; and
- ▶ Prevent or limit input of pollutants into groundwater and reverse any significant or sustained upward trends in the concentration of any groundwater pollutant.

1.4.2 The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve good status or potential by 2027 at the latest. Where it is not possible to achieve this (e.g. through disproportionate costs), alternative water body objectives can be set. The current (baseline) status (e.g. 2015 classification), and the measures required to achieve the 2027 status objective are set out for each water body in the relevant River Basin Management Plans (RBMPs), prepared by the EA every six years.

1.4.3 The WRMP options assessed in this report are primarily located within the RBMP for the North West River Basin District, but some options do extend into the Solway Tweed, Northumbria, Humber, Severn and Dee River Basin Districts. The current RBMPs (known as the 'Cycle 2 plans') were published in February 2016 and they provide the baseline condition of the water environment for the assessment presented in this report.

1.4.4 The WRMP must be able to demonstrate that it would not cause a deterioration in respect of these baseline conditions. Furthermore, for those water bodies that are not currently attaining good status, the WRMP must be able to demonstrate that it would not preclude the delivery of measures to facilitate the improvements needed to attain good status.

## 1.5 Surface Waters

1.5.1 For surface waters (river, lake, transitional/estuarine and coastal water bodies), overall water body status has an ecological and a chemical component. Ecological status is measured on the scale of high, good, moderate, poor, and bad. Chemical status is measured as good or fail, based on the presence or absence of priority substances which present a risk to the environment.

1.5.2 Good ecological status is defined as a slight variation from undisturbed natural conditions, with minimal distortion arising from human activity. The ecological status of water bodies is determined by examining biological elements (e.g. fish, invertebrates, plants) and a number of supporting elements and conditions, including physico-chemical (e.g. metals and organic compounds), and hydromorphological (e.g. depth, width, flow, and 'structure') factors. These elements are summarised in Table 1.1.

<sup>10</sup> Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy.

<sup>11</sup> Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (the Groundwater Directive) including Commission Directive 2014/80/EU which amends Annex II of the original Directive 2006/118/EC

Table 1.1 WFD Classification Elements for Rivers, Lakes, Transitional and Coastal WFD Water Bodies

Water body type	Biological	Physico-chemical and chemical	Hydromorphological
<b>Rivers</b>	Macrophytes Phytobenthos Benthic invertebrates Fish	Thermal conditions Dissolved oxygen Acidification Nutrients Salinity  Organic pollutants Pollution by substances being discharged (e.g. phosphate or ammonia) Chemicals e.g. metals, pesticides	Hydrological regime - quantity and dynamics of water flow connection to groundwater bodies River continuity  Morphological conditions - river depth and width variation structure and substrate of the river bed Structure of the riparian zone.
<b>Lakes</b>	Macrophytes Phytoplankton Benthic invertebrates Fish	Transparency Thermal conditions Dissolved oxygen Acidification Nutrients Salinity  Pollution by substances being discharged Chemicals e.g. metals, pesticides	Hydrological regime - quantity and dynamics of inflows and outflows, residence time, connection to groundwater bodies  Morphological conditions - lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore.
<b>Transitional waters</b>	Phytoplankton Other aquatic flora Benthic invertebrates Fish	Transparency Thermal conditions Dissolved oxygen Nutrients Salinity  Pollution by substances being discharged Chemicals e.g. metals, pesticides	Tidal regime - freshwater flow, wave exposure  Morphological conditions - depth variation, quantity, structure and substrate of the bed, structure of the intertidal zone
<b>Coastal waters</b>	Phytoplankton Other aquatic flora Benthic invertebrates	Transparency Thermal conditions Dissolved oxygen Nutrients Salinity  Pollution by substances being discharged Chemicals e.g. metals, pesticides	Tidal regime - direction of dominant currents wave exposure  Morphological conditions - depth variation, structure and substrate of the bed, structure of the intertidal zone

## 1.6 Groundwater

- 1.6.1 For groundwater bodies, good status has both quantitative and chemical components that are assessed via a series of 'tests'. Both components are assessed providing outcomes of good or poor for each test, and a confidence rating is assigned to the status assessment of high or low. Together, these provide a single overall classification of either good or poor status, reflecting the lowest outcome of these tests to be precautionary.
- 1.6.2 There is also a trend objective set for groundwater bodies where environmentally significant and sustained rising trends in pollutant concentrations need to be identified and, where necessary, reversed.
- 1.6.3 Both the WFD and the GWD also require the prevention of any input of priority substances and limiting (or control) of the input of all other substances to groundwater to prevent the deterioration of groundwater body status.

## 1.7 Protected Areas

- 1.7.1 Assessment against WFD objectives may include consideration of additional or more stringent standards applied to protected areas if these are present, including standards set by other relevant EU legislation. Protected areas are defined in Annex IV of the WFD as:
- ▶ Areas designated for the abstraction of water intended for human consumption;
  - ▶ Areas designated for the protection of economically significant aquatic species;
  - ▶ Bodies of water designated as recreational waters, including areas designated as bathing waters;
  - ▶ Nutrient-sensitive areas, including areas designated as vulnerable zones and areas designated as sensitive areas; and
  - ▶ Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)).
- 1.7.2 A WRMP option would not be considered to be compliant with the WFD if it would have an adverse effect on the conservation objectives of a Natura 2000 protected area unless the tests for overriding public interest under Article 6.4 of the Habitats Directive are met.

## 1.8 Stages in the WFD Assessment and Structure of this Report

- 1.8.1 In late 2017/early 2018, Amec Foster Wheeler undertook the WFD assessment of 115 feasible options to inform the Draft WRMP. The assessment was undertaken in two stages as follows:
- ▶ **Stage 1:** assessment of 81 feasible options to support national water trading and reported on in the 'main' WFD assessment report<sup>4</sup>. This report also included a more detailed assessment of nine feasible options that had been identified at that time as preferred options.
  - ▶ **Stage 2:** assessment of 34 feasible resilience options associated with the Manchester and Pennine Resilience solution and reported on in the WFD supplementary report<sup>4</sup>. At that time, none of the resilience options/solutions had been identified as a being preferred.
- 1.8.2 For the Revised Draft WRMP, the two assessments have been combined into a single report (this document). The list of preferred options for the Revised Draft WRMP is different to that for the Draft WRMP and comprises just one resilience solution (with two composite options) and no resource management options. For context, the assessment of the Draft WRMP preferred options is included in Appendices F, G, H and I.
- 1.8.3 The structure of the remainder of this report is as follows:
- ▶ **Section 2** describes the review of UU's proposals for how it will operate its existing abstractions to determine whether they meet the criteria for sustainable catchments and comply with the WFD;
  - ▶ **Section 3** describes the methodology that has been adopted in order to undertake the WFD assessment of WRMP options;
  - ▶ **Section 4** presents an overview of the WRMP feasible options, and outlines how each type of option has been treated in the assessment process;
  - ▶ **Section 5** presents the results of the assessment of the supply-demand WRMP feasible options;
  - ▶ **Section 6** presents the results of the assessment of the Manchester and Pennine Resilience WRMP feasible options and solutions;



- ▶ **Section 7** presents the results of the assessment of the Revised Draft WRMP Preferred Plan, including the cumulative and protected area assessments;
- ▶ **Section 8** provides a summary of the key outcomes, and the requirements for further work; and
- ▶ **Section 9** is the statement of compliance with the WFD.

## 2. Review of Existing Abstractions

### 2.1 Introduction

- 2.1.1 This section presents the review of UU's proposals for how it will operate its existing abstractions to determine whether they meet the criteria for sustainable catchments and comply with the WFD.
- 2.1.2 As part of the preparation for WRMP19, and working towards sustainable catchments, the EA assessed WFD water bodies against four categories of risk from surface water and groundwater abstractions, as follows:
- ▶ **Category 1:** based on recent actual abstraction rates – causing serious damage now;
  - ▶ **Category 2:** based on recent actual rates – deterioration likely by 2027;
  - ▶ **Category 3:** based on full use of the abstraction licence – deterioration likely after 2027 and by 2040; and
  - ▶ **Category 4:** based on full use of the abstraction licence – no likelihood of deterioration before 2040.
- 2.1.3 The aim of the assessment was to highlight where existing abstractions could impact on WFD objectives and would therefore need mitigation. The initial assessments for the existing abstractions as currently operated and operating at 'licence full' was undertaken by UU. This report provides a review of UU's assessment work in the light of compliance with the WFD.

### 2.2 Licences Under Review

- 2.2.1 An assessment by the EA and UU of all the abstraction licences against the categories above identified<sup>12</sup>:
- ▶ Five licences in Category 1. However, these are all being dealt with in AMP6 so they are not included in this WFD assessment;
  - ▶ No licences in Category 2;
  - ▶ Thirty licences impacting on surface waters and 18 licences impacting on groundwater were in Category 3.
- 2.2.2 For impacts on surface water bodies, the EA identified the "tipping point" (i.e. abstraction volume) below which UU abstractions would no longer cause a risk of deterioration. The tipping point assessment was used to establish five year abstraction limits for the associated licences in order to ensure that long-term abstraction does not cause deterioration. For impacts on groundwater bodies, not included in the EA's "tipping point" assessment, UU assessed the impact of constraining future abstraction to the recent actual as a worst-case.
- 2.2.3 This review includes a review of the water bodies highlighted by the EA and UU to be affected by a Category 1, 2, or 3 abstraction and takes a precautionary approach.

### 2.3 WFD Assessment of Licence Reviews

- 2.3.1 The assessment of licences against WFD water bodies has indicated that when accounting for recommended levels of reduction, confirmed or potential AMP6 measures (either sustainability reductions or new/increased prescribed flows), and an assumption of continuation of current operational activities or abstraction levels, most licences are unlikely to have a significant impact on

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<sup>12</sup> Noted in United Utilities WRMP Methodology WFD no deterioration document – 2 August 2017 and Tipping Points spreadsheet – 2 August 2017.

WFD objectives of the relevant water bodies (e.g. impact levels are either no or minimal impact or minor impact).

- 2.3.2 This excludes the water bodies GB112074070010 (Ehen (upper including Liza)), GB31231398 (Ogden Reservoir Rochdale), and GB112068060300 (Salters Brook), where the relevant licences and activities could potentially lead to medium levels of impact. Further work may be required in these water bodies to either undertake further assessment to reduce the level of impact, or to establish what mitigation should be implemented.
- 2.3.3 The results of the WFD assessments are presented in **Table 2.1**.

Table 2.1 WFD Water Bodies Impacted by Current Abstraction

Water body ID	Water body name	Licences	WFD screening result	Comment
GB102076070690	Lowther (Upper)	NW/076/0005/003	Minor level of impact	The fully licensed assessment indicates impacts at Q30, Q50 and Q70. There is spare capacity in the licences that is greater than the reductions required. However, there is still some residual capacity that could impact on fish and invertebrates which are at high status.
GB112071065210	Colne Water (Laneshaw)	2671321024, 2671321040, 2671321023	Minor level of impact	The fully licensed assessment indicates impacts at Q50, Q70 and Q95. Additionally data is incorrect for Corn Close No.2 borehole. Therefore, even though the spare capacity in the licence is greater than the necessary reductions, there is the potential for an impact on WFD status and objectives.
GB112071065370	Langden Brook	2671315006, 2671315001, 2671315003, 2671315004, 2671315002, 2671315005,	Minor level of impact	The fully licensed assessment indicates impacts at all river flows. However, an assessment matching low flows calculations to flow protection indicates that four of the licences need reductions in order to protect river flows. If measures are implemented in AMP6, this will be mitigated and only minor impacts might be expected. However, if no measures are put in place, the risk would increase to medium.
GB112071065500	Ribble – conf Calder to tidal		No or minimal impact	The flows in this water body currently support good status.
GB112071065700	Duddel Brook	2671338012	No or minimal impact	The fully licensed assessment indicates impacts at Q50, Q70 and Q95. However, an assessment matching low flows calculations to flow protection indicates a potential issue with flow. If measures are implemented in AMP6 this will be mitigated and no impacts would be expected (particularly in light of abstraction being less than target). However, if no measures are put in place the risk would increase to medium.
GB112072066250	Wyre – conf R Brock to tidal	2672405006, 2672405010, 2672406022, 2672408015, 2672408020, 2672408021, 2672409004, 2672410001, 2672411002, 2672401001, 2672405009, 2672405015, 2672406012	Minor level of impact	The fully licensed assessment indicates impacts at Q50, Q70 and Q95. If measures are employed in AMP6 to implement the prescribed flows the impacts will be minor at most (particularly in light of abstraction being less than target). However, if no measures are put in place, the risk would increase to medium.

Water body ID	Water body name	Licences	WFD screening result	Comment
GB112072065770	Lords Brook		No or minimal impact	No impact is predicted for this water body based on the abstractions reviewed for GB112072066250.
GB112072066220	Calder (Wyre)	2672406022, 2672408021, 2672406012	Minor level of impact	The fully licensed assessment indicates impacts at all river flows and the abstraction data indicates that the deficit is greater than the spare capacity. However, if measures identified in AMP6 are implemented, this resolves the issue so there should be only a minor impact.
GB112072066240	Tarnbrook Wyre	2672401001	No or minimal impact	The fully licensed assessments indicates impacts at all river flows. However, the reductions required are lower than the target rate and additional measures are being implemented in AMP6.
GB112074070010	Ehen (upper including Liza)		No or minimal impact	Information provided by UU shows that this water body is impacted by the Ennerdale abstraction licence 2774003008, which will be revoked in 2022. As such the impact for this water body is set as no or minimal impact. If the licence is not revoked the impact would be medium.
GB112071065160	Trawden Brook	2671321022	No or minimal impact	The fully licensed assessment indicates impacts at Q50, Q70 and Q95. However, assessment indicates that deployable output is currently below the target abstraction to prevent deterioration. As such, no impact is expected.
GB112068060550	Crowton Brook	2568001159	No or minimal impact	The current abstraction is below the target set by the EA. Assuming abstraction does not increase and remains below target levels, particularly those relevant to Q70 and Q95 flows, no impact is expected.
GB112068060180	Dane (Clough Brook to Cow Brook)	2568002156, 2568002138	Minor level of impact	The spare capacity in the licence is greater than the necessary reductions and the hydrological regime supports good. Therefore, there should be no impact on WFD status as long as the abstraction stays at its current levels. However, assessments indicate a minor impact at Q95 so a minor impact is possible.
GB112068060300	Salters Brook	2568006082	Medium level of impact	Fully licenced scenarios indicate that the abstraction would have an impact at all river flows (i.e. Q30 to Q95). As the hydrological regime currently supports good, this could have an impact on WFD objectives.
GB112068060320	Ashton Brook	2568006082, 2568006088	No or minimal impact	Fully licenced scenarios indicate that the abstraction would have an impact at all river flows (i.e. Q30 to Q95). However, the abstraction is not used and therefore as long as this remains the case, no impact is expected. If the abstraction was to recommence a medium level of impact would be predicted.
GB112069064690	Beal	2569002206	Minor level of impact	The current abstraction is below the target. However, data indicates that at fully licenced quantities there could be impacts at Q50, Q70 and Q95. Therefore, there could be some minor impacts against WFD objectives.

Water body ID	Water body name	Licences	WFD screening result	Comment
GB31231398	Ogden Reservoir Rochdale	2569002206	No or minimal impact	Fully licenced scenarios indicate that the abstraction would have an impact at all river flows (i.e. Q30 to Q95). As the hydrological regime currently supports good ecological status, this could have an impact on WFD objectives. However, UU data indicates that current borehole DO constraint of 5.7 MI/d is lower than the target abstraction volume of 13.6 MI/d. Therefore the current system constraint protects against the risk of deterioration.
GB112069061210	Hardshaw (Windle) Brook	2569025037	No or minimal impact	Fully licenced scenarios indicate that the abstraction would have an impact at all river flows (i.e. Q30 to Q95). However, the abstraction is not used and therefore as long as this remains the case, no impact is expected. If the abstraction was to recommence, a medium level of impact would be predicted.
GB212069061524	Relief channel		No or minimal impact	This water body is not directly at risk therefore no impact is expected.
GB112068060330	Peckmill Brook, Hoolpool Gutter at Ince Marshes		No or minimal impact	This water body is not directly at risk therefore no impact is expected.
GB112068060350	Rivacre Brook	2568007014	No or minimal impact	Full licence scenarios indicates that the abstraction would have an impact at Q95. However, the abstraction is not used and therefore as long as this remains the case no impact is expected. If the abstraction was to recommence, a medium level of impact would be predicted.
GB112068060270	Dibbinsdale Brook and Clatter Brook	2568007014	No or minimal impact	Fully licenced scenarios indicate that the abstraction would have an impact at Q95. However, the abstraction is not used and therefore as long as this remains the case no impact is expected. If the abstraction was to recommence, a medium level of impact would be predicted.
GB112068060450	Darley Brook	256001158, 256001184, 256001153, 256001180, 256001155, 256001156	Minor level of impact	Fully licenced scenarios indicate that the abstraction would have an impact at Q70 and Q95. However, if the abstraction remains below targets then no or minimal impact would be expected.
GB112068060500	Weaver (Dane to Frodsham)	2568001154, 2568002138, 2568003124, 2568001158, 2568003091, 2568002156, 2568001159, 2568001184, 2568001153, 2568001180, 2568001155, 2568001156, 2568002146, 2568002138,	No or minimal impact	Fully licenced scenarios indicate that the abstraction would have an impact at Q95. However, several abstractions are limited and one is not used. So system restraints prevent a fully licenced scenario.

Water body ID	Water body name	Licences	WFD screening result	Comment
GB212069061523	Relief Channel		No or minimal impact	GW risk assessments indicates that there is no risk of deterioration.

2.3.4 In addition to the assessments above, further investigations have been identified as being required for the following groundwater licences:

- ▶ Thorncliffe Road (2674811009);
- ▶ Schneider Road (2674811008);
- ▶ Foxhill (2568005009);
- ▶ Manley Quarry (2568005011);
- ▶ Manley Common (2568006087);
- ▶ Newton Hollows (2568003076);
- ▶ Grizedale Dock reservoir (2672404001),
- ▶ Bearstone (18/54/04/0119);
- ▶ Dean Brook, Langden/Hareden system (2671338013); and
- ▶ Helsby (2568005008).

2.3.5 For all these licences, an assumption of medium level of impact has been assumed until the investigations have been completed. However, it is expected that in line with the assessments in **Table 2.1**, the risk levels will be reduced to minor impacts based on improved knowledge and through mitigation. As such, no options for this WRMP, specific to these licences, are expected to be required, although this will have to be reviewed upon completion of the investigations.

## 3. Approach to the WFD Assessment of WRMP Feasible Options

### 3.1 Overview

#### Approach to the Assessment

- 3.1.1 The WFD assessment has considered the following key questions in respect of the construction and operational phase of each feasible WRMP option:
- ▶ At the water body scale, would the option result in a deterioration of any of the WFD classification components from one status class to the next, (e.g. from good to moderate), irrespective of whether or not it results in the lowering of overall status?
  - ▶ Would the option prevent any water bodies from achieving good overall status or, where relevant, an alternate objective?
- 3.1.2 Following the assessment of each feasible WRMP option, an assessment was made of the following for each of the preferred options:
- ▶ Would the cumulative effects of multiple WRMP options impact on the objectives of individual WFD water bodies?
  - ▶ Would the cumulative effects of multiple WRMP options impact on the objectives of multiple water bodies that are hydrologically linked (i.e. operational catchments)?
  - ▶ Would the cumulative effects of multiple WRMP options affect protected areas and their associated objectives?
- 3.1.3 If the answer to all of the above five questions is ‘no’ then the option can be considered to be WFD compliant.
- 3.1.4 Whilst some guidance is available to help answer the above questions, the overall assignment of WFD impact was based on expert judgement.
- 3.1.5 The possible future decommissioning of WRMP options is beyond the scope of this assessment, but impacts arising from decommissioning are likely to be similar to those arising from construction.

#### Available Guidance to Support Expert Judgement Decision Making

- 3.1.6 The principal source of relevant guidance on WFD Compliance Assessment in England is the EA. At present, the only publically available guidance is *Clearing the Waters for All*<sup>13</sup>, which relates specifically to activities in estuarine and coastal water bodies up to one nautical mile out to sea. This guidance interprets the ‘no deterioration criterion’ as applying to each supporting WFD element as well as the overall status classification of the water body. So, for example, a deterioration in the quality of macrophytes in a river water body from good to moderate status would be classed as deterioration irrespective of whether this caused the overall water body status to be lowered. This approach was reinforced by a ruling from European Court of Justice<sup>14</sup> on the WFD assessment of dredging activities in Germany, and has been adopted as a general principal for the impact screening of WRMP options presented in this report.
- 3.1.7 Furthermore, the Cycle 2 RBMPs<sup>15</sup> indicate that within class deterioration of any constituent element (e.g. a lowering of the quality of macrophytes in a river water body that does not result in a lowering of the status of macrophytes e.g. from good to moderate) is permissible, but should be

<sup>13</sup> Environment Agency (2016) *Clearing the waters for All* – available at: <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

<sup>14</sup> Court ruling available at [curia.europa.eu](http://curia.europa.eu)

<sup>15</sup> 2015 River Basin Management Plans – available at <https://www.gov.uk/government/collections/river-basin-management-plans-2015>

limited as far as practicable. There are two exceptions to this: first, where the water body is at the lowest possible class (e.g. bad ecological status) where no within class deterioration is allowed; and, second, elements that are at high status (with the exception of morphology), which may be allowed to deteriorate to good status provided a number of additional conditions are met.

- 3.1.8 The EA has also made available their position statement on WFD assessment of new physical works in rivers (position 488\_10<sup>16</sup>) which has been used, as appropriate, to guide the assessment of levels of impact to the construction and operation phase of each WRMP option.
- 3.1.9 The EA has not published any guidance on WFD compliance assessments of lake or groundwater bodies.

## 3.2 WFD Assessment Process

- 3.2.1 The WFD assessment has been undertaken on 115<sup>17</sup> confirmed feasible options (inclusive of the Manchester and Pennine Resilience options). The option reference numbers and names are listed in **Appendix A**. The assessment steps are listed below and then described in more detail in the following sections.
- 3.2.2 WFD assessment steps:
- ▶ Feasible Options
    - ▶ Step 1: Data collection;
    - ▶ Step 2: Level 1 screening of options;
    - ▶ Step 3: Level 2 detailed assessment of potential impacts.
  - ▶ Preferred Options
    - ▶ Step 4: Cumulative assessment; and
    - ▶ Step 5: Protected areas assessment.

### Step 1: Collation of Baseline WFD and Option Data

- 3.2.3 The WFD assessments for each option were based on the engineering scope information provided by UU. Information was provided on likely option 'activities' (e.g. new groundwater abstraction, new pumping stations etc.) as well as small scale maps of preferred routes for any new pipelines that would be required. The engineering scopes are typically high-level documents, to enable desk top assessment, and do not contain information on construction methods, or the exact locations or designs of the new infrastructure.
- 3.2.4 All relevant water bodies that the option could impact on were identified by comparing the engineering pro forma to the spatial extent of WFD water bodies obtained from the EA's Catchment Data Explorer website<sup>18</sup> and NRW Water Watch website<sup>19</sup>. These websites were also used to collate baseline WFD data for each water body for the Level 2 assessments. The Level 1 and Level 2 assessments were based on the 2015 classifications, in line with the 2015 Cycle 2 RBMPs.

### Step 2: Level 1 Screening of Options

- 3.2.5 Each option was broken down into its main constituent parts ('activities') based on construction and operational phases. This included activities such as:

<sup>16</sup> Environment Agency (2015) Position 488\_10 Protecting and improving the water environment: WFD compliance of physical works in rivers.

<sup>17</sup> This includes the enabling works for the trading option, given the option ID 'B2' for the purposes of this assessment, and 34 resilience options.

<sup>18</sup> EA Catchment data explorer, available at: <http://environment.data.gov.uk/catchment-planning/>

<sup>19</sup> NRW Water Watch website, available at: <http://waterwatchwales.naturalresourceswales.gov.uk/en/>



- ▶ **Construction phase;** trenching and laying of pipe lines, building new abstraction infrastructure (e.g. river intakes, pumping stations), refurbishment of current infrastructure; and
- ▶ **Operational phase:** abstractions, discharges, maintenance of pipe lines.

3.2.6 For the supply-demand options, each water body that the option intersects was considered against each activity which would occur in that water body. For the resilience options, the Level 1 screening was undertaken at the option level and individual water bodies were not identified until the Level 2 detailed assessment. The likely impact assigned based on the definitions of impacts described in **Table 3.1**.

Table 3.1 Impact Classification Categories

Level of impact	Description of impact
No or minimal impact	No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved.
Minor level of impact	Impacts from the option when taken on their own have the potential to lead to a minor localised, short-term and fully reversible effect on the quality of the water environment that would not result in the lowering of WFD status.  Impacts would be very unlikely to prevent any target WFD objectives from being achieved.
Medium level of impact	Impacts when taken on their own have the potential to lead to a widespread or prolonged effect on the quality of the water environment that may result in the temporary lowering of WFD status.  Impacts have the potential to prevent target WFD objectives from being achieved.
High level of impact	Impacts when taken on their own have the potential to lead to a significant effect and permanent deterioration of WFD status.  Impacts have a high risk of preventing target WFD objectives from being achieved.

3.2.7 Some activities (e.g. pipe line construction) are highly unlikely to have more than a minor level of impact on a water body, no matter what the status of the water body is. This is because the activities are limited in spatial extent, will occur for a short duration in time, and/or have limited scope for interaction with the water environment. The Level 1 screening assessment assumed that all construction activities will be undertaken in line with best practice construction and pollution control measures, and that all relevant consents would be secured and complied with (refer to **Section 3.3**). For the supply-demand options, where the Level 1 screening identified that a water body would only be subjected to a minimal or minor level of impact from all activities arising from an option, the water body was screened out from the Level 2 detailed assessment and considered to be WFD compliant (note that the same water body may be screened in as a result of activities on other WRMP options). For the resilience options, those options that would only result in a minimal or minor level of impact, from one or more activities, was screened out from the Level 2 detailed assessment.

3.2.8 Other activities have the potential for a medium or high level of impact on a water body. These include activities that could have long term impact on water resources (e.g. a new surface water or groundwater abstraction, significant changes to the groundwater flow regime, or construction of a new reservoir), or involve large scale construction activities within a small water body (e.g. embankment raising of a reservoir which is a WFD water body in its own right). For the supply-demand options, where the Level 1 screening identified that a water body could be subject to a medium or high level of impact from one or more activities, the water body was screened in for Level 2 detailed assessment. For the resilience options, where the Level 1 screening identified an activity that has the potential for a medium or high level of impact, the resilience option was screened in for Level 2 detailed assessment.

3.2.9 Note that feasible options were initially assessed as though they will be the only option to be put in place within a water body.

3.2.10 **Table 3.2** summarises the Level 1 screening impacts from the activities that make up the options.

**Table 3.2 Level 1 Screening Impacts from Option Activities**

Level of impact	Construction activities	Operation activities	Level 1 screening result
<b>No or minimal impact</b>	<ul style="list-style-type: none"> <li>▶ Trenching and laying of pipe lines within the interfluves of a catchment (no watercourse crossings);</li> <li>▶ Modification of an existing water treatment works;</li> <li>▶ Construction of a new water treatment (set back from a watercourse);</li> <li>▶ Construction of new abstraction borehole headworks and associated surface infrastructure;</li> <li>▶ Construction of a new storage reservoir (e.g. small or set back from watercourse).</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintenance of pipe lines;</li> <li>▶ Maintenance and use of pumping stations and water treatment works;</li> <li>▶ Maintenance and use of river intakes/outfalls;</li> <li>▶ Maintenance and use of abstraction borehole headworks and surface infrastructure.</li> </ul>	Screened out of Level 2 detailed assessment
<b>Minor level of impact</b>	<ul style="list-style-type: none"> <li>▶ Trenching and laying of pipe lines involving watercourse crossings;</li> <li>▶ Construction or modification of a new pumping station and/or river intake;</li> <li>▶ Construction of new outfall structure to a watercourse or reservoir;</li> <li>▶ Refurbishment of existing abstraction boreholes or drilling of new abstraction boreholes.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Transfer of water via a river, canal or aqueduct;</li> <li>▶ Use of existing surface water and groundwater abstraction licences, within existing licence conditions and recent actual abstraction patterns.</li> </ul>	Screened out of Level 2 detailed assessment
<b>Medium level of impact</b>	<ul style="list-style-type: none"> <li>▶ Construction/repair of new tunnels and conduits.</li> </ul>	<ul style="list-style-type: none"> <li>▶ New or increased surface water abstraction;</li> <li>▶ New or increased groundwater abstraction;</li> <li>▶ Cessation of an existing discharge to a watercourse;</li> <li>▶ Change to reservoir compensation release;</li> <li>▶ Presence of new underground structures such as tunnels and shafts.</li> </ul>	Screened in for Level 2 detailed assessment
<b>High level of impact</b>	<ul style="list-style-type: none"> <li>▶ Construction of new impounding reservoir (e.g. next to or in line with a watercourse or large compared to water body);</li> <li>▶ Modification to existing reservoir (e.g. embankment raising).</li> </ul>	<ul style="list-style-type: none"> <li>▶ Presence of new reservoir or modified existing reservoir.</li> </ul>	Screened in for Level 2 detailed assessment

3.2.11 For most of the feasible options, all the water bodies affected by an activity that may cause a medium or high level of impact were screened in. For example, due to connections between the surface water and groundwater environment, changes to one may affect the other (e.g. a new groundwater abstraction may reduce baseflow in a surface watercourse). Where new abstractions from a lake or canal that is a WFD water body in its own right are proposed, the river body in which it is situated was also included, as the abstraction may affect the wider water body.

- 3.2.12 The exception to this was for Options WR159 (Group 1 - Improved reservoir compensation release control) and WR160 (Group 2 - Improved reservoir compensation release control) which involve changes to compensation releases from reservoirs. In this case, only the downstream river water bodies were screened in, groundwater bodies and lake water bodies were screened out. This is because it was clear from the engineering scope for these options that there would be no significant construction or operational changes to the reservoirs themselves, and it was then assumed that there would be no change in wetted area of downstream watercourses which may affect groundwater – surface water interactions.
- 3.2.13 In Steps 2 and 3, only the river water body in which the option is situated was considered; downstream river water bodies were not considered at this stage. There is the potential for an option such as a new surface water abstraction to impact on downstream water bodies, and this is considered in the Step 4 cumulative assessment, where impacts on both individual water bodies and operational catchments as a whole are considered.

### Step 3: Level 2 Detailed Assessment of Potential Impacts

- 3.2.14 Where the Level 1 screening of options indicated that an activity may have a medium or high level of impact, further assessment of the potential impacts was undertaken. This was recorded in an impact assessment worksheet for each water body that may be subject to a medium or high level of impact.
- 3.2.15 Additional baseline data for the Level 2 assessments was collected from the EA's Abstraction Licensing Strategies (ALS)<sup>20</sup>. The ALS compare flow in rivers and water levels in aquifers to the recent actual abstraction patterns, the fully licensed abstraction quantity, and the resource allocation for the environment. All surface water catchments and groundwater management units are assigned a resource availability as follows:
- ▶ **Water available:** there is more water than required to meet the needs of the environment, therefore new abstraction may be possible without having an effect on the environment;
  - ▶ **Restricted water available:** recent river flows or levels of groundwater are enough to meet the needs of the environment, but if all abstractions abstract at their licenced quantities, river flows or levels of groundwater would be lower than required to meet the needs of the environment;
  - ▶ **Water not available:** recent river flows or levels of groundwater are below those needed to meet the needs of the environment. River flows or groundwater levels are below the requirements to help support WFD good ecological status.
- 3.2.16 The water availability was used to estimate the likely effects of new or changed abstractions and discharges. This was supported by aquifer designation data<sup>21</sup> and the location of the abstraction compared to surface water courses where required.
- 3.2.17 As for the Level 1 screening, each option was broken down into its main constituent activities. Each activity was considered separately against each WFD element and the WFD baseline that has been collated. However, where feasible, assessments against elements were grouped if the scale and level of impacts were expected to be similar.
- 3.2.18 The assessments were based on available data and evidence as far as possible. However, due to the limited engineering and baseline information available, expert opinion was employed in most cases. Where there was uncertainty over an option (e.g. the exact route of a pipe line is not known), a worst case scenario approach was used (e.g. the assessments have assumed that the pipe line has watercourse crossings rather than not).

<sup>20</sup> Abstraction Licensing Strategies, accessed October 2017: <https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process>

<sup>21</sup> Aquifer designation data, accessed October 2017: <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>

- 3.2.19 The same level of impact categories were used as in the Level 1 screening (**Table 3.1**). The final impact category identified for each part of an option assumes that generic construction best practice and pollution prevention measures would be put in place (see **Section 3.3**).
- 3.2.20 A confidence rating was given to the Level 2 assessments, according to the confidence categories in **Table 3.3**. The confidence rating assigned to each assessment is a reflection on the amount of uncertainty in the option design (e.g. uncertainty over the location and quantity of a new groundwater abstraction would lower the level of confidence in the assessment), and the amount and quality of evidence upon which the impact level has been based (e.g. existing investigations into the impacts of reservoirs by UU and the EA increase the confidence level in the assessment). All the assessments that have only been subject to a Level 1 assessment are assigned a high confidence by default.

Table 3.3 Confidence Level Categories

Confidence category	Description of confidence
Low	Very limited evidence, high risk activity or assessment solely based on expert judgement.
Medium	Reasonable levels of evidence for some aspects of the assessment. Some assumptions and expert opinion required.
High	Good level of evidence with minimal assumptions required or low risk activity.

- 3.2.21 The overall WFD impact of the options was based on the 'one out, all out' methodology used for the WFD. For example, this would mean that if the construction phase of an option has a final level of impact of 'no or minimal' but the operational phase has a level of impact of 'medium', the overall impact to WFD objectives from the option would be identified as 'medium level of impact'.

#### Step 4: Cumulative Assessment

- 3.2.22 Where two or more Preferred Plan options are located in the same water body or operational catchment<sup>22</sup>, a high level assessment has been undertaken to determine the potential for cumulative effects on WFD objectives, should all the options be implemented.
- 3.2.23 The cumulative impact reflects the greatest impact that could occur in either an individual water body within the operational catchment, or on the catchment as a whole. For example, if an operational catchment includes a single water body with a medium level of impact and several water bodies with a minor level of impact, the cumulative impact on the catchment will be at least medium impact. The cumulative impact may be increased to a high level of impact if the options could combine to create a greater impact than they would individually (e.g. the level of impact on the fish classification status could increase if two new abstractions started on the same river but in different water bodies). The same impact classification system has been used for the cumulative assessments as for the Level 1 and Level 2 assessments (**Table 3.1**).

#### Step 5: Protected Areas Assessment

- 3.2.24 Assessments have been undertaken on protected areas related to the protection of habitats and species that are identified in the EA's Catchment Data Explorer<sup>23</sup> as being linked to a water body that may be impacted by a Preferred Plan option. The habitats present in each protected area<sup>24</sup> have been reviewed, and only protected areas with habitats which may be water dependent (e.g.

<sup>22</sup> An operational catchment may comprise a number of river water bodies that combine to form a drainage catchment, or a regional groundwater body.

<sup>23</sup> Downloaded from the EA's Catchment Data Explorer website October 2017: <http://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/12>

<sup>24</sup> Habitat data for protected areas downloaded from the Joint Nature Conservation Committee website October 2017: <http://jncc.defra.gov.uk/page-4>

inland water bodies, bogs, marshes, water fringed vegetation and fens) have been included in the assessment.

- 3.2.25 The assessment considers if a hydrological pathway is present between the protected area and the options. Options located downstream of a protected area are generally not considered to have an impact on a protected area unless the reason for designation could be impacted by new structures or reductions in stream flow (e.g. migratory fish). A single assessment has been undertaken for each protected area regardless of how many options could affect it.
- 3.2.26 The assessment has been informed by expert judgement and detailed evidence where it is available (e.g. hydrological assessments and EA investigations). The same impact classification system has been used for the cumulative assessments as for the screening assessments (Table 3.1). However, an overall combined assessment of construction and operational phase impacts has been provided rather than separate assessments.
- 3.2.27 Other protected areas (e.g. nutrient sensitive areas, bathing waters, shellfish waters and drinking water protection areas) have been assessed as being at low risk of being impacted by the WRMP options (e.g. shellfish waters and bathing waters are related to transitional and coastal waters and so the link between an WRMP is limited). As such, these protected areas are not part of the scope of this WFD assessment.

### 3.3 Assumptions

- 3.3.1 The WFD assessment is based on available data, primarily spatial data on the EA's Catchment Data Explorer website and NRW Water Watch website, and the engineering scopes provided for each option. However, in all cases the information had insufficient detail and so the use of assumptions in the assessment of construction and operational impact was required. The assumptions used were as follows:
- ▶ Construction best practice will be used at all construction sites. As no detailed plans or construction methods were available for the assessments, they are based on the assumption that measures will be implemented that are consistent with the suite of Guidance for Pollution Prevention<sup>25</sup>, and that all relevant consents would be secured and complied with. This is especially crucial in respect of in-channel works and works that take place in proximity to river channels (e.g. within 8 metres);
  - ▶ All new transfer pipe line river watercourse crossings would be installed via trenchless techniques or via a trench and cover technique within a dry working area. Trench and cover techniques would require temporary over pumping of water or temporary diversion of the river channel, and a reinstatement of bed and bank material, and flow, once works are complete. Such works would require consent from the EA or Lead Local Flood Authority, which would ensure WFD compliance;
  - ▶ All new transfer pipe line crossings of estuaries or coastal waters would be installed via horizontal directional drilling or an alternative technique that would minimise disturbance of the bed. Works would be undertaken in line with Marine Management Organisation licence requirements, ensuring WFD compliance;
  - ▶ Ground investigations would be undertaken prior to construction activities. These will identify any contaminated land and mitigation that may be required;
  - ▶ Extensions, modifications, or new pumping stations, water treatment works, etc. would be consented either via permitted development rights, or via planning consent from the Local Planning Authority. Construction of these would involve a relatively small footprint in the context of any WFD water body catchment, would not be laterally extensive (compared to, for example, a new transfer main), and would not involve the requirement for in-channel works.

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<sup>25</sup> <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>

Where planning consent is required, such developments would need to demonstrate that they are compliant with the objectives of the WFD in order to gain planning consent;

- ▶ Dewatering of excavations would not require a permit from the EA/NRW. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. However it is assumed that the dewatering permit would limit any impacts to a minor level (localised and temporary). Dewatering would be of uncontaminated water, and water would be discharged within the same water body. This assumption does not include dewatering activities associated with the new tunnel and tunnel refurbishment Manchester and Pennine resilience options, which would require further detailed assessment to establish the risks posed by dewatering;
- ▶ The relatively shallow and localised excavations associated with laying new transfer pipe lines, and constructing new pumping stations, water treatment works etc. would not present a risk to overall WFD status of groundwater bodies;
- ▶ Construction, refurbishment, and testing of groundwater abstraction boreholes would be undertaken under consent from the EA/NRW. Boreholes would be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.
- ▶ WRMP options that involve a new transfer of water into the water environment (e.g. new outfalls into rivers, canals or reservoirs) would be consented by an appropriate discharge activity permit that stipulates an appropriate standard for water quality in line with the requirements of the WFD standards;
- ▶ For WRMP options that involve the transfer of water via canals, it is assumed this would be undertaken with due consideration to WFD status and objectives and that any water transfer option would be agreed in principle with the canal owner.

## 4. Overview of Feasible Options

- 4.1.1 The 115 WRMP feasible options (comprising of 81 supply-demand options and 34 Manchester and Pennine Resilience options) were assessed to identify if they presented a risk to the delivery of WFD objectives. The following sub-sections describe the activity categories associated with the options and outline how each activity has been dealt with during the Level 1 screening and the Level 2 detailed assessment.

### Construction Phase Activities

#### In-channel Construction Activities

- 4.1.2 A total of 64 WRMP feasible options include the need for the construction of in-channel structures (e.g. new surface water abstractions requiring the construction of intake structures), or the construction of pipe lines with watercourse crossings. In-channel (or in-lake) construction may have the following impact on surface water bodies:
- ▶ Reduction in the chemical status due to deterioration in water quality due to disturbance of soils and sediments, particularly if contaminated;
  - ▶ Reduction in the chemical status due to deterioration in water quality due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery;
  - ▶ Reduction in the ecological status due to deterioration in chemical status;
  - ▶ Reduction in the ecological status due to smothering of habitats or reduction in light due to release of sediments; and
  - ▶ Reduction in the ecological status due to changes in hydrological regime, river continuity or morphological conditions as a result of impoundments or changes to the structure of the channel.
- 4.1.3 For the purposes of the WFD assessment, it has been assumed that construction best practice would be used, including pollution prevention measures (see **Section 3.3**). As such, any effects that do occur would be temporary and localised. In channel construction has therefore been flagged as a minor impact in the Level 1 screening and is not subject to a detailed Level 2 assessment.

#### Surface Catchment Construction Activities

- 4.1.4 A total of 105 WRMP feasible options include the construction or modification of raw water transfer pipe lines, water treatment works, booster stations and other infrastructure in the near surface environment, but away from watercourse channels.
- 4.1.5 These structures typically have a very small footprint compared to the WFD water bodies as a whole, and only involve relatively shallow excavations. Assuming that construction best practice is implemented (see **Section 3.3**), these activities are unlikely to have a negative impact on the status of the water bodies. As such, construction activities away from watercourses have been assigned a no or minimal impact in the Level 1 screening and are not subject to a detailed Level 2 assessment.

#### Abstraction Borehole Construction or Refurbishment

- 4.1.6 A total of 32 WRMP feasible options associated with new groundwater abstractions include the construction of new abstraction boreholes (drilling, borehole development, pumping tests, installation of pumps, head works construction), or the refurbishment of existing boreholes (borehole development, installation of new pumps, new headworks), which may have the following impact on water bodies:

- ▶ Reduction in the chemical status of the groundwater body due to release of drilling chemicals into the aquifer, or migration of near surface contamination to ground;
- ▶ Reduction in the quantitative status of the groundwater body due to changes in groundwater levels and flows during test pumping. This could also affect the chemical status if changes in flows cause migration of contaminated or saline groundwater;
- ▶ Reduction in the quantitative status of the aquifer due to deterioration in a dependent surface water body or groundwater dependent terrestrial ecosystem test as a result of changes in the supply of baseflow to surface water environments during pumping tests;
- ▶ Reduction in the chemical or ecological status of surface water bodies due to reductions in baseflow causing changes to the hydrological regime or reduction in dilution of pollutants.

4.1.7 For the purposes of the WFD assessment, it has been assumed that drilling and test pumping would be undertaken in line with permits from the EA or NRW, and any at surface construction works would be undertaken according to construction best practice and pollution prevention measures (see **Section 3.3**). As such, any effects that do occur would be at worst, temporary and localised. Abstraction borehole drilling and refurbishment has therefore been flagged as a minor impact in the Level 1 screening and is not subject to a detailed Level 2 assessment.

#### Construction or Modification of Reservoirs

4.1.8 Four feasible options propose the construction of new reservoirs (WR004 – Longsleddale Reservoir and WR012 – Borrow Beck Reservoir) or raising the embankment structure of a reservoir (WR037a and WR037b Haweswater Reservoir).

4.1.9 The construction of a new reservoir could have a widespread impact on the river water body in which it is located due to the following:

- ▶ Reduction in the chemical status due to a deterioration in water quality as a result of disturbance of soils and sediments, particularly if contaminated;
- ▶ Reduction in the chemical status due to deterioration in water quality as a result of accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery;
- ▶ Reduction in the ecological status due to smothering of habitats or reduction in light as a result of release of sediments; and
- ▶ Reduction in the ecological status due to changes in hydrological regime, river continuity or morphological conditions as a result of impoundments and watercourse diversions.

4.1.10 While these effects would be temporary during the construction works, they would be widespread and therefore new reservoir construction has been flagged as high impact during the Level 1 screening and is subject to Level 2 detailed assessment.

4.1.11 Impacts of the construction activities associated with raising existing reservoir embankment structures would be similar to those listed above. Whilst these would be temporary, they could have widespread impacts on the lake water body associated with the reservoir due to the relatively small size of the water body. Impacts could also occur on the downstream river water body. These activities have been flagged as high impact during the Level 1 screening and are subject to Level 2 detailed assessment.

4.1.12 Options WR159 (Group 1 - Improved reservoir compensation release control) and WR160 (Group 2 - Improved reservoir compensation release control) involve a change to the penstock arrangements of reservoir compensation releases. As this only involves changes to pipework and associated equipment, any impacts on the WFD status of water bodies would be none or minimal, and this activity is not subject to a detailed Level 2 assessment.



## Construction or Repair of Tunnels and Conduits

- 4.1.13 Two Manchester and Pennine Resilience options include the construction of new tunnels and conduits, and two include the repair of existing tunnels and conduits that make up the regional aqueduct. These four options also include the drilling of temporary and permanent access shafts to the new or existing tunnels. The potential impacts of these activities include:
- ▶ Reductions in the quantitative status of a groundwater body due to dewatering of shafts and tunnels;
  - ▶ Changes to groundwater levels and flow patterns due to dewatering of shafts and tunnels, or through the creation or disruption of groundwater flow pathways due to subsurface excavation and construction. These changes could result in a reduction in the quantitative status of a groundwater body. Depending on the nature of the surface geology and the degree of connectivity between the groundwater and surface water environment, there may also be an impact on the hydrological regime of overlying surface water bodies or protected areas;
  - ▶ Reductions in chemical status of groundwater bodies. This could be caused by migration of contaminated groundwater from shallow contaminated land or abandoned coal workings to unaffected areas of the groundwater body, or by leakages from construction machinery;
  - ▶ Reduction in the chemical status of surface water bodies due to deterioration in water quality arising from disturbance of soils and sediments at the surface, particularly if contaminated, or due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery;
  - ▶ Reduction in the ecological status of surface water bodies due to smothering of habitats or reduction in light as a result of the release of sediments from construction activities; and
  - ▶ Reduction in the ecological status of surface water bodies resulting from a deterioration in chemical status.
- 4.1.14 The length of the tunnels (up to 52 km of new tunnels), the number of access shafts that need to be constructed (estimated at every 3 km), and the scale of the excavation and construction activities means that there is the potential for significant impacts on the WFD status of water bodies. As a result, resilience options that include tunnels have been assigned a medium level of impact in the Level 1 screening and are subject to a Level 2 detailed assessment.

## Operation Phase Activities

### Water Transfers

- 4.1.15 A total of 11 WRMP feasible options (many of the third party options (WR8xx), plus WR099a (Worsthorne Borehole (Compensation)), WR109 (Swineshaw Boreholes (Buckton Castle Water Treatment Works (WTW))), and WR114 (Python Mill Borehole)), involve transfer of water between water bodies via canals, or occasionally surface watercourses. The discharge of water can affect the water quality of the receiving watercourse, and also the hydrological flow regime. For the purposes of this WFD assessment, it has been assumed that any transfers would be consented by an appropriate discharge activity permit or equivalent controls if the activity would be exempt from such regulation. In addition, it is assumed that canals are managed (by the canal owner or equivalent organisations) to maintain flows and water levels to permit navigation and existing water transfer arrangements with UU, and that this is done with due consideration for WFD objectives (see **Section 3.3**).
- 4.1.16 Water transfers have been flagged as a minor level of impact in the Level 1 screening and are not subject to a detailed Level 2 assessment.

### New or Increased Abstractions

- 4.1.17 A total of 65 WRMP feasible options include either a new abstraction or a change to an existing abstraction. Changes to an existing abstraction can either be an increase in the licensed quantity,

or an increase from recent actual abstraction levels, but still within the licensed quantity. For this latter option type, a new abstraction licence is not required, but the increase in abstraction is considered in the WFD assessment, as the increased abstraction may have an impact on the WFD status of the associated water bodies.

- 4.1.18 A further 32 options include a new or increased groundwater abstraction quantity. The impact of this activity may include:
- ▶ Reduction in the quantitative status of the groundwater body due to a failure of the quantitative water balance test as a result of long term abstraction rates from the aquifer exceeding long term recharge rates;
  - ▶ Reduction in the quantitative status of the aquifer due to deterioration in the dependent surface water body or groundwater dependent terrestrial ecosystem test. This can occur as a result of changes in groundwater flows and levels changing the supply of baseflow to surface water environments;
  - ▶ Reduction in the quantitative or chemical status of the groundwater body if changes in groundwater flow induced by the abstraction causes migration of contaminated or saline groundwater;
  - ▶ Reduction in the chemical or ecological status of surface water bodies due to reductions in baseflow causing changes to the hydrological regime or reduction in dilution of pollutants.
- 4.1.19 A total of 33 options include a new or increased surface water abstraction quantity. The impact of this activity may include:
- ▶ Reduction in the ecological status of the surface water body due to changes in the hydrological regime failing to support good status of biological elements such as fish or benthic invertebrates;
  - ▶ Reduction in the chemical status of the surface water body due to reduction of dilution of specific pollutants, priority substances or priority hazardous substances;
  - ▶ Reduction in the ecological status of the surface water body due to changes in the chemical status failing to support good status of biological elements such as fish or benthic invertebrates; and
  - ▶ Reduction in the quantitative water balance of a groundwater body due to changes to the quantity and patterns of leakage of surface water to groundwater.
- 4.1.20 Changes to abstractions may have a widespread or prolonged effect on the WFD status of surface water or ground water bodies, so water bodies in which a new or changed abstraction is located are screened in for Level 2 detailed assessments. For all abstractions, both the groundwater and surface water bodies in which they are located have been screened in. The Level 2 detailed assessment takes the following into consideration:
- ▶ The size of the proposed new abstraction (or size of the increase compared to the current abstraction);
  - ▶ If an abstraction licence is already in place;
  - ▶ The proximity of groundwater abstractions to surface watercourses; and
  - ▶ The availability of water in the relevant surface water and groundwater bodies.

### Changes to Existing Discharges

- 4.1.21 Option WR146 (Davyhulme - Final Effluent Reuse) is a direct final effluent reuse scheme which involves utilisation of the discharge from Davyhulme Waste Water Treatment Works (WwTW). Reduction in the volume of a discharge may affect the hydrological regime of a surface water body and therefore this option (the only option which involves a reduction of a discharge from a WwTW)

has been flagged as medium level of impact in the Level 1 screening and is subject to a Level 2 detailed assessment.

- 4.1.22 Options WR159 and WR160 comprise the reduction in compensation flows from 76 local and four regional reservoirs. This is not a reduction in the consented compensation flow, rather a reduction in the currently discharged volume to bring the compensation release in line with the consented volume. The current WFD status is based on the current flow regime (including recent actual abstraction and discharge patterns) and changes to the discharge patterns could result in a change to the hydrological regime of a surface water body. Therefore, reduction in compensation flows are flagged as medium impact at Level 1 screening for the river water body immediately downstream of the reservoir, and subject to a Level 2 detailed assessment. As the wetted area of the reservoir and downstream watercourses would not change significantly, any impact on groundwater bodies would be minor. Therefore, groundwater bodies for Options WR159 and WR160 have been flagged as no or minimal impact at Level 1 screening and are not subject to a detailed Level 2 assessment.
- 4.1.23 Where a reservoir is a WFD lake water body in its own right, the lake has not been screened in for Level 2 detailed assessment. This is because any water not released as compensation flow will be abstracted for supply, therefore there will not be a significant change to the lake water bodies and they have been flagged as no or minimal impact in the Level 1 screening.

#### Presence of New Reservoirs or Increased Size of Modified Reservoirs

- 4.1.24 Two options (Option WR004 (Longsleddale Reservoir) and Option WR012 (Borrow Beck Reservoir)) include the construction and subsequent operation of a new impounding reservoir. Out of all the activities planned, this has the potential for the greatest impact on the WFD status of the surface water body in which it is constructed due to permanent changes to the habitats, hydrological flow regime, and water quality of the watercourses. It may also result in the reclassification of a water body as highly modified water body. Interactions with underlying groundwater bodies may also occur affecting their WFD status. Therefore, these options are flagged as a high impact at Level 1 screening stage and subject to a Level 2 detailed assessment.
- 4.1.25 While increasing the size of a reservoir through embankment raising or other modifications has a lower potential for significant impacts, these are still flagged as a high impact at Level 1 screening stage, then assessed in more detail in the Level 2 assessment.

#### Presence of New Tunnels and Conduits

- 4.1.26 Two Manchester and Pennine Resilience options include the construction of new tunnels and conduits. These resilience options also include the construction of permanent access shafts to the new or existing tunnels. The potential impacts of these resilience options include:
- ▶ Changes to groundwater levels and flow patterns due to the presence of a new subsurface impermeable structure. Where the diameter of the tunnel is small in comparison to the saturated thickness of the aquifer, and the tunnel is well below the water table, impacts are likely to be minor. However, where the diameter of the tunnel is large relative to the saturated thickness of the aquifer, and the tunnel is close to the water table and active zone of groundwater flow, greater impacts may occur, particularly if the tunnel is perpendicular to the direction of groundwater flow. These changes may cause a reduction in the quantitative status of the groundwater body and may also impact on the hydrological regime of overlying surface water bodies or protected areas (depending on the degree of connection between the groundwater and surface water environment). Changes to groundwater levels and flow patterns may also occur if altered or preferential flow paths are created in the strata immediately surrounding the tunnels and shafts;
  - ▶ Changes to the chemical status of groundwater bodies due to leakages from the aqueduct. However, it is assumed that the potable standard raw water would be free from hazardous and priority hazardous substances and other pollutants and would therefore not have a significant negative effect on the chemical status of the groundwater body.

- 4.1.27 The presence of large (up to 52 km long tunnels) impermeable structures in the subsurface has the potential to result in permanent changes to the groundwater environment which may impact on both groundwater and surface water bodies. As a result, resilience options which include tunnels have been assigned a medium level of impact in the Level 1 screening and have been subject to a Level 2 assessment.

### Enabling Works for Trading Option

- 4.1.28 The Draft WRMP included a strategic choice to trade water to Thames Water during drought years (although this now longer forms part of United Utilities' Preferred Plan for the Revised Draft WRMP) but is included here for completeness to ensure all feasible options are considered. Water would be released from Lake Vyrnwy into the River Severn, re-abstracted from the River Severn at Deerhurst, transferred by a new pipeline to the River Thames at Culham, then re-abstracted from the River Thames using Thames Water existing infrastructure.
- 4.1.29 For the purposes of preparing the Draft WRMP and undertaking the WFD assessment, UU agreed with Thames Water that any environmental impacts downstream of Vyrnwy in the Severn catchment, and in the Thames catchments associated with this transfer, would be assessed in Thames Water's Water Resources Management Plan. These activities have therefore not been included in this WFD assessment, although the findings of the Thames Water WFD assessment<sup>26</sup> in respect of this transfer are summarised below. As the water traded is currently abstracted for UU supply, it is assumed that there would be no impacts on Lake Vyrnwy itself.
- 4.1.30 In order to facilitate the transfer of water from the UU supply area to the Thames Water supply area, enabling works would be required. The enabling works for the trading option include:
- ▶ Upgrading of the Vyrnwy Aqueduct;
  - ▶ Modifications to Oswestry WTW;
  - ▶ Transfer of water from the Dee Aqueduct to the Vyrnwy Aqueduct;
  - ▶ Construction of four booster stations; and
  - ▶ Transfer of water from Duddon Common Booster Station and Sandiford WTW.
- 4.1.31 These enabling works are included in this WFD assessment (Option B2).

### Summary of the Thames Water Draft Water Resources Management Plan 2019 WFD Assessment of a Severn Thames Transfer

- 4.1.32 The Thames Water WFD assessment highlights that the additional releases of water from Lake Vyrnwy would be not likely to have a significant adverse impact on the WFD physico-chemical or chemical classifications sufficient to result in a change of WFD status in the Afon Vyrnwy or River Severn. However, the assessment notes that there is some uncertainty as to effects on dissolved oxygen and water temperature in the upper reaches of the Afon Vyrnwy downstream of the reservoir, due to the higher releases which may adversely impact on aquatic ecology, as well as a risk of higher flow velocities leading to the resuspension of copper from river bed sediment associated with historic copper mine workings in the river catchment area. The WFD assessment states that there may be beneficial effects under some flow conditions, particularly during low flows in hot weather, with higher flows helping to moderate elevated water temperatures and increasing dilution of diffuse pollution pressures.
- 4.1.33 The WFD assessment states that abstraction of water from the River Severn at Deerhurst would not be anticipated to result in a change in the flow regime that would be materially significant such as to alter the chemical status of the river. The abstracted water would be treated at the nearby treatment works, which would include ferric chloride, clarification and rapid gravity filters (RGF)

<sup>26</sup> Ricardo (2017) *Draft Water Resources Management Plan 2019: Water Framework Directive Assessment*. Available from <https://corporate.thameswater.co.uk/-/media/Site-Content/Your-water-future-2018/Appendices/dWRMP19-Apendix-BB---Water-framework-directive-151217.pdf> [Accessed July 2018].

treatment processes. The first flush of water through the pipeline after a period of non-use has the potential for adverse effects to water quality, although mitigation includes that the first flush of water through the pipeline would be tested and if required treated at a temporary holding lagoon. Once operational, the discharge would be treated to environmental standards at the water treatment works and this would provide sufficient quality of water for discharge taking account of the mixing and dilution that would occur within the receiving waters.

- 4.1.34 The effects of the discharge at the discharge/flow augmentation point at Culham (Thames (Evenlode to Thame) and the potentially impacted waterbodies downstream were considered in the WFD assessment. The assessment states that discharge would be treated to environmental standards and therefore there would be a low risk of impacting the physico-chemical quality elements of these River Thames water bodies (which are currently assessed as being at moderate WFD status). Peaks in suspended solids would be monitored and if there was an elevated level of suspended solids, the abstraction from the River Severn would be reduced to just the pipeline 'sweetening' flows, and would be treated prior to the main treatment works. The outfall to the River Thames would involve an aeration cascade structure to oxygenate the discharge water to minimise any adverse impacts on dissolved oxygen concentrations in the river. The assessment notes that there is the potential for some organic pollutants to be in the discharged, such as metaldehyde, as these pollutants are more difficult to treat and remove at the water treatment works.

## 5. Results of the WFD Assessment of WRMP Supply-Demand Feasible Options

### 5.1 Level 1 Screening of Feasible Options

- 5.1.1 The Level 1 screening identified 328 WFD water bodies that may be impacted by the 81 supply-demand feasible options. Many of these water bodies could be impacted by more than one option, resulting in a total number of 584 option-water body combinations. The screening exercise was undertaken for each option and its related water bodies. The results of the screening exercise are summarised in **Table 5.1** and presented in full in **Appendix B**.

Table 5.1 Summary of Level 1 Screening Exercise for Feasible Options

	No of option– water body combinations	No of water bodies	No of options
<b>Total</b>	584	328	81
<b>High level of impact</b>	10	6	4
<b>Medium level of impact</b>	198	126	65
<b>Minor level of impact</b>	201	128	39
<b>No or minimal impact</b>	175	127	28

Note that a water body may have varying levels of impact from different options, and an option may have differing levels of impact on different water bodies. This means that some water bodies and options are counted more than once in the values in this table.

### 5.2 Level 2 Assessment of Feasible Options

- 5.2.1 The Level 1 screening identified 69 feasible options that may have a medium or a high level of impact on one or more water bodies. The water bodies that may be subject to a medium or a high level of impact from these options were subject to a Level 2 detailed assessment. This involved further consideration of the activities proposed within those water bodies and review of baseline data. Following the Level 2 detailed assessment, the level of impact assigned during the Level 1 screening may have been reduced or increased depending on the judgement of the likely impact.
- 5.2.2 The results of the Level 2 assessment were combined with the results of the Level 1 assessment to produce a combined assessment result which is summarised in **Table 5.2** and presented in full in **Appendix B**. The individual Level 2 assessment spreadsheets are presented in **Appendix C**. In general terms, the Level 2 detailed assessments resulted in a lowering of the level of impacts, a reflection on the conservative approach adopted in the Level 1 screening.
- 5.2.3 Four options were identified as having a high level of impact. These are:
- ▶ WR004: Longsleddale reservoir;
  - ▶ WR012: Borrow Beck impounding reservoir;
  - ▶ WR039a: River Eden; and
  - ▶ WR119b: Egremont Boreholes (new).

Table 5.2 Summary of Combined Assessment Results for Feasible Options

	No of option– water body combinations	No of water bodies	No of options
<b>Total</b>	584	328	81
<b>High level of impact</b>	4	4	4
<b>Medium level of impact</b>	52	38	34
<b>Minor level of impact</b>	337	198	68
<b>No or minimal impact</b>	191	134	38

Note that a water body may have varying levels of impact from different options, and an option may have differing levels of impact on different water bodies. This means that some water bodies and options are counted more than once in the values in this table.

## 6. Results of the WFD Assessment of Manchester and Pennine Resilience Options and Solutions

### 6.1 Introduction

6.1.1 The results of the Level 1 and Level 2 assessments for each resilience option are summarised in **Table 6.1**, and described by solution in Sections **Error! Reference source not found.** to **Error! Reference source not found.**. The assessments are presented in full in Appendices D and E.

6.1.2 For each of the five resilience solutions, the impact level of all the individual resilience options within that solution have been considered, and initial screening level cumulative and protected area assessments have been undertaken.

### 6.2 Resilience Options

6.2.1 **Table 6.1** presents a summary of the resilience options assessment. This assessment indicates that, in total:

- ▶ 22 resilience options have a no or minimal level of impact;
- ▶ 7 resilience options have a minor level of impact; and
- ▶ 5 resilience options have a medium level of impact.

Table 6.1 Summary of Resilience Option Assessment

Option Number	Solution	Option Description	WFD Impact Level	Confidence Rating
3	C	Manchester and Pennine Aqueduct to Raw: 2 Stage filtration (Bury)	No or minimal impact	High
37-38	B	Manchester and Pennine Aqueduct section T05 to T06	Medium level of impact	Low
37-42	D, E	Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low
46	A, E	WELM Uprate to 150MI/day	No or minimal impact	High
112	B, D	Manchester and Pennine Aqueduct Outage (4 weeks) for installation of connections	No or minimal impact	High
212	C	Manchester and Pennine Aqueduct to Raw (Newton-in-Bowland)	No or minimal impact	High
213	C	Manchester and Pennine Aqueduct to Raw (Clayton-le-Moors)	No or minimal impact	High
214	C	Manchester and Pennine Aqueduct to Raw (Haslingden)	No or minimal impact	High
215	E	Alternative Supply: Raw water transfer and WTW (Clayton-le-Moors)	Medium level of impact	Medium
216	A, E	Alternative Supply: Raw water abstraction and WTW (Haslingden)	Minor level of impact	Medium
217	E	Alternative Supply: Raw water transfer and WTW (Newton-in-Bowland)	Minor level of impact	High
218	E	Alternative Supply: Raw water transfer and WTW (Preston)	Minor level of impact	High



Option Number	Solution	Option Description	WFD Impact Level	Confidence Rating
238	B	Metals & UV treatment of BSPs: Bury	No or minimal impact	High
260	A	Ribblesdale South Well Isolation	No or minimal impact	High
261	A	Haslingden Well Isolation	No or minimal impact	High
296	A	T05 targeted repair 2025	Medium level of impact	Low
297	A	T06 targeted repair 2025	Medium level of impact	Low
301	C	Lunesdale Siphon BSPs North	Minor level of impact	High
303	C	Lunesdale Siphon BSPs South	Minor level of impact	High
306	C	Ribblesdale Siphon BSPs North	Minor level of impact	High
348	B	Metals & UV Treatment of BSPs: Lunesdale Siphon (1)	No or minimal impact	High
349	B	Metals & UV Treatment of BSPs: Lunesdale Siphon (2)	No or minimal impact	High
350	B	Metals & UV Treatment of BSPs: Lunesdale Siphon (3)	No or minimal impact	High
351	B	Metals & UV Treatment of BSPs: Lunesdale Siphon (4)	No or minimal impact	High
352	B	Metals & UV Treatment of BSPs: Lunesdale Siphon (5)	No or minimal impact	High
353	B	Metals & UV Treatment of BSPs: Lunesdale Siphon (6)	No or minimal impact	High
354	B	Metals & UV Treatment of BSPs: Hodder Siphon	No or minimal impact	High
355	B	Metals & UV Treatment of BSPs: Ribblesdale Siphon (1)	No or minimal impact	High
356	B	Metals & UV Treatment of BSPs: Ribblesdale Siphon (2)	No or minimal impact	High
357	B	Metals & UV Treatment of BSPs: Ribblesdale Siphon (3)	No or minimal impact	High
358	B	Metals & UV Treatment of BSPs: Ribblesdale Siphon (4)	No or minimal impact	High
359	B	Metals & UV Treatment of BSPs: Ribblesdale Siphon (5)	No or minimal impact	High
360	B	Metals & UV Treatment of BSPs: Haslingden	No or minimal impact	High
382	C	Manchester and Pennine Aqueduct to Raw: WTW reduced flow	Minor level of impact	High

## 6.3 Solution A (FM20-SO4)

- 6.3.1 Solution A includes six resilience options involving new sources and targeted repair of Tunnel 5 and Tunnel 6 (T05 and T06), centred around upgrading the West East Link Main (WELM), construction of a new associated break tank near Bolton and new abstraction from the River Irwell with treatment.
- 6.3.2 Three resilience options in this solution have been assessed at no or minimal impact with a high level of confidence in the Level 1 screening assessment:
- ▶ 46: WELM Upgrade to 150MI/day;
  - ▶ 260: Ribblesdale South Well Isolation; and

▶ 261: Haslingden Well Isolation.

- 6.3.3 Option 216 (Alternative Supply: Raw water abstraction and WTW (Haslingden)) was assigned a medium level of impact in the Level 1 screening assessment as it includes a new surface water abstraction, but following the Level 2 assessment, the impact was lowered to minor with a medium confidence due to the relatively small size of the abstraction and the availability of water in the surface water body.
- 6.3.4 Two resilience options (296: T05 targeted repair 2025, and 297: T06 targeted repair 2025) were assigned a medium level of impact in the Level 1 screening, and this was confirmed in the Level 2 detailed assessment, but with a low level of confidence. These resilience options involve the repair of the existing Manchester and Pennine Aqueduct tunnels and conduits, including new access shafts. Medium impacts could occur in the groundwater bodies as a result of water quality impacts from drilling shafts through mine workings, or spillages from construction machinery in the subsurface environment. The assessment results have been assigned a low level of confidence due to the lack of design detail at this stage, and the high level of the WFD assessment (i.e. no detailed baseline data has been collected).
- 6.3.5 Cumulative assessments have not been undertaken at this time. Initial screening indicates that for most water bodies or operational catchments affected by more than one resilience option, the impact level would not be raised above the highest impact level assigned to the individual options. However, the Croal and Irwell catchment will be affected by both of the tunnel repair options (296 and 297) plus the new abstraction under Option 216. If this solution is selected as the preferred solution, further cumulative assessment would therefore be required.
- 6.3.6 No waterbodies affected by the options that comprise this solution are linked to a protected area, so a protected area assessment would not be required if this solution is selected as the preferred solution.

## 6.4 Solution B (C29)

- 6.4.1 Solution B includes sixteen resilience options related to new tunnel sections T05 and 06 and partial UV and metals treatment at existing UU facilities along the length of the existing Manchester and Pennine Aqueduct.
- 6.4.2 Fifteen of the sixteen resilience options have been assessed as no or minimal impact with a high level of confidence in the Level 1 screening. This includes resilience options 112 (HA Outage (4 weeks) for installation of connections), 238 and 348 to 360 (metals and UV treatment of bulk supply points).
- 6.4.3 Option 37 – 38 (Manchester and Pennine Aqueduct section T05 to T06) was assigned a medium level of impact in the Level 1 screening, and this was confirmed in the Level 2 detailed assessment, but with a low level of confidence. This resilience option involves the construction of 19.2 km of new tunnel and conduit, along with associated temporary and permanent access shafts, and connections into the existing Manchester and Pennine Aqueduct.
- 6.4.4 Medium impacts could occur in the construction phase due to dewatering of the tunnel and shafts, and due to water quality impacts from drilling shafts through mine workings, or spillages from construction machinery in the subsurface environment. Medium impacts could also occur in the operation phase due to permanent changes in the groundwater flow regime, impacting both groundwater and surface water bodies.
- 6.4.5 A detailed study of the geology of the tunnel route has not been undertaken at this time, and good connections between the groundwater and surface water environment have been assumed. Further study may indicate that lower permeability strata (e.g. mudstones) and superficial deposits (e.g. glacial till) may protect surface water bodies from impacts arising from changes in the groundwater regime. Due to this uncertainty, the general high level nature of the WFD assessments, and the lack of design detail at this stage, the results have been assigned a low level of confidence.

- 6.4.6 Cumulative assessments have not been undertaken at this time. Initial screening indicates that no waterbody that is affected by this solution is affected by more than one option. Several individual waterbodies in the Croal and Irwell catchment and the Calder catchment are affected by Option 37-38 and in consequence, a cumulative assessment would be required should this solution be taken forward as the preferred solution, although it is unlikely that the impact on the surface watercourses would be raised above the current medium level of impact.
- 6.4.7 No waterbodies affected by the options that comprise this solution are linked to a protected area that is designated for protection of habitats and species, so a protected area assessment would not be required if this solution is selected as the preferred solution.

## 6.5 Solution C (FM15-SO4b)

- 6.5.1 This solution includes eight resilience options for converting the Manchester and Pennine Aqueduct to raw water supply and building water treatment works (WTWs).
- 6.5.2 All eight of the resilience options that make up this solution have been assessed as no or minimal or minor level of impact with a high level of confidence in the Level 1 screening. These resilience options would include new pipelines and/or new WTWs but with suitable construction best practice and pollution control measures in place, they would not have a prolonged or widespread impact on the WFD status of water bodies.
- 6.5.3 Cumulative assessments have not been undertaken at this time. As no options in this solution would have greater than a minimal level of impact, a cumulative assessment would not be required if this solution is selected as the preferred solution.
- 6.5.4 No waterbodies affected by options in this solution are linked to a protected area, so a protected area assessment would not be required if this solution is selected as the preferred solution.

## 6.6 Solution D (C11)

- 6.6.1 Solution D includes two resilience options associated with new tunnel sections T01, 02, 03, 04, 05 and 06.
- 6.6.2 Option 112 (HA Outage (4 weeks) for installation of connections) has been assessed as no or minimal impact with a high level of confidence in the Level 1 screening because there is no new infrastructure and no construction works proposed as part of this resilience option.
- 6.6.3 Option 37 – 42 (Manchester and Pennine Aqueduct sections T01 to T06) was assigned a medium level of impact in the Level 1 screening, and this was confirmed in the Level 2 detailed assessment, although with a low level of confidence. This resilience option involves the construction of 51.8 km of new tunnel and conduit, along with associated temporary and permanent access shafts, and connections into the existing Manchester and Pennine Aqueduct.
- 6.6.4 Medium impacts could occur in the construction phase of this resilience option due to dewatering of the tunnel and shafts, and due to water quality impacts from drilling shafts through mine workings, or spillages from construction machinery in the subsurface environment. Medium impacts could also occur in the operation phase due to permanent changes in the groundwater flow regime, impacting both groundwater and surface water bodies.
- 6.6.5 A detailed study of the geology of the tunnel route has not been undertaken at this time, and good connections between the groundwater and surface water environment have been assumed. Further study may indicate that lower permeability strata (e.g. mudstones) and superficial deposits (e.g. glacial till) may protect surface water bodies from impacts arising from changes in the groundwater regime. Due to this uncertainty, the general high level nature of the WFD assessments, and the lack of design detail at this stage, the results have been assigned a low level of confidence.

- 6.6.6 Cumulative assessments have not been undertaken at this time. An initial screening indicates that no waterbody that is affected by this solution is affected by more than one option. Several individual waterbodies in the Croal and Irwell catchment, the Calder catchment, the Kent catchment, the Bela catchment and the Hodder and Loud catchment are affected by Option 37-42. If this solution is selected as the preferred solution, a cumulative assessment would therefore be required; however, it is unlikely that the impact on the surface watercourses would be raised above the current medium level of impact.
- 6.6.7 Six waterbodies affected by options under this solution are linked to protected areas that are designated for protection of habitats and species (The Bowland Fells, Morecambe Bay Pavements and the River Kent). In consequence, a protected area assessment would be required if this solution is selected as the preferred solution.

## 6.7 Solution E (C17)

- 6.7.1 This solution includes six resilience options, comprising new tunnel sections as for Solution D, plus new sources requiring WTWs and associated pipelines.
- 6.7.2 Three of the six resilience options have been assessed as no or minimal impact, or minor level of impact with a high level of confidence in the Level 1 screening because they involve relatively small scale in catchment or in channel construction works. These are resilience options:
- ▶ 46: WELM Uprate to 150 Ml/day;
  - ▶ 217: Alternative Supply: Raw water transfer and WTW (Newton-in-Bowland); and
  - ▶ 218: Alternative Supply: Raw water transfer and WTW (Preston).
- 6.7.3 Options 215 (Alternative Supply: Raw water transfer and WTW (Clayton-le-Moors)) and 216 (Alternative Supply: Raw water abstraction and WTW (Haslingden)) are both related to new surface water abstractions, and were assigned a medium level of impact in the Level 1 screening assessment. The Level 2 detailed assessment lowered the impact of Option 216 to a minor level of impact due to the relatively small size of the proposed abstraction and the availability of water in the surface water body in which the new abstraction is located. The impact of Option 215 has remained at medium in the Level 2 detailed assessment due to the large size of the abstraction.
- 6.7.4 As with Solution D, Option 37 – 42 (Manchester and Pennine Aqueduct sections T01 to T06) was assigned a medium level of impact in the Level 1 screening, and this was confirmed in the Level 2 detailed assessment, but with a low level of confidence. This resilience options involves the construction of 51.8 km of new tunnel and conduit, along with associated temporary and permanent access shafts, and connections into the existing Manchester and Pennine Aqueduct.
- 6.7.5 Medium impacts could occur in the construction phase of this option due to dewatering of the tunnel and shafts, and due to water quality impacts from drilling shafts through mine workings, or spillages from construction machinery in the subsurface environment. Medium impacts could also occur in the operation phase due to permanent changes in the groundwater flow regime, impacting both groundwater and surface water bodies.
- 6.7.6 A detailed study of the geology of the tunnel route has not been undertaken at this time, and good connections between the groundwater and surface water environment have been assumed. Further study may indicate that lower permeability strata (e.g. mudstones) and superficial deposits (e.g. glacial till) may protect surface water bodies from impacts arising from changes in the groundwater regime. Due to this uncertainty, the general high level nature of the WFD assessments, and the lack of design detail at this stage, the results have been assigned a low level of confidence.
- 6.7.7 Cumulative assessments have not been undertaken at this time. An initial screening indicates that for most water bodies or operational catchments affected by more than one option, the impact level would not be raised above the highest impact level assigned to the individual options. However, the three waterbodies will be affected the tunnel options (37-42) plus a new abstraction (option 215

or 216). If this solution is selected as the preferred solution, further cumulative assessment would therefore be required.

- 6.7.8 Six waterbodies affected by options in this solution are linked to protected areas that are designated for protection of habitats and species (The Bowland Fells, the River Kent, and Morecambe Bay Pavements), so a protected area assessment would be required if this solution is selected as the preferred solution.

## 7. Results of the WFD Assessment of the Revised Draft WRMP Preferred Plan

### 7.1 Overview

- 7.1.1 As set out in **Section 1.3**, the Revised Draft WRMP Preferred Plan includes the following strategic choices:
- ▶ Adopt an enhanced leakage reduction comprising a total of 190 MI/d over the planning period, a reduction of just over 40% from the baseline position of 448MI/d. By the end of 2024/25 UU plans to reduce leakage by at least 67 MI/d, or 15%;
  - ▶ Improve level of service for drought permits and orders to augment supply from 1 in 20 years to 1 in 40 years (moving from 5% to 2.5% annual average risk);
  - ▶ Increase resilience to other hazards, specifically for the regional aqueduct system associated with Manchester and Pennines Resilience. This involves completing Solution D, which involves rebuilding all single line sections of the relevant aqueduct.
- 7.1.2 The Preferred Plan encompasses a combination of preferred demand management measures and resilience options designed to achieve the three strategic choices outlined above. It should be noted that the supply-demand preferred options that comprise the Preferred Plan do not include resource management measures (i.e. they are demand management measures including leakage reduction and water efficiency) and are therefore not expected to have impacts on WFD water bodies. The preferred Manchester and Pennine Resilience solution (Solution D) has been considered as part of this WFD assessment.
- 7.1.3 **Table 7.1** lists the resilience options that comprise the preferred Manchester and Pennine Resilience solution.

Table 7.1 Summary of Option Assessment for Manchester and Pennine Resilience Solution D

Option Number	Option Description	WFD Impact Level	Confidence Rating
37-42	Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low
112	Manchester and Pennine Aqueduct Outage (4 weeks) for installation of connections	No or minimal impact	High

### 7.2 Results of the Assessment of Solution D

- 7.2.1 Solution D includes two resilience options associated with new tunnel sections T01, 02, 03, 04, 05 and 06. A summary of the Level 1 and Level 2 assessments for these options is presented in **Appendix J** and the Level 2 detailed assessments are included in **Appendix E**.

#### Individual Option Assessments

- 7.2.2 Option 112 (Manchester and Pennine Aqueduct Outage (4 weeks) for installation of connections) has been assessed as having no or minimal impact with a high level of confidence in the Level 1 screening because there is no new infrastructure and no construction works proposed as part of this resilience option.
- 7.2.3 Option 37 – 42 (Manchester and Pennine Aqueduct sections T01 to T06) was assigned a medium level of impact in the Level 1 screening, and this was confirmed in the Level 2 detailed assessment,

although with a low level of confidence. This resilience option involves the construction of 51.8 km of new tunnel and conduit, along with associated temporary and permanent access shafts, and connections into the existing Manchester and Pennine Aqueduct.

- 7.2.4 Medium impacts could occur in the construction phase of this resilience option due to dewatering of the tunnel and shafts, and due to water quality impacts from drilling shafts through mine workings, or spillages from construction machinery in the subsurface environment. Medium impacts could also occur in the operation phase due to permanent changes in the groundwater flow regime, impacting both groundwater and surface water bodies.
- 7.2.5 A detailed study of the geology of the tunnel route has not been undertaken at this time, and good connections between the groundwater and surface water environment have been assumed. Further study may indicate that lower permeability strata (e.g. mudstones) and superficial deposits (e.g. glacial till) may protect surface water bodies from impacts arising from changes in the groundwater regime. Due to this uncertainty, the general high level nature of the WFD assessments, and the lack of design detail at this stage, the results have been assigned a low level of confidence.

### Water Body Cumulative Assessment

- 7.2.6 Where two or more options are located in the same water body, there is the potential for a cumulative impact on that waterbody. However, no waterbody that is affected by Solution D is affected by more than one option, so a waterbody scale cumulative assessment is not required.

### Operational Catchment Cumulative Assessment

- 7.2.7 Where two or more options are located in multiple water bodies within one operational catchment, there may be cumulative effects on WFD objectives. For example, impacts in a downstream water body may combine with impacts from an upstream water body and result in a greater impact than assessed for each individual water body.
- 7.2.8 Several individual waterbodies in the Bela, Calder, Croal and Irwell, Hodder and Loud, and Kent operational catchments are affected by Option 37-42. Therefore, operational catchment scale cumulative assessments have been undertaken.
- 7.2.9 The same impact classification system has been used for the cumulative assessments as for the Level 1 and Level 2 assessments. The results are summarised in **Table 7.2** and presented in full in **Appendix K**.
- 7.2.10 For all five operational catchments, the cumulative impact on a catchment scale will not exceed the maximum impact on an individual water body of a medium level of impact. This is because:
- ▶ The individual option assessment assumed a worst-case scenario, due to the high-level nature of the assessment, and the lack of detailed information available at this stage on the design of the tunnel, the nature of the geological strata it will pass through, and the linkages between the groundwater and surface water environment.
  - ▶ All the individual waterbodies have flow available across some or all of the flow regime, helping to mitigate any impacts on baseflow arising from the operational presence of the tunnels in the subsurface.

Table 7.2 Summary of Operational Catchment Cumulative Assessment

Operational Catchment	WFD Water Body Information			Option		Assessment Result		
	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
Bela	GB112073071090	River	Peasey Beck	37-42	Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low	Medium level of impact
	GB112073071080	River	Lupton (Farleton) Beck			Medium level of impact	Low	
	GB112073071100	River	Stainton Beck			Medium level of impact	Low	
Calder	GB112071065490	River	Calder - Pendle Water to conf Ribble	37-42	Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low	Medium level of impact
	GB112071065040	River	Hyndburn			Medium level of impact	Low	
Croal and Irwell	GB112069064641	River	Irwell (Cowpe Bk to Rossendale STW)	37-42	Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low	Medium level of impact
	GB112069064620	River	Irwell (Rossendale STW to Roch)			Medium level of impact	Low	
	GB112069064650	River	Ogden			Medium level of impact	Low	
Hodder and Loud	GB112071065420	River	Whitendale River	37-42	Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low	Medium level of impact
	GB112071065560	River	Hodder - conf Easington Bk to conf Ribble			Medium level of impact	Low	
Kent	GB112073071370	River	Mint	37-42		Medium level of impact	Low	Medium level of impact





Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
	GB112073071340	River	Flodder Beck		Manchester and Pennine Aqueduct sections T01 to T06	Medium level of impact	Low	

## Protected Area Assessment

- 7.2.11 Six water bodies affected by Option 37-42 are linked to protected areas that are designated for protection of habitats and species (Bowland Fells, Morecambe Bay Pavements and the River Kent). Therefore, a protected area assessment has been undertaken.
- 7.2.12 An assessment was undertaken for all habitat and species protected areas that are linked to a water body that contains a Preferred Plan option. The list of protected areas requiring assessment was established by comparing the list of protected areas and the water bodies they are linked to<sup>27</sup>, to the list of water bodies affected by Option 37-42 (**Appendix D**).
- 7.2.13 Protected area assessments were undertaken for three protected areas. The results are presented in **Table 7.3**. For the Bowland Fells and Morecambe Bay Pavements protected areas, the level of impact is assessed as no or minimal due to the distance between the protected areas and the option. The potential impact on the River Kent protected area has been assessed as medium because two river water bodies which form part of the SAC have been assigned a medium level of impact in the Level 2 assessment. There may be impacts on the hydrological regime of the water courses, which could affect the migratory fish which are present in the SAC.

Table 7.3 Results of the Protected Area Assessment

Protected area	Designation	Preferred options	Summary of protected area assessment	Assessment Results
<b>Bowland Fells</b>	SPA	Manchester and Pennine Aqueduct sections T01 to T06	<p>The new tunnel will pass beneath Bowland Fells SPA. At surface or near surface construction works have the potential to impact on the SPA, but it has been confirmed by UU that no at or near surface works (e.g. shaft construction) would be undertaken within the SPA. The nearest shafts are located 2 km to the north and 4 km to the south of the SPA.</p> <p>The SPA does include water dependent habitats (bogs, marshes, water fringed vegetation, fens) but given the depth of the tunnelling works and that no surface construction works will take place in or adjacent to the SPA, there should be no or minimal impact on the SPA.</p>	No or minimal impact
<b>Morecambe Bay Pavements</b>	SAC	Manchester and Pennine Aqueduct sections T01 to T06	<p>Morecambe Bay Pavements is comprised of several separate distinct areas, with the closest situated approximately 6 km to the west of the proposed new aqueduct sections. Only the southernmost sections near Kirkby Lonsdale are connected hydraulically to the option via the Lupton (Farleton) Beck water body.</p> <p>The SAC includes water dependent habitats (inland water bodies (Haweswater) and bogs, marshes, water fringed vegetation and fens); however these make up only 0.4% and 0.6% of the SAC respectively.</p> <p>Haweswater is not in the section of the SAC that is hydraulically connected to the option via the Lupton (Farleton) Beck river water body. Given that water dependent habitats make up less than 1% of the SAC, and that the SAC is 6 km from the option, any impact on the SAC is likely to be minimal.</p>	No or minimal impact

<sup>27</sup> Downloaded from the EA's Catchment Data Explorer website October 2017: <http://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/12>

Protected area	Designation	Preferred options	Summary of protected area assessment	Assessment Results
River Kent	SAC	Manchester and Pennine Aqueduct sections T01 to T06	<p>The River Kent SAC is situated at the very north of Option 37 – 42 and is linked to the option via two river water bodies, Mint and Flodder Beck, both tributaries of the River Kent and part of the SAC.</p> <p>The SAC is almost completely (99%) comprised of inland water bodies, and this includes several species of migratory fish which may be affected by reductions in river flows.</p> <p>The northern extent of the option is within approximately 700 m of the river Mint.</p> <p>The Level 2 detailed assessment for the Mint and Flodder Beck water bodies indicated a medium level of impact (with low confidence), which also applies to the SAC.</p>	Medium level of impact.

## 8. Summary and Conclusions

### 8.1 Summary of Feasible Options Assessment

- 8.1.1 A WFD assessment was undertaken on 115 feasible resource management and Manchester and Pennine Resilience options to inform UU's Revised Draft WRMP. Each option was subject to a Level 1 screening exercise. Option-water body combinations that were identified as being subject to a medium or high level of impact in the Level 1 screening were then subject to a Level 2 detailed assessment.
- 8.1.2 The results of the screening and detailed assessments were collated to produce a combined assessment result for all option-water body assessments, which are presented in **Appendix B** for the supply-demand feasible options and **Appendix D** for the Manchester and Pennine resilience feasible options and summarised in Sections 5 and 6.

### 8.2 Summary of Preferred Plan Assessment

- 8.2.1 UU has identified one resilience solution (Solution D) which forms part of the Preferred Plan for WRMP19. The solution comprises two options:
- ▶ Option 112: Manchester and Pennine Aqueduct Outage (4 weeks) for installation of connections; and
  - ▶ Option 37 – 42: Manchester and Pennine Aqueduct sections T01 to T06.

#### **Option 112: Manchester and Pennine Aqueduct Outage (4 weeks) for installation of connections**

- 8.2.2 Option 112 has been assessed as having no or minimal impact with a high level of confidence in the Level 1 screening because there is no new infrastructure and no construction works proposed as part of this resilience option.

#### **Option 37 – 42: Manchester and Pennine Aqueduct sections T01 to T06.**

- 8.2.3 Option 37 – 42 was assigned a medium level of impact in the Level 1 screening, and this was confirmed in the Level 2 detailed assessment, although with a low level of confidence. This resilience option involves the construction of 51.8 km of new tunnel and conduit, along with associated temporary and permanent access shafts, and connections into the existing Manchester and Pennine Aqueduct.
- 8.2.4 Medium impacts could occur in the construction phase of this resilience option due to dewatering of the tunnel and shafts, and due to water quality impacts from drilling shafts through mine workings, or spillages from construction machinery in the subsurface environment. Medium impacts could also occur in the operation phase due to permanent changes in the groundwater flow regime, impacting both groundwater and surface water bodies.
- 8.2.5 The new tunnel passes through five operational catchments containing more than one waterbody which may be affected by the construction or operation of the new infrastructure. There is the potential for cumulative effects in these five operational catchments, but the cumulative assessment indicates that the cumulative impact will be no greater than the medium level of impact assigned to the individual water bodies.
- 8.2.6 The option is linked to three protected areas designated for habitats and/or species. Two of the protected areas would be subject to no or minimal impact, but there could be a medium level of impact on the River Kent SAC due to changes in the hydrological regime of the River Mint and Flodder affecting migratory fish.

- 8.2.7 A detailed study of the geology of the tunnel route has not been undertaken at this time, and good connections between the groundwater and surface water environment have been assumed. Further study may indicate that lower permeability strata (e.g. mudstones) and superficial deposits (e.g. glacial till) may protect surface water bodies from impacts arising from changes in the groundwater regime. Due to this uncertainty, the general high-level nature of the WFD assessments, and the lack of design detail at this stage, the results have been assigned a low level of confidence.

## 8.3 Summary of the Preferred Plan

- 8.3.1 The assessment results for the Preferred Plan for WRMP19 are summarised in **Table 8.1**. The results indicate that Option 37-42 of the Manchester and Pennine Resilience solution could have a medium level of impact against WFD objectives and as such, this option will require further assessment at the detailed planning (project) stage.

Table 8.1 Summary of Assessment Results for the Preferred Plan Options

Option	Result of Individual assessment	Result of cumulative assessment	Result of Protected Area assessment	Overall result	Confidence level
Option 112	No or minimal impact	n/a	n/a	No or minimal impact	High
Option 37 – 42	Medium level of impact	Medium level of impact	Medium level of impact	Medium level of impact	Low

## 8.4 WRMP Preferred Plan Options Requiring Further Assessment

### The Reality of Moderate Potential Impact: A Regulatory Perspective

- 8.4.1 One of the Preferred Plan options (Option 37-42) has been assigned a medium level of potential impact on account of the risk to the quantitative and chemical status of groundwater bodies and changes to the hydrological regime (and therefore ecological status) of rivers. These activities pose a potential risk of widespread or prolonged impacts on the status of WFD water bodies.
- 8.4.2 In such cases, further WFD assessment is required to be more conclusive in respect of requirements, or otherwise, for bespoke mitigation in order to ensure that WFD objectives are not compromised. In reality, on consideration of further information and dialogue with the EA on proposed bespoke mitigation measures, this option is unlikely to result in significant or long-term potential impacts. Therefore, WFD compliance is unlikely to be an issue in respect of regulatory permitting once the further assessment provides the appropriate level of confidence for presentation to the regulator.
- 8.4.3 The assessment of Option 37-42 has a low level of confidence, which reflects the high-level nature of the WFD assessments undertaken at this time. The lack of detailed design or environmental baseline information has necessitated a precautionary approach to the assessments, which relies on assumptions (e.g. that changes to the groundwater environment will result in changes to flows in surface water courses), and results in a worst case level of impact. Further assessment and dialogue with the EA would likely result in a reduction of the level of impact, and an increase in the level of confidence.

### Preferred Plan Option Requiring Further Assessment

- 8.4.4 Further detailed WFD assessment should be undertaken on Option 37-42 as it has been assigned a medium level of impact in the individual, cumulative and protected area assessments.

- 8.4.5 Further assessment should include consideration of more detailed design information, investigation of the water environment (in particular links between the groundwater and surface water environments), detailed impact assessment, and more detailed review of WFD objectives to ensure that the impacts highlighted in this report are appropriately accounted for.

## 9. Statement of Compliance with the WFD

### 9.1 Current Abstraction Licences

- 9.1.1 The assessments of the data provided by the EA and UU indicate that although there is some residual risk, overall the operation of the licences, the reductions noted by the EA and the schemes identified for AMP6 should be enough to mitigate against any significant risks to the WFD water bodies and are therefore compliant with the requirements of the WFD.

### 9.2 Preferred Plan Options

- 9.2.1 The assessments for the preferred options that comprise the Preferred Plan for WRMP19 indicate that one of the options (Option 37-42) could have a medium level of impact against WFD objectives. Further WFD assessment is therefore required to be more conclusive in respect of requirements, or otherwise, for bespoke mitigation in order to ensure that WFD objectives are not compromised.
- 9.2.2 In reality, on consideration of further information and dialogue with the EA on proposed bespoke mitigation measures during the consultation and project stages, this option is unlikely to result in significant or long-term potential impacts. Therefore, WFD compliance is unlikely to be an issue in respect of regulatory permitting once the further assessment provides the appropriate level of confidence for presentation to the regulator.

### 9.3 Article 4.7 Requirements

- 9.3.1 If the impact assessment for a Preferred Plan option concluded that there was a high risk that the option would not be compliant with WFD requirements after mitigation (i.e. there would be a deterioration in WFD status of one or more water bodies), documentation would be required to justify permitting of the option under the provisions of Article 4.7 of the WFD. Article 4.7 states that the option would not be in breach of the WFD if the following conditions were met:
- ▶ All practicable mitigation has been incorporated;
  - ▶ There are no significantly better environmental options;
  - ▶ The option is of overriding public interest and/or the benefits of the option outweigh the benefits of WFD compliance; and
  - ▶ The reasons for the modifications to the water body are flagged to the EA for reporting in the next RBMP.
- 9.3.2 The Planning Inspectorate and the EA would be responsible for deciding whether the Article 4.7 conditions have been met with respect to any option.
- 9.3.3 Based on the assessments in this report, there is currently no requirement to implement Article 4.7 for either the current abstractions or the Preferred Plan options. However, this is based on the assumptions detailed in this report, the need to implement reductions on some of the current licences, and the assumption that additional investigations and mitigation will be implemented for the Preferred Plan options noted in **Section 8.4**.



# Appendix A

## List of Feasible Options



Option				
Ref	Option Name	Resilience Option?	Preferred Option at dWRMP Stage?	Preferred Option at fWRMP Stage?
WR001	River Alt To Prescott WTW			
WR003	Fisher Tarn (Kendal) to Thirlmere Aqueduct and Lostock For Treatment			
WR004	Longsleddale Reservoir			
WR006	Glaze Brook			
WR007	Sankey Brook			
WR009	River Rawthey To Watchgate			
WR012	Borrow Beck IR			
WR026a	River Ribble Support To Stocks Reservoir			
WR037a	Haweswater Reservoir – Raise Embankment Structure			
WR037b	Haweswater Reservoir – Raise Embankment Structure			
WR039a	River Eden (Temple Sowerby) To Watchgate			
WR041	River Irthing to Cumwhinton plus Castle Carrock Link			
WR047a	Milwr Tunnel, Bagillt (Transfer to Huntington)			
WR049b	River Ribble (Transfer to Anglezarke IR)			
WR062a	Worthington WTW			
WR062b	Worthington WTW (Rivington)			
WR074	River Darwen (Transfer to Fishmoor WTW)			
WR076	River Bollin			
WR079b	Appleton Reservoir, Warrington			
WR079c	Appleton Reservoir, Warrington			
WR079d	Appleton Reservoir, Warrington			
WR095	Roughton Gill			
WR099a	Worsthorne Borehole (Compensation)			
WR099b	Worsthorne Borehole (Hurstwood IR)		Yes	
WR099c	Worsthorne Borehole (Worsthorne WTW)			
WR100	Thornccliffe Road Borehole, Barrow-in-Furness			
WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity		Yes	
WR102a	Widnes Boreholes to Prescott WTW			
WR102ai	Widnes Boreholes To Prescott WTW			
WR102b	Widnes Boreholes To Liverpool And Warrington DMZs			
WR102c	Widnes Boreholes To Runcorn And Warrington DMZs			
WR102d	Eccleston Hill Borehole to Prescott WTW			
WR102e	Bold Heath Boreholes to Prescott WTW		Yes	
WR105a	Lymm Boreholes (Abandonment of Existing WTW Facility; New WTW at Sow Brook)			
WR105ai	Lymm Boreholes (Abandonment of Existing WTW Facility; New WTW at Sow Brook)			
WR105b	Lymm Boreholes (Abandonment of Existing WTW Facility; New WTW at Hill Cliffe)			
WR105bi	Lymm Boreholes (Abandonment Of Existing WTW Facility; New WTW At Hill Cliffe)			
WR106	Walton And Daresbury Boreholes			
WR107a	Aughton Park & Moss End Boreholes (Royal Oak WTW)			
WR107ai	Aughton Park & Moss End Boreholes (Royal Oak WTW)			
WR107b	Randles Bridge, Knowsley, Primrose Hill			
WR109	Swineshaw Boreholes (Buckton Castle WTW)			
WR110	Rushton Spencer Boreholes			
WR111	Woodford Borehole			
WR112	Bramhall Borehole			
WR113	Tytherington Boreholes		Yes	
WR114	Python Mill Borehole		Yes	
WR119a	Egremont Boreholes (Existing)			
WR119b	Egremont Boreholes (New)			
WR120	Cross Hill Boreholes, Wirral			
WR120i	Cross Hill Boreholes, Wirral			
WR121a	Eaton Boreholes (Hollins Hill)			
WR121b	Eaton Boreholes (Mid Cheshire Main)			
WR122	Newton Hollows Boreholes			
WR125	Bearstone Boreholes			
WR128	Tarn Wood (North Eden to Carlisle)			
WR129	North Cumbria Boreholes			
WR140	Horwich Wwtw – Final Effluent Reuse			
WR141	Rossendale Wwtw- Final Effluent Reuse			
WR142	Hyndburn Wwtw – Final Effluent Reuse			
WR144	Saddleworth and Mossley Top- Final Effluent Reuse			
WR146	Davyhulme- Final Effluent Reuse			
WR148	Cumwhinton Boreholes plus Castle Carrock Link			
WR150	Castle Carrock Dead Water Storage			
WR153	Simmonds Hill- Increased WTW Capacity			
WR154	Sandiford – Increased WTW Capacity			
WR159	Group 1 - Improved reservoir compensation release control from 76 individual reservoirs		Yes	
WR160	Group 2 - Improved reservoir compensation release control from Vyrnwy, Rivington, Thirlmere and Haweswater Reservoirs		Yes	
WR800	River Bela to Thirlmere Aqueduct			
WR810	Third Party Option: Cow Green IR To Haweswater via Heltondale Aqueduct			
WR812	Third Party Option: Kielder Water IR Transfer			
WR813	Third Party Option: Scammonden IR To Buckton Castle via Huddersfield Narrows Canal			
WR814a	Increased Abstraction Capacity at Heronbridge			
WR814b	Increased treatment capacity at Hurlleston WTW via Canal			
WR814c	Increased treatment capacity at Hurlleston WTW via Canal			
WR816	Third Party Option: Manchester Bolton Bury Canal To Integrated Zone			
WR817	Third Party Option: Carr Mill Dam To Integrated Resource Zone			
WR820	Third Party Option: Shropshire Union Canal To Integrated Resource Zone			
WR821	Shropshire Union Canal		Yes	
WR824	Third Party Option: Blenkinsopp Mine			
B2	Enabling Works		Yes	
3	HA to Raw: 2 Stage filtration Woodgate Hill	Yes		
37-38	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	Yes		
37-42	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	Yes		Yes
46	WELM Uprate to 150M/day	Yes		
112	HA Outage (4 weeks) for installation of connections	Yes		Yes
212	HA to Raw: Fober Barn	Yes		
213	HA to Raw: Martholme	Yes		
214	HA to Raw: Townsend Fold	Yes		
215	Alternative Supply: Raw water transfer and WTW at Martholme BSP	Yes		
216	Alternative Supply: Raw water abstraction and WTW at Townsend Fold BSP	Yes		
217	Alternative Supply: Raw water transfer and WTW at Fober Barn BSP	Yes		
218	Alternative Supply: Raw water transfer and WTW at Mill Lane	Yes		
238	Metals & UV treatment of bulk supply points (BSPs): Woodgate Hill	Yes		
260	Ribblesdale South Well Isolation	Yes		
261	Townsend Fold South Well Isolation	Yes		
296	T05 targeted repair 2025	Yes		
297	T06 targeted repair 2025	Yes		
301	Lunesdale Siphon BSPs North	Yes		

Option			
Ref	Option Name	Resilience Option?	Preferred Option at dWRMP Stage?
303	Lunesdale Siphon BSPs South	Yes	
306	Ribblesdale Siphon BSPs North	Yes	
348	Metals & UV Treatment of Bulk Supply Points (BSPs): Lunesdale Siphon, Mansergh BSP	Yes	
349	Metals & UV Treatment of Bulk Supply Points (BSPs): Lunesdale Siphon, Casterton BSP	Yes	
350	Metals & UV Treatment of Bulk Supply Points (BSPs): Lunesdale Siphon, Parkside Farm BSP	Yes	
351	Metals & UV Treatment of Bulk Supply Points (BSPs): Lunesdale Siphon, Jacksons Pasture BSP	Yes	
352	Metals & UV Treatment of Bulk Supply Points (BSPs): Lunesdale Siphon, Lowgill BSP	Yes	
353	Metals & UV Treatment of Bulk Supply Points (BSPs): Lunesdale Siphon, Birks Farm BSP	Yes	
354	Metals & UV Treatment of Bulk Supply Points (BSPs): Hodder Siphon, Fober Barn BSP	Yes	
355	Metals & UV Treatment of Bulk Supply Points (BSPs): Ribblesdale Siphon, Waddington BSP	Yes	
356	Metals & UV Treatment of Bulk Supply Points (BSPs): Ribblesdale Siphon, Bashall Town BSP	Yes	
357	Metals & UV Treatment of Bulk Supply Points (BSPs): Ribblesdale Siphon, Spring Wood BSP	Yes	
358	Metals & UV Treatment of Bulk Supply Points (BSPs): Ribblesdale Siphon, Martholme BSP	Yes	
359	Metals & UV Treatment of Bulk Supply Points (BSPs): Ribblesdale Siphon, Brown Birks BSP	Yes	
360	Metals & UV Treatment of Bulk Supply Points (BSPs): Haslingden Walmsley Tunnel (Townsend Fold BSP)	Yes	
382	HA to Raw: Watchgate WTW reduced flow	Yes	



# Appendix B

## Summary of Level 1 Screening and Level 2 Detailed Assessment Results for Supply-demand Feasible Options



Option		WFD Water Body Information													Option Detail													Impacts									
Ref	Option Name	ID	Type	Hydro - morphological Designation	WB Name	Operational Catchment	Ecological Status	Ecological Objective	Quantitative Status	Quantitative Objective	Chemical Status	Chemical Objective	Overall Status	Overall Objective	Pipe line on land	Pipe line with water source crossings	New / modified surface water (6 & 7) / intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / treatment	Transfer of water via aqueduct	New / modified surface water abstraction quantity	Creation of existing discharge to surface water	New abstraction well / spring / refurbishment	New abstraction well / borehole / surface structures	New / increased abstraction quantity	Changed to reservoir compensation release	New reservoir / refurbishment	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result			
WR049b	River Ribble (Transfer to Anglezarke IR)	G811207064911	River	Heavily modified	Lostock US Farington Weir	Yarrow and Lostock	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																			Minor level of impact		
WR049c	River Ribble (Transfer to Anglezarke IR)	G811207064951	River	Heavily modified	Yarrow US Big Lodge Water	Yarrow and Lostock	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																			Minor level of impact		
WR049d	River Ribble (Transfer to Anglezarke IR)	G8112071065500	River	Heavily modified	Ribble-conf Calder to Tidal	Big Ribble	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y	Y	Y					Y												Medium level of impact		
WR049e	River Ribble (Transfer to Anglezarke IR)	G8112071065300	River	No designation	Darwen-conf Roddlesworth to tidal	Darwen	Bad	Good by 2027	n/a	n/a	Good	Good by 2027	Bad	Good by 2027	Y	Y																			Minor level of impact		
WR049f	River Ribble (Transfer to Anglezarke IR)	G8112071065280	River	Heavily modified	Many Brooks	Darwen	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																			Minor level of impact		
WR049g	River Ribble (Transfer to Anglezarke IR)	G8112070064850	River	Heavily modified	Douglas upper	Douglas OC	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027								Y													Minor level of impact		
WR049h	River Ribble (Transfer to Anglezarke IR)	G841202G100500	Groundwater	No designation	Fylde Permo-Triassic Sandstone Aquifers	Fylde Permo-Triassic Sandstone Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y	Y	Y					Y												Medium level of impact		
WR049i	River Ribble (Transfer to Anglezarke IR)	G841202G100300	Groundwater	No designation	Douglas Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																			Minor level of impact		
WR049j	River Ribble (Transfer to Anglezarke IR)	G81202G11900	Lake	Artificial	Anglezarke Reservoir	Douglas OC	Moderate	Good by 2027	n/a	n/a	Good	Good by 2027	Moderate	Good by 2027								Y													Minor level of impact		
WR062a	Worthington WTW	G8112070064780	River	Heavily modified	Douglas- Mid	Douglas OC	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027					Y																	No or minimal impact	
WR062b	Worthington WTW	G841202G100300	Groundwater	No designation	Douglas, Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027					Y																	No or minimal impact	
WR062c	Worthington WTW (Rivington)	G8112070064780	River	Heavily modified	Douglas- Mid	Douglas OC	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																				Minor level of impact	
WR062d	Worthington WTW (Rivington)	G8112070064800	River	Heavily modified	Buckhow (Mc Bibb) Brook	Douglas OC	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																				Minor level of impact	
WR062e	Worthington WTW (Rivington)	G8112070064850	River	Heavily modified	Douglas- Upper	Douglas OC	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																				Minor level of impact	
WR062f	Worthington WTW (Rivington)	G841202G100300	Groundwater	No designation	Douglas, Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y																				Minor level of impact	
WR074	River Darwen (Transfer to Fishmoor WTW)	G8112071065500	River	Heavily modified	Ribble-conf Calder to Tidal	Big Ribble	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y	Y	Y					Y													Medium level of impact	
WR074	River Darwen (Transfer to Fishmoor WTW)	G8112071065300	River	No designation	Darwen - conf Roddlesworth to tidal	Darwen	Good	Good by 2027	n/a	n/a	Good	Good by 2027	Good	Good by 2027	Y	Y																				No or minimal impact	
WR074	River Darwen (Transfer to Fishmoor WTW)	G8112071065290	River	No designation	Darwen - conf Blakewater to conf Roddlesworth	Darwen	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Y	Y																					No or minimal impact
WR074	River Darwen (Transfer to Fishmoor WTW)	G8112071065250	River	No designation	Roddlesworth	Darwen	Good	Good by 2027	n/a	n/a	Good	Good by 2027	Good	Good by 2027	Y	Y																				No or minimal impact	
WR074	River Darwen (Transfer to Fishmoor WTW)	G8112071065270	River	No designation	Darwen - conf Roddlesworth to tidal	Darwen	Good	Good by 2027	n/a	n/a	Good	Good by 2027	Good	Good by 2027	Y	Y																				No or minimal impact	
WR074	River Darwen (Transfer to Fishmoor WTW)	G841202G100300	Groundwater	No designation	Douglas, Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2027	Good	Good by 2027	Good	Good by 2027	Y	Y																					No or minimal impact
WR074	River Darwen (Transfer to Fishmoor WTW)	G841202G100500	Groundwater	No designation	Fylde Permo-Triassic Sandstone Aquifers	Fylde Permo-Triassic Sandstone Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y	Y	Y					Y													Medium level of impact	
WR076	River Bollin	G8112069061382	River	Heavily modified	Bollin (Ashley Mill to Manchester Ship Canal)	Bollin Dean Mersey Upper	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR076	River Bollin	G8112069060980	River	No designation	Sinderland Brook	Bollin Dean Mersey Upper	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y																				Minor level of impact	
WR076	River Bollin	G841202G0991700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079b	Applenton Reservoir, Warrington	G811232665	Lake	Heavily modified	Applenton Reservoir	Weaver Lower	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079c	Applenton Reservoir, Warrington	169	River	No designation	Non reportable water body to the south of the River Mersey	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079d	Applenton Reservoir, Warrington	G841202G0991700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079e	Applenton Reservoir, Warrington	G841202G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																					Medium level of impact
WR079f	Applenton Reservoir, Warrington	G811232665	Lake	Heavily modified	Applenton Reservoir	Weaver Lower	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079g	Applenton Reservoir, Warrington	169	River	No designation	Non reportable water body to the south of the River Mersey	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079h	Applenton Reservoir, Warrington	G841202G0991700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079i	Applenton Reservoir, Warrington	G841202G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																					Medium level of impact
WR079j	Applenton Reservoir, Warrington	G811232665	Lake	Heavily modified	Applenton Reservoir	Weaver Lower	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079k	Applenton Reservoir, Warrington	169	River	No designation	Non reportable water body to the south of the River Mersey	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079l	Applenton Reservoir, Warrington	G841202G0991700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	Y	Y	Y					Y												Medium level of impact	
WR079m	Applenton Reservoir, Warrington	G841202G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																					Medium level of impact
WR095	Roughton Gill	G8102070573380	River	No designation	Chalk Beck	Weaver-Wampool	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																				No or minimal impact	
WR095	Roughton Gill	G8102070673740	River	No designation	Whelpe (Cold) Beck	Caldew	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	Y	Y	Y	Y																	Medium level of impact	
WR095	Roughton Gill	G840202G102300	Groundwater	No designation	Eden and Esk Lower Paleozoic and Carboniferous Aquifers	Eden and Esk Lower Paleozoic and Carboniferous Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y	Y	Y	Y																		Medium level of impact
WR099a	Worsthorne Borehole (Compensation)	G8112071065090	River	Heavily modified	Brun- headwaters to conf Don	Caldew	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y								Y	Y											Medium level of impact	
WR099b	Worsth																																				

Option		WFD Water Body Information													Option Detail													Impacts																		
Ref	Option Name	ID	Type	Hydro - morphological Designation	WB Name	Operational Catchment	Ecological Status	Ecological Objective	Quantitative Status	Quantitative Objective	Chemical Status	Chemical Objective	Overall Status	Overall Objective	Pipe line on hand	Pipe line with water source crossings	New / modified surface water (6 & 7v) / intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / can / duct	Transfer of water via aqueduct	Transfer of water via surface water abstraction quantity	Creation of existing discharge to surface water	New abstraction well / spring / refurbishment	New abstraction well / borehole / surface structure	New / increased abstraction quantity	Charged to reservoir / compensation release	New reservoir / compensation release	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result												
WR102c	Wildes Boreholes To Runcom And Warrington DMZs	170	River	No designation	Non reportable water body to the north of the River Mersey Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Sankey Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aq	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Y																			No or minimal impact	N			No or minimal impact							
WR102e	Wildes Boreholes To Runcom And Warrington DMZs	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Sankey Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2026	Poor	Good by 2027	Poor	Good by 2027	Y	Y									Y	Y										Minor level of impact	N			Minor level of impact						
WR102c	Wildes Boreholes To Runcom And Warrington DMZs	GB41101G202600	Groundwater	No designation	Wirral and West Cheshire Permo-Triassic Sandstone Aquifers	Wirral and West Cheshire Permo-Triassic Sandstone Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y																							No or minimal impact	N			No or minimal impact				
WR102d	Ecclleston Hill Borehole to Prescott WTW	GB112069061210	River	Heavily modified	Hardshaw (Windle) Brook	Sankey	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y											Y	Y	Y										Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact				
WR102d	Ecclleston Hill Borehole to Prescott WTW	GB41201G100100	Groundwater	No designation	Sankey and Glaze Carboniferous aquifers	Sankey and Glaze Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Poor by 2015	Poor	Poor by 2015	Y																								No or minimal impact	N			No or minimal impact			
WR102d	Ecclleston Hill Borehole to Prescott WTW	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y												Y	Y	Y										Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact			
WR102e	Bald Heath Boreholes to Prescott WTW	170	River	No designation	Non reportable water body to north of River Mersey	Sankey	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Y											Y	Y	Y									Medium level of impact	Y	Minor level of impact	High	Minor level of impact				
WR102e	Bald Heath Boreholes to Prescott WTW	GB112069061210	River	Heavily modified	Hardshaw (Windle) Brook	Sankey	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y																								No or minimal impact	N			No or minimal impact			
WR102e	Bald Heath Boreholes to Prescott WTW	GB112069061170	River	Heavily modified	Sutton Brook	Sankey	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																							Minor level of impact	N			Minor level of impact			
WR102e	Bald Heath Boreholes to Prescott WTW	GB112069060990	River	Heavily modified	Whittle Brook (Mersey Estuary)	Sankey	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y																								No or minimal impact	N			No or minimal impact			
WR102e	Bald Heath Boreholes to Prescott WTW	GB112069060710	River	No designation	Prescot Brook (Logwood Mill Brook)	DITON	moderate	Moderate by 2027	n/a	n/a	Good	Good by 2027	moderate	Moderate by 2027	Y																								No or minimal impact	N			No or minimal impact			
WR102e	Bald Heath Boreholes to Prescott WTW	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y											Y	Y	Y										Medium level of impact	Y	Minor level of impact	High	Minor level of impact			
WR102e	Bald Heath Boreholes to Prescott WTW	GB41201G100100	Groundwater	No designation	Sankey and Glaze Carboniferous aquifers	Sankey and Glaze Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Poor by 2015	Poor	Poor by 2015	Y	Y																								Minor level of impact	N			Minor level of impact		
WR105a	Lymn Boreholes (Abandonment of Existing WTW Facility; New WTW at SOW Brook)	169	River	No designation	Non reportable water body to the south of the River Mersey Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a																										No or minimal impact	N			No or minimal impact		
WR105a	Lymn Boreholes (Abandonment of Existing WTW Facility; New WTW at SOW Brook)	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027																										No or minimal impact	N			No or minimal impact		
WR105a	Lymn Boreholes (Abandonment of Existing WTW Facility; New WTW at Hill Cliffe)	169	River	No designation	Non reportable water body to the south of the River Mersey Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a																										No or minimal impact	N			No or minimal impact		
WR105a	Lymn Boreholes (Abandonment of Existing WTW Facility; New WTW at Hill Cliffe)	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027																										No or minimal impact	N			No or minimal impact		
WR105a	Lymn Boreholes (Abandonment of Existing WTW Facility; New WTW at Hill Cliffe)	169	River	No designation	Non reportable water body to the south of the River Mersey Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Y																									Minor level of impact	N			Minor level of impact	
WR105a	Lymn Boreholes (Abandonment of Existing WTW Facility; New WTW at Hill Cliffe)	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																								Minor level of impact	N			Minor level of impact		
WR106	Walton And Daresbury Boreholes	169	River	heavily modified	Kedwick Brook	Weaver Lower	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y										Y	Y	Y												Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
WR106	Walton And Daresbury Boreholes	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																									Minor level of impact	N			Minor level of impact	
WR106	Walton And Daresbury Boreholes	GB41201G101700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y											Y	Y	Y												Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	
WR107a	Aughton Park & Moss End Boreholes (Royal Oak WTW)	GB112069060640	River	Heavily modified	Downholland (Lydiate/Cheshire Lines) Brook	AIT	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Y	Y											Y	Y	Y												Medium level of impact	Y	Medium level of impact	Medium	Medium level of impact	
WR107a	Aughton Park & Moss End Boreholes (Royal Oak WTW)	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																									Minor level of impact	N			Minor level of impact	
WR107a	Aughton Park & Moss End Boreholes (Royal Oak WTW)	GB112069060640	River	Heavily modified	Downholland (Lydiate/Cheshire Lines) Brook	AIT	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Y	Y												Y	Y	Y												Medium level of impact	Y	Medium level of impact	Medium	Medium level of impact
WR107a	Aughton Park & Moss End Boreholes (Royal Oak WTW)	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																									Minor level of impact	N			Minor level of impact	
WR107b	Randles Bridge, Knowsley, Primrose Hill	GB112063060610	River	Heavily modified	Croxteth/ Knowsley Brook	AIT	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																										Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR107b	Randles Bridge, Knowsley, Primrose Hill	GB112063060630	River	Heavily modified	Simonswood Brook	AIT	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																										Minor level of impact	N			Minor level of impact
WR107b	Randles Bridge, Knowsley, Primrose Hill	GB112063060640	River	Heavily modified	Downholland (Lydiate/Cheshire Lines) Brook	AIT	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Y	Y																										Minor level of impact	N			Minor level of impact
WR107b	Randles Bridge, Knowsley, Primrose Hill	GB112063064510	River	Heavily modified	Chionall Brook	AIT	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																										Minor level of impact	N			Minor level of impact
WR107b	Randles Bridge, Knowsley, Primrose Hill	GB112070064830	River	Heavily modified	Three Ponds Waterway	Crossens System	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y											Y	Y	Y													Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR107b	Randles Bridge, Knowsley, Primrose Hill	GB41201G101700	Groundwater	No designation	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	n/a	n/a	Poor	Good by 2027	Poor	Good by 2027	Poor	Good by 2027	Y	Y																									Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	
WR109	Swineshaw Boreholes (Buckton Castle WTW)	GB112069061111	River	Heavily modified	Tame (Chew Brook to Swineshaw Brook)	Goyt Etherow Tame	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015													Y	Y	Y													Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR109	Swineshaw Boreholes (Buckton Castle WTW)	GB41201G102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	Manchester and Cheshire East Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027																												Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR110	Rushdon Spencer Boreholes	GB112068060180	River	No designation	Dane (Clough Brook to Cow Brook)	Dane	n/a	Good by 2027																																						











Option		WFD Water Body Information											Option Detail														Impacts																
Ref	Option Name	ID	Type	Hydro - morphological Designation	WB Name	Operational Catchment	Ecological Status	Ecological Objective	Quantitative Status	Quantitative Objective	Chemical Status	Chemical Objective	Overall Status	Overall Objective	Pipe line on land	Pipe line with water source crossings	New / modified surface water (6 & 7v) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / wetland	Transfer of water via aqueduct	New / increased surface water abstraction quantity	Creation of existing discharge to surface water	New abstraction well siting / refurbishment	New abstraction well headworks / surface structures	New / increased abstraction quantity	Changed to reservoir compensation release	New reservoir / refurbishment siting	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result									
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB11067051910	River	No designation	Cefring - confluence Dee to Teiw	Dee	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	Y																			Minor level of impact	N			Minor level of impact				
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB11067051600	River	No designation	Morlas Brook	Dee	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	Y																					Minor level of impact	N			Minor level of impact		
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB109054055010	River	No designation	Perry - source to conf Common Bk	Perry Roden and Tern North Shropshire	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB109054054970	River	No designation	Perry - conf Common Bk to conf Tetchill Bk	Perry Roden and Tern North Shropshire	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB109054055000	River	No designation	Tetchill Bk - source to conf R Perry	Perry Roden and Tern North Shropshire	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Moderate by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB109054055020	River	No designation	Roden - source to conf unnamed trib	Perry Roden and Tern North Shropshire	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Moderate by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB109054054980	River	No designation	Tributary - source to conf R Roden	Perry Roden and Tern North Shropshire	Bad	Good by 2027	n/a	n/a	Good	Good by 2015	Bad	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB11067052200	River	No designation	Wortherbury Brook - upper	Dee	Poor	Moderate by 2027	n/a	n/a	Fail	Good by 2027	Poor	Moderate by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB112068055260	River	No designation	Bickley Brook	Weaver Upper	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB112068055300	River	No designation	Weaver (Source to Marbury Brook)	Weaver Upper	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB112068055470	River	No designation	Weaver (Marbury Brook to Barnett Brook)	Weaver Upper	Poor	Moderate by 2027	n/a	n/a	Good	Good by 2015	Poor	Moderate by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB112068055250	River	No designation	Edleston Brook	Weaver Upper	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB112068055340	River	No designation	Rookery Brook, Burland and Brindley Bk. to Weaver	Weaver Upper	Moderate	Good by 2021	n/a	n/a	Good	Good by 2015	Moderate	Good by 2021	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB112068060460	River	No designation	Weaver (Marbury Brook to Dane)	Weaver Upper	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB70910082	Canal	Artificial	Llangollen Canal	Perry Roden and Tern North Shropshire Canals	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB411016200200	Groundwater	No designation	Dee Silurian/Ordovician	Dee Silurian/Ordovician	n/a	n/a	Good	None given	Good	Good by 2015	Good	Good by 2015	Y	Y							Y															Medium level of impact	Y	Minor level of impact	Low	Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB411016202200	Groundwater	No designation	Dee Carboniferous Limestone	Dee Carboniferous Limestone	n/a	n/a	Good	None given	Good	Good by 2015	Good	Good by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB411016204800	Groundwater	No designation	Dee Carboniferous Coal Measures	Dee Carboniferous Coal Measures	n/a	n/a	Good	None given	Poor	Poor by 2015	Poor	Poor by 2015	Y	Y																					Minor level of impact	N			Minor level of impact		
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB4090205205400	Groundwater	No designation	Severn Uplands - Carboniferous Owestry	Severn Uplands - Carboniferous Owestry	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB411016202400	Groundwater	No designation	Dee Permo-Triassic Sandstone	Dee Permo-Triassic Sandstone	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB4090205991800	Groundwater	No designation	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB4120205991700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y																						Minor level of impact	N			Minor level of impact	
WR814c	Increased treatment capacity at Hurlston WTW via Canal	GB409020591400	Groundwater	No designation	Dee Triassic Mercia Mudstone	Dee Triassic Mercia Mudstone	n/a	n/a	Good	None given	Good	Good by 2015	Good	Good by 2015	Y	Y																						Minor level of impact	N			Minor level of impact	
WR816	Integrated Zone	GB112069060840	River	heavily modified	Inwell (Roch to Croal)	Croal Inwell	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR816	Third Party Option: Manchester Bolton Bury Canal To Integrated Zone	GB71210501	Canal	Artificial	Manchester, Bolton and Bury Canal (North)	Croal Inwell Canals	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR816	Integrated Zone	GB4120205101800	Groundwater	No designation	Northern Manchester Carboniferous Aquifers	Manchester Northern Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	No or minimal impact	Medium	No or minimal impact
WR816	Third Party Option: Manchester Bolton Bury Canal To Integrated Zone	GB112069064620	River	heavily modified	Inwell (Rosendale STW to Roch)	Croal Inwell	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y	Y																			Minor level of impact	N			Minor level of impact
WR816	Integrated Zone	GB112069064600	River	heavily modified	Roch (Spodden to Inwell)	Roch Ink Medlock	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	Y	Y	Y	Y	Y																			No or minimal impact	N			No or minimal impact
WR816	Third Party Option: Carr Mill Dam To Integrated Resource Zone	GB112069061230	River	heavily modified	Black Brook (Mersey Estuary)	Sankey	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR817	Zone	GB112069061220	River	heavily modified	Millington (Newton) Brook	Sankey	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y	Y	Y	Y	Y																			No or minimal impact	N			No or minimal impact
WR817	Third Party Option: Carr Mill Dam To Integrated Resource Zone	GB71210888	Canal	Artificial	St Helens Canal	Sankey Canals	Moderate	Good by 2027	n/a	n/a	Good	Good by 2027	Moderate	Good by 2027	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR817	Zone	GB4120205100100	Groundwater	No designation	Sankey and Glaze Carboniferous aquifers	Sankey and Glaze Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Poor by 2015	Poor	Poor by 2015	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	No or minimal impact	Medium	No or minimal impact
WR820	Resource Zone	GB112068060460	River	No designation	Weaver (Marbury Brook to Dane)	Weaver Upper	Poor	Good by 2027	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Y	Y	Y	Y	Y	Y																			Minor level of impact	N			Minor level of impact
WR820	Third Party Option: Shropshire Union Canal To Integrated Resource Zone	GB71210133	River	Artificial	Shropshire Union Canal, Market Drayton to Ellesmere Port	Weaver Upper Canals	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	Minor level of impact	Low	Minor level of impact
WR820	Resource Zone	GB112068055340	River	No designation	Rookery Brook, Burland and Brindley Bk. to Weaver	Weaver upper	Moderate	Good by 2021	n/a	n/a	Good	Good by 2015	Moderate	Good by 2021	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
WR820	Third Party Option: Shropshire Union Canal To Integrated Resource Zone	GB4120205991700	Groundwater	No designation	Weaver and Dane Quaternary Sand and Gravel Aquifers	Weaver and Dane Quaternary Sand and Gravel Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	Y	Y	Y	Y																			Medium level of impact	Y	No or minimal impact	Medium	No or minimal



# Appendix C

## Level 2 Detailed Assessments for Supply-demand Feasible Options

Water body ID: GB112063061442				Scheme: River Alt to Prescott WTW				
Water Body Name: Alt DS Bull Bridge				Reference: WR001				
RBMP: Alt and Crossens				Construction		Operational		
Operational catchment: Alt				Direct		Direct		
Designation (and uses): Heavily modified								
Relevant upstream water bodies: Alt US Bull Bridge, Downholland Brook								
Downstream water bodies: Alt								
WFD Element	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	(Resector)			New /modified surface water intake. Minor level of impact.  Transfer pipe line on land. No or minimal impact.  New pumping station. Minor level of impact.	High	New surface water abstraction quantity. Medium level of impact. New surface water abstraction from the River Alt near Maghull of 5-20 Ml/d. In the ALS water is identified as available at all flows (Q30, Q50, Q70 and Q95) however the abstraction is moderate in size and could have a medium impact on the hydrological regime of the River Alt. A new abstraction licence would be required to be issued by the Environment Agency.	Medium
		Phytoplankton	Not provided					
		Macrophytes						
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	Poor					
	Fish	Not provided						
	Hydro-morphology	Hydrological regime	Supports good					
		River continuity	Not provided					
		Morphological conditions	Not provided					
		Physico-chemical	General physico-chemical	All high/good except ammonia-moderate, Phosphate- poor				
Specific pollutants:			All high					
WFD elements for Rivers: Chemical	Priority hazardous substances	Tributyltin Compounds- fail						
	Priority substances	All good						
Overall Status/ Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Fail	Good by 2027	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\North Eden\WR127  
 EA Abstraction Licence Strategy: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

		<b>Water body ID:</b>	GB41201G101700	<b>Scheme:</b>	River Alt to Prescot WTW								
		<b>Water body Name:</b>	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifer	<b>Reference</b>	WR001								
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction		Operational						
		<b>Operational catchment:</b>	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifer	<b>Impact potential</b>	Direct		Direct						
		<b>Designation (and uses):</b>	No designation										
		<b>Relevant upstream water bodies:</b>	N/A										
		<b>Downstream water bodies:</b>	N/A										
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>					
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			Transfer pipe line on land. No or minimal impact.	High	Use of new transfer pipe line, and pumping station. No or minimal impact.	Medium				
		Quantitative GWDEs test	Good										
		Quantitative Saline Intrusion	Poor										
		Quantitative Water Balance	Good										
		Chemical Dependent Surface Water Body Status	Poor										
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Drinking Water Protected Area	Poor							Transfer pipe line with water course crossings. No or minimal impact.	High	New surface water abstraction quantity. Minor level of impact. New surface water abstraction from the River Alt near Maghull of 5 - 20 M3/d. The ALS highlights restricted availability of groundwater in the area. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer, however as the ALS indicates there is surface water available at all flows its likely that any reductions in leakage would be minor and localised, and unlikely to have a sustained or wide spread impact on the quantitative water balance of the groundwater body.	Medium
		Chemical GWDEs test	Good										
		Chemical Saline Intrusion	Poor										
		General Chemical Test	Good										
		Prevent and Limit Objective											
		Trend Assessment	Upward trend										
		Overall Status Potential											
Quantitative	Poor	Good by 2027	N/A										
Chemical (GW)	Poor	Good by 2027	N/A										
Overall	Poor	Good by 2027	N/A										

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [\\WAR-FS1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible Options/North Eden/WR127/](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible%20Options/North%20Eden/WR127/)

EA Abstraction Licence Strategy: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

Water body ID:		GB112073071100	Scheme:		FISHER TARN (KENDAL) TO THIRLMERE AQUEDUCT AND LOSTOCK FOR TREATMENT					
Water body Name:		Stainton Beck	Reference:		WR003					
RBMP:		North West	Scheme Phase:		Construction		Operational			
Operational catchment:		Bela	Impact potential:		Direct		Direct			
Designation (and uses):		No designation								
Relevant upstream water bodies:		N/A								
Downstream water bodies:		Bela								
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence			
WFD elements for Rivers: Ecological	Biology	Phytoplankton	-		New transfer pipe line on land No or minimal impact.  New pumping station Minor level of impact.  New / modified water treatment works No or minimal impact.	High	New surface water abstraction quantity. Minor level of impact. A new abstraction licence would be granted by the Environment Agency (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status). The yield of the reservoir is uncertain and is assumed to equate to the previous licence condition of 0.273 M/d. There is also a requirement to maintain an existing compensation flow condition of 0.273 M/d from the reservoir to the watercourse (Stainton Beck). The Environment Agency's Abstraction Licensing Strategy for South Cumbria shows water available at all flow regimes (Q95, Q70, Q50 and Q30).	Medium		
		Macrophytes	-							
		Macrophytes and phytoplankton	Moderate							
		Benthic invertebrates	Good							
		Fish	-							
	Hydro-morphology	Hydrological regime	High							
		River continuity	-							
		Morphological conditions	Supports good							
		Physico-chemical	General physico-chemical	All high						
			Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment								
	Priority substances	Does not require assessment								
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A						
	Chemical	Good	Good by 2015	N/A						
	Overall	Moderate	Good by 2027	N/A						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZWR003WR003\\_Fisher\\_Tarn.xls](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZWR003WR003_Fisher_Tarn.xls)

EA Flood Maps (WIBY): <http://maps.environment-agency.gov.uk/wiby/wiby/Controller?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&ln=1.2>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/wiby/wiby/Controller?topic=waste&layerGroups=default&lang=e&ep=map&scale=1&x=357682.99999999994&y=355133.99999999994&fx=322374&fy=497910&lg>

EA Abstraction Licence Strategy (South Cumbria): <https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy>

		Water body ID:	Groundwater	Scheme:	FISHER TARN (KENDAL) TO THIRLMERE AQUEDUCT AND LOSTOCK FOR TREATMENT				
		Water body Name:	IRZ	Reference	WR003				
		RBMP:	North West	Scheme Phase	Construction		Operational		
		Operational catchment:	Cumbria South Low	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	N/A						
		Downstream water bodies:	N/A						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>New surface water abstraction quantity.</b> No or minimal impact. As the abstraction is from a reservoir, and compensation flows will be maintained, there will be no or very minimal change in groundwater - surface water interactions as a result of the new abstraction. The Environment Agency's Abstraction Licensing Strategy for South Cumbria shows water available at all flow regimes (Q95, Q70, Q50 and Q30).</p>	High	
		Quantitative GWDTes test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor						
		Chemical Drinking Water Protected Area	Good						
	Supporting Elements (groundwater)	Chemical GWDTes test	Good						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Good						
		Prevent and Limit Objective	-						
	Trend Assessment	No trend							
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A					
	Chemical (GW)	Poor	Good by 2027	N/A					
	Overall	Poor	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR003\WR003 Fisher Tarn.xlsx>  
 EA Abstraction Licence Strategy (South Cumbria): <https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy>



Water body ID:		GB112073071430		Scheme:		Longsleddale Reservoir		
Water body Name:		Sprint		Reference		WR004		
RBMP:		Kent and Leven		Scheme Phase		Construction		
Operational catchment:		Kent		Impact potential		Direct		
Designation (and uses):		No designation				Operational		
Relevant upstream water bodies:		Not identified				Direct		
Downstream water bodies:		Kent- cont Sprint to Tidal						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New transfer pipe line on land.</b> No or minimal impact.</p> <p><b>New transfer pipe line with water course crossings.</b> Minor level of impact.</p> <p><b>New pumping station.</b> Minor level of impact.</p> <p><b>New impounding reservoir.</b> Medium level of impact on water body downstream of the proposed reservoir. The reach of the water body that will form part of the new reservoir is assessed in the operation section.</p> <p><b>Biology:</b> temporary habitat changes will result from the diversion of the Sprint during construction. There is the potential for suspended sediment to enter the Sprint and affect the ecology (i.e. smothering, reduction in light) including fish, macrophytes/phytobenthos and invertebrates. Sediment loss downstream of the reservoir will deplete habitats, fish migration is likely to be affected and flow within the watercourse is also likely to decrease.</p> <p><b>Hydromorphology:</b> diversion of the Sprint during construction will result in temporary changes to the hydrological regime, river continuity and morphological conditions.</p> <p><b>Chemical and Physicochemical:</b> direct temporary effects could occur as a result of accidental spillage or leakage of chemicals such as Polycyclic Aromatic Hydrocarbons (PAHs) associated with construction vehicle/machinery fuels and oils, or metals (from machinery itself). The initial flooding of the valley may result in a "pulse" of poor quality water due to disturbance of contaminated sediment.</p>	Medium	<p><b>Use of new transfer pipe line and pumping station.</b> No or minimal impact.</p> <p><b>New impounding reservoir.</b> High level of impact. New impounding reservoir and abstraction of 25 M/d.</p> <p><b>Biology:</b> long term habitat changes will result from the flooding of the Sprint valley.</p> <p><b>Hydromorphology:</b> long term changes to the hydrological regime of the Sprint will result from the presence of the reservoir. Both high and low flows will be changed. Changes to sediment transport regime will change morphological conditions. River continuity will be interrupted by the embankment.</p> <p><b>Chemical and Physicochemical:</b> long term water quality changes are likely to occur due to the silling and storage of water in the reservoir.</p> <p>The construction of a new reservoir may result in the re-designation of the Sprint as a highly modified water body for water supply. It is unlikely that the reservoir could be constructed/operated without a deterioration of status in one or more elements.</p>	High
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	High					
		Benthic invertebrates	High					
		Fish	High					
	Hydromorphology	Hydrological regime	Supports good					
		River continuity	Not provided					
		Morphological conditions	Supports good					
	Physico-chemical	General physico-chemical	All high					
		Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/SP otential	Ecological	Good	Good by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR004\WR004\_Longsleddale  
 Abstraction Licensing Strategies (South Cumbria): <https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy>

		Water body ID:	GB41202G102100	Scheme:	Longsleddale Reservoir		
		Water body Name:	South Cumbria Lower Palaeozoic and Carboniferous Aquifer	Reference	WR004		
		RBMP:	North West GW	Scheme Phase	Construction	Operational	
		Operational catchment:	South Cumbria Lower Palaeozoic and Carboniferous Aquifer	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	Not identified				
		Downstream water bodies:	Not identified				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	High
		Quantitative GWDTes test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTes test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	-				
Supporting Element	Trend Assessment	Trend Assessment	No trend				
		Quantitative	Good	Good by 2015	N/A		
Overall Status Potential	at	Chemical (GW)	Poor	Good by 2027	N/A		
		Overall	Poor	Good by 2027	N/A		

Assumptions	
1-	Application of standard best practice construction and pollution prevention methods.
2-	Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3-	Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4-	New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5-	A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6-	Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7-	Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8-	Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence	
Catchment Data Explorer:	<a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma:	\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR\WR004\WR004 - Longsleddale Reservoir.xlsx
Abstraction Licensing Strategies (South Cumbria):	<a href="https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy">https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy</a>

Water body ID:		GB112069061420		Scheme:		Glaze Brook			
Water body Name:		Glaze		Reference		WR006			
RBMP:		Mersey Lower		Scheme Phase		Construction			
Operational catchment:		Glaze		Impact potential		Direct			
Designation (and uses):		No designation				Direct			
Relevant upstream water bodies:		Bedford Brook and Pennington Brook (Glaze)							
Downstream water bodies:		Mersey/Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin)							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		High	Medium	<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> Minor level of impact.</p> <p><b>New surface water intake.</b> Minor level of impact.</p> <p><b>New surface water abstraction quantity.</b> Medium level of impact. New surface water abstraction from Glaze Brook near the village of Glaze Brook of 15 M/d. In the ALS water is identified as available at Q30, Q50 and Q70, but restricted at Q95 flows. The abstraction is moderate in size and could have a medium impact on the hydrological regime of Glaze Brook, particularly at low flows. A new abstraction licence would be required to be issued by the Environment Agency.</p> <p><b>Use of new transfer pipe line.</b> No or minimal impact.</p>		
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	Poor						
		Benthic invertebrates	Poor						
		Fish	Poor						
	Hydrograph	Hydrological regime	Supports good						
		River continuity	Not provided						
		Morphological conditions	Supports good						
		Physico-chemical	General physico-chemical	All high/good except: Ammonia- moderate, BOD-poor, Phosphate- Poor					
			Specific pollutants:	All high					
WFD elements for Rivers: Chemical	Priority hazardous substances	All good							
	Priority substances	All good							
Overall Status/Potential	Ecological	Poor	Poor by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Poor	Poor by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [\\WAR-FS1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR006/WR006\\_Glaze](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR006/WR006_Glaze)

Abstraction Licence Strategy: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

		Water body ID:	GB41201G101700	Scheme:	Glaze Brook									
		Water body Name:	Merseyside Permo-Triassic Sandstone Aquifers	Reference	WR006									
		RBMP:	North West GW	Scheme Phase	Construction		Operational							
		Operational catchment:	Merseyside North Permo-Triassic Sandstone Aq	Impact potential	Direct		Direct							
		Designation (and uses):	No designation											
		Relevant upstream water bodies:	Not identified											
		Downstream water bodies:	Not identified											
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence						
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p>New surface water abstraction quantity.</p> <p>Minor level of impact. New surface water abstraction from Glaze Brook near the village of Glaze Brook of 15 M/d. The ALS highlights water is available in East Glaze but not available in West Glaze groundwater. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer. The principal aquifer is likely to be well connected to surface water bodies, but any changes in leakage are likely to be minor and localised, and not have a significant impact on the aquifers quantitative water balance.</p>	Medium						
		Quantitative GWDTES test	Good											
		Quantitative Saline Intrusion	Poor											
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good						High	<p>New surface water abstraction quantity.</p> <p>Minor level of impact. New surface water abstraction from Glaze Brook near the village of Glaze Brook of 15 M/d. The ALS highlights water is available in East Glaze but not available in West Glaze groundwater. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer. The principal aquifer is likely to be well connected to surface water bodies, but any changes in leakage are likely to be minor and localised, and not have a significant impact on the aquifers quantitative water balance.</p>	Medium			
		Chemical Dependent Surface Water Body Status	Poor											
		Chemical Drinking Water Protected Area	Poor											
Supporting Licence	Licence	Chemical GWDTES test	Good									High	<p>New surface water abstraction quantity.</p> <p>Minor level of impact. New surface water abstraction from Glaze Brook near the village of Glaze Brook of 15 M/d. The ALS highlights water is available in East Glaze but not available in West Glaze groundwater. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer. The principal aquifer is likely to be well connected to surface water bodies, but any changes in leakage are likely to be minor and localised, and not have a significant impact on the aquifers quantitative water balance.</p>	Medium
		Chemical Saline Intrusion	Poor											
		General Chemical Test	Good											
		Prevent and Limit Objective	-											
Overall Status/Potential	Overall	Trend Assessment	Upward trend			High	<p>New surface water abstraction quantity.</p> <p>Minor level of impact. New surface water abstraction from Glaze Brook near the village of Glaze Brook of 15 M/d. The ALS highlights water is available in East Glaze but not available in West Glaze groundwater. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer. The principal aquifer is likely to be well connected to surface water bodies, but any changes in leakage are likely to be minor and localised, and not have a significant impact on the aquifers quantitative water balance.</p>	Medium						
		Quantitative	Poor	Good by 2027	N/A									
		Chemical (GW)	Poor	Good by 2027	N/A									
Overall	Overall	Overall	Poor	Good by 2027	N/A				High	<p>New surface water abstraction quantity.</p> <p>Minor level of impact. New surface water abstraction from Glaze Brook near the village of Glaze Brook of 15 M/d. The ALS highlights water is available in East Glaze but not available in West Glaze groundwater. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer. The principal aquifer is likely to be well connected to surface water bodies, but any changes in leakage are likely to be minor and localised, and not have a significant impact on the aquifers quantitative water balance.</p>	Medium			
		Quantitative	Poor	Good by 2027	N/A									
		Chemical (GW)	Poor	Good by 2027	N/A									

Assumptions
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>

Evidence
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR006\WR006_Glaze Brook.xlsx</p> <p>Abstraction Licence Strategy: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf</a></p>

Water body ID:		GB41201G101700		Scheme:		Sankey Brook		
Water body Name:		Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers		Reference		WR007		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers		Impact potential		Operational		
Designation (and uses):		No designation				Direct		
Relevant upstream water bodies:		N/A						
Downstream water bodies:		N/A						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	good			<p>Transfer pipe line with water course crossing. No or minimal impact.</p> <p>New water treatment works. No or minimal impact.</p> <p>New surface water intake. No or minimal impact.</p>	High	<p>New surface water abstraction quantity. No or minimal impact. New surface water abstraction from Sankey Brook near Great Sankey of 10 Mld. The ALS identifies restricted availability of groundwater in the area. The abstraction is moderate in size, but is located in a transitional surface water body which has water available across all flows. Any reductions in flow as a result of the new abstraction are unlikely to have a significant impact on leakage to the aquifer or on the quantitative water balance of the aquifer.</p> <p>New Transfer Pipe Line and Pumping Station No or minimal impact.</p>	Medium
	Quantitative GWDTes test	good						
	Quantitative Saline Intrusion	Poor						
	Quantitative Water Balance	good						
WFD elements for Groundwater: Chemical	Chemical Dependent Surface Water Body Status	Poor						
	Chemical Drinking Water Protected Area	Poor						
	Chemical GWDTes test	good						
	Chemical Saline Intrusion	Poor						
	General Chemical Test	good						
	Prevent and Limit Objective	-						
	Trend Assessment	Upward trend						
Overall Status/Potential	Quantitative	Poor	Good by 2026	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which wo
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR007\WR00  
 EA Abstraction Licence Strategy: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7861\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7861_35d3ed.pdf)

		Water body ID:	GB531206908100	Scheme:	Sankey Brook					
		Water body Name:	Mersey	Reference	WR007					
		RBMP:	North West	Scheme Phase	Construction		Operational			
		Operational catchment:	Sankey	Impact potential	Direct		Direct			
		Designation (and uses):	Heavily modified							
		Relevant upstream water bodies:	and Clatter Brook, Ditton Brook							
		Downstream water bodies:	Mersey Mouth							
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Moderate			New surface water intake. Minor level of impact.	High	New surface water abstraction quantity. Medium level of impact. New surface water abstraction from the Sankey Brook near Great Sankey of 10 MI/d. In the ALS water is identified as available at all flows for the transitional water body. However the abstraction is moderate in size and could have an impact on the hydrological regime of lower part of the Sankey Brook. A new abstraction licence would be required to be issued by the Environment Agency.	Medium	
		Macrophytes	High	Good by 2015						
		Macrophytes and phytobenthos								
		Benthic invertebrates	Good	Good by 2015						
		Fish	-	-						
	Hydrology	Hydrological regime	Supports good							
		River continuity	-							
		Morphological conditions	-							
		Physical-chemical	General physico-chemical	Moderate	Good by 2027					
			Specific pollutants:	Moderate	Good by 2027					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good								
	Priority substances	Fail	Good by 2015							
		Moderate	Good by 2027	N/A						
Overall Status/Potential	Ecological	Moderate								
	Chemical	Fail	Good by 2027	N/A						
	Overall	Moderate	Good by 2027	N/A						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VRZWR007\WR007\_Sankey Brook.docx  
 EA Abstraction Licence Strategy: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

Water body ID:		GB112072071710		Scheme:		RIVER RAWTHEY TO WATCHGATE		
Water body Name:		Rawthey - Lower		Reference:		WR009		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Greta and Rawthey		Impact potential:		Direct		
Designation (and uses):		No designation				Operational		
						Direct		
Relevant upstream water bodies:		Clough, Dee - conf Deepdale Bk to conf Rawthey, Rawthey - Upper						
Downstream water bodies:		Lune - conf Rawthey to conf Greta						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Transfer pipe line on land. No or minimal impact.	Use of new transfer pipeline, and pumping station. No or minimal impact.	
		Macrophytes	-					
		Macrophytes and phytobenthos	High					
		Benthic invertebrates	High					
		Fish	High					
	Hydromorphology	Hydrological regime	High					
		River continuity	-					
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	-					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>
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<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VRZ\WR009\WR009_River Rawthey to Watchgate.docx</p> <p>EA Abstraction Licence Strategy: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf</a></p>
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		Water body ID:	GB41202G102700	Scheme:	RIVER RAWTHEY TO WATCHGATE		
		Water body Name:	Lune and Wyre Carboniferous Aquifers	Reference	WR009		
		RBMP:	North West	Scheme Phase	Construction	Operational	
		Operational catchment:	Lune and Wyre Carboniferous Aquifers	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	N/A				
		Downstream water bodies:	N/A				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good				
		Quantitative GWDTes test	Good				
		Quantitative Saline intrusion	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good				
		Chemical dependent	Good				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTes test	Good				
		Chemical Saline intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	-				
		Trend Assessment	Upward Trend				
Overall Status/Potential	Quantitative	Good	Good by 2027	N/A			
	Chemical (GW)	Good	Good by 2027	N/A			
	Overall	Good	Good by 2027	N/A			

Assumptions	
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.	
Evidence	
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/Design/Feasible%20Options/WR009/WR009_River_Rawthey_to_Watchgate.docx">\\WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/Design/Feasible Options/WR009/WR009_River Rawthey to Watchgate.docx</a> EA Abstraction Licence Strategy: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/117917v1_161231.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/117917v1_161231.pdf</a>	



Water body ID:		GB112072071770		Scheme:		Borrow Beck IR		
Water body Name:		Borrow Beck		Reference:		WR012		
RBMP:		Lune		Scheme Phase		Operational		
Operational catchment:		Lune Upper		Impact potential		Direct		
Designation (and uses):		No designation						
Relevant upstream water bodies:		Not identified						
Downstream water bodies:		Lune- conf Birk Beck to conf Rawthey						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New transfer pipe line on land.</b> No or minimal impact.</p> <p><b>New transfer pipe line with water course crossings.</b> Minor level of impact.</p> <p><b>New impounding reservoir.</b> Medium level of impact on water body downstream of the proposed reservoir. The reach of the water body that will form part of the new reservoir is assessed in the operation section.</p> <p><b>Biology:</b> temporary habitat changes will result from the diversion of the Borrow Beck during construction. There is the potential for suspended sediment to enter the Borrow Beck and effect the ecology (i.e. smothering, reduction in light) including fish, macrophytes/phytobenthos and invertebrates.</p> <p><b>Hydromorphology:</b> diversion of the Borrow Beck during construction will result in temporary changes to the hydrological regime, river continuity and morphological conditions.</p> <p><b>Chemical and Physiochemical:</b> direct temporary effects could occur as a result of accidental spillage or leakage of chemicals such as Polycyclic Aromatic Hydrocarbons (PAHs) associated with construction vehicle/machinery fuels and oils, or metals (from machinery itself). The initial flooding of the valley may result in a "pulse" of poor quality water.</p>	High	<p><b>Use of transfer pipe line.</b> No or minimal impact.</p> <p><b>New impounding reservoir.</b> High level of impact.</p> <p><b>Biology:</b> long term habitat changes will result from the flooding of the Borrow Beck valley. This may be partly mitigated by fish passes.</p> <p><b>Hydromorphology:</b> long term changes to the hydrological regime of the Borrow Beck will result from the presence of the reservoir. Both high and low flows will be changed. Changes to sediment transport regime will change morphological conditions. River continuity will be interrupted by the embankment.</p> <p><b>Chemical and Physiochemical:</b> long term water quality changes are likely to occur due to the stilling and storage of water in the reservoir.</p> <p>The construction of a new reservoir may result in the re-designation of the Borrow Beck as a highly modified water body for water supply. It is unlikely that the reservoir could be constructed/operated without a deterioration of status in one or more elements.</p>	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	High					
		Fish	Not provided					
	Hydromorphology	Hydrological regime	High					
		River continuity	Not provided					
		Morphological conditions	Supports good					
		Physico-chemical	General physico-chemical	All high				
			Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2027	NA				
	Chemical	Good	Good by 2015	NA				
	Overall	Good	Good by 2027	NA				

Assumptions
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>
Evidence
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WRZ\WR075\WR075 Stocks Reservoir.xlsx</p>

		<b>Water body ID:</b>	GB41202G102100	<b>Scheme:</b>	<b>Borrow Beck IR</b>			
		<b>Water body Name:</b>	South Cumbria Lower Palaeozoic and Carboniferous Aquifers	<b>Reference</b>	<b>WR012</b>			
		<b>RBMP:</b>	North West GW	<b>Scheme Phase</b>	<b>Construction</b>		<b>Operational</b>	
		<b>Operational catchment:</b>	Cumbria South Lower Paleozoic and Carboniferous Aq	<b>Impact potential</b>	<b>Direct</b>		<b>Direct</b>	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	Not identified					
		<b>Downstream water bodies:</b>	Not identified					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>
<b>WFD elements for Groundwater: Quantitative</b>	<b>Quantitative Status Element</b>	<b>Quantitative Dependent Surface Water Body Status</b>	Good			<b>High</b>	<b>Use of transfer pipe line and pumping station.</b> No or minimal impact.  <b>New impounding reservoir.</b> Minor level of impact. The presence of the new lake and embankment is unlikely to have widespread effects on the groundwater body. Localised recharge patterns and interaction with the surface water body are likely to change, but these changes are small in extent compared to the water body as a whole. The solid geology is primarily mudstones and siltstones (with some sandstone layers). The relatively low permeability and transmissivity of this secondary aquifer reduce the sensitivity of the groundwater body to impacts from the reservoir.  Changes to the classification and status of the Borrow Beck surface water body may have implications for the status of this groundwater body (e.g. via the quantitative dependent surface water body status).	<b>High</b>
		<b>Quantitative GWDTes test</b>	Good					
		<b>Quantitative Saline Intrusion</b>	Good					
		<b>Quantitative Water Balance</b>	Good					
<b>WFD elements for Groundwater: Chemical</b>	<b>Chemical Status Element</b>	<b>Chemical Dependent Surface Water Body Status</b>	Poor					
		<b>Chemical Drinking Water Protected Area</b>	Good					
		<b>Chemical GWDTes test</b>	Good					
		<b>Chemical Saline Intrusion</b>	Good					
		<b>General Chemical Test</b>	Good					
		<b>Supporting Elements</b>						
	<b>Prevent and Limit Objective</b>	Not provided						
	<b>Trend Assessment</b>	No trend						
<b>Overall Status/Potential</b>	<b>Quantitative</b>	<b>Good</b>	<b>Good by 2015</b>	<b>N/A</b>				
	<b>Chemical (GW)</b>	<b>Poor</b>	<b>Good by 2027</b>	<b>N/A</b>				
	<b>Overall</b>	<b>Poor</b>	<b>Good by 2027</b>	<b>N/A</b>				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR075WR075 Stocks Reservoir.xlsx](http://www.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/WR075WR075_Stocks_Reservoir.xlsx)  
 EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&lg=EA>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=waste&layerGroups=default&lang=e&ep=map&scale=1&x=357682.9999999994&y=355133.9999999994#x=322374&y=497910>  
 EA aquifer designation mapping: <http://apps.environment-agency.gov.uk/wiyby/default.aspx>  
 BGS Geology Mapping: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

		<b>Water body ID:</b>	GB112071065612	<b>Scheme:</b>	RIVER RIBBLE SUPPORT TO STOCKS RESERVOIR		
		<b>Water body Name:</b>	Ribble DS Stock Beck	<b>Reference:</b>	WR026a		
		<b>RBMP:</b>	North West	<b>Scheme Phase:</b>	Construction		Operational
		<b>Operational catchment:</b>	Ribble Middle - Settle	<b>Impact potential:</b>	Direct		Direct
		<b>Designation (and uses):</b>	No designation				
		<b>Relevant upstream water bodies:</b>					
		<b>Downstream water bodies:</b>					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	Medium
		Macrophytes	-				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	High				
		Fish	-				
	Hydro-morphology	Hydrological regime	Supports good				
		River continuity	-				
		Morphological conditions	-				
		General physico-chemical	Good				
		Specific pollutants:	High				
WFD elements for Rivers: Chemical	Priority hazardous substances	Fail					
	Priority substances	Good					
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Fail	Fail by 2015	N/A			
	Overall	Moderate	Moderate by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which wo
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671/1/1/WRMP\\_Support/5/Design/Feasible\\_Options/IRZ/WR026a/WR026a/EA\\_Abstraction\\_Licence\\_Strategy\\_\(xxx\).xlsx](http://www.war-fs1.global.amec.com/shared/Projects/38671/1/1/WRMP_Support/5/Design/Feasible_Options/IRZ/WR026a/WR026a/EA_Abstraction_Licence_Strategy_(xxx).xlsx)

Water body ID:		GB41202G103000		Scheme:		RIVER RIBBLE SUPPORT TO STOCKS RESERVOIR							
Water body Name:		Ribble Carboniferous Aquifers		Reference		WR026a							
RBMP:		North West		Scheme Phase		Construction							
Operational catchment:		Ribble Carboniferous Aquifers		Impact potential		Direct							
Designation (and uses):		No designation				Operational							
Relevant upstream water bodies:													
Downstream water bodies:													
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence						
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Medium						
		Quantitative GWDTes test	Good					Transfer pipe line on land. No or minimal impact.					
		Quantitative Saline Intrusion	Good						Transfer pipe line with water course crossings. No or minimal impact.				
		Quantitative Water Balance	Good							Use of new transfer pipe line, pumping station, surface water intake, outfall No or minimal impact.			
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good								New surface water abstraction quantity. Minor level of impact. New surface water abstraction from the River Ribble near Clitheroe of 5 - 10 M/d. The ALS does not highlight any restricted or non availability of groundwater in the area, or surface water in the River Ribble. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer, however these would be localised, and the secondary Carboniferous aquifer is unlikely to be highly dependent on leakage from surface water courses to maintain its quantitative water balance.		
		Chemical Drinking Water Protected Area	Good									New pumping station. No or minimal impact.	
		Chemical GWDTes test	Good										New outfall to reservoir. No or minimal impact.
		Chemical Saline Intrusion	Good										
		General Chemical Test	Good										
		Prevent and Limit Objective	Good										
		Trend Assessment	No trend										
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A									
	Chemical (GW)	Good	Good by 2015	N/A									
	Overall	Good	Good by 2015	N/A									

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which v
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossing
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/W/R026a/WF](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/W/R026a/WF)  
 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f8](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f8)

Water body ID:		GB30229073		Scheme:		HAWESWATER RESERVOIR – RAISE EMBANKMENT STRUCTURE		
Water body Name:		Haweswater Reservoir		Reference		WR037b		
RBMP:		Solway tweed		Scheme Phase		Construction		
Operational catchment:		Eamont		Impact potential		Direct		
Designation (and uses):		Heavily modified				Operational		
Relevant upstream water bodies:		-						
Downstream water bodies:		-						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	High		<p><b>Raise height of reservoir embankment.</b> Minor level of impact.</p> <p><b>Biology:</b> There is the potential for suspended sediment to enter the reservoir and effect the ecology (i.e. smothering, reduction in light) including fish, macrophytes/phytobenthos and invertebrates. However any impacts would be temporary and restricted to the downstream section of the reservoir, close to the embankment.</p> <p><b>Hydromorphology:</b> No longer term or extensive changes to the hydrological regime of the reservoir are expected.</p> <p><b>Chemical and Physiochemical:</b> direct temporary effects could occur as a result of accidental spillage or leakage of chemicals such as Polycyclic Aromatic Hydrocarbons (PAHs) associated with construction vehicle/machinery fuels and oils, or metals (from machinery itself). The initial flooding of the new reservoir volume may result in a "pulse" of poor quality water.</p>	High	<p><b>Operation of increased volume reservoir</b> No or minimal impact. The reservoir water body would increase in size as a result of the raised embankment. No or minimal impacts on biology, hydromorphology, chemical and physiochemical elements are expected, which would not cause a deterioration in WFD status. It is assumed that current compensation flow releases, fish pass arrangements and the characteristics of the banks of the reservoir would be maintained.</p>	Medium
		Macrophytes	-					
		Phytobenthos	-					
		Macrophytes and phytobenthos	-					
		Chironomids (CPET)	-					
	Hydromorphology	Fish	-					
		Hydrological regime	-					
		River continuity	-					
	Physico-chemical	Morphological conditions	-					
		General physico-chemical	Moderate					
Specific pollutants:		-						
WFD elements for Lakes/Reservoirs: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/ Permit at	Ecological	Good	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>3- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>4- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>5- Reservoir compensation flows and fish pass arrangements will be maintained during construction and operation.</p> <p>6- In-channel works will be undertaken at a time which won't have a significant impact on fish communities</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR2\WR037a\WR037_Haweswater Reservoir.docx</p> <p>EA aquifer designation mapping: <a href="http://apps.environment-agency.gov.uk/wyby/default.aspx">http://apps.environment-agency.gov.uk/wyby/default.aspx</a></p> <p>BGS Geology Mapping: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a></p>	

Water body ID:		GB102076070720		Scheme:		HAWESWATER RESERVOIR – RAISE EMBANKMENT STRUCTURE			
Water body Name:		Haweswater Beck		Reference:		WR037b			
RBMP:		Solway tweed		Scheme Phase:		Construction			
Operational catchment:		Eamont		Impact potential:		Direct			
Designation (and uses):		No designation				Operational			
Relevant upstream water bodies:									
Downstream water bodies:		Lowther (Lower)							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		<p><b>Raise height of reservoir embankment.</b> Minor level of impact.</p> <p><b>Biology:</b> There is the potential for suspended sediment to enter the Haweswater Beck and effect the ecology (i.e. smothering, reduction in light) including fish, macrophytes/phytobenthos and invertebrates. However any impacts would be temporary.</p> <p><b>Hydromorphology:</b> No long term or extensive changes to the hydrological regime of the Haweswater Beck are expected, as it is assumed that compensation flows from the reservoir would be maintained during construction. Sediment release may have a short term impact on the morphological conditions of the Beck.</p> <p><b>Chemical and Physicochemical:</b> direct temporary effects could occur as a result of accidental spillage or leakage of chemicals such as Polycyclic Aromatic Hydrocarbons (PAHs) associated with construction vehicle/machinery fuels and oils, or metals (from machinery itself). The initial flooding of the new reservoir volume may result in a "pulse" of poor quality water.</p>	Medium	<p><b>Operation of increased volume reservoir</b> Minor level of impact. Part of the upper reaches of the Haweswater Beck will be flooded by the increased volume of the reservoir. This will result in changes to habitats, hydromorphology, chemical and physicochemical elements in the effected reach. However this is expected to be a small reach of water course, and an extension of the existing reservoir habitats so a deterioration of the status of the WFD water body is unlikely. It is assumed that current compensation flow releases and fish pass arrangements would be maintained.</p>	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	-						
		Benthic invertebrates	Good						
		Fish	Moderate						
	Hydromorphology	Hydrological regime	-						
		River continuity	-						
Morphological conditions		-							
Physico-chemical	General physico-chemical	Good							
	Specific pollutants:	-							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Good	Good by 2027	N/A					
	Chemical	Good	Good by 2027	N/A					
	Overall	Good	Good by 2027	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 3- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 4- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 5- Reservoir compensation flows and fish pass arrangements will be maintained during construction and operation. 6- In-channel works will be undertaken at a time which won't have a significant impact on fish communities

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZWR037a/WR037_Haweswater_Reservoir.docx">http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZWR037a/WR037_Haweswater_Reservoir.docx</a> EA aquifer designation mapping: <a href="http://apps.environment-agency.gov.uk/wvby/default.aspx">http://apps.environment-agency.gov.uk/wvby/default.aspx</a> BGS Geology Mapping: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a>

Water body ID:		GB40201G102300		Scheme:		HAWESWATER RESERVOIR – RAISE EMBANKMENT STRUCTURE		
Water Body Name:		Eden and Esk Lower Palaeozoic and Carboniferous Aquifers		Reference:		WR037b		
RBMP:		Solway Tweed		Scheme Phase		Construction		
Operational catchment:		Eden and Esk Lower Palaeozoic and Carboniferous Aquifers		Impact potential		Operational		
Designation (and uses):		No designation				Direct		
Relevant upstream water bodies:		N/A						
Downstream water bodies:		N/A						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good		Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative	Good			High	High	
		Quantitative GWDEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
		Chemical dependent	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Drinking Water Protected Area	Good					
		Chemical GWDEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	-					
WFD elements for Groundwater: Supporting Elements (Indicators)	Supporting Elements (Indicators)	Trend Assessment	Upward Trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	NA				
	Chemical (GW)	Good	Good by 2015	NA				
	Overall	Good	Good by 2015	NA				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 3- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 4- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 5- Reservoir compensation flows and fish pass arrangements will be maintained during construction and operation.
- 6- In-channel works will be undertaken at a time which won't have a significant impact on fish communities

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZWR037a/WR037\\_Haweswater\\_Reservoir.docx](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZWR037a/WR037_Haweswater_Reservoir.docx)  
 EA aquifer designation mapping: <http://apps.environment-agency.gov.uk/wyby/default.aspx>  
 BGS Geology Mapping: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Water body ID:		GB30229073		Scheme:		HAWESWATER RESERVOIR – RAISE EMBANKMENT STRUCTURE			
Water body Name:		Haweswater Reservoir		Reference:		WR037b			
RBMP:		Solway Tweed		Scheme Phase		Construction			
Operational catchment:		Eamont		Impact potential		Operational			
Designation (and uses):		Heavily modified				Direct			
Relevant upstream water bodies:		-							
Downstream water bodies:		-							
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence		
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	High			<p><b>Raise height of reservoir embankment.</b> Minor level of impact.</p> <p><b>Biology:</b> There is the potential for suspended sediment to enter the reservoir and effect the ecology (i.e. smothering, reduction in light) including fish, macrophytes/phytobenthos and invertebrates. However any impacts would be temporary and restricted to the downstream section of the reservoir, close to the embankment.</p> <p><b>Hydromorphology:</b> No longer term or extensive changes to the hydrological regime of the reservoir are expected.</p> <p><b>Chemical and Physicochemical:</b> direct temporary effects could occur as a result of accidental spillage or leakage of chemicals such as Polycyclic Aromatic Hydrocarbons (PAHs) associated with construction vehicle/machinery fuels and oils, or metals (from machinery itself). The initial flooding of the new reservoir volume may result in a "pulse" of poor quality water.</p>	<p><b>Operation of increased volume reservoir</b> No or minimal impact. The reservoir water body would increase in size as a result of the raised embankment. No or minimal impacts on biology, hydromorphology, chemical and physicochemical elements are expected, which would not cause a deterioration in WFD status. It is assumed that current compensation flow releases, fish pass arrangements and the characteristics of the banks of the reservoir would be maintained.</p>	<p><b>High</b></p>	<p><b>Medium</b></p>
		Macrophytes	-						
		Phytobenthos	-						
		Macrophytes and phytobenthos	-						
		Chironomids (CPET)	-						
		Fish	-						
	Hydro-morphology	Hydrological regime	-						
		River continuity	-						
		Morphological conditions	-						
		General physico-chemical	Moderate						
Physico-chemical	Specific pollutants:	-							
	WFD elements for Lakes/Reservoirs: Chemical	Does not require assessment							
WFD elements for Lakes/Reservoirs: Chemical	Priority substances	Does not require assessment							
	Overall Status/Potential	Ecological	Good	Good by 2027	N/A				
		Chemical	Good	Good by 2027	N/A				
		Overall	Good	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 3- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 4- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 5- Reservoir compensation flows and fish pass arrangements will be maintained during construction and operation.
- 6- In-channel works will be undertaken at a time which won't have a significant impact on fish communities

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZWR037b\WR037\_Haweswater Reservoir.docx  
 EA aquifer designation mapping: <http://apps.environment-agency.gov.uk/wiyby/default.aspx>  
 BGS Geology Mapping: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>



		Water body ID:	GB102076070720	Scheme:	HAWESWATER RESERVOIR – RAISE EMBANKMENT STRUCTURE				
		Water body Name:	Haweswater Beck	Reference	WR037b				
		RBMP:	Solway Tweed	Scheme Phase	Construction		Operational		
		Operational catchment:	Eamont	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	-						
		Downstream water bodies:	Lowther (Lower)						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			<p><b>Raise height of reservoir embankment.</b> Minor level of impact.</p> <p><b>Biology:</b> There is the potential for suspended sediment to enter the Haweswater Beck and effect the ecology (i.e. smothering, reduction in light) including fish, macrophytes/phytobenthos and invertebrates. However any impacts would be temporary.</p> <p><b>Hydromorphology:</b> No long term or extensive changes to the hydrological regime of the Haweswater Beck are expected, as it is assumed that compensation flows from the reservoir would be maintained during construction. Sediment release may have a short term impact on the morphological conditions of the Beck.</p> <p><b>Chemical and Physiochemical:</b> direct temporary effects could occur as a result of accidental spillage or leakage of chemicals such as Polycyclic Aromatic Hydrocarbons (PAHs) associated with construction vehicle/machinery fuels and oils, or metals (from machinery itself). The initial flooding of the new reservoir volume may result in a "pulse" of poor quality water.</p>	Medium	<p><b>Operation of increased volume reservoir</b> Minor level of impact. Part of the upper reaches of the Haweswater Beck will be flooded by the increased volume of the reservoir. This will result in changes to habitats, hydromorphology, chemical and physiochemical elements in the effected reach. However this is expected to be a small reach of water course, and an extension of the existing reservoir habitats so a deterioration of the status of the WFD water body is unlikely. It is assumed that current compensation flow releases and fish pass arrangements would be maintained.</p>	Medium
		Macrophytes	-						
		Macrophytes and phytobenthos	-						
		Benthic invertebrates	Good						
		Fish	Moderate						
	Hydromorphology	Hydrological regime	-						
		River continuity	-						
		Morphological conditions	-						
	Physico-chemical	General physico-chemical	Good						
Specific pollutants:		-							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Good	Good by 2027	N/A					
	Chemical	Good	Good by 2027	N/A					
	Overall	Good	Good by 2027	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 3- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 4- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 5- Reservoir compensation flows and fish pass arrangements will be maintained during construction and operation. 6- In-channel works will be undertaken at a time which won't have a significant impact on fish communities

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR\WR037b\WR037_Haweswater Reservoir.docx EA aquifer designation mapping: <a href="http://apps.environment-agency.gov.uk/wyby/default.aspx">http://apps.environment-agency.gov.uk/wyby/default.aspx</a> BGS Geology Mapping: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a>

		<b>Water body ID:</b>	GB40201G102300	<b>Scheme:</b>	HAWESWATER RESERVOIR – RAISE EMBANKMENT STRUCTURE		
		<b>Water Body Name:</b>	Eden and Esk Lower Palaeozoic and Carboniferous Aquifers	<b>Reference</b>	WR037b		
		<b>RBMP:</b>	Solway Tweed	<b>Scheme Phase</b>	Construction		Operational
		<b>Operational catchment:</b>	Eden and Esk Lower Palaeozoic and Carboniferous Aquifers	<b>Impact potential</b>	Direct		Direct
		<b>Designation (and uses):</b>	No designation				
		<b>Relevant upstream water bodies:</b>	N/A				
		<b>Downstream water bodies:</b>	N/A				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative	Good			High	High
		Quantitative GWDEs test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
		Chemical dependent	Good				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDEs test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	-				
WFD elements for Groundwater: Chemical	Chemical Status Element	Trend Assessment	Upward Trend				
		Supporting Elements (Guidance)					
Overall Status/Poten tial	Quantitative	Good	Good by 2015	NA			
	Chemical (GW)	Good	Good by 2015	NA			
	Overall	Good	Good by 2015	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 3- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 4- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 5- Reservoir compensation flows and fish pass arrangements will be maintained during construction and operation.
- 6- In-channel works will be undertaken at a time which won't have a significant impact on fish communities

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZWR037b/WR037\\_Haweswater\\_Reservoir.docx](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZWR037b/WR037_Haweswater_Reservoir.docx)  
 EA aquifer designation mapping: <http://apps.environment-agency.gov.uk/wyby/default.aspx>  
 BGS Geology Mapping: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Water body ID:		GB102076070980		Scheme:		RIVER EDEN (TEMPLE SOWERBY) TO WATCHGATE		
Water body Name:		Eden Lyvennet to Eamont		Reference:		WR039a		
RBMP:		Solway Tweed		Scheme Phase:		Construction		
Operational catchment:		Eden Upper		Impact potential:		Direct		
Designation (and uses):		No designation				Operational		
Relevant upstream water bodies:		Crowdunle Beck - Lower, Eden - Scandal Beck to Lyvennet, Leith				Direct		
Downstream water bodies:		Eden - Eamont to tidal						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Use of new transfer pipe line, pumping station and surface water intake. No or minimal impact.	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate					
		Benthic invertebrates	High					
		Fish	High					
	Hydro-morphology	Hydrological regime	High					
		River continuity						
		Morphological conditions	-					
		Physico-chemical	General physico-chemical	High				
			Specific pollutants:	High				
WFD elements for Rivers: Chemical	Priority hazardous substances	Good						
	Priority substances	Good						
Overall Status/Potential	Ecological	Moderate	Good by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a sign
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries c
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR039/WR039\\_River\\_Eden\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Eden\\_and\\_Esk\).pdf](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR039/WR039_River_Eden_EA_Abstraction_Licence_Strategy_(Eden_and_Esk).pdf); [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1384b1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf)

		Water body ID:	GB40201G100400	Scheme:	RIVER EDEN (TEMPLE SOWERBY) TO WATCHGATE			
		Water body Name:	Eden Valley and Carlisle Basin Permo-Triassic sandstone aquifers	Reference	WR039a			
		RBMP:	Solway Tweed	Scheme Phase	Construction		Operational	
		Operational catchment:	Eden Valley and Carlisle Basin Permo-Triassic sandstone aquifers	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:						
		Downstream water bodies:						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Medium	
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					
		Chemical Drinking Water Protected Area	Poor					
		Chemical GWDTEs test	Poor					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	-					
		Trend Assessment	Upward trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR039/WR039\\_EA\\_AbstractionLicenceStrategy\\_EdenandEsk.pdf](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR039/WR039_EA_AbstractionLicenceStrategy_EdenandEsk.pdf)

<b>Water body ID:</b>		GB102076073981		<b>Scheme:</b>		River Irthing to Cumwhinton Plus Castle Carrock Link	
<b>Water body Name:</b>		Irthing DS Crammel Linn Waterfall		<b>Reference</b>		WR041	
<b>RBMP:</b>		Eden and Esk		<b>Scheme Phase</b>		Construction	
<b>Operational catchment:</b>		Esk and Irthing		<b>Impact potential</b>		Operational	
<b>Designation (and uses):</b>		No designation				Direct	
<b>Relevant upstream water bodies:</b>		Gelt, Irthing US Crammel Linn Waterfall, King Water and Quarry Beck					
<b>Downstream water bodies:</b>		Eden- Eamont to tidal					
<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>			<b>Confidence</b>	<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New surface water intake. Minor level of impact.  New pumping station. Minor level of impact.	Medium	New surface water abstraction quantity. Medium level of impact. A new abstraction licence would be granted by the Environment Agency (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) on the River Irthing at Newby East, near Warwick Bridge of 6.5 Ml/d. The ALS (Abstraction Licensing Strategy) indicates that there is restricted water available from surface water sources at all flow regimes (Q95, Q70, Q50 and Q30).  Use of new pipe lines, surface water intake and pumping station. No or minimal impact.
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	High				
		Fish	Good				
	Hydromorphology	Hydrological regime	Supports good				
		River continuity	Not provided				
		Morphological conditions	Supports good				
	Physico-chemical	General physico-chemical	All high				
		Specific pollutants:	All high				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Carlisle\WR041\WR041\_River\_Irthing\_to\_Cumwhinton.docx  
 EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&lg=1,2,10.&scale=7>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=waste&layerGroups=default&lang=e&ep=map&scale=1&x=357682.99999999994&y=355133.99999999994&x=322374&y=497910&lg=1,2,3,10.&scale=7>  
 Abstraction Licensing Strategies (Eden and Esk): <https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy>

		Water body ID:	GB40201G100400	Scheme:	River Irthing to Cumwhinton Plus Castle Carrock Link		
		Water body Name:	Permo-Triassic Sandstone Aquifers	Reference	WR041		
		RBMP:	Solway Tweed GW	Scheme Phase	Construction	Operational	
		Operational catchment:	Eden Valley and Carlisle Basin Permo-Triassic Sandstone Aq	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	Not provided				
		Downstream water bodies:	Not provided				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good			High	Medium
		Quantitative GWDTes test	Good				
	Quantitative Saline Intrusion	Good					
	Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good				
		Chemical Drinking Water Protected Area	Poor		Transfer pipe line on land. No or minimal impact.		
		Chemical GWDTes test	Poor		Transfer pipe line with water course crossings. No or minimal impact.		
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Supporting Elements (Groundwater)	Prevent and Limit Objective	-			
			Trend Assessment	Upward trend			
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Carlisle\WR041\WR041_River Irthing to Cumwhinton.docx
EA Flood Maps (WIVBY): <a href="https://maps.environment-agency.gov.uk/wivby/wivbyController?z=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lc=1,2,10.&amp;scale=7">https://maps.environment-agency.gov.uk/wivby/wivbyController?z=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lc=1,2,10.&amp;scale=7</a>
EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/wivby/wivbyController?z=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lc=1,2,10.&amp;scale=7">http://maps.environment-agency.gov.uk/wivby/wivbyController?z=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lc=1,2,10.&amp;scale=7</a>
Abstraction Licensing Strategies (Eden and Esk): <a href="https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy">https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy</a>

Water body ID:		166		Scheme:		Milwr Tunnel, Baglitt (Transfer to Huntington)			
Water body Name:		Non reportable WB at the mouth of the River Dee		Reference		WR047a			
RBMP:		N/A		Scheme Phase		Construction			
Operational catchment:		N/A		Impact potential		Direct			
Designation (and uses):		No designation							
Relevant upstream water bodies:		N/A							
Downstream water bodies:		N/A							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	N/A		Transfer pipe line on land. No or minimal impact.	High	New surface water abstraction quantity Medium level of impact. A new abstraction licence would be granted by National Resources Wales (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) from the outfall of the Milwr tunnel at Baglitt up to 20 M/d even in dry summers, possibly more at other times). There is no Abstraction Management Strategy (NRW) for this transitional waterbody.	Low	
		Macrophytes	N/A						
		Macrophytes and phytobenthos	N/A						
		Benthic invertebrates	N/A						
		Fish	N/A						
	Hydrology	Hydrological regime	N/A						Transfer pipe line with water course crossings. Minor level of impact.
		River continuity	N/A						
		Morphological conditions	N/A						
	Physico-Chemical	General physico-chemical	N/A						New surface water intake. Minor level of impact.
		Specific pollutants:	N/A						
WFD elements for Rivers: Chemical	Priority hazardous substances	N/A		New pumping station. Minor level of impact.					
	Priority substances	N/A							
Overall Status Potential	Ecological	N/A	N/A	N/A					
	Chemical	N/A	N/A	N/A					
	Overall	N/A	N/A	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proformas: \\WAR.FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\82\WR075\WR075 Stocks Reservoir.xlsx EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lg=1.2.10">http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lg=1.2.10</a> EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lg=1.2.10">http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lg=1.2.10</a> NRW Catchment Abstraction Management Strategy (Dee): <a href="https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf">https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf</a>

Water body ID:		GB41102G204800		Scheme:		Milwr Tunnel, Bagillt (Transfer to Huntington)		
Water body Name:		Dee Carboniferous Coal Measures		Reference		WR047a		
RBMP:		Dee		Scheme Phase		Construction Operational		
Operational catchment:		Dee Carboniferous Coal Measures		Impact potential		Direct Direct		
Designation (and uses):		No designation						
Relevant upstream water bodies:		Not identified						
Downstream water bodies:		Not identified						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	New surface water abstraction quantity. Minor level of impact. A new abstraction licence would be granted by National Resources Wales (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) from the outfall of the Milwr tunnel at Bagillt up to 20 M/d even in dry summers, possibly more at other times). Increased surface water abstraction may result in localised minor reductions in leakage from rivers to the aquifer, but the Coal Measures are unlikely to be heavily reliant on river leakage to support water resources.	Medium
		Quantitative GWDTEs test	High					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	Not provided					
Overall Status/Potential	Supporting Elements	Trend Assessment	Not provided					
		Quantitative	Good	None provided.	N/A			
		Chemical (GW)	Poor	Poor by 2015	N/A			
Overall		Poor	Poor by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WRZWR075\WR075 Stocks Reservoir.xlsx  
 EA Flood Maps (WYBY): <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=en&topic=floodmapitx=344705&y=511476&lg=1,2,10,5&ca>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=en&topic=floodmapitx=344705&y=511476&lg=1,2,10,5&ca>  
 NRW Catchment Abstraction Management Strategy (Dee): [https://naturalresources.wales/media/674759/dee\\_cams\\_2015\\_english.pdf](https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf)



Water body ID:		GB112071065500		Scheme:		River Ribble (Transfer to Anglezarke ir)		
Water body name:		Ribble-conf Calder to Tidal		Reference		WR049b		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Big Ribble		Impact potential		Operational		
Designation (and uses):		Heavily modified				Direct		
Relevant upstream water bodies:		Showley Brook,Calder - Pendle Water to conf Ribble,Ribble DS Stock Beck,Duddel Brook						
Downstream water bodies:		RIBBLE						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos			Transfer pipe line on land. No or minimal impact.  New surface water intake. Minor level of impact.  New pumping station. Minor level of impact.	High	New surface water abstraction quantity. Medium level of impact. A new abstraction licence would be granted by the Environment Agency (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) with an abstraction of up to 40 Ml/d. The ALS (Abstraction Licensing Strategy) indicates that there is water available from the Ribble (at Q70, Q50 and Q30), however 40 Ml/d is a relatively large abstraction and impacts on the hydrological regime may occur.	
		Macrophytes						
		Macrophytes and phytobenthos	Moderate	Good by 2027				N/A
		Benthic invertebrates	Good	Good by 2015				N/A
		Fish						
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015				N/A
		River continuity						
		Morphological conditions	Supports Good	Supports Good by 2015				N/A
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				N/A
		Specific pollutants:	High	High by 2015				N/A
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015	N/A				
	Priority substances	Good	Good by 2015	N/A				
Overall Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/W/R049b">http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/W/R049b</a> EA Abstraction Licence Strategy (Ribble, Douglas & Crossens): <a href="https://www.gov.uk/government/publications/ribble-douglas-and-crossens-abstraction-licensing-strategy">https://www.gov.uk/government/publications/ribble-douglas-and-crossens-abstraction-licensing-strategy</a>



		Water body ID:	GB112071065500	Scheme:	RIVER DARWEN (TRANSFER TO FISHMOOR WTW)			
		Water body name:	Ribble-conf Calder to Tidal	Reference:	WR074			
		RBMP:	North West	Scheme Phase	Construction		Operational	
		Operational catchment:	Big Ribble	Impact potential	Direct		Direct	
		Designation (and uses):	Heavily modified					
		Relevant upstream water bodies:	Showley Brook, Calder - Pendle Water to conf Ribble, Ribble DS Stock Beck, Duddel Brook					
		Downstream water bodies:	RIBBLE					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos				High	<p><b>New surface water abstraction quantity.</b>                      Medium level of impact. A new abstraction licence would be granted by the Environment Agency (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) with an abstraction of up to 10 Ml/d from the River Darwen near Roach Bridge. The ALS (Abstraction Licensing Strategy) indicates that there is water available at all flow regimes (Q95, Q70, Q50 and Q30), however the abstraction is moderate in size and could have a medium impact on the hydrological regime of the River Darwen.</p> <p><b>Use of new pipe line, surface water intake and pumping station.</b>                      No or minimal impact.</p>	Medium
		Macrophytes						
		Macrophytes and phytobenthos	Moderate	Good by 2027	N/A			
		Benthic invertebrates	Good	Good by 2015	N/A			
		Fish						
	Hydro-morphology	Hydrological regime	Supports Good	Supports Good by 2015	N/A			
		River continuity						
		Morphological conditions	Supports Good	Supports Good by 2015	N/A			
		General physico-chemical	Moderate	Good by 2027	N/A			
		Specific pollutants:	High	High by 2015	N/A			
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015	N/A				
	Priority substances	Good	Good by 2015	N/A				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

Assumptions
1- Application of standard best practice pollution prevention methods e.g. the GPPs 2- Small scale shallow dewatering would take place 3- Stockpiling of resources or spoil near watercourse maybe required 4- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required 5- Assumed all over ground pipelay will be along roads and over water crossings along existing bridges 6- An abstraction licence can be granted that will ensure there is no significant environmental impact from the abstraction 7- Dewatering of excavations would not require a permit from the Environment Agency. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed above. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZWR049b">WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZWR049b</a> EA Abstraction Licence Strategy (Ribble, Douglas & Crossens)

Water body ID:		GB41201G100500		Scheme:		RIVER DARWEN (TRANSFER TO FISHMOOR WTW)	
Water Body Name:		Fylde Permo-Triassic Sandstone Aquifers		Reference		WR074	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Fylde Permo-Triassic Sandstone Aquifers		Impact potential		Direct	
Designation (and uses):		No designation				Operational	
Relevant upstream water bodies:		N/A					
Downstream water bodies:		N/A					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative	Good	Good by 2015	N/A	High	Medium	<p><b>New surface water abstraction quantity.</b>                      Minor level of impact. A new abstraction licence would be granted by the Environment Agency (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) with an abstraction of up to 10 MI/d from the River Darwen near Roach Bridge. Due to the moderate size of the proposed abstraction, there may be reductions in leakage from the river to the aquifer, which could impact locally on the quantitative water balance of this principal sandstone aquifer. However as the ALS indicates there is water available at all flow regimes (Q95, Q70, Q50 and Q30) in the surface water body, the flow is unlikely to be reduced sufficiently to have a wide or significant impact on the water balance of the water body as a whole.</p> <p><b>Use of new pipe line, surface water intake and pumping station.</b>                      No or minimal impact.</p>
	Quantitative GWDTES test	Good	Good by 2015	N/A			
	Quantitative Saline Intrusion	Good	Good by 2015	N/A			
Quantitative Water Balance	Good	Good by 2015	N/A				
Chemical Drinking Water Protected Area	Good	Good by 2015	N/A	<p><b>Transfer pipe line on land.</b>                      No or minimal impact.</p> <p><b>New surface water intake.</b>                      No or minimal impact.</p> <p><b>New pumping station.</b>                      No or minimal impact.</p>			
Chemical GWDTES test	Good	Good by 2015	N/A				
Chemical Saline Intrusion	Good	Good by 2015	N/A				
General Chemical Test	Good	Good by 2015	N/A				
Supporting Elements	Prevent and Limit Objective						
Trend Assessment	No Trend	N/A					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Environmental permitting will be adhered to and will stipulate appropriate conditions for water quality and quantity.
- 2- Application of standard best practice pollution prevention methods e.g. the GPPs
- 3- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required
- 4- Assumed all over ground pipelay will be along roads and over water crossings along existing bridges
- 5- Dewatering of excavations would not require a permit from the Environment Agency. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed above. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671\\_UU WRMP\\_Support\5\\_Design\Feasible\\_Options\IRZ\WR049b](\\WAR-FS1.global.amec.com\shared\Projects\38671_UU WRMP_Support\5_Design\Feasible_Options\IRZ\WR049b)

<b>Water body ID:</b>		GB112069061382		<b>Scheme:</b>		River Bollin	
<b>Water body Name:</b>		Bollin (Ashley Mill to Manchester Ship Canal)		<b>Reference</b>		WR076	
<b>RBMP:</b>		Mersey Upper		<b>Scheme Phase</b>		Construction Operational	
<b>Operational catchment:</b>		Bollin Dean Mersey Upper		<b>Impact potential</b>		Direct Direct	
<b>Designation (and uses):</b>		Heavily modified					
<b>Relevant upstream water bodies:</b>		Birkin Brook- Moberley Brook to River Bollin (including Rostherne Brook)					
<b>Downstream water bodies:</b>		Manchester Ship Canal					
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New surface water intake. Minor level of impact.  New pumping station. Minor level of impact.  New water treatment works. No or minimal impact.	High	Use of new transfer pipe line, pumping station and water treatment works. No or minimal impact.  New surface water abstraction quantity. Medium level of impact. New surface water abstraction from the River Bollin near Lymm of 25 M3/d. In the ALS water is identified as available at all flows (Q30, Q50, Q70 and Q95) however the abstraction is relatively large in size and could have a medium impact on the hydrological regime of the River Bollin. A new abstraction licence would be required to be issued by the Environment Agency.
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Not provided				
	Hydro-morphology	Benthic invertebrates	Good				
		Fish	Poor				
		Hydrological regime	Supports good				
		River continuity	Not provided				
Physico-chemical	Morphological conditions	Not provided					
	General physico-chemical	All high/good except: Phosphate- poor					
	Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Moderate by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR076/WR076\\_RnEA\\_Abstraction\\_Licence\\_Strategy\\_\(Upper\\_Mersey\).htm](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR076/WR076_RnEA_Abstraction_Licence_Strategy_(Upper_Mersey).htm)

		Water body ID:	GB41202G991700	Scheme:	River Bollin		
		Water body Name:	Weaver and Dane Quaternary Sand and Gravel Aquifers	Reference	WR076		
		RBMP:	North West GW	Scheme Phase	Construction	Operational	
		Operational catchment:	Weaver and Dane Quaternary Sand and Gravel Aquifers	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	N/A				
		Downstream water bodies:	N/A				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	Medium
		Quantitative GWDTes test	Good				
Quantitative Saline Intrusion	Good			Transfer pipe line on land. No or minimal impact.	Use of new transfer pipe line, pumping station and water treatment works. No or minimal impact.		
Quantitative Water Balance	Good			Transfer pipe line with water course crossings. No or minimal impact.			
Chemical Dependent	Poor			New surface water intake. No or minimal impact.			
Chemical Drinking Water Protected Area	Good			New pumping station. No or minimal impact.			
Chemical GWDTes test	Poor			New water treatment works. No or minimal impact.			
Chemical Saline Intrusion	Good						
General Chemical Test	Poor						
Prevent and Limit Objective	Not provided						
Trend Assessment	Upward trend						
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: [http://www.ar.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR076/WR076\\_River\\_Bollin.xlsx](http://www.ar.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR076/WR076_River_Bollin.xlsx)  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

Water body ID:		GB31232665		Scheme:		APPLETON RESERVOIR, WARRINGTON			
Water body Name:		Appleton Reservoir		Reference:		WR079b			
RBMP:		North West		Scheme Phase:		Construction			
Operational catchment:		Weaver Lower		Impact potential:		Direct			
Designation (and uses):		Heavily modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:									
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence				
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	Moderate		Modified surface water intake. Minor level of impact.	High	Increased surface water abstraction quantity Medium level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 6 Ml/d.  The ALS does not provided an assessment of the water availability of the reservoir itself, but the catchment in which Appleton Reservoir is located has no water available at Q30 to Q70 and limited water available at Q95. This means that river flows are below the level required to support good ecological status.  The required abstraction quantity is within the current abstraction licence (12 Ml/d) for the reservoir. Recent use of the reservoir has been for emergency fire-fighting supply for an industrial customer. It is assumed that the reinstated potable water abstraction would involve higher abstraction rates than recent use, and as such, reinstatement of the abstraction may cause widespread or prolonged effects on the WFD status of the lake water body.	Low	
		Macrophytes	-						
		Phytobenthos	-						
		Macrophytes and phytobenthos	-						
		Chironomids (CPET)	-						
	Hydro-morphology	Fish	-						
		Hydrological regime	-						
		River continuity	-						
		Physico-chemical	Morphological conditions	-					
			General physico-chemical	Moderate					
Specific pollutants:	-								
WFD elements for Lakes/Reservoirs: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/ Potential at	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR079abcd\WR079 Appleton Reservoir.docx>  
 EA Abstraction Licence Strategy (Lower Mersey & Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LT](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LT)

Water body ID:		GB169	Scheme:		APPLETON RESERVOIR, WARRINGTON			
Water body Name:		Not part of a river WB catchment	Reference:		WR079b			
RBMP:		North West	Scheme Phase:		Construction		Operational	
Operational catchment:		-	Impact potential:		Direct		Direct	
Designation (and uses):		-						
Relevant upstream water bodies:		-						
Downstream water bodies:		-						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Use of new transfer pipe line, pumping station water treatment works, and surface water intake. No or minimal impact.  Increased surface water abstraction quantity. Minor level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 6 Ml/d.  The ALS states that the catchment in which Appleton Reservoir is located has no water available at Q30 to Q70 and limited water available at Q95. This means that river flows are below the level required to support good ecological status. However, the water body downstream of the reservoir has water available at all flows.  Reinstating the abstraction has the potential to reduce flows in the downstream part of the water body (assuming the reinstated abstraction would be greater than the current use as emergency fire fighting supply), but given the downstream surface water body has water available at all flows, the abstraction is from a reservoir rather than the "natural" water courses within the surface water body, the abstraction is within the current licenced quantity, and assuming compensation flows from the reservoir will be maintained, impacts on the surface water body are unlikely to be prolonged or widespread.	Low	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	-					
		Fish	-					
	Hydromorphology	Hydrological regime	-					
		River continuity	-					
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	-					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	-						
	Priority substances	-						
Overall Status/Potential	Ecological	-						
	Chemical	-						
	Overall	-						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which w
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossing
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VR2\WR079abcd\WR079 Apple>  
 EA Abstraction Licence Strategy (Lower Mersey & Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300496](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300496)



		Water body ID:	GB41202G991700	Scheme:	APPLETON RESERVOIR, WARRINGTON				
		Water body Name:	Weaver and Dane Quaternary Sand and Gravel Aquifers	Reference	WR079b				
		RBMP:	North West	Scheme Phase	Construction		Operational		
		Operational catchment:	Weaver and Dane Quaternary Sand and Gravel Aquifers	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	-						
		Downstream water bodies:	-						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. No or minimal impact.  Modified surface water intake. No or minimal impact.  New pumping station. No or minimal impact.	High	Use of new transfer pipe line, pumping station, surface water intake. No or minimal impact.  Increased surface water abstraction quantity Minor level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 6 Ml/d.  There may be localised or temporary effects on interactions between the reservoir, downstream water courses and groundwater, as the groundwater body comprises shallow sands and gravels which may be well connected to surface water courses. As the proposed abstraction is from a reservoir, within the current abstraction licence (12 Ml/d), and downstream surface water bodies have water available at all flows, changes are unlikely to be widespread or prolonged. There is no groundwater management unit defined for this area.	Medium
		Quantitative GWDEs test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor						
		Chemical Drinking Water Protected Area	Good						
		Chemical GWDEs test	Poor						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Poor						
		Supporting Elements (Groundwater)	Prevent and Limit Objective	-					
Overall Status/Potential	Supporting Elements (Groundwater)	Trend Assessment	Upward trend						
		Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Poor	Good by 2027	N/A				
Overall	Poor	Good by 2027	N/A						

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't h 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of c 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR079abcd\WR079_Appleton EA Abstraction Licence Strategy (Lower Mersey & Ail): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LI">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LI</a>

		Water body ID:	GB31232665	Scheme:	APPLETON RESERVOIR, WARRINGTON			
		Water body Name:	Appleton Reservoir	Reference:	WR079c			
		RBMP:	North West	Scheme Phase:				
		Operational catchment:	Weaver Lower	Impact potential:	Construction	Operational		
		Designation (and uses):	Heavily modified		Direct	Direct		
		Relevant upstream water bodies:						
		Downstream water bodies:						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	Moderate			High	<p>Increased surface water abstraction quantity Medium level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 9 Ml/d.</p> <p>The ALS does not provide an assessment of the water availability of the reservoir itself, but the catchment in which Appleton Reservoir is located has no water available at Q30 to Q70 and limited water available at Q95. This means that river flows are below the level required to support good ecological status.</p> <p>The required abstraction quantity is within the current abstraction licence (12 Ml/d) for the reservoir. Recent use of the reservoir has been for emergency fire-fighting supply for an industrial customer. It is assumed that the reinstated potable water abstraction would involve higher abstraction rates than recent use, and as such, reinstatement of the abstraction may cause widespread or prolonged effects on the WFD status of the lake water body.</p>	
		Macrophytes	-					
		Phytobenthos	-					
		Macrophytes and phytobenthos	-					
		Chironomids (CPET)	-					
	Hydro-morphology	Fish	-					
		Hydrological regime	-					
		River continuity	-					
		Physico-chemical	Morphological conditions	-				
			General physico-chemical	Moderate				
Specific pollutants:	-							
WFD elements for Lakes/Reservoirs: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/ Potential at	Ecological	Moderate	Moderate by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Moderate by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR079abcd\WR079 Appleton Reservoir.docx  
 EA Abstraction Licence Strategy (Lower Mersey & Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LT](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LT)

Water body ID:		GB169	Scheme:		APPLETON RESERVOIR, WARRINGTON			
Water body Name:		Not part of a river WB catchment	Reference:		WR079c			
RBMP:		North West	Scheme Phase:		Construction		Operational	
Operational catchment:		-	Impact potential:		Direct		Direct	
Designation (and uses):		-						
Relevant upstream water bodies:		-						
Downstream water bodies:		-						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> Minor level of impact.</p> <p><b>New surface water intake.</b> Minor level of impact.</p> <p><b>New pumping station.</b> Minor level of impact.</p> <p><b>New water treatment works.</b> No or minimal impact.</p>	High	<p><b>Use of new transfer pipe line, pumping station water treatment works, and surface water intake.</b> No or minimal impact.</p> <p><b>Increased surface water abstraction quantity.</b> Minor level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 9 Ml/d.</p> <p>The ALS states that the catchment in which Appleton Reservoir is located has no water available at Q30 to Q70 and limited water available at Q95. This means that river flows are below the level required to support good ecological status. However, the water body downstream of the reservoir has water available at all flows.</p> <p>Reinstating the abstraction has the potential to reduce flows in the downstream part of the water body (assuming the reinstated abstraction would be greater than the current use as emergency fire fighting supply), but given the downstream surface water body has water available at all flows, the abstraction is from a reservoir rather than the "natural" water courses within the surface water body, the abstraction is within the current licenced quantity, and assuming compensation flows from the reservoir will be maintained, impacts on the surface water body are unlikely to be prolonged or widespread.</p>	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	-					
		Fish	-					
	Hydro-morphology	Hydrological regime	*					
		River continuity	-					
		Morphological conditions	-					
		Physico-chemical	General physico-chemical	*				
			Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	-						
	Priority substances	-						
Overall Status/Potential	Ecological	-	-					
	Chemical	-	-					
	Overall	-	-					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't affect the watercourse.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings will be installed via a trench and cover technique within a dry working area.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR079abcd\WR079\_Apple EA Abstraction Licence Strategy (Lower Mersey & Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/L](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/L)

		Water body ID:	GB41202G991700	Scheme:	APPLETON RESERVOIR, WARRINGTON			
		Water body Name:	Weaver and Dane Quaternary Sand and Gravel Aquifers	Reference	WR079c			
		RBMP:	North West	Scheme Phase	Construction		Operational	
		Operational catchment:	Weaver and Dane Quaternary Sand and Gravel Aquifers	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	-					
		Downstream water bodies:	-					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Use of new transfer pipe line, pumping station, surface water intake. No or minimal impact.	Medium
		Quantitative GWDEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDEs test	Poor					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Poor					
		Prevent and Limit Objective	-					
WFD elements for Groundwater: Supporting Elements (Groundwater)	Supporting Elements	Trend Assessment	Upward trend					
		Overall Status/Potential						
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't h
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of c
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR079abcd\WR079\_Appleton

EA Abstraction Licence Strategy (Lower Mersey & Ail): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LI](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LI)

		Water body ID:	GB31232665	Scheme:	APPLETON RESERVOIR, WARRINGTON				
		Water body Name:	Appleton Reservoir	Reference:	WR079b				
		RBMP:	North West	Scheme Phase:	Construction		Operational		
		Operational catchment:	Weaver Lower	Impact potential:	Direct		Direct		
		Designation (and uses):	Heavily modified						
		Relevant upstream water bodies:							
		Downstream water bodies:							
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	Moderate			Increased surface water abstraction quantity Medium level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 12 Ml/d.  The ALS does not provide an assessment of the water availability of the reservoir itself, but the catchment in which Appleton Reservoir is located has no water available at Q30 to Q70 and limited water available at Q95. This means that river flows are below the level required to support good ecological status.  The required abstraction quantity is within the current abstraction licence (12 Ml/d) for the reservoir. Recent use of the reservoir has been for emergency fire-fighting supply for an industrial customer. It is assumed that the reinstated potable water abstraction would involve higher abstraction rates than recent use, and as such, reinstatement of the abstraction may cause widespread or prolonged effects on the WFD status of the lake water body.	Low		
		Macrophytes	-						
		Phytobenthos	-						
		Macrophytes and phytobenthos	-						
		Chironomids (CPET)	-						
	Hydro-morphology	Fish	-						
		Hydrological regime	-						
		River continuity	-						
		Physico-chemical	Morphological conditions	-					
			General physico-chemical	Moderate					
Specific pollutants:	-								
WFD elements for Lakes/Reservoirs: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/ Potential at	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR079abcd\WR079 Appleton Reservoir.docx  
 EA Abstraction Licence Strategy (Lower Mersey & Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LT](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LT)

Water body ID:		GB169	Scheme:		APPLETON RESERVOIR, WARRINGTON			
Water body Name:		Not part of a river WB catchment	Reference:		WR079b			
RBMP:		North West	Scheme Phase:		Construction	Operational		
Operational catchment:		-	Impact potential:		Direct	Direct		
Designation (and uses):		-						
Relevant upstream water bodies:		-						
Downstream water bodies:		-						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Use of new transfer pipe line, pumping station water treatment works, and surface water intake. No or minimal impact.  Increased surface water abstraction quantity. Minor level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 12 M/d.  The ALS states that the catchment in which Appleton Reservoir is located has no water available at Q30 to Q70 and limited water available at Q95. This means that river flows are below the level required to support good ecological status. However, the water body downstream of the reservoir has water available at all flows.  Reinstating the abstraction has the potential to reduce flows in the downstream part of the water body (assuming the reinstated abstraction would be greater than the current use as emergency fire fighting supply), but given the downstream surface water body has water available at all flows, the abstraction is from a reservoir rather than the "natural" water courses within the surface water body, the abstraction is within the current licenced quantity, and assuming compensation flows from the reservoir will be maintained, impacts on the surface water body are unlikely to be prolonged or widespread.	Low	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	-					
		Fish	-					
	Hydro-morphology	Hydrological regime	-					
		River continuity	-					
		Morphological conditions	-					
		Physico-chemical	General physico-chemical	-				
			Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	-						
	Priority substances	-						
Overall Status/Potential	Ecological	-						
	Chemical	-						
	Overall	-						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which w
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossing
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VR2\WR079abcd\WR079 Apple EA Abstraction Licence Strategy \(Lower Mersey & Alt\): https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300496](\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VR2\WR079abcd\WR079 Apple EA Abstraction Licence Strategy (Lower Mersey & Alt): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300496)

Water body ID:		GB41202G991700		Scheme:		APPLETON RESERVOIR, WARRINGTON	
Water body Name:		Weaver and Dane Quaternary Sand and Gravel Aquifers		Reference		WR079b	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Weaver and Dane Quaternary Sand and Gravel Aquifers		Impact potential		Operational	
Designation (and uses):		No designation				Direct	
Relevant upstream water bodies:		-					
Downstream water bodies:		-					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	Good			<p>Transfer pipe line on land. No or minimal impact.</p> <p>Transfer pipe line with water course crossings. No or minimal impact.</p> <p>Modified surface water intake. No or minimal impact.</p> <p>New pumping station. No or minimal impact.</p>	High	<p>Use of new transfer pipe line, pumping station, surface water intake. No or minimal impact.</p> <p>Increased surface water abstraction quantity Minor level of impact. Reinstatement of surface water abstraction from the Appleton reservoir, near Warrington of 12 M/d.</p> <p>There may be localised or temporary effects on interactions between the reservoir, downstream water courses and groundwater, as the groundwater body comprises shallow sands and gravels which may be well connected to surface water courses. As the proposed abstraction is from a reservoir, is equal to the current abstraction licence (12 M/d), and downstream surface water bodies have water available at all flows, changes are unlikely to be widespread or prolonged. There is no groundwater management unit defined for this area.</p>
	Quantitative GWDTes test	Good					
	Quantitative Saline Intrusion	Good					
	Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Dependent Surface Water Body Status	Poor					
	Chemical Drinking Water Protected Area	Good					
	Chemical GWDTes test	Poor					
	Chemical Saline Intrusion	Good					
	General Chemical Test	Poor					
	Prevent and Limit Objective	-					
WFD elements for Groundwater: Supporting Elements (Groundwater)	Trend Assessment	Upward trend					
	Overall Status/Potential						
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't h
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of c
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR079abcd\WR079\_Appleton

EA Abstraction Licence Strategy (Lower Mersey & Ail): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT)

Water body ID:		GB102076073740		Scheme:		Roughton Gill			
Water body name:		Whelpo (Cald) Beck		Reference		WR095			
RBMP:		Solway Tweed		Scheme Phase					
Operational catchment:		Caldew		Impact potential					
Designation (and uses):		No designation		Construction		Operational			
Relevant upstream water bodies:		NA		Direct		Direct			
Downstream water bodies:		Caldew d/s Calderbeck							
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Transfer pipe line on land. No or minimal impact.	High	New groundwater abstraction quantity. Minor level of impact. Reinstatement of abstraction at Roughton Gill Mine. Maximum output of 1.5 Ml/d.	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	-						
		Benthic invertebrates	Good						
		Fish	Good						
	Hydrogeomorphology	Hydrological regime	High						Transfer pipe line with water course crossings. Minor level of impact.
		River continuity	-						New surface water intake. Minor level of impact.
		Morphological conditions	Supports good						New water treatment works. Minor level of impact.
	Physico-Chemical	General physico-chemical	All high						
		Specific pollutants:	Copper and Zinc-high						
Priority hazardous substances		Good							
WFD elements for Rivers: Chemical	Priority substances	Good							
	Overall Status-Potential	Good	Good by 2015	NA					
	Chemical	Good	Good by 2015	NA					
	Overall	Good	Good by 2015	NA					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\North Eden\WR095\WR095 Roughton Gill.xsm  
 Aquifer designation map: <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>  
 EA Abstraction Licence Strategy (Eden & Esk): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1384b1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf)



		<b>Water body ID:</b>	GB40201G102300	<b>Scheme:</b>	Roughton Gill			
		<b>Water Body Name:</b>	Eden and Esk Lower Palaeozoic and Carboniferous Aquifers	<b>Reference</b>	WR095			
		<b>RBMP:</b>	Solway Tweed	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Eden and Esk Lower Palaeozoic and Carboniferous Aquifers	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	N/A					
		<b>Downstream water bodies:</b>	N/A					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	New groundwater abstraction quantity. Minor level of impact. Reinstatement of abstraction at Roughton Gill Mine. Maximum output of 1.5 M/d.  The ALS does not define a groundwater management unit for this secondary aquifer. Given the small size of the abstraction, and that it is likely abstracting water that would discharge to the Roughton Gill if not abstracted, widespread or prolonged effects on the quantitative water balance of the groundwater body are not anticipated.	Medium
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
Quantitative Water Balance	Good							
Chemical dependent	Good							
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Drinking Water Protected Area	Good		Transfer pipe line on land. No or minimal impact.			
		Chemical GWDTEs test	Good		Transfer pipe line with water course crossings. No or minimal impact.			
		Chemical Saline Intrusion	Good		New /modified surface water intake. No or minimal impact.			
		General Chemical Test	Good		New / modified water treatment works. No or minimal impact.			
		Prevent and Limit Objective	-					
WFD elements for Groundwater: Supporting Elements (unaudited)	Supporting Elements (unaudited)	Trend Assessment	Upward Trend					
		Overall Status/Potential	Quantitative	Good	Good by 2015	N/A		
Overall Status/Potential	Overall	Chemical (GW)	Good	Good by 2015	N/A			
		Overall	Good	Good by 2015	N/A			

Assumptions	
1-	Application of standard best practice construction and pollution prevention methods.
2-	Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3-	Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4-	New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5-	A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6-	Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7-	Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8-	Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence	
Catchment Data Explorer:	<a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma:	<a href="\\WAR-FS1.gblbal.amec.com\shared\Projects\38671_UU_WRMP_Support\5_Design\Feasible_Options\North_Eden\WR095\WR095_Roughton_Gill_xlsm">\\WAR-FS1.gblbal.amec.com\shared\Projects\38671_UU_WRMP_Support\5_Design\Feasible_Options\North_Eden\WR095\WR095_Roughton_Gill_xlsm</a>
Aquifer designation map:	<a href="http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx">http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx</a>
EA Abstraction Licence Strategy (Eden & Esk):	<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf</a>

Water body ID:		GB112071065090		Scheme: Worsthorne Borehole (Compensation)							
Water body Name:		Brun- headwaters to conf Don		Reference		WR099a					
RBMP:		Ribble		Scheme Phase		Construction Operational					
Operational catchment:		Calder		Impact potential		Direct Direct					
Designation (and uses):		Heavily modified									
Relevant upstream water bodies:		None									
Downstream water bodies:		Brun- conf Don to conf Calder									
WFD Element (Receptor)		Status		RBMP objective		Alternate Objective if less than Good					
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			Abstraction well refurbishment. No or Minimal Impact Expected.	Confidence				
		Macrophytes	Not provided								
		Macrophytes and phytobenthos	Good								
		Benthic invertebrates	Moderate								
		Fish	Good								
	Hydromorphology	Hydrological regime	Not provided								
		River continuity	Not provided								
		Morphological conditions	Not provided								
		Physico-chemical	General physico-chemical	All high/good							
			Specific pollutants:	Not provided							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment			Transfer pipe line on land. No or minimal impact.	High					
	Priority substances	Does not require assessment									
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			Transfer pipe line with water course crossings. Minor level of impact.	Confidence			
	Chemical	Good	Good by 2015	N/A							
	Overall	Moderate	Good by 2027	N/A							
									Changed groundwater abstraction quantity. Minor level of impact. Reinstatement of Worsthorne borehole. Maximum output of 4 Ml/d based on existing abstraction licence, discharged to River Brun as compensation flow.  The ALS shows that surface water is available at Q95 flows only, whilst limited at Q70 and not available at Q50 and Q30. Given that there is already an abstraction licence in place, the moderate size of the abstraction, that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, and that the abstracted water is to be discharged to the River Brun as compensation flow, the use of the borehole is not expected to have a widespread or prolonged effect on the hydrological regime of this water body.  Use of new transfer pipe line. No or minimal impact.		

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\1R2\WR075\WR075 Stoc  
 ice Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT79](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT79)

		Water body ID:	GB41202G100300	Scheme:	Worsthorne Borehole (Compensation)		
		Water body Name:	Douglas, Darwen and Calder Carboniferous Aquifers	Reference	WR099a		
		RBMP:	North West GW	Scheme Phase	Construction		Operational
		Operational catchment:	Douglas Darwen and Calder Carboniferous Aq	Impact potential	Direct		Direct
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	Not identified				
		Downstream water bodies:	Not identified				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>Changed groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of Worsthorne borehole. Maximum output of 4 Ml/d based on existing abstraction licence, discharged to River Brun as compensation flow.</p> <p>The ALS does not identify a GWMU for this area, but does show that surface water is available at Q95 flows only, whilst limited at Q70 and not available at Q50 and Q30. Given there is already an abstraction licence in place, the abstraction is of moderate size, and that the abstracted water is to be used as a compensation flow, there is unlikely to be a widespread or prolonged effect on the quantitative water balance of the aquifer or on the quantitative dependent surface water body status.</p> <p><b>Use of new transfer pipe line.</b> No or minimal impact.</p>
		Quantitative GWDTes test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTes test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	Not provided				
		Trend Assessment	Upward trend				
Overall Status/Potential	Quantitative	Good	Good by 2015	NA			
	Chemical (GW)	Poor	Good by 2027	NA			
	Overall	Poor	Good by 2027	NA			

Assumptions
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>

Evidence
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: <a href="\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx">\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx</a></p> <p>EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a></p>

		<b>Water body ID:</b>	GB112071065090	<b>Scheme:</b>	Worsthorne Borehole (Hurstwood IR)			
		<b>Water body Name:</b>	Brun- headwaters to conf Don	<b>Reference</b>	WR099b			
		<b>RBMP:</b>	Ribble	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Calder	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	Heavily modified					
		<b>Relevant upstream water bodies:</b>	Not identified					
		<b>Downstream water bodies:</b>	Brun- conf Don to conf Calder					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	<p><b>Changed groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of Worsthorne borehole. Maximum output of 4 M/d based on existing abstraction licence. For transfer to Hurstwood Impounding reservoir.</p> <p>The ALS shows that surface water is available at Q95 flows only whilst limited at Q70 and not available at Q50 and Q30. Given that there is already an abstraction licence in place, the moderate size of the abstraction, the abstraction is approx. 800m away from the River Brun, and that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, the use of the borehole is not expected to have a widespread or prolonged effect on the hydrological regime of this water body.</p> <p><b>Use of new transfer pipe line.</b> No or minimal impact.</p>	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	Moderate					
		Fish	Good					
	Hydromor-physiology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
		Physico-chemical	General physico-chemical	All high/good				
			Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proformas: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stoc>

EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/](https://www.gov.uk/government/uploads/system/uploads/attachment_data/)

Water body ID:		GB41202G100300		Scheme:		Worsthorne Borehole (Hurstwood IR)		
Water body Name:		Douglas, Darwen and Calder Carboniferous Aquifers		Reference		WR099b		
RBMP:		North West GW		Scheme Phase		Construction		
Operational catchment:		Douglas Darwen and Calder Carboniferous Aq		Impact potential		Direct		
Designation (and uses):		No designation						
Relevant upstream water bodies:		Not identified						
Downstream water bodies:		Not identified						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>Changed groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of Worsthorne boreholes. Maximum output of 4 Ml/d based on existing abstraction licence. For transfer to Hurstwood Impounding Reservoir.</p> <p>The ALS does not identify a GWMU for this area, but does show that surface water is available at Q95 flows only, whilst limited at Q70 and not available at Q50 and Q30. Pressures on baseflow from the aquifer would likely show up as a water restriction at low flows (i.e. Q95) rather than higher flows. As there is already an abstraction licence in place, the abstraction is of moderate size, and the water body is a secondary aquifer, widespread and prolonged effects on the quantitative water balance of the groundwater body are unlikely.</p> <p><b>Use of new transfer pipe line.</b> No or minimal impact.</p>	Medium
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	Not provided					
Supporting Elements (Groundwater)	Trend Assessment	Trend Assessment	Upward trend					
		Overall Status	Poor	Good by 2015	N/A			
Overall Status	Potential	Chemical (GW)	Poor	Good by 2027	N/A			
		Overall	Poor	Good by 2027	N/A			

Assumptions	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>	

Evidence	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: <a href="http://www.war.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR075/WR075_Stocks_Reservoir.xlsx">http://www.war.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR075/WR075_Stocks_Reservoir.xlsx</a></p> <p>EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a></p>	

Water body ID:		GB112071065090	Scheme:		Worstshorne Borehole (Worstshorne WTW)								
Water body Name:		Brun- headwaters to conf Don	Reference		WR099c								
RBMP:		Ribble	Scheme Phase		Construction		Operational						
Operational catchment:		Calder	Impact potential		Direct		Direct						
Designation (and uses):		Heavily modified											
Relevant upstream water bodies:		Not identified											
Downstream water bodies:		Brun- conf Don to conf Calder											
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence							
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Reinstate and refurbish abstraction boreholes. No or Minimal Impact Expected.	High	<p><b>Changed groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of Worstshorne borehole. Maximum output of 4 Ml/d based on existing abstraction licence. For transfer to Worstshorne WTW.</p> <p>The ALS shows that surface water is available at Q95 flows only whilst limited at Q70 and not available at Q50 and Q30 (Note, this need clarifying with the EA). Given that there is already an abstraction licence in place, the moderate size of the abstraction, and that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, the use of the borehole is not expected to have a widespread or prolonged effect on the hydrological regime of this water body.</p>	Medium					
		Macrophytes	Not provided										
		Macrophytes and phytobenthos	Good										
		Benthic invertebrates	Moderate										
		Fish	Good										
	Hydrology	Hydrological regime	Not provided										
		River continuity	Not provided										
		Morphological conditions	Not provided										
	Physico-chemical	General physico-chemical	All high/good							Modified water treatment works. No or minimal impact.	High	<p><b>Changed groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of Worstshorne borehole. Maximum output of 4 Ml/d based on existing abstraction licence. For transfer to Worstshorne WTW.</p> <p>The ALS shows that surface water is available at Q95 flows only whilst limited at Q70 and not available at Q50 and Q30 (Note, this need clarifying with the EA). Given that there is already an abstraction licence in place, the moderate size of the abstraction, and that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, the use of the borehole is not expected to have a widespread or prolonged effect on the hydrological regime of this water body.</p>	Medium
		Specific pollutants:	Not provided										
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment											
	Priority substances	Does not require assessment											
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A									
	Chemical	Good	Good by 2015	N/A									
	Overall	Moderate	Good by 2027	N/A									

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: [\\WAR-FS1\\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR07\5\WR075 Stock](\\WAR-FS1_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR07\5\WR075 Stock)  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data](https://www.gov.uk/government/uploads/system/uploads/attachment_data)

		<b>Water body ID:</b>	GB41202G100300	<b>Scheme:</b>	<b>Worsthorne Borehole (Worsthorne WTW)</b>			
		<b>Water body Name:</b>	Douglas, Darwen and Calder Carboniferous Aquifers	<b>Reference</b>	WR099c			
		<b>RBMP:</b>	North West GW	<b>Scheme Phase</b>	<b>Construction</b>		<b>Operational</b>	
		<b>Operational catchment:</b>	Douglas Darwen and Calder Carboniferous Aq	<b>Impact potential</b>	<b>Direct</b>		<b>Direct</b>	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	Not identified					
		<b>Downstream water bodies:</b>	Not identified					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>
<b>WFD elements for Groundwater: Quantitative</b>	<b>Quantitative Status Element</b>	Quantitative Dependent Surface Water Body Status	Good			<b>High</b>	<b>Changed groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of Worsthorne boreholes. Maximum output of 4 M/d based on existing abstraction licence. For transfer to Worsthorne WTW.	<b>Medium</b>
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
<b>WFD elements for Groundwater: Chemical</b>	<b>Chemical Status Element</b>	Chemical Dependent Surface Water Body Status	Poor		<b>Abstraction well refurbishment.</b> Minor level of impact.			
		Chemical Drinking Water Protected Area	Good		<b>Modified water treatment works.</b> No or minimal impact.			
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	Not provided					
<b>Supporting Elements (Groundwater)</b>	Trend Assessment	Upward trend						
	<b>Overall Status/ Potential</b>	<b>Quantitative</b>	<b>Good</b>	<b>Good by 2015</b>	<b>N/A</b>			
		<b>Chemical (GW)</b>	<b>Poor</b>	<b>Good by 2027</b>	<b>N/A</b>			
		<b>Overall</b>	<b>Poor</b>	<b>Good by 2027</b>	<b>N/A</b>			

<b>Assumptions</b>
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
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8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

<b>Evidence</b>
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proformas: <a href="W:\AR-FS1_global.amec.com\shared\Projects\38671_UU WRMP Support\5 Design\Feasible Options\WRZ\WR075\WR075 Stocks Reservoir.xls">W:\AR-FS1_global.amec.com\shared\Projects\38671_UU WRMP Support\5 Design\Feasible Options\WRZ\WR075\WR075 Stocks Reservoir.xls</a>
EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a>

Water body ID:		344	Scheme:		THORNCLIFFE ROAD BOREHOLE, BARROW-IN-FURNESS					
Water body Name:		Non reportable WB at the River Duddon Estuary	Reference		WR100					
RBMP:		N/A	Scheme Phase		Construction		Operational			
Operational catchment:		N/A	Impact potential		Direct		Direct			
Designation (and uses):		N/A								
Relevant upstream water bodies:		N/A								
Downstream water bodies:		N/A								
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence			
WFD elements for Rivers: Ecological	Biology	Phytoplankton	N/A		New water treatment works. No or minimal impact.	High	Increased groundwater abstraction quantity to 4.5 Ml/d. Minor level of impact. Increased groundwater abstraction from the Thorncliffe Road site due to construction of new borehole. Increase in abstraction from 4.5 Ml/d to 9.0 Ml/d. Current licenced rate is 4.5 Ml/d.	Medium		
		Macrophytes	N/A							
		Macrophytes and phytoplankton	N/A							
		Benthic invertebrates	N/A							
		Fish	N/A							
	Hydro-morphology	Hydrological regime	N/A							
		River continuity	N/A							
		Morphological conditions	N/A							
		Physico-chemical	General physico-chemical	N/A						New abstraction well drillings. No or minimal impact.
			Specific pollutants:	N/A						New abstraction well headworks / surface structures. No or minimal impact.
WFD elements for Rivers: Chemical	Priority hazardous substances	N/A								
	Priority substances	N/A								
Overall Status/Potential	Ecological	N/A	N/A	N/A						
	Chemical	N/A	N/A	N/A						
	Overall	N/A	N/A	N/A						

**Assumptions**

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- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
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- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR2\WR100\WR100\_Thorncliffe Road Borehole, Barrow.docx  
 Abstraction license strategy (South Cumbria): <https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy>



		Water body ID:	GB41201G101900	Scheme:	THORNCLIFFE ROAD BOREHOLE, BARROW-IN-FURNESS			
		Water body Name:	Furness Permo-Triassic sandstone aquifers	Reference	WR100			
		RBMP:	North West	Scheme Phase	Construction		Operational	
		Operational catchment:	Furness Permo-Triassic sandstone aquifers	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good	Good by 2015		High	<p><b>Increased groundwater abstraction quantity to 4.5 Ml/d.</b> Minor level of impact. Increased groundwater abstraction from the Thorncliffe Road site due to construction of new borehole. Increase in abstraction from 4.5 Ml/d to 9.0 Ml/d. Current licenced rate is 4.5 Ml/d.</p> <p>The Abstraction Licensing Strategy (ALS) indicates that there is limited water available (there is a licence restriction of 4.2 Ml/d water available from the South Furness groundwater management unit). However, as part of this option a reduction in abstraction from the Schneider Road boreholes (located approx. 600 m to the east and within the same groundwater body) would be implemented to avoid negative impacts on the quantitative water balance of the groundwater body. Therefore any impacts on the groundwater body would be localised.</p> <p><b>Use of water treatment works and pumping station.</b> No or minimal impact.</p>	High
		Quantitative GWDTes test	Good	Good by 2015				
		Quantitative Saline Intrusion	Good	Good by 2015				
		Quantitative Water Balance	Good	Good by 2015				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good	Good by 2015				
		Chemical Drinking Water Protected Area	Good	Good by 2015				
		Chemical GWDTes test	Good	Good by 2015				
		Chemical Saline Intrusion	Good	Good by 2015				
		General Chemical Test	Good	Good by 2015				
		Supporting Elements	Prevent and Limit Objective	-				
Trend Assessment	No trend							
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
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- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\Shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR100\WR100\\_Thornciffe Road Borehole, Barrow.docx](\\WAR-FS1.global.amec.com\Shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR100\WR100_Thornciffe Road Borehole, Barrow.docx)  
 Abstraction license strategy (South Cumbria): <https://www.gov.uk/government/publications/south-cumbria-abstraction-licensing-strategy>

Water body ID:		GB112072065822	Scheme:		FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY			
Water body Name:		Wyre DS Grizedale Brook conflu	Reference		WR101			
RBMP:		North West	Scheme Phase		Construction		Operational	
Operational catchment:		Wyre and Calder	Impact potential		Direct		Direct	
Designation (and uses):		No designation						
Relevant upstream water bodies:		Calder (Wyre), Wyre - Upper						
Downstream water bodies:		Wyre - conf R Brock to tidal						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence			Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-	Abstraction well refurbishment. No or minimal impact.	High	Increased groundwater abstraction quantity Medium level of impact. Increased abstraction of 30 Ml/d (from approximately 98 Ml/d recent use, to approx. 128 Ml/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 Ml/d).	Low	
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate					
		Benthic invertebrates	High					
		Fish	High					
	Hydro-morphology	Hydrological regime	Does not support good					Modified abstraction well headworks / surface structures. No or minimal impact.
		River continuity	-					
Morphological conditions		-						
Physico-chemical	General physico-chemical	Good						
	Specific pollutants:	High						
	Priority hazardous substances	Does not require assessment						
WFD elements for Rivers: Chemical	Priority substances	Good						
	Ecological	Good	Good by 2027	N/A				
Overall Status Potential	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

**Assumptions**

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- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
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- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\UU WRMP WFD\Report\CombinedReport\\_Aug2018\Appendices\38671cgs1061\\_Combined\\_WFD\\_Report\\_Appendices\\_v1.xlsx](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)  
 Abstraction license strategy (Lune and Wyre): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)

Water body ID:		GB112072065810		Scheme:		FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY	
Water body Name:		Brock		Reference		WR101	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Brock and Trib		Impact potential		Direct	
Designation (and uses):		No designation				Operational	
Relevant upstream water bodies:		New Draught Brook				Direct	
Downstream water bodies:		Wyre - conf R Brock to tidal					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos			High	Increased groundwater abstraction quantity Minor level of impact. Increased abstraction of 30 Ml/d (from approximately 98 Ml/d recent use, to approx. 128 Ml/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 Ml/d).	Medium
		Macrophytes					
		Macrophytes and phytobenthos	Good	Good by 2015			
		Benthic invertebrates	High	Good by 2015			
		Fish					
	Hydro-morphology	Hydrological regime	Does not support good	Supports good by 2027			
		River continuity					
		Morphological conditions	Supports good.	-			
		General physico-chemical	All high or good	Good by 2015			
		Specific pollutants:	Copper: high	High by 2015			
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
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- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZWR101/WR101\\_Franklaw\\_Z\\_site\\_increased\\_WTW\\_capacity.docx](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZWR101/WR101_Franklaw_Z_site_increased_WTW_capacity.docx)

Abstraction license strategy (Lune and Wyre): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)

Water body ID:		GB112072066220		Scheme:		FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY	
Water body Name:		Calder (Wyre)		Reference		WR101	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Wyre and Calder		Impact potential		Direct	
Designation (and uses):		Heavily Modified				Operational	
						Direct	
Relevant upstream water bodies:							
Downstream water bodies:		Wyre DS Grizedale Brook conti					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos			High	<p><b>Increased groundwater abstraction quantity</b> Medium level of impact. Increased abstraction of 30 M/d (from approximately 98 M/d recent use, to approx. 128 M/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 M/d).</p> <p>The Abstraction Licensing Strategy (ALS) indicates that there is no water available for the groundwater body in which the abstraction boreholes are located. This means that more water has been abstracted based on recent amounts than the amount available. In this surface water body there is no surface water available at any flow.</p> <p>The Environment Agency have classified these abstractions as Category 3 which means that based on full use of the abstraction licence deterioration is likely after 2027. The recent actual abstraction rates are not causing deterioration. It is not clear at which abstraction rate between recent actual and fully licenced deterioration would start to occur.</p> <p>Based on the evidence above, that there may be good hydraulic connections between the principal sandstone aquifer and water courses, and that the Franklaw R site is approx. 600 m from the River Calder, it is considered that there is the potential for widespread or prolonged effects on the hydrological regime of the surface water body, although this is associated with a number of uncertainties (such as if abstraction will increase at the Franklaw R site).</p>	Low
		Macrophytes	-	-			
		Macrophytes and phytobenthos	Good	Good by 2015			
		Benthic invertebrates	Good	Good by 2015			
		Fish	Moderate	Good by 2027			
	Hydromorphology	Hydrological regime	Not assessed				
		River continuity	Not assessed				
		Morphological conditions	Not assessed				
	Physico-chemical	General physico-chemical	All good or high apart from phosphate and biochemical oxygen demand at moderate	Good by 2027			
		Specific pollutants:	Not assessed				
WFD elements or Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [WAR-FS1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Feasible\\_Options/IRZ/WR101/WR101\\_Franklaw\\_Z\\_site\\_increased\\_WTW\\_capacity.docx](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR101/WR101_Franklaw_Z_site_increased_WTW_capacity.docx)  
 Abstraction license strategy (Lune and Wyre): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)

Water body ID:		GB112072065790		Scheme:		FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY				
Water body Name:		New Draught Brook		Reference		WR101				
RBMP:		North West		Scheme Phase		Construction				
Operational catchment:		Brock and Trib		Impact potential		Direct				
Designation (and uses):		No designation				Operational				
Relevant upstream water bodies:		Barton (Westfield) Brook, Woodplumpton Brook				Direct				
Downstream water bodies:		Brock								
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence				
WFD elements for Rivers: Ecological	Biology	Phytobenthos			Abstraction well refurbishment. No or minimal impact.	High	Increased groundwater abstraction quantity Medium level of impact. Increased abstraction of 30 Ml/d from approximately 98 Ml/d recent use, to approx. 128 Ml/d, split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 Ml/d).  The Abstraction Licensing Strategy (ALS) indicates that there is no water available for the groundwater body in which the abstraction boreholes are located. This means that more water has been abstracted based on recent amounts than the amount available. In this surface water body there is no surface water available at Q95, Q70 and Q50 but limited water available at Q30.  The Environment Agency have classified these abstractions as Category 3 which means that based on full use of the abstraction licence deterioration is likely after 2027. The recent actual abstraction rates are not causing deterioration. It is not clear at which abstraction rate between recent actual and fully licenced deterioration would start to occur.  Based on the evidence above, that there may be good hydraulic connections between the principal sandstone aquifer and water courses, and that the Franklaw K and J sites are within 500 m of the River Brock and the Old River Brock, it is considered that there is the potential for widespread or prolonged effects on the hydrological regime of the surface water body, although this is associated with a number of uncertainties (such as if abstraction will increase at the Franklaw K and J sites).	Low		
		Macrophytes	-	-						
		Macrophytes and phytobenthos	Poor	Good by 2027						
		Benthic invertebrates								
		Fish	Poor	Good by 2027						
	Hydro-morphology	Hydrological regime	Supports good	Supports good by 2015						
		River continuity								
		Morphological conditions	Supports good	-						
		Physico-chemical	General physico-chemical	All good or high apart from dissolved oxygen and phosphate which are poor.					Good by 2027.	
			Specific pollutants:	Copper: high					High by 2015	
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment							
	Priority substances	Does not require assessment	Does not require assessment							
Overall Status/Potential	Ecological	Poor	Good by 2027	N/A						
	Chemical	Good	Good by 2015	N/A						
	Overall	Poor	Good by 2027	N/A						

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR101/WR101_Franklaw_Z_site_increased_WTW_capacity.docx">http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR101/WR101_Franklaw_Z_site_increased_WTW_capacity.docx</a> Abstraction license strategy (Lune and Wyre): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf</a>

Water body ID:		GB112072065800		Scheme:		FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY			
Water body Name:		Barton (Westfield) Brook		Reference		WR101			
RBMP:		North West		Scheme Phase		Construction			
Operational catchment:		Brock and Trib		Impact potential		Direct			
Designation (and uses):		No designation				Operational			
Relevant upstream water bodies:		-				Direct			
Downstream water bodies:		New Draught Brook							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos			Abstraction well refurbishment. No or minimal impact.	High	Increased groundwater abstraction quantity Medium level of impact. Increased abstraction of 30 Ml/d (from approximately 98 Ml/d recent use, to approx. 128 Ml/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 Ml/d).	Low	
		Macrophytes							
		Macrophytes and phytobenthos	Poor	Good by 2027					
		Benthic invertebrates	Moderate	Good by 2027					
		Fish	Poor	Good by 2027					
	Hydro-morphology	Hydrological regime	Does not support good	Supports good by 2027					
		River continuity							
		Morphological conditions	Supports good	-					
	Physico-chemical	General physico-chemical	All high or good apart from biochemical oxygen demand which is moderate and phosphate which is poor	Good by 2027					
		Specific pollutants:	Copper: high	High by 2015					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Poor	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Poor	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR101\WR101\_Franklaw Z site\_increased WTW capacity.docx  
 Abstraction license strategy (Lune and Wyre): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)

Water body ID:		GB112072065760		Scheme:		FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY		
Water body Name:		Woodplumpton Brook		Reference		WR101		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Brock and Trib		Impact potential		Direct		
Designation (and uses):		No designation				Operational		
Relevant upstream water bodies:		-				Direct		
Downstream water bodies:		New Draught Brook						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos			Abstraction well refurbishment. No or minimal impact.	High	Increased groundwater abstraction quantity Medium level of impact. Increased abstraction of 30 M/d (from approximately 98 M/d recent use, to approx. 128 M/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 M/d).  The Abstraction Licensing Strategy (ALS) indicates that there is no water available for the groundwater body in which the abstraction boreholes are located. This means that more water has been abstracted based on recent amounts than the amount available. In this surface water body there is no surface water available at Q95, Q70 and Q50 but limited water available at Q30.  The Environment Agency have classified these abstractions as Category 3 which means that based on full use of the abstraction licence deterioration is likely after 2027. The recent actual abstraction rates are not causing deterioration. It is not clear at which abstraction rate between recent actual and fully licenced deterioration would start to occur.  Based on the evidence above, that there may be good hydraulic connections between the principal sandstone aquifer and water courses, and that the Broughton A site is within 200 m of the Woodplumpton Brook, it is considered that there is the potential for widespread or prolonged effects on the hydrological regime of the surface water body, although this is associated with a number of uncertainties (such as if abstraction will increase at the Broughton A site).	Low
		Macrophytes	-	-				
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Moderate	Good by 2027				
		Fish						
	Hydro-morphology	Hydrological regime	Does not support good	Supports good by 2027				
		River continuity						
		Morphological conditions	Supports good	-				
	Physico-chemical	General physico-chemical	All high apart from ammonia which is moderate, and biochemical oxygen demand and phosphate which are poor	Good by 2027				
		Specific pollutants:	-	Not assessed				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

Assumptions	
1-	Application of standard best practice construction and pollution prevention methods.
2-	Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3-	Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4-	New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5-	A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6-	Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7-	Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8-	Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.
Evidence	
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>	
Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR101\WR101_Franklaw Z site_increased WTW capacity.docx	
Abstraction license strategy (Lune and Wyre): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf</a>	

		<b>Water body ID:</b>	GB41201G100500	<b>Scheme:</b>	FRANKLAW Z SITE PLUS INCREASED FRANKLAW WTW TREATMENT CAPACITY			
		<b>Water body Name:</b>	Fylde Permo-Triassic Sandstone Aquifers	<b>Reference</b>	WR101			
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Fylde Permo-Triassic Sandstone Aquifers	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	N/A					
		<b>Downstream water bodies:</b>	N/A					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>Increased groundwater abstraction quantity</b> Medium level of impact. Increased abstraction of 30 Ml/d (from approximately 98 Ml/d recent use, to approx. 128 Ml/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 Ml/d).</p> <p>The Abstraction Licensing Strategy (ALS) indicates that there is no water available for the groundwater body in which the abstraction boreholes are located. This means that more water has been abstracted based on recent amounts than the amount available. Therefore the increased abstraction could cause deterioration in the quantitative water balance of the aquifer.</p> <p>The Environment Agency have classified these abstractions as Category 3 which means that based on full use of the abstraction licence deterioration is likely after 2027. The recent actual abstraction rates are not causing deterioration. It is not clear at which abstraction rate between recent actual and fully licenced deterioration would start to occur.</p> <p>Based on the evidence above, it is considered that there is the potential for widespread or prolonged effects on WFD status, although this is associated with a number of uncertainties (such as the exact location of abstraction increases, and the abstraction rates at which deterioration would occur)</p> <p><b>Use of water treatment works.</b> No or minimal impact.</p>	
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	-					
Supporting Elements	Trend Assessment	Trend Assessment	No trend					
		Overall Status/Potential	Quantitative	Good	Good by 2027	N/A		
		Chemical (GW)	Good	Good by 2027	N/A			
		Overall	Good	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\RZ\WR101\WR101\\_Franklaw\\_Z\\_site\\_increased WTW capacity.docx](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/RZ/WR101/WR101_Franklaw_Z_site_increased_WTW_capacity.docx)  
 Abstraction license strategy (Lune and Wyre): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)



		<b>Water body ID:</b>	GB112069061210	<b>Scheme:</b>	ECCLESTON HILL BOREHOLE TO PRESCOT WTW			
		<b>Water body Name:</b>	Hardshaw (Windle) Brook	<b>Reference</b>	WR102d			
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Sankey	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	Heavily modified					
		<b>Relevant upstream water bodies:</b>	N/A					
		<b>Downstream water bodies:</b>	Sankey Brook (Hardshaw Brook to Rainford Brook)					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	Increased groundwater abstraction quantity. Minor level of impact. Increase in daily peak abstraction rates at Eccleston Hill borehole, but no change to overall annual licence quantity or other conditions. There may short term localised impacts on the hydrological regime of surface water courses due to increased daily abstraction rates but as the overall abstraction quantity is unchanged these should not have a long term impact on the status of the water body as a whole.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate					
		Benthic invertebrates	Moderate					
		Fish	-					
	Hydrology	Hydrological regime	Does not support good					
		River continuity	-					
		Morphological conditions	-					
		General physico-chemical	All high except Phosphate-moderate					
		Specific pollutants:	Triclosan is high					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR102d/WR102d\\_Eccleston\\_Hill\\_BH\\_to\\_Prescot.xlsx](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102d/WR102d_Eccleston_Hill_BH_to_Prescot.xlsx)  
 EA Flood Maps (WYBY): <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=5114>  
 EA Historical Landfill: <http://maps.environment>  
 EA Abstraction Licence Strategy (Lower Mersey and Ait): <https://www.gov.uk/government/publications/lower-mersey-and-ait-abstraction-licensing-strategy>

Water body ID:		GB41201G101700		Scheme:		ECCLESTON HILL BOREHOLE TO PRESCOT WTW		
Water body Name:		Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers		Reference		WR102d		
RBMP:		North West Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq		Scheme Phase		Construction		
Operational catchment:		No designation		Impact potential		Operational		
Designation (and uses):		NA				Direct		
Relevant upstream water bodies:		NA				Direct		
Downstream water bodies:		NA						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative Element	Quantitative Dependent Surface Water Body Status	Good			Transfer pipe line on land. No or minimal impact.  Abstraction well refurbishment. Minor level of impact  Abstraction well headworks / surface structures. No or minimal impact.	High	Increased groundwater abstraction quantity. Minor level of impact. Increase in daily peak abstraction rates at Eccleston Hill borehole, but no change to overall annual licence quantity or other conditions. The abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body. The may be localised temporary changes to the status of the groundwater body, but as the overall abstraction quantity is unchanged these should not have a long term impact on the status of the water body as a whole.	Medium
	Quantitative GWDTEs test	Good						
	Quantitative Saline Intrusion	Poor						
	Quantitative Water Balance	Good						
	Chemical Dependent Surface Water Body Status	Poor						
WFD elements for Groundwater: Chemical Element	Chemical Drinking Water Protected Area	Poor						
	Chemical GWDTEs test	Good						
	Chemical Saline Intrusion	Poor						
	General Chemical Test	Good						
	Prevent and Limit Objective	-						
Overall Status: Potential	Trend Assessment	Upward trend						
	Quantitative	Poor	Good by 2027	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
Overall	Poor	Good by 2027	N/A					

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR\WR102d\WR102d\\_Eccleston Hill BH to Prescott.xlsx](\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR\WR102d\WR102d_Eccleston Hill BH to Prescott.xlsx)

EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap&k=344705&y=511476&lg=1,2,10,&scale=7>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=waste&layerGroups=default&lang=e&ep=map&scale=1&x=357682.99999999994&y=355133.99999999994&k=322374&y=497910&lg=1,2,3,10,&scale=7>

EA Abstraction Licence Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>

Water body ID:		170	Scheme:		Milwr Tunnel, Bagillt (Transfer to Huntington)			
Water body Name:		Non reportable water body to north of River Mersey	Reference		WR047a			
RBMP:		N/A	Scheme Phase		Construction		Operational	
Operational catchment:		Sankey	Impact potential		Direct		Direct	
Designation (and uses):		No designation						
Relevant upstream water bodies:		N/A						
Downstream water bodies:		N/A						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	N/A		High	<p><b>New groundwater abstraction quantity.</b> Minor level of impact. New groundwater abstraction of 1.35 M/d annual average and 9 M/d peak capacity from the Bold Heath boreholes. A new abstraction licence would be required from the Environment Agency.</p> <p>The Abstraction Licensing Strategy (ALS) for Lower Mersey and Alt indicates that there is restricted water available in the groundwater body, but there is water available at all flows in the surface water body. Impacts on the hydrological regime of the surface water body are likely to be localised and temporary.</p> <p><b>Transfer pipe line.</b> No or minimal impact.</p>		
		Macrophytes	N/A					
		Macrophytes and phytobenthos	N/A					
		Benthic invertebrates	N/A					
		Fish	N/A					
	Physico-chemical	Hydrological regime	N/A					
		River continuity	N/A					
		Morphological conditions	N/A					
		General physico-chemical	N/A					
		Specific pollutants:	N/A					
WFD elements for Rivers: Chemical	Priority hazardous substances	N/A						
	Priority substances	N/A						
Overall Status/Potential	Ecological	N/A	N/A	N/A				
	Chemical	N/A	N/A	N/A				
	Overall	N/A	N/A	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\RW\WR075\WR075 Stocks Reservoir.xlsx  
 EA Flood Maps (WYBY): <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&g>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&g>  
 EA Abstraction Licence Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>

		<b>Water body ID:</b>	GB41201G101700	<b>Scheme:</b>	<b>BOLD HEATH BOREHOLES TO PRESCOT WTW</b>		
		<b>Water body Name:</b>	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	<b>Reference</b>	WR102e		
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	<b>Construction</b>		<b>Operational</b>
		<b>Operational catchment:</b>	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	<b>Impact potential</b>	<b>Direct</b>		<b>Direct</b>
		<b>Designation (and uses):</b>	No designation				
		<b>Relevant upstream water bodies:</b>	N/A				
		<b>Downstream water bodies:</b>	N/A				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	High
		Quantitative GWDEs test	Good				
		Quantitative Saline Intrusion	Poor				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor			High	High
		Chemical Drinking Water Protected Area	Poor				
		Chemical GWDEs test	Good				
		Chemical Saline Intrusion	Poor				
		General Chemical Test	Good				
		Prevent and Limit Objective					
		Trend Assessment	Upward trend				
Overall Status/Potential	Supporting Element	Quantitative	Poor	Good by 2027	N/A		
		Chemical (GW)	Poor	Good by 2027	N/A		
		Overall	Poor	Good by 2027	N/A		

Assumptions
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR102e\WR102e_Bold Heath BHs to Prescott.xlsx
EA Flood Maps (WIBY): <a href="http://maps.environment-agency.gov.uk/wiby/wibyController?x=357683.D&amp;y=355134.D&amp;scale=1&amp;layerGroups=default&amp;eg=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;le=1,2,10,&amp;scale=7">http://maps.environment-agency.gov.uk/wiby/wibyController?x=357683.D&amp;y=355134.D&amp;scale=1&amp;layerGroups=default&amp;eg=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=344705&amp;y=511476&amp;le=1,2,10,&amp;scale=7</a>
EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/wiby/wibyController?topic=waste&amp;layerGroups=default&amp;lang=e&amp;eg=map&amp;scale=1&amp;x=357682.9999999994&amp;y=355133.9999999994&amp;x=322374&amp;y=497910&amp;le=1,2,3,10,&amp;scale=7">http://maps.environment-agency.gov.uk/wiby/wibyController?topic=waste&amp;layerGroups=default&amp;lang=e&amp;eg=map&amp;scale=1&amp;x=357682.9999999994&amp;y=355133.9999999994&amp;x=322374&amp;y=497910&amp;le=1,2,3,10,&amp;scale=7</a>
EA Abstraction Licence Strategy (Lower Mersey and Alt): <a href="https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy">https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy</a>
Personal email communication between the EA and UU 20/12/2016.

		Water body ID:	GB112068060520	Scheme:	WALTON AND DARESURY BOREHOLES		
		Water body name:	Keckwick Brook	Reference	WR106		
		RBMP:	North West	Scheme Phase	Construction	Operational	
		Operational catchment:	Weaver Lower	Impact potential	Direct	Direct	
		Designation (and uses):	heavily modified				
		Relevant upstream water bodies:	n/a				
		Downstream water bodies:	Mersey				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos				High	Medium
		Macrophytes					
		Macrophytes and phytobenthos					
	Benthic invertebrates	Bad	Good by 2027	N/A			
	Fish	Poor	Good by 2027	N/A			
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015	N/A		
		River continuity					
Physico-chemical	Morphological conditions	Supports Good	Supports Good by 2015	N/A			
	General physico-chemical	Moderate	Good by 2027	N/A			
	Specific pollutants:	High	High by 2015	N/A			
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015	N/A			
	Priority substances	Good	Good by 2015	N/A			
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Feasible\\_Options/IRZ/WR106](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR106)  
 Abstraction Licence Strategy (Lower Mersey and Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_788\\_1\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_788_1_35d3ed.pdf)

Water body ID:		GB169		Scheme:		WALTON AND DARESURY BOREHOLES		
Water body Name:		Non-reportable water		Reference:		WR106		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Weaver Lower		Impact potential:		Direct		
Designation (and uses):		No designation				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Reinstatement and refurbish abstraction boreholes. No or Minimal Impact Expected.  Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New water treatment works. No or minimal impact.	High	New/increased groundwater abstraction quantity. Minor level of impact. Reinstatement of boreholes at Walton. Maximum output of 3.9 M/d based on existing abstraction licence. The ALS does not identify a GWMU for this area, but does show that surface water is available across the full flow regime. Given that there is already an abstraction licence in place, the moderate size of the abstraction, the availability of surface water, and that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, the use of the boreholes is not expected to have a widespread or prolonged effect on the hydrological regime of the non reportable water body.  Use of new transfer pipe line and water treatment works. No or minimal impact.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	-					
		Fish	-					
	Hydro-morphology	Hydrological regime	-					
		River continuity	-					
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	-					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	-						
	Priority substances	-						
Overall Status/Potential	Ecological	-	-					
	Chemical	-	-					
	Overall	-	-					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR\\_FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible\\_Options\IBZ\WR105b\WR105b\\_-\\_Lymm\\_BHs\\_\(Hill\\_Cliffe\).xlsx](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IBZ/WR105b/WR105b_-_Lymm_BHs_(Hill_Cliffe).xlsx)  
 Abstraction Licence Strategy (Lower Mersey and Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

Water body ID:		GB41202G991700		Scheme:		WALTON AND DARESURY BOREHOLES	
Water Body Name:		Weaver and Dane Quaternary Sand and Gravel Aquifers		Reference:		WR106	
RBMP:		Weaver and Dane Quaternary Sand and Gravel Aquifers		Scheme Phase		Construction	
Operational catchment:		Weaver and Dane Quaternary Sand and Gravel Aquifers		Impact potential		Direct	
Designation (and uses):		No designation				Operational	
Relevant upstream water bodies:		N/A				Direct	
Downstream water bodies:		N/A					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative	Good	Good by 2015	N/A	High	Medium	
	Quantitative GWDTes test	Good	Good by 2015	N/A			
	Quantitative Saline Intrusion	Good	Good by 2015	N/A			
	Quantitative Water Balance	Good	Good by 2015	N/A			
	Chemical Drinking Water Protected Area	Good	Good by 2015	N/A			
	Chemical GWDTes test	Poor	Good by 2027	N/A			
WFD elements for Groundwater: Chemical	Chemical Saline Intrusion	Good	Good by 2015	N/A	High	Medium	<p><b>New abstraction well drilling / refurbishment.</b> Minor level of impact.</p> <p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> No or minimal impact.</p> <p><b>New/increased groundwater abstraction quantity.</b> Minor level of impact. Reinstatement of boreholes at Whalton and Daresbury. Maximum output of 8.45 M/d based on existing abstraction licence. The ALS does not identify a GWMU for this area, but does show that surface water is available across the full flow regime. Given that there is already an abstraction licence in place, the moderate size of the abstraction, and the availability of surface water the use of the boreholes is expected to only have a minor localised and temporary effect on the quantitative status of the groundwater body.</p> <p><b>Use of new transfer pipe line.</b> No or minimal impact.</p>
	General Chemical Test	Poor	Good by 2027	N/A			
	Prevent and Limit Objective						
	Trend Assessment	Upward trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A	High	Medium	
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [Engineers Proforma: \WAR-FS1.global.amec.com/shared/Projects/38671 UU WRMP Support/5 Design/Feasible Options/IRZWR106](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZWR106)  
 Abstraction Licence Strategy (Lower Mersey and Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

		<b>Water body ID:</b>	GB112069060640	<b>Scheme:</b>	Aughton Park & Moss End Boreholes (Royal Oak WTW)			
			Downholland (Lydiate/Cheshires Lines) Brook	<b>Reference</b>	WR107a			
		<b>Water body Name:</b>						
		<b>RBMP:</b>	Alt and Crossens	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Alt	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	Heavily modified					
		<b>Relevant upstream water bodies:</b>	Not identified					
		<b>Downstream water bodies:</b>	Downholland Brook					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided		<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> Minor level of impact.</p> <p><b>Modified water treatment works.</b> No or minimal impact.</p> <p><b>New abstraction well drilling / refurbishment.</b> No or minimal impact.</p> <p><b>New / modified abstraction well headworks / surface structures.</b> No or minimal impact.</p>	High	<p><b>Increased groundwater abstraction quantity to (44MI/d to 54MI/d).</b> Medium level of impact. New abstraction of 10 MI/d from two refurbished boreholes at Aughton Park and Moss End. There may be effects on the quantitative water balance of the aquifer as the abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body. There is water available in the surface water body at Q30, Q50 and Q70.</p> <p><b>Use of pipe lines and water treatment works.</b> No or minimal impact.</p>	
		Macrophytes	Not provided					
		Macrophytes and phytoplankton	Moderate					
		Benthic invertebrates	Poor					
		Fish	Good					
	Hydro-morphology	Hydrological regime	Does not support good					
		River continuity	Not provided					
		Morphological conditions	Not provided					
		Physico-chemical	General physico-chemical	All high/good except: Phosphate- moderate				
			Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/ Potential	Ecological	Poor	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR107a\WR107a\\_Aughton Park\\_Moss End Boreholes \(Royal Oak WTW\).xlsx](http://\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR107a\WR107a_Aughton Park_Moss End Boreholes (Royal Oak WTW).xlsx)  
 EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=5114768>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/historical-landfill/>  
 EA Abstraction Licence Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>



		<b>Water body ID:</b>	GB41201G101700	<b>Scheme:</b>	Aughton Park & Moss End Boreholes (Royal Oak WTW)			
		<b>Water body Name:</b>	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	<b>Reference</b>	WR107a			
		<b>RBMP:</b>	North West GW	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aquifers	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	N/A					
		<b>Downstream water bodies:</b>	N/A					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	Medium	
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Poor		Transfer pipe line on land. No or minimal impact.			
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent	Poor		Transfer pipe line with water course crossings. No or minimal impact.			
		Chemical Drinking Water Protected Area	Poor					
		Chemical GWDTes test	Good		Modified water treatment works. No or minimal impact.			
		Chemical Saline Intrusion	Poor		Abstraction well refurbishment. Minor level of impact.			
		General Chemical Test	Good					
		Prevent and Limit Objective	Not provided		Abstraction well headworks / surface structures. No or minimal impact.			
		Trend Assessment	Upward trend					
Overall Status/Potential	Supporting Elements	Quantitative	Poor	Good by 2027	N/A			
		Chemical (GW)	Poor	Good by 2027	N/A			
		Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WRZ\WR107a\WR107a\_Aughton Park\_Moss End Boreholes (Royal Oak WTW).xlsx  
 EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=34470>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/historical-landfill/>  
 EA Abstraction Licence Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>

Water body ID:		GB112069060640		Scheme:		Aughton Park & Moss End Boreholes (Royal Oak WTW)	
Water body Name:		Downholland (Lydiate/Cheshires Lines) Brook		Reference:		WR107ai	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Alt		Impact potential		Direct	
Designation (and uses):		Heavily modified					
Relevant upstream water bodies:		Not identified					
Downstream water bodies:		Downholland Brook					
WFD Element (Receptor)		Status		RBMP objective		Alternate Objective if less than Good	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	Increased groundwater abstraction quantity to (44M/d to 54M/d). Medium level of impact. New abstraction of 10 M/d from two refurbished boreholes at Aughton Park and Moss End. There may be effects on the quantitative water balance of the aquifer as the abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body. There is water available in the surface water body at Q30, Q50 and Q70.
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Moderate				
		Benthic invertebrates	Poor				
		Fish	Good				
	Hydromorphology	Hydrological regime	Does not support good				
		River continuity	Not provided				
		Morphological conditions	Not provided				
		General physico-chemical	All high/good except: Phosphate- moderate				
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Poor	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Poor	Good by 2027	N/A			

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR107ai\WR107a_Au</p> <p>EA Abstraction Licence Strategy (Lower Mersey and Alt): <a href="https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-str">https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-str</a></p>	

		<b>Water body ID:</b>	GB41201G101700	<b>Scheme:</b>	Aughton Park & Moss End Boreholes (Royal Oak WTW)			
		<b>Water body Name:</b>	Basin and North Merseyside Permo-	<b>Reference</b>	WR107ai			
		<b>RBMP:</b>	North West GW	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Lower and Merseyside North	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	N/A					
		<b>Downstream water bodies:</b>	N/A					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	New groundwater abstraction quantity. Medium level of impact. New abstraction of 10 Ml/d from two refurbished boreholes at Aughton Park and Moss End. There may be effects on the quantitative water balance of the aquifer as the abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body.	Medium
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Poor					
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good					
		Chemical Dependent	Poor					
		Chemical Drinking Water Protected Area	Poor					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Poor					
		General Chemical Test	Good					
		Supporting Elements	Prevent and Limit Objective	Not provided				
Trend Assessment	Upward trend							
Overall Status/Potential	Quantitative	Poor	Good by 2027	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, or</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>
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<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR107a\WR107a_Aughton Park_Moss End Boreholes (Royal Oak WTW).xlsx</p> <p>EA Abstraction Licence Strategy (Lower Mersey and Alt): <a href="https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy">https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy</a></p>
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Water body ID:		GB112063060610		Scheme:		Randles Bridge, Knowsley, Primrose Hill			
Water body Name:		Croxteth/ Knowsley Brook		Reference		WR107b			
RBMP:		Alt and Crossens		Scheme Phase		Construction			
Operational catchment:		Alt		Impact potential		Operational			
Designation (and uses):		Heavily modified		Direct		Direct			
Relevant upstream water bodies:		Not identified							
Downstream water bodies:		Alt US Bull Bridge							
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Abstraction well refurbishment. No or minimal impact.	High	Reinstated groundwater abstraction quantity. Minor level of impact. Reinstatement of boreholes at Randles Bridge, and Knowsley (Primrose Hill also reinstated but located approx. 14 km to the north). Maximum combined output of 8 M/d (at Randles Bridge, and Knowsley) based on existing abstraction licence.	Medium	
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	Not provided						
		Benthic invertebrates	Poor						
		Fish	Not provided						
	Hydro-morphology	Hydrological regime	Supports good						
		River continuity	Not provided						
		Morphological conditions	Not provided						
		Physico-chemical	General physico-chemical	All high/good except: Phosphate- moderate					
			Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR EA Abstraction Licence Strategy (Lower Mersey and Alt); [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/3004](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3004)

		<b>Water body ID:</b>	GB112070064830	<b>Scheme:</b>	Randles Bridge, Knowsley, Primrose Hill				
		<b>Water body Name:</b>	Three Pool's Waterway	<b>Reference</b>	WR107b				
		<b>RBMP:</b>	Ait and Crossens	<b>Scheme Phase</b>					
		<b>Operational catchment:</b>	Crossens System	<b>Impact potential</b>					
		<b>Designation (and uses):</b>	Heavily modified	<b>Construction</b>	Operational				
		<b>Relevant upstream water bodies:</b>	Not identified	<b>Direct</b>	Direct				
		<b>Downstream water bodies:</b>	Back Drain and Sluice						
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>		
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided			Abstraction well refurbishment. No or minimal impact.  Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  Modified water treatment works. No or minimal impact.	High	Reinstated groundwater abstraction quantity. Minor level of impact. Reinstatement of boreholes at Primrose Hill (Randles Bridge and Knowsley also reinstated but located approx. 14 km to the south). Maximum output of 4 Ml/d (at Primrose Hill) based on existing abstraction licence.  The ALS indicates that groundwater is limited in this area, but also shows that surface water is available across the full flow regime. Given that there is already an abstraction licence in place, and the availability of surface water, the use of the borehole is not expected to have a widespread or prolonged effect on the hydrological regime of this water body.  Use of new transfer pipe line and water treatment works. No or minimal impact.	Medium
		Macrophytes	Not provided						
		Macrophytes and phytoplankton	High						
		Benthic invertebrates	Moderate						
		Fish	Poor						
	Hydro-morphology	Hydrological regime	Supports good						
		River continuity	Not provided						
		Morphological conditions	Not provided						
		General physico-chemical	All high/good except Phosphate- moderate						
		Specific pollutants:	All high						
WFD elements for Rivers: Chemical	Physico-chemical	Priority hazardous substances	Good						
		Priority substances	Does not require assessment						
		Overall Status/Potential							
	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: [http://www.globalamec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Feasible\\_Options/WRZ/WR075/WR075\\_Sy](http://www.globalamec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/WRZ/WR075/WR075_Sy)  
 EA Abstraction Licence Strategy (Lower Mersey and Ait): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LT](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LT)

		Water body ID:	GB41201G101700	Scheme:	Randles Bridge, Knowsley, Primrose Hill				
		Water body Name:	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers	Reference	WR107b				
		RBMP:	North West GW	Scheme Phase	Construction		Operational		
		Operational catchment:	Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	Not identified						
		Downstream water bodies:	Not identified						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Reinstated groundwater abstraction quantity. Medium level of impact. Reinstatement of boreholes at Randles Bridge, Knowsley and Primrose Hill. Maximum combined output of 11 M/d based on existing abstraction licence.	Low	
		Quantitative GWDTes test	Good						
		Quantitative Saline Intrusion	Poor						
Quantitative Water Balance	Good			Abstraction well refurbishment. Minor level of impact.					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor						Transfer pipe line on land. No or minimal impact.
		Chemical Drinking Water Protected Area	Poor						Transfer pipe line with water course crossings. No or minimal impact.
		Chemical GWDTes test	Good						Modified water treatment works. No or minimal impact.
		Chemical Saline Intrusion	Poor						
		General Chemical Test	Good						
		Prevent and Limit Objective	Not provided						
Overall Status/ Potential	Supporting Element	Trend Assessment	Upward trend						
		Quantitative	Poor	Good by 2027	N/A				
		Chemical (GW)	Poor	Good by 2027	N/A				
Overall		Poor	Good by 2027	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proformas: <a href="\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx">\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx</a> EA Abstraction Licence Strategy (Lower Mersey and All): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf</a>

Water body ID:				Scheme:				SWINESHAW BOREHOLES (BUCKTON CASTLE WTW)			
Water body name:				Reference				WR109			
RBMP:				Scheme Phase				Construction		Operational	
Operational catchment:				Impact potential				Direct		Direct	
Designation (and uses):											
Relevant upstream water bodies:				Tame (Source to Chew Brook), Chew Brook							
Downstream water bodies:				Tame (Swineshaw Brook to Mersey)							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence				
WFD elements for Rivers: Ecological	Biology	Phytobenthos			New outfall to river. Minor level of impact.	High	Increased groundwater abstraction quantity. Minor level of impact. New abstraction of 4 Ml/d from refurbished boreholes at Swineshaw. Previous abstraction licence revoked in 1992. The surface water body has water available across all flows, indicating that any reduction in surface water flow due to this new relatively small abstraction may not cause a deterioration in water body status. The abstracted water is discharged to the surface water system, further limiting any impacts of reduced baseflow.	Medium			
		Macrophytes									
		Macrophytes and phytobenthos									
		Benthic invertebrates	Moderate	Good by 2027					N/A		
		Fish									
	Hydromorphology	Hydrological regime									
		River continuity									
		Morphological conditions							N/A		
		General physico-chemical	Good	Good by 2015					N/A		
		Specific pollutants:	High	High by 2015					N/A		
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment	N/A	New / modified abstraction well headworks / surface structures. No or minimal impact.	High	Increased groundwater abstraction quantity. Minor level of impact. New abstraction of 4 Ml/d from refurbished boreholes at Swineshaw. Previous abstraction licence revoked in 1992. The surface water body has water available across all flows, indicating that any reduction in surface water flow due to this new relatively small abstraction may not cause a deterioration in water body status. The abstracted water is discharged to the surface water system, further limiting any impacts of reduced baseflow.	Medium			
	Priority substances	Does not require assessment	Does not require assessment	N/A							
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A							
	Chemical	Good	Good by 2015	N/A							
	Overall	Moderate	Moderate by 2015	N/A							

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR049b">http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR049b</a> EA Abstraction Licence Strategy (Upper Mersey): <a href="https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy">https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy</a>

Water body ID:		GB41202G102900		Scheme:		SWINESHAW BOREHOLES (BUCKTON CASTLE WTW)	
Water Body Name:		Manchester and East Cheshire Carboniferous Aquifers		Reference		WR109	
RBMP:		North West GW		Scheme Phase		Construction	
Operational catchment:		Manchester and East Cheshire Carboniferous Aquifers		Impact potential		Operational	
Designation (and uses):		No designation				Direct	
Relevant upstream water bodies:		N/A					
Downstream water bodies:		N/A					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative	Good	Good by 2015	N/A	High	Medium	<p><b>Abstraction well refurbishment.</b> Minor level of impact.</p> <p><b>Abstraction well headworks / surface structures.</b> No or minimal impact.</p> <p><b>Increased groundwater abstraction quantity.</b> Minor level of impact. New abstraction of 4 M/d from refurbished boreholes at Swineshaw. Previous abstraction licence revoked in 1992. There is no groundwater management unit defined in the ALS for this location. The surface water body has water available across all flows, indicating that groundwater may be available for this relatively small new licence.</p> <p><b>Transfer pipe line.</b> No or minimal impact.</p>
	Quantitative	Good	Good by 2015	N/A			
	Quantitative Saline Intrusion	Good	Good by 2015	N/A			
	Quantitative Water Balance	Good	Good by 2015	N/A			
WFD elements for Groundwater: Chemical	Chemical Drinking Water Protected Area	Poor	Good by 2027	N/A			
	Chemical GWDTes test	Good	Good by 2015	N/A			
	Chemical Saline Intrusion	Good	Good by 2015	N/A			
	General Chemical Test	Good	Good by 2015	N/A			
	Prevent and Limit Objective						
	Trend Assessment	Upward trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/VRZ/WR049b">Engineers Proforma: \WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VRZ\WR049b</a> EA Abstraction Licence Strategy (Upper Mersey): <a href="https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy">https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy</a>



		<b>Water body ID:</b>	GB112068060180	<b>Scheme:</b>	Ruston Spencer Boreholes				
		<b>Water body Name:</b>	Dane (Clough Brook to Cow Brook)	<b>Reference</b>	WR110				
		<b>RBMP:</b>	Weaver Goway	<b>Scheme Phase</b>	Construction		Operational		
		<b>Operational catchment:</b>	Dane	<b>Impact potential</b>	Direct		Direct		
		<b>Designation (and uses):</b>	No designation						
		<b>Relevant upstream water bodies:</b>	Clough Brook and Dane (Source to Clough Brook)						
		<b>Downstream water bodies:</b>	Dane (cow Brook to Wheelock)						
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			No construction activities.	High	Increased groundwater abstraction quantity. Medium level of impact. Increase in groundwater abstraction of 2 Ml/d from Rushton Spencer boreholes. The ALS does not identify a groundwater management unit in this area, but the surface water body has limited water available at Q95 and Q50 (water available at Q70 and Q30), indicating there is some pressure on water resources in the area. However the new licence quantity is relatively small.	Medium
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	High						
		Benthic invertebrates	Good						
		Fish	Poor						
	Hydromorphology	Hydrological regime	Supports good						
		River continuity	Not provided						
		Morphological conditions	Supports good						
	Physico-chemical	General physico-chemical	All high/good						
		Specific pollutants:	All high						
WFD elements for Rivers: Chemical	Chemical	Priority hazardous substances	Does not require assessment						
		Priority substances	Does not require assessment						
Overall Status/Potential	Overall	Ecological	Poor	Good by 2027	N/A				
		Chemical	Good	Good by 2015	N/A				
		Overall	Poor	Good by 2027	N/A				

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>
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<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR7\WR075\WR075 Stocks Reservoir.xlsx</p> <p>EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=34">http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=34</a></p> <p>EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/historical-landfill/">http://maps.environment-agency.gov.uk/historical-landfill/</a></p> <p>Weaver and Dane ALS: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcff.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcff.pdf</a></p>
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		<b>Water body ID:</b>	GB41202G102900	<b>Scheme:</b>	Ruston Spencer Boreholes		
		<b>Water body Name:</b>	Manchester and East Cheshire Carboniferous Aquifer	<b>Reference</b>	WR110		
		<b>RBMP:</b>	North West GW	<b>Scheme Phase</b>	Construction	Operational	
		<b>Operational catchment:</b>	Manchester and Cheshire East Carboniferous Aquifer	<b>Impact potential</b>	Direct	Direct	
		<b>Designation (and uses):</b>	No designation				
		<b>Relevant upstream water bodies:</b>	Not identified				
		<b>Downstream water bodies:</b>	Not identified				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good		No construction activities.	High	Increased groundwater abstraction quantity. Medium level of impact. Increase in groundwater abstraction of 2 Ml/d from Rushton Spencer boreholes. The ALS does not identify a groundwater management unit in this area, but the surface water body has limited water available at Q95 and Q50 (water available at Q70 and Q30), indicating there is some pressure on water resources in the area. However the new licence quantity is relatively small.
		Quantitative GWDTes test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good				
		Chemical Drinking Water Protected Area	Poor				
		Chemical GWDTes test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	Not provided				
Overall Status/Potential	Supporting Element	Trend Assessment	Upward trend				
		Quantitative	Good	Good by 2015	N/A		
		Chemical (GW)	Poor	Good by 2027	N/A		
		Overall	Poor	Good by 2027	N/A		

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>
<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/VR2/WR075/WR075_Stocks_Reservoir.xlsx">http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/VR2/WR075/WR075_Stocks_Reservoir.xlsx</a></p> <p>EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap&amp;fx=3">http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap&amp;fx=3</a></p> <p>EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap&amp;fx=3">http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap&amp;fx=3</a></p> <p>Weaver and Dane ALS: <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcff.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcff.pdf</a></p>

		Water body ID:	GB112069061360		Scheme:	WOODFORD BOREHOLE			
		Water body name:	Dean (Bollington to Bollin)		Reference	WR111			
		RBMP:	Mersey Upper		Scheme Phase	Construction		Operational	
		Operational catchment:	Bollin Dean Mersey Upper		Impact potential	Direct		Direct	
		Designation (and uses):	not designated artificial or heavily modified						
		Relevant upstream water bodies:	Dean (Lamaload to Bollington), Harrop Brook						
		Downstream water bodies:	Bollin (River Dean to Ashley Mill)						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos				High	New groundwater abstraction quantity. Minor level of impact. Increase in abstraction quantity at Woodford borehole from current licensed quantity of 9 Ml/d to 12 Ml/d. ALS indicates restricted water available from the GWMU for this area. Surface water is available at high flows (Q30 and Q50), but has limited availability at lower flows (Q70 and Q95). Lower flows are likely to be dependent on baseflow from the underlying Permo-Triassic aquifer which could be reduced by additional abstraction. However, given that there is an existing abstraction licence, the additional volume required is relatively small, and that the ALS indicates there is some water available, it is unlikely that the increased abstraction would have widespread or prolonged effects on the hydrological regime of surface watercourses. A variation to the abstraction licence would be required from the Environment Agency.	Medium	
		Macrophytes							
		Macrophytes and phytobenthos	Poor	Good by 2027	N/A				
		Benthic invertebrates	Moderate	Moderate by 2015	N/A				
		Fish	Good	Good by 2015	N/A				
	Hydro-morphology	Hydrological regime	Supports Good	Supports Good by 2015	N/A				
		River continuity							
		Morphological conditions	Supports Good		N/A				
		Physico-chemical	General physico-chemical	Moderate	Good by 2027				N/A
			Specific pollutants:						N/A
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment	N/A					
	Priority substances	Does not require assessment	Does not require assessment	N/A					
Overall Status/Potential	Ecological	Poor	Moderate by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Poor	Moderate by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/WRZ/WR049b](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/WRZ/WR049b)  
 Abstraction Licensing Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c6011.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c6011.pdf)

Water body ID:		GB41201G101100		Scheme:		WOODFORD BOREHOLE					
Water Body Name:		Manchester and East Cheshire Permo-Triassic Sandstone Aquifers		Reference:		WR111					
RBMP:		North West GW		Scheme Phase		Construction					
Operational catchment:		Manchester and Cheshire East Permo-Triassic Sandstone Aquifers		Impact potential		Operational					
Designation (and uses):		No designation				Direct					
Relevant upstream water bodies:		N/A									
Downstream water bodies:		N/A									
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence				
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative	Poor	Good by 2021	N/A	New groundwater abstraction quantity. Minor level of impact. Increase in abstraction quantity at Woodford borehole from current licensed quantity of 9 Ml/d to 12 Ml/d. ALS indicates restricted water available from the GW/MU for this area. Surface water is available at high flows (Q30 and Q50, but has limited availability at lower flows (Q70 and Q95). Given the existing abstraction licence, the relatively small additional volume required, and that the ALS indicates there is some water available, it is unlikely that the increased abstraction would have widespread or prolonged effects on the quantitative water balance of the groundwater body as a whole. A variation to the abstraction licence would be required from the Environment Agency.	High	Medium			
		Quantitative GWDTEs test	Good	Good by 2015	N/A						
		Quantitative Saline Intrusion	Poor	Good by 2021	N/A						
		Quantitative Water Balance	Good	Good by 2015	N/A						
Chemical dependent											
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Drinking Water Protected Area	Good	Good by 2015	N/A				New abstraction well drilling / refurbishment. Minor level of impact.	High	Medium
		Chemical GWDTEs test	Good	Good by 2015	N/A						
		Chemical Saline Intrusion	Poor	Good by 2021	N/A						
		General Chemical Test	Good	Good by 2015	N/A						
		Prevent and Limit Objective									
Supporting Elements (Groundwater)	Trend Assessment		Upward Trend								
Overall Status/Potential		Quantitative	Poor	Good by 2021	N/A						
		Chemical (GW)	Poor	Good by 2021	N/A						
		Overall	Poor	Good by 2021	N/A						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
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- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support5 Design\Feasible Options\WRZ\WR049b](\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support5 Design\Feasible Options\WRZ\WR049b)

Abstraction Licensing Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

		Water body ID:	GB112069061360		Scheme:	WOODFORD BOREHOLE		
		Water body name:	Dean (Bollington to Bollin)		Reference:	WR111		
		RBMP:	Mersey Upper		Scheme Phase	Construction		
		Operational catchment:	Bollin Dean Mersey Upper		Impact potential	Direct		
		Designation (and uses):	not designated artificial or heavily modified			Operational		
		Relevant upstream water bodies:	Dean (Lamaload to Bollington) Harrop Brook			Direct		
		Downstream water bodies:	Bollin (River Dean to Ashley Mill)					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos				High	New groundwater abstraction quantity. Medium level of impact. New groundwater abstraction from new borehole at Bramhal of 5 Ml/d. ALS indicates restricted water available from the GWMU for this area. Surface water is available at high flows (Q30 and Q50), but has limited availability at lower flows (Q70 and Q95). Given the limited water availability, particularly at low flows, and the moderate size of the proposed abstraction, there may be widespread or prolonged effects on the hydrological regime of the water body if baseflows are reduced (there are likely to be good connections between the principal Permo-Triassic aquifer and surface water bodies). A new abstraction licence would be required from the Environment Agency.	Medium
		Macrophytes						
		Macrophytes and phytobenthos	Poor	Good by 2027	N/A			
		Benthic invertebrates	Moderate	Moderate by 2015	N/A			
		Fish	Good	Good by 2015	N/A			
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015	N/A			
		River continuity						
Physico-chemical	Morphological conditions	Supports Good		N/A				
	General physico-chemical	Moderate	Good by 2027	N/A				
	Specific pollutants:			N/A				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment	N/A				
	Priority substances	Does not require assessment	Does not require assessment	N/A				
Overall Status/Potential	Ecological	Poor	Moderate by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Poor	Moderate by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/VRZWR049b](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/VRZWR049b)

Abstraction Licensing Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

Aquifer designations: <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>

Water body ID:		GB41201G101100		Scheme:		WOODFORD BOREHOLE	
Water Body Name:		Manchester and East Cheshire Permo-Triassic Sandstone Aquifers		Reference		WR111	
RBMP:		North West GW		Scheme Phase		Construction	
Operational catchment:		Manchester and Cheshire East Permo-Triassic Sandstone Aquifers		Impact potential		Operational	
Designation (and uses):		No designation				Direct	
Relevant upstream water bodies:		N/A					
Downstream water bodies:		N/A					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Poor	Good by 2021	N/A	High	Medium
		Quantitative GWDTEs test	Good	Good by 2015	N/A		
		Quantitative Saline Intrusion	Poor	Good by 2021	N/A		
		Quantitative Water Balance	Good	Good by 2015	N/A		
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Drinking Water Protected Area	Good	Good by 2015	N/A		
		Chemical GWDTEs test	Good	Good by 2015	N/A		
		Chemical Saline Intrusion	Poor	Good by 2021	N/A		
		General Chemical Test	Good	Good by 2015	N/A		
		Prevent and Limit Objective					
		Trend Assessment	Upward Trend				
Overall Status/Potential	Quantitative	Poor	Good by 2021	N/A			
	Chemical (GW)	Poor	Good by 2021	N/A			
	Overall	Poor	Good by 2021	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR2\WR049>  
 Abstraction Licensing Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)  
 Aquifer designations: <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>

		Water body ID:	GB112069061320	Scheme:	TYTHERINGTON BOREHOLES		
		Water body name:	Bollin (Source to Dean)	Reference	WR113		
		RBMP:	Mersey Upper	Scheme Phase	Construction	Operational	
		Operational catchment:	Bollin Dean Mersey Upper	Impact potential	Direct	Direct	
		Designation (and uses):	heavily modified				
		Relevant upstream water bodies:	n/a				
		Downstream water bodies:	Bollin (River Dean to Ashley Mill)				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos				Medium	Increased groundwater abstraction quantity. Minor level of impact. Increased peak abstraction quantity of 3 M/d at refurbished Tytherington Boreholes. No changes to existing abstraction licence required.  Any impacts of the status of the surface water body are likely to be temporary and localised as there is no overall increase in annual abstraction and the peak daily increase is relatively small. The abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body, but water is available in the surface water body across all flows.  Use of pipelines and water treatment works. No or minimal impact.
		Macrophytes					
		Macrophytes and phytobenthos	Moderate	Moderate by 2027	Moderate by 2027		
		Benthic invertebrates	Good	Good by 2027	N/A		
		Fish	Moderate	Moderate by 2027	Moderate by 2027		
	Hydro-morphology	Hydrological regime					
		River continuity					
		Morphological conditions		Not assessed			
		General physico-chemical	Moderate	Moderate by 2027	Moderate by 2027		
		Specific pollutants:	High	High by 2027	N/A		
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment	N/A			
	Priority substances	Does not require assessment	N/A	N/A			
Overall Status/Potential	Ecological	Moderate	Moderate by 2027	Moderate by 2027			
	Chemical	Good	Good by 2027	N/A			
	Overall	Moderate	Moderate by 2027	Moderate by 2027			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR049b">\\WAR-FS1.global.amec.com\shared\Projects\38671_UU WRMP Support\5 Design\Feasible_Options\IRZ\WR049b</a> EA Abstraction Licence Strategy (Upper Mersey): <a href="https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy">https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy</a>

		Water body ID:	GB41201G101100	Scheme:	TYTHERINGTON BOREHOLES			
		Water Body Name:	Manchester and East Cheshire Permo-Triassic Sandstone Aquifers	Reference	WR113			
		RBMP:	North West GW	Scheme Phase	Construction		Operational	
		Operational catchment:	Manchester and Cheshire East Permo-Triassic Sandstone Aq	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative	Poor	Good by 2027	N/A	High	Increased groundwater abstraction quantity. Minor level of impact. Increased peak abstraction quantity of 3 M/d at refurbished Tytherington Boreholes. No changes to existing abstraction licence required.	Medium
		Quantitative GWDTEs test	Good	Good by 2027	N/A			
		Quantitative Saline Intrusion	Poor	Good by 2027	N/A			
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good	Good by 2027	N/A			
		Chemical Drinking Water Protected Area	Good	Good by 2027	N/A			
		Chemical GWDTEs test	Good	Good by 2027	N/A			
WFD elements for Groundwater: Chemical	Supporting Elements (unaudited)	Chemical Saline Intrusion	Poor	Good by 2027	N/A			
		General Chemical Test	Good	Good by 2027	N/A			
		Prevent and Limit Objective						
Overall Status/Potential	Overall	Trend Assessment	Upward Trend	N/A				
		Quantitative	Poor	Good by 2027	N/A			
		Chemical (GW)	Poor	Good by 2027	N/A			
		Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VRZ\WR049b](\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VRZ\WR049b)

EA Abstraction Licence Strategy (Upper Mersey): <https://www.gov.uk/government/publications/upper-mersey-abstraction-licence-strategy>



		Water body ID:	GB112069064720	Scheme:	PYTHON MILL BOREHOLE			
		Water body name:	Roch (Source to Spodden)	Reference	WR114			
		RBMP:	Irwell	Scheme Phase	Construction	Operational		
		Operational catchment:	Roch Irk Medlock	Impact potential	Direct	Direct		
		Designation (and uses):	Heavily modified					
		Relevant upstream water bodies:	Beal					
		Downstream water bodies:	Roch (Spodden to Irwell)					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos				High	<p><b>Increased groundwater abstraction quantity.</b> Medium level of impact. New abstraction of up to 3 Ml/d from refurbished borehole at Python Mill. A new abstraction licence would be required from the Environment Agency.</p> <p>The ALS does not define a groundwater management unit for this area, but the surface water body has no water available across all flows, indicating there is pressure on water resources. The lack of water availability and the proximity of the borehole to the River Roch (approx. 150 m) means that there could be prolonged and widespread impacts on the surface water body.</p> <p><b>Use of pipe line.</b> No or minimal impact.</p>	
		Macrophytes						
		Macrophytes and phytobenthos	Moderate	Good by 2027	N/A			
		Benthic invertebrates	Good	Good by 2027	N/A			
		Fish	Moderate	Good by 2027	N/A			
	Hydro-morphology	Hydrological regime						<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Abstraction well refurbishment.</b> No or minimal impact.</p> <p><b>Modified abstraction well headworks / surface structures.</b> No or minimal impact.</p>
		River continuity						
		Morphological conditions		Not assessed	N/A			
		General physico-chemical	High	Good by 2027	N/A			
		Specific pollutants:		High by 2027	High by 2027			
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2027	N/A				
	Priority substances	Good	Good by 2027	N/A				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Moderate	Good by 2027	N/A				

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p> <p>9 - A discharge license would need to be sought to meet environmental regulations for WFD for New discharge scour into Rochdale Canal</p>
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<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: <a href="http://WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR049b">\\WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR049b</a></p> <p>EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/publications/northern-manchester-abstraction-licensing-strategy">https://www.gov.uk/government/publications/northern-manchester-abstraction-licensing-strategy</a></p>
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		Water body ID:	GB41202G101800		Scheme:	PYTHON MILL BOREHOLE			
		Water Body Name:	Northern Manchester Carboniferous Aquifers		Reference	WR114			
		RBMP:	North West GW		Scheme Phase	Construction		Operational	
		Operational catchment:	Manchester Northern Carboniferous Aquifers		Impact potential	Direct		Direct	
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	N/A						
		Downstream water bodies:	N/A						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good	Good by 2027	N/A	Transfer pipe line on land. No or minimal impact.  New outfall to Rochdale Canal. Minor level of impact.  Abstraction well refurbishment. Minor level of impact.  Abstraction well headworks / surface structures. No or minimal impact.	High	New groundwater abstraction quantity. Medium level of impact. New abstraction of up to 3 Ml/d from refurbished borehole at Python Mill. A new abstraction licence would be required from the Environment Agency.  The ALS does not define a groundwater management unit for this area, but the surface water body has no water available across all flows, indicating there is pressure on water resources.  Transfer pipe line. No or minimal impact.  Transfer of water via Rochdale Canal. Minor level of impact.	Low
		Quantitative GWDTes test	Good	Good by 2027	N/A				
		Quantitative Saline Intrusion	Good	Good by 2027	N/A				
		Quantitative Water Balance	Good	Good by 2027	N/A				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status							
		Chemical Drinking Water Protected Area	Good	Good by 2027	N/A				
		Chemical GWDTes test	Good	Good by 2027	N/A				
		Chemical Saline Intrusion	Good	Good by 2027	N/A				
		General Chemical Test	Good	Good by 2027	N/A				
		Supporting Element	Prevent and Limit Objective						
Overall Status/Potential	Trend Assessment	Trend Assessment	Upward Trend	N/A					
		Quantitative	Good	Good by 2027	N/A				
		Chemical (GW)	Poor	Good by 2027	N/A				
		Overall	Poor	Good by 2027	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZWR049b">Engineers Proforma: \\\WAR-FS1.global.amec.com\shared\Projects\38671_UU_WRMP_Support\5_Design\Feasible_Options\IRZWR049b</a>
EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/publications/northern-manchester-abstraction-licensing-strategy">https://www.gov.uk/government/publications/northern-manchester-abstraction-licensing-strategy</a>

		Water body ID:	GB112074069980	Scheme:	Egremont Boreholes (Existing)		
		Water body Name:	Ehen (lower)	Reference	WR119a		
		RBMP:	South West Lakes	Scheme Phase	Construction		Operational
		Operational catchment:	Ehen-Calder	Impact potential	Direct		Direct
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	Ehen (upper including Liza), Keekle (lower) and Kirk Beck (Ehen)				
		Downstream water bodies:	Cumbria Coastal Waters				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	<p><b>New groundwater abstraction.</b></p> <p>Minor level of impact. Continuation of abstraction of 11 Ml/d from four existing boreholes at Merry Hill, Kellhead, Gully Flatts and Black Ling (only the Merry Hill and Gully Flatts boreholes are within this surface water body). The boreholes are planned for decommissioning in 2022 but this option would see abstraction continuing at current rates.</p> <p>The ALS states that there is groundwater available from the West Cumbria Groundwater Management Unit, but no water available across the flow regime in this surface water body. The ALS will take into account the effects of the current abstraction licence, so a continuation of abstraction is unlikely to reduce the availability of water further.</p> <p>It is assumed that the current abstraction would not have been recently licensed if it would cause a deterioration in WFD status, therefore it is unlikely that an extension to the licence would cause deterioration, however this cannot be guaranteed as the water environment may change between the recent licensing of the boreholes and 2022. A new abstraction licence would be required from the Environment Agency from 2022 onwards.</p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	High				
		Fish	High				
	Hydromorphology	Hydrological regime	Does not support good				
		River continuity	Not provided				
		Morphological conditions	Supports good				
	Physico-chemical	General physico-chemical	All high/good				
		Specific pollutants:	All high				
WFD elements for Rivers: Chemical	Priority hazardous substances	All good					
	Priority substances	All good					
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/Design/Feasible Options/WR119a/WR119b\\_Egremont Boreholes/Abstraction Licensing Strategies \(CAMS process\)](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/Design/Feasible%20Options/WR119a/WR119b_Egremont%20Boreholes/Abstraction%20Licensing%20Strategies%20(CAMS%20process).docx): <https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process>

Water body ID:		GB353	Scheme:		Egremont Boreholes (Existing)					
Water body Name:		Non reportable water bodies on St Bees Coast	Reference		WR119a					
RBMP:		South West Lakes	Scheme Phase		Construction		Operational			
Operational catchment:		-	Impact potential		Direct		Direct			
Designation (and uses):		-								
Relevant upstream water bodies:		-								
Downstream water bodies:		-								
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	N/A		No construction activities planned in this water body. No or minimal impact.	High	<p><b>New groundwater abstraction.</b></p> <p>Minor level of impact. Continuation of abstraction of 11 M/d from four existing boreholes at Merry Hill, Kellhead, Gully Flatts and Black Ling (only the Kellhead and Black Ling boreholes are within this surface water body). The boreholes are planned for decommissioning in 2022 but this option would see abstraction continuing at current rates.</p> <p>The ALS states that there is groundwater available from the West Cumbria Groundwater Management Unit, and surface water available across the full flow regime in the surface water body. The ALS will take into account the effects of the current abstraction licence, so a continuation of abstraction is unlikely to reduce the availability of water further.</p> <p>It is assumed that the current abstraction would not have been recently licensed if it would cause a deterioration in WFD status, therefore it is unlikely that an extension to the licence would cause deterioration, however this cannot be guaranteed as the water environment may change between the recent licensing of the boreholes and 2022. A new abstraction licence would be required from the Environment Agency from 2022 onwards.</p>	Low		
		Macrophytes	N/A							
		Macrophytes and phytobenthos	N/A							
		Benthic invertebrates	N/A							
		Fish	N/A							
	Hydromorphology	Hydrological regime	N/A							
		River continuity	N/A							
		Morphological conditions	N/A							
		Physico-chemical	General physico-chemical	N/A						
			Specific pollutants:	N/A						
WFD elements for Rivers: Chemical	Priority hazardous substances	N/A								
	Priority substances	N/A								
Overall Status/Potential at	Ecological	N/A	N/A	N/A						
	Chemical	N/A	N/A	N/A						
	Overall	N/A	N/A	N/A						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR119h\WR119b Egremont Borehole  
 Abstraction Licensing Strategies (CAMS process): <https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process>

		Water body ID:	GB41201G102000	Scheme:	Egremont Boreholes (Existing)			
		Water body Name:	West Cumbria Permo-Triassic Sandstone Aquifers	Reference	WR119a			
		RBMP:	North West GW	Scheme Phase	Construction		Operational	
		Operational catchment:	West Cumbria Permo-Triassic Sandstone Aquifers	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	Not identified					
		Downstream water bodies:	Not identified					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>New groundwater abstraction.</b>                      Minor level of impact. Continuation of abstraction of 11 M/d from four existing boreholes at Merry Hill, Kellhead, Gully Flatts and Black Ling. The boreholes are planned for decommissioning in 2022 but this option would see abstraction continuing at current rates.</p> <p>The ALS states that there is groundwater available from the West Cumbria Groundwater Management Unit. There is surface water available across the flow regime in the water bodies associated with the Kellhead and Black Ling boreholes, but no water available across the flow regime in the surface water body associated with the Merry Hill and Gully Flatts boreholes (River Ehen). The ALS will take into account the effects of the current abstraction licence, so a continuation of abstraction is unlikely to reduce the availability of water further.</p> <p>It is assumed that the current abstraction would not have been recently licensed if it would cause a deterioration in WFD status, therefore it is unlikely that an extension to the licence would cause deterioration, however this cannot be guaranteed as the water environment may change between the recent licensing of the boreholes and 2022. The boreholes are also located close to the coast so consideration should be given to the potential for saline intrusion into the aquifer with continued use. A new abstraction licence would be required from the Environment Agency from 2022 onwards.</p>	Low
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good		<p><b>No construction activities planned in this water body.</b>                      No or minimal impact.</p>	High		
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
Supporting Elements (Groundwater)	Prevent and Limit Objective	Not provided						
	Trend Assessment	No trend						
Overall Status/Potential	1	Quantitative	Good	Good by 2015	N/A			
		Chemical (GW)	Good	Good by 2015	N/A			
		Overall	Good	Good by 2015	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR119b\WR119b Egremont Boreholes (New).xsm Abstraction Licensing Strategies (CAMS process): <a href="https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process">https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process</a>



		Water body ID:	GB353	Scheme:	Egremont Boreholes (New)			
		Water body Name:	Non reportable water bodies on St Bees Coast	Reference	WR119b			
		RBMP:	South West Lakes	Scheme Phase	Construction		Operational	
		Operational catchment:	-	Impact potential	Direct		Direct	
		Designation (and uses):	-					
		Relevant upstream water bodies:	-					
		Downstream water bodies:	-					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytoplankton	N/A			High	<p><b>New groundwater abstraction.</b>                      Medium level of impact. New abstraction of 7.5 Ml/d from three new boreholes at Sandwith, Rottington and Moor Platts. The ALS states that there is groundwater available from the West Cumbria Groundwater Management Unit. There is surface water available across the flow regime in the non-reportable water bodies associated with the three new boreholes. Although there is water available in both the groundwater and surface water bodies, there is likely to be a strong hydraulic connection between the principal sandstone aquifer and the overlying surface water bodies. The water courses are small coastal streams, likely to be dependent on baseflow from the aquifer. Therefore the new moderately sized abstraction may have a widespread or prolonged effect on the hydrological regime of the water courses. A new abstraction licence would be required from the Environment Agency.</p>	
		Macrophytes	N/A					
		Macrophytes and phytobenthos	N/A					
		Benthic invertebrates	N/A					
		Fish	N/A					
	Hydro-morphology	Hydrological regime	N/A					<p><b>New abstraction well drilling / refurbishment.</b>                      No or minimal impact.</p> <p><b>New / modified abstraction well headworks / surface structures.</b>                      No or minimal impact.</p>
		River continuity	N/A					
		Morphological conditions	N/A					
	Physico-chemical	General physico-chemical	N/A					
		Specific pollutants:	N/A					
WFD elements for Rivers: Chemical	Priority hazardous substances	N/A						
	Priority substances	N/A						
Overall Status / Potential	Ecological	N/A	N/A	N/A				
	Chemical	N/A	N/A	N/A				
	Overall	N/A	N/A	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/WR2/WR119b/WR119b\\_Egremont\\_Boreholes\\_Abstraction\\_Licensing\\_Strategies\\_\(CAMS\\_process\).htm](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/WR2/WR119b/WR119b_Egremont_Boreholes_Abstraction_Licensing_Strategies_(CAMS_process).htm)

		Water body ID:	GB41201G102000	Scheme:	Egremont Boreholes (New)			
		Water body Name:	West Cumbria Permo-Triassic Sandstone Aquifers	Reference	WR119b			
		RBMP:	North West GW	Scheme Phase	Construction		Operational	
		Operational catchment:	West Cumbria Permo-Triassic Sandstone Aquifers	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	Not identified					
		Downstream water bodies:	Not identified					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>New groundwater abstraction.</b> Medium level of impact. New abstraction of 10 M/d from three new boreholes at Sandwith, Rottington and Moor Platts, plus a refurbished borehole at Catgill (2.5 M/d per borehole).</p> <p>The ALS states that there is groundwater available from the West Cumbria Groundwater Management Unit. There is surface water available across the flow regime in the water bodies associated with the three new boreholes, but no water available across the flow regime in the surface water body associated with the refurbished Catgill borehole (River Ehen). There is likely to be a strong hydraulic connection between the principal sandstone aquifer and the overlying surface water bodies, so while the new abstraction is unlikely to have a significant effect on the quantitative water balance of the groundwater body as a whole, it may have an impact on the quantitative status of dependent surface water bodies. The boreholes are also located close to the coast so consideration should be given to the potential for saline intrusion into the aquifer. A new abstraction licence would be required from the Environment Agency.</p> <p><b>Use of new transfer pipe line, and pumping station.</b> No or minimal impact.</p>	Medium
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
Quantitative Water Balance	Good							
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
Supporting Element	Prevent and Limit Objective	Not provided						
	Trend Assessment	No trend						
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR119b\WR119b Egremont Boreholes (New).xism Abstraction Licensing Strategies (CAMS process): <a href="https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process">https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process</a>





		Water body ID:	GB41101G202600	Scheme:	Cross Hill Boreholes, Wirral		
		Water body Name:	Permo-Triassic Sandstone Aquifers	Reference:	WR120		
		RBMP:	North West GW	Scheme Phase	Construction	Operational	
		Operational catchment:	Cheshire Permo-Triassic Sandstone Aquifers	Impact potential	Direct		Direct
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	Not identified				
		Downstream water bodies:	Not identified				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>New groundwater abstraction quantity.</b> Medium level of impact. New 15 Ml/d abstraction licence from three new boreholes at Cross Hill.</p> <p>The abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body (more water is licensed than the amount available, but recent actual abstractions are lower than the amount available).</p> <p>The option includes revocation of existing licences at Hooton, Gorston and Spring Hill. This will offset the impacts of the new abstraction on the quantitative water balance of the groundwater body as a whole. However, only one of these licences is within the same groundwater body as the Cross Hills site, and all are situated some distance away (5 to 10 km). There may therefore be prolonged or widespread impacts on the Quantitative Dependent Surface Water Body Status, or the Quantitative GWDTEs test status for example.</p> <p><b>Water treatment works.</b> No or minimal impact.</p>
		Quantitative GWDTEs test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good				
		Chemical Drinking Water Protected Area	Poor				
		Chemical GWDTEs test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
	Supporting Elements (Groundwater)	Prevent and Limit Objective	Not provided				
		Trend Assessment	Upward trend				
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\VRZ\WR120\WR120\_Cross Hill BHs.xlsx  
 EA Flood Maps (WYBY): <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap&x=344705&y=5114>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap&x=344705&y=5114>  
 Abstraction Licensing Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>

Water body ID:		GB112068060530		Scheme:		CROSS HILL BOREHOLES, WIRRAL		
Water body Name:		The Birket including Ar		Reference:		WR1201		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Wirral		Impact potential:		Direct		
Designation (and uses):		Heavily modified				Operational		
Relevant upstream water bodies:		Not identified				Direct		
Downstream water bodies:		Mersey						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		New water treatment works. No or minimal impact.	High	New groundwater abstraction quantity to 15MI/d. Medium level of impact. New 15 MI/d abstraction licence from three new boreholes at Cross Hill. The abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body, but water available across all flows in the surface water body. The option includes revocation of existing licences at Hooton, Gorston and Spring Hill which may offset the impacts of the new abstraction. However the exact location and the licenced quantities of these abstractions is unknown and there may be strong connections between surface waters and the sandstone aquifer, meaning this moderately sized new abstraction may have an impact on the hydrological regime of the surface water body.	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Not provided					
		Benthic invertebrates	Poor					
		Fish	Poor					
	Hydro-morphology	Hydrological regime	Supports good					New abstraction well drilling. No or minimal impact.
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high except: Ammonia-moderate, BOD-moderate, Dissolved oxygen- bad and Phosphate- poor					New abstraction well headworks / surface structures. No or minimal impact.
		Specific pollutants:	All high					
Priority hazardous substances		All good						
WFD elements for Rivers: Chemical	Priority substances	Does not require assessment						
	Overall Status/Potential							
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which wo 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR120\WR120_Cross Hill Boreholes, Wirral.docx Abstraction Licensing Strategy (Lower Mersey and Alt): <a href="https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy">https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy</a>

Water body ID:		GB41101G202600		Scheme:		CROSS HILL BOREHOLES, WIRRAL	
Water body Name:		Wirral and West Cheshire Permo-Triassic Sandstone Aquifers		Reference		WR120i	
RBMP:		North West GW		Scheme Phase		Construction	
Operational catchment:		Cheshire Permo-Triassic Sandstone Aquifers		Impact potential		Direct	
Designation (and uses):		No designation				Operational	
Relevant upstream water bodies:		Not identified				Direct	
Downstream water bodies:		Not identified					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	Good			<p><b>New water treatment works.</b> No or minimal impact.</p> <p><b>New abstraction well drilling.</b> Minor level of impact.</p> <p><b>New abstraction well headworks / surface structures.</b> No or minimal impact.</p>	High	<p><b>New groundwater abstraction quantity.</b> Medium level of impact. New 15 Ml/d abstraction licence from three new boreholes at Cross Hill. The abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body, however the option includes revocation of existing licences at Hooton, Gorston and Spring Hill. This may offset the impacts of the new abstraction, but the exact location and the licenced quantities of these abstractions is unknown.</p> <p><b>Water treatment works.</b> No or minimal impact.</p>
	Quantitative GWDTes test	Good					
	Quantitative Saline Intrusion	Good					
	Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Dependent Surface Water Body Status	Good					
	Chemical Drinking Water Protected Area	Poor					
	Chemical GWDTes test	Good					
	Chemical Saline Intrusion	Good					
	General Chemical Test	Good					
	Prevent and Limit Objective	Not provided					
Supporting Elements (for Groundwater)	Trend Assessment	Upward trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on the watercourse. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estua 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR120\WR120_Cross Hill Boreholes, Wirral.docx Abstraction Licensing Strategy(Lower Mersey and Alt): <a href="https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy">https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy</a>

Water body ID:		GB112068055440		Scheme:		EATON BOREHOLES (Hollins Hill)			
Water body Name:		Wettenhall Brook		Reference		WR121a			
RBMP:		North West		Scheme Phase		Construction			
Operational catchment:		Weaver Upper		Impact potential		Direct			
Designation (and uses):		No designation				Operational			
						Direct			
Relevant upstream water bodies:		-							
Downstream water bodies:		Ash Brook (Darley Brook to Weaver)							
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Transfer pipe line on land. No or minimal impact.  New water treatment works. No or minimal impact.  New pumping station. No or minimal impact.  Abstraction well refurbishment. No or minimal impact.  Modified abstraction well headworks / surface structures. No or minimal impact.	High	New / increased groundwater abstraction quantity Minor level of impact. Restart abstraction from two refurbished boreholes at Eaton. Planned yield is 4.2 - 6.7 M/d, within the current abstraction licence of 7.3 M/d.  No Groundwater Management Unit is defined in the ALS for this area, but surface water is available across the whole flow regime. Given the availability of surface water and that the boreholes are already licensed a widespread or prolonged impact on WFD status is unlikely.  New transfer pipe line, pumping station and water treatment works. No or minimal impact.	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	Poor						
		Benthic invertebrates	Good						
		Fish	Good						
	Hydrographology	Hydrological regime	Supports Good						
		River continuity	-						
		Morphological conditions	Supports Good						
		Physico-chemical	General physico-chemical	Moderate					
			Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Parent	Ecological	Good	Good by 2027	NA					
	Chemical	Good	Good by 2027	NA					
	Overall	Good	Good by 2027	NA					

Assumptions
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma: <a href="http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102a/WR102a">www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102a/WR102a</a>
Abstraction licensing strategy (Weaver and Dane): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lti_7884_52">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lti_7884_52</a>

		Water body ID:	GB41202G9	Scheme:	EATON BOREHOLES (Hollins Hill)				
		Water body Name:	Weaver and Reference	WR121a					
		RBMP:	North West	Scheme Phase		Construction		Operational	
		Operational catchment:	Weaver and	Impact potential		Direct		Direct	
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	N/A						
		Downstream water bodies:	N/A						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good			Transfer pipe line on land. No or minimal impact.	High	New / increased groundwater abstraction quantity Minor level of impact. Restart abstraction from two refurbished boreholes at Eaton. Planned yield is 4.2 - 6.7 Ml/d, within the current abstraction licence of 7.3 Ml/d.	Medium
		Quantitative GWDTes test	Good						
		Quantitative Saline intrusion	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good						
		Chemical dependent	Poor						
		Chemical Drinking Water Protected Area	Good						
WFD elements for Groundwater: Supportting Elements	Supporting Elements	Chemical GWDTes test	Poor						
		Chemical Saline intrusion	Good						
		General Chemical Test	Poor						
		Prevent and Limit Objective	-						
		Trend Assessment	Upward trend						
Overall Status-Potential	Quantitative	Good	Good by 2027	N/A					
	Chemical (GW)	Good	Good by 2027	N/A					
	Overall	Good	Good by 2027	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102a/WR102a_Widnes_BHs_to_Prescol_d.pdf">http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102a/WR102a_Widnes_BHs_to_Prescol_d.pdf</a> Abstraction licensing strategy (Weaver and Dane): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/ir_7884_52dcff.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/ir_7884_52dcff.pdf</a>



		Water body ID:	GB41202G9	Scheme:	EATON BOREHOLES (Mid Cheshire Main)			
		Water body Name:	Weaver and Reference	WR121b				
		RBMP:	North West	Scheme Phase		Construction		
		Operational catchment:	Weaver and	Impact potential		Direct		
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good			High	Medium	
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good					
		Chemical dependent	Poor					
		Chemical Drinking Water Protected Area	Good					
WFD elements for Groundwater: Supportting Elements	Supporting Elements	Chemical GWDTes test	Poor					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Poor					
		Prevent and Limit Objective	-					
		Trend Assessment	Upward trend					
Overall Status-Potential		Quantitative	Good	Good by 2027	N/A			
		Chemical (GW)	Good	Good by 2027	N/A			
		Overall	Good	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102b/WR102b_Widnes_BHs_to_Liverpool.pdf">http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR102b/WR102b_Widnes_BHs_to_Liverpool.pdf</a> Abstraction licensing strategy (Weaver and Dane): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/ir_7884_52dcff.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/ir_7884_52dcff.pdf</a>





		Water body ID:	GB41101G202600	Scheme:	Newton Hollows Boreholes		
		Water body Name:	Permo-Triassic Sandstone Aquifers	Reference	WR122		
		RBMP:	North West GW	Scheme Phase	Construction	Operational	
		Operational catchment:	Permo-Triassic Sandstone Aquifers	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	N/A				
		Downstream water bodies:	N/A				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Cumulative Dependent Surface Water Body	Good			High	Medium
		Quantitative GWDTEs test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good				
		Chemical Drinking Water Protected Area	Poor				
		Chemical GWDTEs test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	Not provided				
Supporting Elements	Trend Assessment	Upward trend					
	Overall Status/Potential	Quantitative	Good	Good by 2015	N/A		
		Chemical (GW)	Poor	Good by 2027	N/A		
		Overall	Poor	Good by 2027	N/A		

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in-channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers proforma: <a href="\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR122\WR122 - Newton Hollows BHs.xlsm">\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR122\WR122 - Newton Hollows BHs.xlsm</a> Abstraction Licence Strategy (Lower Mersey and Alt): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf</a>

Water body ID:		GB109054055150	Scheme:	Bearstone Boreholes				
Water body Name:		Tern- source to conf Loggerheads Bk	Reference	WR125				
RBMP:		Severn Middle Shropshire	Scheme Phase	Construction		Operational		
Operational catchment:		North Shropshire	Impact potential	Direct		Direct		
Designation (and uses):		No designation						
Relevant upstream water bodies:		Not identified						
Downstream water bodies:		Tern- conf Loggerheads Bk to conf Bailey Bk						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		High	New / increased groundwater abstraction quantity. Medium level of impact. Restart groundwater abstraction from two refurbished boreholes near Bearstone. Abstraction rates of 4.98 - 6.36 M/d, within the current abstraction licence quantity.  The ALS identifies that water is not available from the groundwater management unit, and is limited at Q50, Q70 and Q95 (available at Q30) in the surface water body. The ALS will take the current abstraction licence into account. Given the restricted availability of water, and the proximity to the River Tern, restarting the moderately sized abstraction could have an impact on the hydrological regime of the surface water body.	Medium	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Moderate					
		Benthic invertebrates	High					
		Fish	Good					
	Hydro-morphology	Hydrological regime	Does not support good					
		River continuity	Not provided					
		Morphological conditions	Supports good					
		Physico-chemical	General physico-chemical	All high except: Phosphahte-poor				
			Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status\ Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

Assumptions	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>	

Evidence	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR125\WR125\EA Abstraction Licence Strategy (Shropshire and Middle Sever): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/f">https://www.gov.uk/government/uploads/system/uploads/attachment_data/f</a></p>	

		Water body ID:	GB40901G300100	Scheme:	Bearstone Boreholes			
		Water body Name:	Shropshire Middle Severn-PT Sandstone East Shropshire	Reference	WR125			
		RBMP:	Severn England GW	Scheme Phase	Construction		Operational	
		Operational catchment:	Shropshire Middle Severn-PT Sandstone East Shropshire	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Poor			High	Medium	Medium
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Poor					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					
		Chemical Drinking Water Protected Area	Poor					
		Chemical GWDTes test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Poor					
		Prevent and Limit Objective	Not provided					
		Trend Assessment	Upward trend					
Overall Status/Potential	Supporting Elements	Quantitative	Poor	Poor by 2015	N/A			
		Chemical (GW)	Poor	Good by 2050	N/A			
		Overall	Poor	Poor by 2015	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR125/WR125_Bearstone_Boreholes.xlsx">WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR125/WR125_Bearstone_Boreholes.xlsx</a> EA Abstraction Licence Strategy (Shropshire and Middle Severn): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291395/LIT_5393_7eeda4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291395/LIT_5393_7eeda4.pdf</a>

		<b>Water body ID:</b>	GB102076073910	<b>Scheme:</b>	TARN WOOD (NORTH EDEN TO CARLISLE)			
		<b>Water body Name:</b>	Pow Maughan Beck	<b>Reference</b>	WR128			
		<b>RBMP:</b>	Solway Tweed	<b>Scheme Phase</b>	<b>Construction</b>	<b>Operational</b>		
		<b>Operational catchment:</b>	Eden lower	<b>Impact potential</b>	<b>Direct</b>		<b>Direct</b>	
		<b>Designation (and uses):</b>						
		<b>Relevant upstream water bodies:</b>	-					
		<b>Downstream water bodies:</b>	Eden - Eamont to tidal					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytoplankton	-			High	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	Good					
		Fish	Poor					
	Hydro-morphology	Hydrological regime	High					
		River continuity	-					
		Morphological conditions	-					
		General physico-chemical	Moderate (High for ph)					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671\_UU WRMP Support\5 Design\Feasible Options\Carlisle\WR128\WR128\_Tam Wood (North Eden to Carlisle).docx  
 Abstraction Licensing Strategy (Eden and Esk): <https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy>

		Water body ID:	GB40201G1	Scheme:	TARN WOOD (NORTH EDEN TO CARLISLE)			
		Water body Name:	Eden Valley	Reference	WR128			
		RBMP:		Scheme Phase	Construction		Operational	
		Operational catchment:	Eden Valley	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	Increased groundwater abstraction quantity. Minor level of impact. Increased groundwater abstraction from 2.3 Ml/d to 4 Ml/d from refurbished boreholes at Tarn Wood. It is unclear if an increase in annual licence quantity is required. The abstraction licensing strategy (ALS) indicates that there is water available in the groundwater body and the increases in daily quantity is relatively small.	Medium
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good					
		Chemical Dependent	Good					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTes test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Supporting Elements	Prevent and Limit Objective	-				
	Trend Assessment	Upward Trend						
Overall Status/Potential		Quantitative	Good	Good by 2027	N/A			
		Chemical (GW)	Good	Good by 2027	N/A			
		Overall	Good	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Carlisle\WR128\WR128 Tarn Wood (North Eden to Carlisle).doc

Abstraction Licensing Strategy (Eden and Esk): <https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy>

Water body ID:		GB102075073410		Scheme:		NORTH CUMBRIA BOREHOLES		
Water body Name:		Wampool (Upper)		Reference		WR129		
RBMP:		Solway Tweed		Scheme Phase		Construction		
Operational catchment:		Waver-Wampool		Impact potential		Direct		
Designation (and uses):		No designation						
Relevant upstream water bodies:		(Wampool), Wiza Beck						
Downstream water bodies:		Pow Beck (Wampool)						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	<p><b>New / increased groundwater abstraction quantity</b>                      Minor level of impact. New groundwater abstraction of 2 M/d from a new borehole at Thursby. This is part of a larger scheme of two new boreholes at Thursby and Waverton (2 M/d each), and continuation of abstraction from existing boreholes at Scales (6 M/d). Total scheme abstraction of 10 M/d, 6 M/d of which is licenced at Scales, but will expire in 2022.</p> <p>There is no groundwater management unit defined for the secondary aquifer in the ALS. The surface water body for the Thursby borehole has limited water availability at Q95 but water available at medium and higher flows. As the proposed abstraction is relatively small, surface water is generally available, and there may not be good hydraulic connectors between the secondary aquifer and surface water courses, it is unlikely that the new abstraction would have a widespread or prolonged effect on the hydrological regime of the surface water body. A new abstraction licence will be required from the Environment Agency.</p> <p><b>Use of new transfer pipe line.</b>                      No or minimal impact.</p>	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	High					
		Benthic invertebrates	Good					
		Fish	Poor					
	Hydro-morphological (eg)	Hydrological regime	Supports Good					
		River continuity	-					
		Morphological conditions	Supports Good					
		Physico-chemical	General physico-chemical	Moderate (High for ph)				
			Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Feasible\\_Options/IRZ/WR129/WR129\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Eden\\_and\\_Esk\).htm](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZ/WR129/WR129_EA_Abstraction_Licence_Strategy_(Eden_and_Esk).htm); [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_Aquifer\\_designation\\_map.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_Aquifer_designation_map.pdf)  
 Aquifer designation map: <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>

		Water body ID:	GB102075073440	Scheme:	NORTH CUMBRIA BOREHOLES			
		Water body Name:	Waver	Reference	WR129			
		RBMP:	Solway Tweed	Scheme Phase				
		Operational catchment:	Waver-Wampool	Impact potential	Construction	Operational		
		Designation (and uses):	Not designated		Direct	Direct		
		Relevant upstream water bodies:	Holme Dub					
		Downstream water bodies:	Solway					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	<p><b>New / increased groundwater abstraction quantity</b>                      Minor level of impact. New groundwater abstraction of 2 M/d from a new borehole at Waverton. This is part of a larger scheme of two new boreholes at Thursby and Waverton (2 M/d each), and continuation of abstraction from existing boreholes at Scales (6 M/d). Total scheme abstraction of 10 M/d, 6 M/d of which is licenced at Scales, but will expire in 2022.</p> <p>There is no groundwater management unit defined for the secondary aquifer in the ALS. The surface water body for the Waterton borehole has water available at all flows. As the proposed abstraction is relatively small, surface water is available, and there may not be good hydraulic connections between the secondary aquifer and surface water courses, it is unlikely that the new abstraction would have a widespread or prolonged effect on the hydrological regime of the surface water body. A new abstraction licence will be required from the Environment Agency.</p> <p><b>Use of new transfer pipe line.</b>                      No or minimal impact.</p>	
		Macrophytes						
		Macrophytes and phytobenthos	Moderate					
		Benthic invertebrates	Moderate					
		Fish	Good					
	Hydromorphology	Hydrological regime	Supports Good					<p><b>Transfer pipe line on land.</b>                      No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b>                      Minor level of impact.</p> <p><b>New abstraction well drilling.</b>                      No or minimal impact.</p> <p><b>New abstraction well headworks / surface structures.</b>                      No or minimal impact.</p>
		River continuity	-					
Morphological conditions		-						
Physico-chemical	General physico-chemical	Good						
	Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR129\WR129\_North Cumbria Boreholes.docx  
 EA Abstraction Licence Strategy (Eden and Esk): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1384b1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf)  
 Aquifer designation map: <http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>



Water body ID:		GB102075073480		Scheme:		NORTH CUMBRIA BOREHOLES			
Water body Name:		Dub		Reference		WR129			
RBMP:		Solway Tweed		Scheme Phase		Construction			
Operational catchment:		Ellen and West Coast		Impact potential		Direct			
Designation (and uses):		No designation				Operational			
						Direct			
Relevant upstream water bodies:		Holme Dub							
Downstream water bodies:		Waver							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			Transfer pipe line on land. No or minimal impact.	High	<p><b>New / increased groundwater abstraction quantity</b></p> <p>Minor level of impact. Continued abstraction from existing boreholes at Scales after 2022. This is part of a larger scheme of two new boreholes at Thursby and Waverton (2 M/d each), and continuation of abstraction from existing boreholes at Scales (6 M/d). Total scheme abstraction of 10 M/d, 6 M/d of which is licenced at Scales, but will expire in 2022.</p> <p>The ALS indicates that there is water available from this groundwater body. This surface water body has limited water available at Q95, but water available at medium and higher flows. Given that the sources are already licenced and currently in use (the ALS takes current abstractions into account) and that there is generally water available, it is unlikely that continuing abstraction from the scales boreholes would have a widespread or prolonged effect on the hydrological regime of the surface water body. A new abstraction licence would be required after 2022 from the Environment Agency.</p> <p><b>Use of new transfer pipe line.</b> No or minimal impact.</p>	Medium
		Macrophytes	-						
		Macrophytes and phytobenthos	Good						
		Benthic invertebrates	Good						
		Fish	Bad						
	Hydro-morphology	Hydrological regime	Supports good						
		River continuity	-						
		Morphological conditions	Supports Good						
		General physico-chemical	Moderate (High for ph)						
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Good	Good by 2027	N/A					
	Chemical	Good	Good by 2027	N/A					
	Overall	Good	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR129\WR129\_No EA Abstraction Licence Strategy (Eden and Esk); [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1)

Water body ID:		GB40202G100900		Scheme:		NORTH CUMBRIA BOREHOLES			
Water body Name:		Triassic and Jurassic Aquifers		Scheme Phase		Construction		Operational	
RBMP:		Solway Tweed		Reference		WR129			
Operational catchment:		Triassic and Jurassic Aquifers		Impact potential		Direct		Direct	
Designation (and uses):		N/A							
Relevant upstream water body(ies)		N/A							
Downstream water body(ies)		N/A							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good	Good by 2015		<p>Transfer pipe line on land. No or minimal impact.</p> <p>Transfer pipe line with water course crossings. No or minimal impact.</p> <p>New abstraction well drilling. Minor level of impact.</p> <p>New abstraction well headworks / surface structures. No or minimal impact.</p>	High	<p><b>New / increased groundwater abstraction quantity</b> Minor level of impact. New groundwater abstraction of 2 M/d from a new borehole at Thursby and 2 M/d from a new borehole at Waverton. This is part of a larger scheme of two new boreholes at Thursby and Waverton (2 M/d each), and continuation of abstraction from existing boreholes at Scales (6 M/d). Total scheme abstraction of 10 M/d, 6 M/d of which is licenced at Scales, but will expire in 2022.</p> <p>There is no groundwater management unit defined for this secondary aquifer in the ALS. The surface water body for the Thursby borehole has limited water availability at Q95 but water available at medium and higher flows. The surface water body for the Waverton borehole has water available at all flows. As the proposed abstractions are relatively small, surface water is generally available, it is unlikely that the new abstractions would have a widespread or prolonged effect on the quantitative water balance of the groundwater body or on dependent surface water bodies. A new abstraction licence will be required from the Environment Agency.</p> <p><b>New Transfer Pipe Line</b> No or minimal impact.</p>	Medium
		Quantitative GWDEs test	Good	Good by 2015					
		Quantitative Saline Intrusion	Good	Good by 2015					
		Quantitative Water Balance	Good	Good by 2015					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good	Good by 2015					
		Chemical Drinking Water Protected Area	Good	Good by 2015					
		Chemical GWDEs test	Good	Good by 2015					
		Chemical Saline Intrusion	Good	Good by 2015					
		General Chemical Test	Good	Good by 2015					
		Prevent and Limit Objective	n/a						
Overall Status/Potential	Supporting Elements (Groundwater)	Trend Assessment	No trend						
		Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Good	Good by 2015	N/A				
Overall	Good	Good by 2015	N/A						

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry workin 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feas EA Abstraction Licence Strategy (xxx).

		Water body ID:	GB40201G100400	Scheme:	NORTH CUMBRIA BOREHOLES		
		Water body Name:	Eden Valley and Carlisle Basin Permo-Triassic sandstone aquifers	Reference	WR129		
		RBMP:	Solway tweed	Scheme Phase	Construction	Operational	
		Operational catchment:	Eden Valley and Carlisle Basin Permo-Triassic sandstone aquifers	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	NIA				
		Downstream water bodies:	NIA				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good			High	<p>Use of new transfer pipe line. No or minimal impact.</p> <p><b>New / increased groundwater abstraction quantity</b> Minor level of impact. Continued abstraction from existing boreholes at Scales after 2022. This is part of a larger scheme of two new boreholes at Thursby and Waverton (2 Ml/d each), and continuation of abstraction from existing boreholes at Scales (6 Ml/d). Total scheme abstraction of 10 Ml/d, 6 Ml/d of which is licenced at Scales, but will expire in 2022.</p> <p>The ALS indicates that there is water available from this groundwater body. The overlying surface water body has limited water available at Q95, but water available at medium and higher flows. Given that the sources are already licenced and currently in use (the ALS takes current abstractions into account) and that there is generally water available, it is unlikely that continuing abstraction from the scales boreholes would have a widespread or prolonged effect on the quantitative water balance of the water body or the overlying dependent surface water body. A new abstraction licence would be required after 2022 from the Environment Agency.</p>
		Quantitative GWDTes test	Good				
Quantitative Saline Intrusion	Good						
Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTes test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	-				
WFD elements for Groundwater: Supporting Elements	Supporting Element	Trend Assessment	Upward Trend				
		Overall Status/Potential	Good	Good by 2027	NIA		
Overall Status/Potential	Quantitative	Good	Good by 2027	NIA			
	Chemical (GW)	Good	Good by 2027	NIA			
	Overall	Good	Good by 2027	NIA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WRZ\WR129\WR129\_North Cumbria Boreholes.docx  
 EA Abstraction Licence Strategy (Eden and Esk): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1384b1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf)

Water body ID:		GB112070064850		Scheme:		HORWICH WwTW – FINAL EFFLUENT REUSE		
Water body Name:		Douglas - Upper		Reference:		WR140		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Douglas OC		Impact potential:		Direct		
Designation (and uses):		Heavily modified				Operational		
Relevant upstream water bodies:		Not identified				Direct		
Downstream water bodies:		Buckhow (Hic Bibbi) Brook						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		New surface water intake. Minor level of impact.  Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New pumping station. Minor level of impact.  Modified water treatment works. No or minimal impact.	High	New surface water abstraction quantity. Medium level of impact. New surface water abstraction from Pearl Brook/River Douglas near Horwich of 5 Mld. In the ALS water is identified as available at all flows (Q30, Q50, Q70 and Q95) however the abstraction is moderate in size and could have a widespread or prolonged effect on the hydrological regime of the River Douglas. A new abstraction licence would be required to be issued by the Environment Agency.	High
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	High					
		Benthic invertebrates	Moderate					
		Fish	Not provided					
	Hydro-morphology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
		General physico-chemical	All high except: Ammonia-moderate and Phosphate-moderate.					
		Specific pollutants:	All high					
WFD elements for Rivers: Chemical	Priority hazardous substances	All good						
	Priority substances	All good						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which wo
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR140\WR14  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/](https://www.gov.uk/government/uploads/system/uploads/attachment_data/)

Water body ID:		GB41202G100300		Scheme:		HORWICH WwtW – FINAL EFFLUENT REUSE	
Water body Name:		Douglas, Darwen and Calder Carboniferous Aquifers		Reference:		WR140	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Douglas, Darwen and Calder Carboniferous Aquifers		Impact potential		Operational	
Designation (and uses):		No designation		Direct		Direct	
Relevant upstream water bodies:		Not identified					
Downstream water bodies:		Not identified					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Medium
		Quantitative GWDTEs test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTEs test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
	Supporting Elements (groundwater)	Prevent and Limit Objective	Not provided				
		Trend Assessment	Upward trend				
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time when 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR140\EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/38671/gos1061_Combined_WFD_Report_Appendices_v1.xlsx">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/38671/gos1061_Combined_WFD_Report_Appendices_v1.xlsx</a>

Water body ID:		GB112069064641		Scheme:		Rossendale WwTW- Final Effluent Reuse			
Water body Name:		Irwell (Cowpe Bk to Rossendale STW)		Reference		WR141			
RBMP:		Irwell		Scheme Phase		Construction			
Operational catchment:		Croal Irwell		Impact potential		Operational			
Designation (and uses):		Heavily modified				Direct			
Relevant upstream water bodies:		Brook, Limy Water and							
Downstream water bodies:		Irwell (Rossendale STW to Roch)							
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New surface water intake. Minor level of impact.  New pumping station. Minor level of impact.  Modified water treatment works. No or minimal impact.	High	Use of new transfer pipe line, water treatment works, pumping station and surface water intake. No or minimal impact.  New surface water abstraction quantity. Medium level of impact. New abstraction from the River Irwell, downstream of Rossendale WwTW of 10 Ml/d. In the ALS water is identified as available at all flows (Q30, Q50, Q70 and Q95) however the abstraction is moderate in size and could have a widespread or prolonged effect on the hydrological regime of the River Irwell. A new abstraction licence would be required to be issued by the Environment Agency.	Medium	
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	Moderate						
		Benthic invertebrates	Good						
		Fish	Not provided						
	Hydromorphology	Hydrological regime	Supports good						
		River continuity	Not provided						
		Morphological conditions	Not provided						
		Physico-chemical	General physico-chemical	All high except: pH- moderate and Phosphate- moderate					
			Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR141/WR141\\_Ros](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR141/WR141_Ros)  
 Abstraction Licensing Strategies (Northern Manchester): <https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-pro>

Water body ID:		GB41202G101800		Scheme:		Rossendale WwTW- Final Effluent Reuse		
Water body Name:		Northern Manchester Carboniferous Aquifers		Reference		WR141		
RBMP:		North West GW		Scheme Phase		Construction		
Operational catchment:		Northern Manchester Carboniferous Aquifers		Impact potential		Operational		
Designation (and uses):		No designation						
Relevant upstream water bodies:		Not identified						
Downstream water bodies:		Not identified						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Use of new transfer pipe line, water treatment works, pumping station and surface water intake. No or minimal impact.	Medium
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor			High	Minor level of impact. New surface water abstraction from the River Inwell, downstream of Rossendale WwTW of 10 M/d. The ALS does not identify a groundwater management unit for this area. Due to the moderate size of the proposed abstraction there may be reductions in leakage from the river to the aquifer. However due to the availability of water in the surface water body it is likely that these would be localised, and the secondary aquifer is unlikely to be highly dependent on leakage from surface water courses to maintain its quantitative water balance.	Medium
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	Not provided					
Trend Assessment	Upward trend							
Overall Status (Potential)	Supporting Element	Quantitative	Good	Good by 2015	N/A	High		Medium
		Chemical (GW)	Poor	Good by 2027	N/A			
		Overall	Poor	Good by 2027	N/A			

Assumptions	
1-	Application of standard best practice construction and pollution prevention methods.
2-	Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3-	Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4-	New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5-	A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6-	Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7-	Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8-	Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence	
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>	
Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/WRZ/WR141/WR141_Rossendale_EFR.xlsx">WAR-FS1.global.amec.com/shared/Projects/38671_UU WRMP Support/5 Design/Feasible Options/WRZ/WR141/WR141_Rossendale_EFR.xlsx</a>	
Abstraction Licensing Strategies (Northern Manchester): <a href="https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process">https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process</a>	

Water body ID:		GB112071065490	Scheme:		HYNDBURN WWTW – FINAL EFFLUENT REUSE				
Water body Name:		Calder - Pendle Water to conf Ribble	Reference		WR142				
RBMP:		North West	Scheme Phase		Construction		Operational		
Operational catchment:		Calder	Impact potential		Direct		Direct		
Designation (and uses):		No designation							
Relevant upstream water bodies:		Green Brook, Hyndburn Brook - Lower, Pendle Water - Colne Water to							
Downstream water bodies:		Ribble - conf Calder to tidal							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytoplankton	-		<p><b>New surface water intake.</b> Minor level of impact.</p> <p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> Minor level of impact.</p> <p><b>New pumping station.</b> Minor level of impact.</p> <p><b>Modified water treatment works.</b> No or minimal impact.</p>	<p><b>High</b></p>	<p><b>Use of new transfer pipe line, pumping station, and water treatment works.</b> No or minimal impact.</p> <p><b>New surface water abstraction quantity.</b> Medium level of impact. New surface water abstraction from the River Calder downstream of Hyndburn of up to 10 Ml/d . In the ALS water is identified as available at all flows (Q30, Q50, Q70 and Q95) however the abstraction is moderate in size and could have a medium impact on the hydrological regime of the River Calder. A new abstraction licence would be required to be issued by the Environment Agency.</p>	<p><b>Medium</b></p>	
		Macrophytes	-						
		Macrophytes and phytoplankton	Moderate						
		Benthic invertebrates	Good						
		Fish	Good						
	Hydro-morphology	Hydrological regime	-						
		River continuity	-						
		Morphological conditions	-						
		General physico-chemical	Moderate						
		Specific pollutants:	High						
WFD elements for Rivers: Chemical	Priority hazardous substances	Good							
	Priority substances	Good							
Overall Status/Potential	Ecological	Good	Good by 2027	N/A					
	Chemical	Good	Good by 2027	N/A					
	Overall	Good	Good by 2027	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR142\WR142_Hyndburn_EF">\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR142\WR142_Hyndburn_EF</a> EA Abstraction Licence Strategy (Aire and Calder): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/117919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/117919v3_f881c4.pdf</a>



Water body ID:		GB41202G100300		Scheme:		HYNDBURN WwTW – FINAL EFFLUENT REUSE	
Water body Name:		Douglas, Darwen and Calder Carboniferous Aquifers		Reference:		WR142	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Douglas, Darwen and Calder Carboniferous Aquifers		Impact potential		Operational	
Designation (and uses):		No designation		Direct		Direct	
Relevant upstream water bodies:		Not identified					
Downstream water bodies:		Not identified					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Medium
		Quantitative GWDTEs test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor				
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTEs test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
	Supporting Elements (groundwater)	Prevent and Limit Objective	Not provided				
		Trend Assessment	Upward trend				
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time when no water is present. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings will be installed via a trench and cover technique within a dry working area. New pipe line crossings will be installed via a trench and cover technique within a dry working area. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR142 EA Abstraction Licence Strategy (Aire and Calder): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/L1791">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/L1791</a>

Water body ID:		GB112069061111		Scheme:		Saddleworth and Mossley Top- Final Effluent Reuse		
Water body Name:		Tame (Chew Brook to Mersey)		Reference		WR144		
RBMP:		Mersey Upper		Scheme Phase		Construction		
Operational catchment:		Goyt Etherow Tame		Impact potential		Operational Direct		
Designation (and uses):		Heavily Modified						
Relevant upstream water bodies:		Source to Chew						
Downstream water bodies:		Tame (Swineshaw Brook to Mersey)						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New pumping station. Minor level of impact.  New / modified water treatment works. Minor level of impact.	Medium	New surface water abstraction quantity. Minor level of impact. A new abstraction licence would be granted by the Environment Agency (assuming the proposed abstraction quantity would not have a detrimental effect on WFD status) of 5 Ml/d from the River Tame, downstream of Mossley Top WwTW, utilising discharges from both Mossley Top and Saddleworth WwTWs. The ALS (Abstraction Licensing Strategy) indicates that there is water available at all flow regimes (Q95, Q70, Q50 and Q30).  Use of new pipe line, pumping station and water treatment works. No or minimal impact.	Medium
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Not provided					
		Benthic invertebrates	Moderate					
		Fish	Not provided					
	Hydromorphology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high/good					
		Specific pollutants:	All high					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Good						
Overall Status / Potential	Ecological	Moderate	Moderate by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Moderate by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR2\WR144\WR144 Saddleworth Mossley Top.xlsx  
 EA Flood Maps (W1YBY): <http://maps.environment-agency.gov.uk/w1yby/w1yby/Controller?x=357683.0&y=355134.0&scale=1&layerGroups=default&map=map&textonly=off&lang=en&topic=floodmap#x=344705&y=511476&l=1,2,10,&scale=7>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/w1yby/w1yby/Controller?x=357683.0&y=355134.0&scale=1&layerGroups=default&map=map&textonly=off&lang=en&topic=floodmap#x=344705&y=511476&l=1,2,10,&scale=7>  
 Abstraction Licensing Strategies (Upper Mersey): <https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy>

Water body ID:		GB41202G102900	Scheme:		Saddleworth and Mossley Top- Final Effluent Reuse		
Water body Name:		Manchester and East Cheshire Carboniferous Aquifers	Reference		WR144		
RBMP:		North West GW	Scheme Phase		Construction	Operational	
Operational catchment:		Manchester and Cheshire East Carboniferous Aquifers	Impact potential		Direct	Direct	
Designation (and uses):		No designation					
Relevant upstream water bodies:		Not identified					
Downstream water bodies:		Not identified					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence			Confidence
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	Good		High	New surface water abstraction quantity. No or minimal impact. Increased surface water abstraction may result in localised minor reductions in leakage from rivers to the aquifer. However, these mainly secondary aquifers consisting of Coal Measures and Millstone Grit rocks are unlikely to be heavily reliant on river leakage to support water resources. The ALS also indicates that water is available in the surface water body across the flow regime (Q95, Q70, Q50 and Q30), indicating this relatively small proposed abstraction (5 Ml/d) is unlikely to reduce flows sufficiently to impact on leakage from the River Tame to the groundwater body.	Medium	
	Quantitative GWDTes test	Good					
	Quantitative Saline Intrusion	Good					
	Quantitative Water Balance	Good					
	Chemical Dependent Surface Water Body Status	Good	Transfer pipe line on land. No or minimal impact.				
	Chemical Drinking Water Protected Area	Poor	Transfer pipe line with water course crossings. No or minimal impact.				
	Chemical GWDTes test	Good	New pumping station. No or minimal impact.				
	Chemical Saline Intrusion	Good	New / modified water treatment works. No or minimal impact.				
	General Chemical Test	Good					
	Prevent and Limit Objective	Not provided					
Overall Status/ Permit all	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671\\_UU\\_WRMP\\_Support\5\\_Design\Feasible\\_Options\WRZ\WR144\WR144\\_Saddleworth\\_Mossley\\_Top.xlsx](\\WAR-FS1.global.amec.com\shared\Projects\38671_UU_WRMP_Support\5_Design\Feasible_Options\WRZ\WR144\WR144_Saddleworth_Mossley_Top.xlsx)

EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&eg=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&le=1,2,10,&scale>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/historical-landfill/>

Abstraction Licensing Strategies (Upper Mersey): <https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy>

Water body ID:		GB112069061452		Scheme:		Davyhulme- Final Effluent Reuse			
Water body Name:		Irwell/ Manchester Ship Canal (Irk to confluence with Upper Mersey)		Reference		WR146			
RBMP:		Irwell		Scheme Phase		Construction			
Operational catchment:		Croal Irwell		Impact potential		Operational			
Designation (and uses):		Heavily modified				Direct			
Relevant upstream water bodies:		Folly Brook and Saltey Brook, Irk (Wince to Irwell), Irwell (Croal to Irk) and Medlock (Lumb Brook to Irwell)							
Downstream water bodies:		Mersey/Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin)							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not assessed		High	Use of new transfer pipe line. No or minimal impact.  Decreased surface water discharge quantity. Medium level of impact. Reduction of the existing Davyhulme WwTW discharge to the Manchester Ship Canal by up to 100 Ml/d.  The ALS indicates that there is surface water is available at all flow regimes (Q30, Q70, Q50 and Q30). Although there is water availability (suggesting a surplus), given the large decrease in discharge to the canal there is the potential for widespread or prolonged effects on the hydrological regime.	Medium		
		Macrophytes	Not assessed						
		Macrophytes and phytobenthos	Not assessed						
		Benthic invertebrates	Not assessed						
		Fish	Not assessed						
	Hydrology	Hydrological regime	Supports good	Supports good by 2015					
		River continuity	Not assessed						
		Morphological conditions	Not assessed						
		Physico-chemical	General physico-chemical	All high/ good except: Ammonia- poor, Dissolved oxygen- bad and Phosphate- poor.				Vairable	
			Specific pollutants:	All high				High by 2015	
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015						
	Priority substances	Good	Good by 2015						
Overall Status/ Potential	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR.FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR146\WR146\_Davyhulme  
 Abstraction Licensing Strategy (Lower Mersey and Ait): <https://www.gov.uk/government/publications/lower-mersey-and-ait-abstraction-licensing-strategy>

Water body ID:		GB41201G101100		Scheme:		Davyhulme- Final Effluent Reuse		
Water body Name:		Manchester and East Cheshire Permo-Triassic Sandstone Aquifers		Reference		WR146		
RBMP:		North West GW		Scheme Phase		Construction		
Operational catchment:		Manchester and East Cheshire Permo-Triassic Sandstone Aquifers		Impact potential		Operational		
Designation (and uses):		No designation				Direct		
Relevant upstream water bodies:		Not identified				Direct		
Downstream water bodies:		Not identified						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Poor	Good by 2021		High	Use of new transfer pipe line, water treatment works, and storage reservoir. No or minimal impact.  Decreased surface water discharge quantity. Minor level of impact. Reduction of the existing Davyhulme WwTW discharge to the Manchester Ship Canal by up to 100 Ml/d.  The ALS indicates that there is limited groundwater availability. Given the large decrease in discharge to the canal there is the potential for reductions in leakage to the groundwater body. However, given the availability of surface water, that no changes to the wetted area of the canal are anticipated, and that groundwater - surface water interactions between the engineered canal and the aquifer are expected to be minimal, widespread or prolonged effects in the quantitative water balance of the aquifer are unlikely.	Medium
		Quantitative GWDTes test	Good	Good by 2015				
		Quantitative Saline Intrusion	Poor	Good by 2021				
		Quantitative Water Balance	Good	Good by 2015				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status						
		Chemical Drinking Water Protected Area	Good	Good by 2015				
		Chemical GWDTes test	Good	Good by 2015				
		Chemical Saline Intrusion	Poor	Good by 2021				
		General Chemical Test	Good	Good by 2015				
		Prevent and Limit Objective						
Overall Status/ Potential	Supporting Element	Trend Assessment	Upward Trend					
		Quantitative	Poor	Good by 2021	N/A			
		Chemical (GW)	Poor	Good by 2021	N/A			
Overall	Poor	Good by 2021	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment_planning/">http://environment.data.gov.uk/catchment_planning/</a> Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WRZ\WR146\WR146_Davyhulme_FFR.xlsx Abstraction Licensing Strategy (Lower Mersey and AR): <a href="https://www.gov.uk/government/publications/lower-mersey-and-ait-abstraction-licensing-strategy">https://www.gov.uk/government/publications/lower-mersey-and-ait-abstraction-licensing-strategy</a>

		<b>Water body ID:</b>	GB102076073910	<b>Scheme:</b>	CUMWHINTON BOREHOLES PLUS CASTLE CARROCK LINK			
		<b>Water body Name:</b>	Pow Maughan Beck	<b>Reference</b>	WR148			
		<b>RBMP:</b>	Solway Tweed	<b>Scheme Phase</b>	<b>Construction</b>	<b>Operational</b>		
		<b>Operational catchment:</b>	Eden lower	<b>Impact potential</b>	<b>Direct</b>		<b>Direct</b>	
		<b>Designation (and uses):</b>						
		<b>Relevant upstream water bodies:</b>	-					
		<b>Downstream water bodies:</b>	Eden - Eamont to tidal					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	Good					
		Fish	Poor					
	Hydro-morphology	Hydrological regime	High					
		River continuity	-					
		Morphological conditions	-					
		General physico-chemical	Moderate (High for ph)					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2027	N/A				
	Chemical	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>New pumping station.</b> Minor level of impact.</p> <p><b>New / modified water treatment works.</b> No or minimal impact.</p> <p><b>New abstraction well drilling.</b> No or minimal of impact.</p> <p><b>New abstraction well headworks / surface structures.</b> No or minimal impact.</p>	High	<p><b>New groundwater abstraction quantity.</b> Minor level of impact. New groundwater abstraction of 6.5 Ml/d from two new boreholes at Cumwhinton. The abstraction licensing strategy (ALS) indicates that there is water available in the groundwater body and the surface water body at all flows and the new licence quantity is relatively small.</p> <p><b>Use of pipe lines, pumping station and water treatment works.</b> No or minimal impact.</p>	Medium
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**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671\\_UU WRMP Support\5 Design\Feasible Options\Carlisle\WR148\WR148\\_Cumwhinton BHs\\_Carrock link.docx](\\WAR-FS1.global.amec.com\shared\Projects\38671_UU WRMP Support\5 Design\Feasible Options\Carlisle\WR148\WR148_Cumwhinton BHs_Carrock link.docx)  
 Abstraction Licensing Strategy (Eden and Esk): <https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy>

		Water body ID:	GB40201G	Scheme:	CUMWHINTON BOREHOLES PLUS CASTLE CARROCK LINK			
		Water body Name:	Eden Valley	Reference	WR148			
		RBMP:		Scheme Phase	Construction		Operational	
		Operational catchment:	Eden Valley	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	New groundwater abstraction quantity. Minor level of impact. New groundwater abstraction of 6.5 Ml/d from two new boreholes at Cumwhinton. The abstraction licensing strategy (ALS) indicates that there is water available in the groundwater body and the new licence quantity is relatively small.	Medium
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good					
		Chemical Dependent	Good					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTes test	Good					
		Chemical Saline Intrusion	Good					
WFD elements for Groundwater: Supporting Elements	Supporting Elements	General Chemical Test	Good					
		Prevent and Limit Objective	-					
		Trend Assessment	Upward Trend					
Overall Status/Potential	Quantitative	Good	Good by 2027	N/A				
	Chemical (GW)	Good	Good by 2027	N/A				
	Overall	Good	Good by 2027	N/A				

Assumptions	
1-	Application of standard best practice construction and pollution prevention methods.
2-	Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3-	Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact
4-	New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5-	A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6-	Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7-	Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be
8-	Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence	
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>	
Engineers Proforma: <a href="\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Carlisle\WR148\WR148_Cumwhinton BHs_Carrock link.docx">\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Carlisle\WR148\WR148_Cumwhinton BHs_Carrock link.docx</a>	
Abstraction Licensing Strategy (Eden and Esk): <a href="https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy">https://www.gov.uk/government/publications/eden-and-esk-abstraction-licensing-strategy</a>	

		<b>Water body ID:</b>	GB112068060330	<b>Scheme:</b>	Simmonds Hill- increased WTW Capacity		
		<b>Water body Name:</b>	Peckmill Brook, Hoolpo	<b>Reference</b>	WR153		
		<b>RBMP:</b>	Weaver Gowy	<b>Scheme Phase</b>	Construction	Operational	
		<b>Operational catchment:</b>	Gowy	<b>Impact potential</b>	Direct	Direct	
		<b>Designation (and uses):</b>	No designation				
		<b>Relevant upstream water bodies:</b>	Not identified				
		<b>Downstream water bodies:</b>	Mersey				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	<p><b>Increased groundwater abstraction quantity</b>                      Medium level of impact. Increased abstraction from refurbished boreholes at Simmonds Hill. Abstraction licences are already in place and it is unclear how much additional quantity is required. There are likely to be moderate effects on water quantity as the abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body and limited water availability in the surface water body at Q95 and Q70.</p> <p><b>Water treatment works.</b>                      No or minimal impact</p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Poor				
		Benthic invertebrates	Not provided				
		Fish	Moderate				
	Hydromorphology	Hydrological regime	Supports good				
		River continuity	Not provided				
		Morphological conditions	Not provided				
	Physico-chemical	General physico-chemical	All high except: Ammonia-moderate and Phosphate-moderate				
		Specific pollutants:	All high				
Priority hazardous substances		Does not require assessment					
WFD elements for Rivers: Chemical	Priority substances	Does not require assessment					
	Overall Status/Potential						
Overall Status/Potential	Ecological	Poor	Poor by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Poor	Poor by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671\\_UU\\_WRMP\\_Support\5\\_Design\Feasible Options\WR153\WR153\\_Simmonds Hill.xlsx](\\WAR-FS1.global.amec.com\shared\Projects\38671_UU_WRMP_Support\5_Design\Feasible Options\WR153\WR153_Simmonds Hill.xlsx)  
 EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=5114>  
 EA Historical Landfill: <http://maps.environment>  
 Abstraction Licensing Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>



		Water body ID:	GB112068060500	Scheme:	Simmonds Hill- increased WTW Capacity			
		Water body Name:	Weaver (Dane to Frods)	Reference	WR153			
		RBMP:	Weaver Goway	Scheme Phase	Construction		Operational	
		Operational catchment:	Weaver Lower	Impact potential	Direct		Direct	
		Designation (and uses):	Heavily modified					
		Relevant upstream water bodies:	(Wheelock to Weaver),					
		Downstream water bodies:	Mersey					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	Increased groundwater abstraction quantity Medium level of impact. Increased abstraction from refurbished boreholes at Simmonds Hill. Abstraction licences are already in place and it is unclear how much additional quantity is required. There are likely to be moderate effects on water quantity as the abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body and limited water availability in the surface water body at Q95 and Q70.	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	Bad					
		Fish	Not provided					
	Hydro-morphology	Hydrological regime	Supports good					Modified water treatment works. No or minimal impact.
		River continuity	Not provided					
		Morphological conditions	Not provided					
		General physico-chemical	All high except: Ammonia-poor, BOD- poor and Phosphate- poor					
		Specific pollutants:	All high					
Physico-chemical	Priority hazardous substances	All good			Abstraction well refurbishment. No or minimal impact.			
	Priority substances	All good						
	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
Overall Status/Potential	Overall	Moderate	Good by 2027	N/A		Modified abstraction well headworks / surface structures. No or minimal impact.		

**Assumptions**

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- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
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- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WR\WR153\WR153 Simmonds Hill.xlsx>

EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang= e&topic=floodmap#x=344705&y=355134.0>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/historical-landfill/>

Abstraction Licencing Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licencing-strategy>

		<b>Water body ID:</b>	GB41101G202600	<b>Scheme:</b>	Simmonds Hill- increased WTW Capacity				
		<b>Water body Name:</b>	Wirral and West Cheshire Permo-Triassic Sandstone Aquifers	<b>Reference</b>	WR153				
		<b>RBMP:</b>	North West GW	<b>Scheme Phase</b>	Construction		Operational		
		<b>Operational catchment:</b>	Cheshire West Permo-Triassic Sandstone Aquifers	<b>Impact potential</b>	Direct		Direct		
		<b>Designation (and uses):</b>	No designation						
		<b>Relevant upstream water bodies:</b>	N/A						
		<b>Downstream water bodies:</b>	N/A						
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	Increased groundwater abstraction quantity Medium level of impact. Increased abstraction from refurbished boreholes at Simmonds Hill. Abstraction licences are already in place and it is unclear how much additional quantity is required. There are likely to be moderate effects on water quantity as the abstraction licensing strategy (ALS) indicates that there is restricted water available in the groundwater body.		
		Quantitative GWDTes test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					High	Water treatment works. No or minimal impact
		Chemical Drinking Water Protected Area	Poor						
		Chemical GWDTes test	Good						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Good						
		Prevent and Limit Objective	Not provided						
Supporting Elements	Trend Assessment	Upward trend							
	Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Poor	Good by 2027	N/A				
		Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
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- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Feasible\\_Options/IRZ/WR153/WR153\\_Simmonds\\_Hill.xlsx](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/IRZ/WR153/WR153_Simmonds_Hill.xlsx)

EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/historical-landfill/>

Abstraction Licensing Strategy (Lower Mersey and Alt): <https://www.gov.uk/government/publications/lower-mersey-and-alt-abstraction-licensing-strategy>

		Water body ID:	GB112068060450	Scheme:	SANDIFORD – INCREASED WTW CAPACITY						
		Water body Name:	Darley Brook	Reference	WR154						
		RBMP:	North West	Scheme Phase	Operational						
		Operational catchment:	Weaver Lower	Impact potential	Direct						
		Designation (and uses):	heavily modified		Direct						
		Relevant upstream water bodies:	-								
		Downstream water bodies:	Ash Brook (Darley Brook to Weaver)								
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence				
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			Modified water treatment works. No or minimal impact.	High	Increased groundwater abstraction quantity. Minor level of impact. Refurbishment of boreholes at Organsdale, Delamere, Cotebrook and Sandiford. Maximum combined increase in abstraction of 10 M/d within existing abstraction licence constraints.	Medium		
		Macrophytes	-								
		Macrophytes and phytobenthos	-								
		Benthic invertebrates	-								
		Fish	Bad								
	Hydro-morphology	Hydrological regime	-								
		River continuity	-								
		Morphological conditions	-								
		Physico-chemical	General physico-chemical	Moderate							
			Specific pollutants:	-							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment									
	Priority substances	Does not require assessment									
Overall Status/Potential	Ecological	Moderate	Good by 2027								
	Chemical	Good	-								
	Overall	Moderate	Good by 2027								

**Assumptions**

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- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
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- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers' Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR154\WR1  
 EA Abstraction Licence Strategy (Weaver and Dane): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319959/lit\\_7884\\_52dcdf.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcdf.pdf)  
 EA Abstraction Licence Strategy (Lower Mersey and Ait): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

		<b>Water body ID:</b>	GB41101G202600	<b>Scheme:</b>	SANDIFORD – INCREASED WTW CAPACITY			
		<b>Water body Name:</b>	Wirral and West Cheshire Permo-Triassic Sandstone Aquifers	<b>Reference</b>	WR154			
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction		Operational	
		<b>Operational catchment:</b>	Wirral and Cheshire West Permo-Triassic Sandstone Aq	<b>Impact potential</b>	Direct		Direct	
		<b>Designation (and uses):</b>	No designation					
		<b>Relevant upstream water bodies:</b>	N/A					
		<b>Downstream water bodies:</b>	N/A					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Increased groundwater abstraction quantity. Medium level of impact. Refurbishment of boreholes at Organsdale, Delamere, Eddisbury, Cotebrook and Sandford. Maximum combined increase in abstraction of 10 Ml/d within existing abstraction licence constraints.	Low
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
		Chemical Dependent Surface Water Body Status	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Drinking Water Protected Area	Poor					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	-					
WFD elements for Groundwater: Supporting Elements (Groundwater)	Supporting Elements (Groundwater)	Trend Assessment	Upper Trend					
		Quantitative	Good	Good by 2015	N/A			
Overall Status/Potential	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers' Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\WRZ\WR154\WR154\_1  
 EA Abstraction Licence Strategy (Weaver and Dane): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319959/lt\\_7884\\_52dcff.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lt_7884_52dcff.pdf)  
 EA Abstraction Licence Strategy (Lower Mersey and Alt): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LT_7881_35d3ed.pdf)

Water body ID:		GB112068060480	Scheme:	SANDIFORD – INCREASED WTW CAPACITY					
Water body Name:		Cuddington Brook (Source to Crowton Brook)	Reference	WR154					
RBMP:		North West	Scheme Phase	Construction		Operational			
Operational catchment:		Weaver Lower	Impact potential	Direct		Direct			
Designation (and uses):		Not designated							
Relevant upstream water bodies:		-							
Downstream water bodies:		Crowton Brook							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Modified water treatment works. No or minimal impact.  New abstraction well refurbishment. No or minimal impact.	High	Increased groundwater abstraction quantity. Minor level of impact. Refurbishment of boreholes at Eddisbury. Maximum combined increase in abstraction of 10 Ml/d (across multiple sites) within existing abstraction licence constraints.  The ALS indicates that there is restricted groundwater is available for the groundwater management unit in which the boreholes are located. Surface water is not available at Q95 and Q50, and is restricted at Q30 and Q70.  The size of the current abstraction licence is unknown. There is poor water availability of both groundwater and surface water, but as only a small proportion of the additional 10 Ml/d is likely to be sourced from this surfacewater body, and the increase will be within existing licence constraints, there is unlikely to be widespread or prolonged effects on the hydrological regime of this water body.	Low	
		Macrophytes	-						
		Macrophytes and phytobenthos	Moderate						
	Hydro-morphology	Benthic invertebrates	Good						
		Fish	-						
		Hydrological regime	Supports good						
		River continuity	-						
Physico-chemical	Morphological conditions	Supports good							
	General physico-chemical	All high except Ammonia-moderate, Phosphate-poor							
	Specific pollutants:	-							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Good by 2021						
	Chemical	Good	Good by 2015						
	Overall	Moderate	Good by 2021						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers' Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR154\WR1  
 EA Abstraction Licence Strategy (Weaver and Dane): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319959/lit\\_7884\\_52dcdf.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcdf.pdf)  
 EA Abstraction Licence Strategy (Lower Mersey and Ait): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

Water body ID:		GB112071065040		Scheme:		Group 1 - Improved reservoir compensation release control – MITCHELLS HOUSE 1 & 2		
Water body Name:		Hyndburn		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Calder		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:		None				Direct		
Downstream water bodies:		Hyndburn Brook - Lower						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Mitchells House 1 and Mitchells House 2 reservoirs from 0.4 Ml/d to 0.3 Ml/d, a reduction of 0.1 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that most of the surface water body has water available at all flows, however the relatively small part of the water body that contains the two reservoirs has water available at Q95 but no water available at medium to high flows (Q70, Q50 and Q30). It is likely the compensation flow from the reservoir that maintains the water availability at Q95, and as such a reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction in compensation releases, that water is available across most of the surface water body at all flows, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	-	Not assessed				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Good	Good by 2015				
	Hydro-morphology	Hydrological regime	Supports Good	Supports Good by 2015				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

Water body ID:		GB112074069790		Scheme:		Group 1 - Improved reservoir compensation release control – POAKA BECK, PENNINGTON & HARLOCK		
Water body Name:		Mill Beck (Poaka Beck)		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Duddon		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:		Morecambe Bay						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Poaka Beck and Harlock reservoirs from 2.9 Ml/d to 2.6 Ml/d, a reduction of 0.3 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has no water available at all flows and as such a reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction in compensation releases, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	-	Not assessed				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Bad	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015					
	Priority substances	Good	Good by 2015					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (South Cumbria): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LIT\\_7918\\_cfa86.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_cfa86.pdf)

Water body ID:		GB112073071160		Scheme:		Group 1 - Improved reservoir compensation release control – POAKA BECK, PENNINGTON & HARLOCK		
Water body Name:		Dragley Beck		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Leven		Impact potential:		Direct		
Designation (and uses):		not designated artificial or heavily modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:		Leven						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Pennington reservoir from 2.9 Ml/d to 2.6 Ml/d, a reduction of 0.3 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has no water available at high and low flows (Q30 and Q95 respectively), and that limited water is available at medium flows (Q50 and Q70), and as such a reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction in compensation releases, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Good	Good by 2015				
		Fish	-	-				
	Hydromorphology	Hydrological regime	Does Not Support Good	Supports Good by 2027				
		River continuity						
		Morphological conditions	Supports Good					
	Physico-chemical	General physico-chemical	Good	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).
Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a>



Water body ID:		GB112073071210		Scheme:		Group 1 - Improved reservoir compensation release control – LEVERS WATER			
Water body Name:		Yewdale/Church Beck		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Crake		Impact potential:		Direct			
Designation (and uses):		not designated artificial or heavily modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:		Crake							
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b> Minor level of impact. Reduction of compensation flow from Levers Water reservoir from 2.9 Ml/d to 2.6 Ml/d, a reduction of 0.3 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS shows that most of the surface water body has water available at all flows, however the part of the water body that contains the reservoir and its upstream catchment has no water available at any flows, and the part of the water body immediately downstream of the reservoir has no water available at all flows other than Q30. As such a reduction in the compensation flow may effect the hydrological regime of the surface water body and cause a reduction in ecological status. However, given the small reduction in compensation releases, that water is available across most of the surface water body at all flows, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.</p>	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	Good	Good by 2015					
		Benthic invertebrates	High	Good by 2015					
		Fish	Moderate	Good by 2027					
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015					
		River continuity							
		Morphological conditions	Supports Good						
	Physico-chemical	General physico-chemical	High	Good by 2015					
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015						
	Priority substances	Good	Good by 2015						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

Assumptions	
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).	
Evidence	
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a>	

Water body ID:		GB112071065270		Scheme:		Group 1 - Improved reservoir compensation release control – FISHMOOR TOTAL		
Water body Name:		Darwen - conf Davy Field Bk to conf Blakewater		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction Operational		
Operational catchment:		Darwen		Impact potential:		Direct Direct		
Designation (and uses):		Heavily Modified						
Relevant upstream water bodies:		Field Bk, Davyfield Brook						
Downstream water bodies:		Darwen- conf Blakewater to conf Roddlesworth						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Fishmoor (Total) reservoir from 2.0 M/d to 1.7 M/d, a reduction of 0.3 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that all of the surface water body has water available at all flows (Q95, Q70, Q50 and Q30). Given the small reduction in compensation releases, that water is available across the surface water body at all flows, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	-	Not assessed				
		Benthic invertebrates	Moderate	Good by 2027				
		Fish	Good	Good by 2015				
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015				
		River continuity	-					
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LI17919v3\\_1881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LI17919v3_1881c4.pdf)

Water body ID:		GB112069061320		Scheme:		Group 1 - Improved reservoir compensation release control – RIDGEGATE & TRENTABANK			
Water body Name:		Bollin (Source to Dean)		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Bollin Dean Mersey Upper		Impact potential:		Direct			
Designation (and uses):		Heavily Modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:		Bollin (River Dean to Ashley Mill)							
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Ridgigate and Trentabank reservoirs from 2.1 Ml/d to 1.8 Ml/d, a reduction of 0.3 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	Moderate	Moderate by 2015					
		Benthic invertebrates	Good	Good by 2015					
		Fish	Moderate	Moderate by 2015					
	Hydromorphology	Hydrological regime	-	-					
		River continuity							
		Morphological conditions	-						
	Physico-chemical	General physico-chemical	Moderate	Moderate by 2015					
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

		Water body ID:	GB112069060650	Scheme:	Group 1 - Improved reservoir compensation release control – LAMALOAD		
		Water body Name:	Dean (Lamaload to Bollington)	Scheme Phase:	WR159		
		RBMP:	North West	Reference:	Construction		Operational
		Operational catchment:	Bollin Dean Mersey Upper	Impact potential:	Direct		Direct
		Designation (and uses):	Heavily Modified				
		Relevant upstream water bodies:					
		Downstream water bodies:	Dean (Bollinton to Bollin)				
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	Medium
		Macrophytes	-				
		Macrophytes and phytobenthos	-	Not assessed			
		Benthic invertebrates	-	-			
		Fish	-	-			
	Hydro-morphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Moderate	Good by 2027			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

		Water body ID:	GB102076070690	Scheme:	Group 1 - Improved reservoir compensation release control – WET SLEDDALE					
		Water body Name:	Lowther (Upper)	Scheme Phase:	WR159					
		RBMP:	Solway Tweed	Reference:	Construction		Operational			
		Operational catchment:	Eden and Esk	Impact potential:	Direct		Direct			
		Designation (and uses):	Heavily Modified							
		Relevant upstream water bodies:	Swindale Beck (Lowther)							
		Downstream water bodies:	Lowther (Lower)							
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Wet Sleddale reservoir from 7.8 M/d to 7.4 M/d, a reduction of 0.4 M/d.  The ALS shows that the surface water body has no water available at any flow. However, the reduction is small compared to the total compensation release, and the heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.	High	
		Macrophytes	-							
		Macrophytes and phytobenthos	-	Not assessed						
		Benthic invertebrates	High	Good by 2015						
		Fish	High	Good by 2015						
	Hydro-morphology	Hydrological regime	-	Not assessed						
		River continuity								
		Morphological conditions	-							
		Physico-chemical	General physico-chemical	All high	Good by 2015					
			Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment							
	Priority substances	Does not require assessment	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Good by 2021	N/A						
	Chemical	Good	Good by 2015	N/A						
	Overall	Moderate	Good by 2021	N/A						

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Eden and Esk): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1384b1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf)

Water body ID:		GB112069064580		Scheme:		Group 1 - Improved reservoir compensation release control – WAYOH, ENTWISTLE & JUMBLES		
Water body Name:		Bradshaw Brook		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Croal Irwell		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:		Tonge						
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	<p>Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Wayoh, Entwistle and Jumbles reservoirs from 24.3 M/d to 23.6 M/d, a reduction of 0.7 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS shows that the part of the surface water body which contains the Turton and Entwistle Reservoir and the Wayoh Reservoir and the reservoirs upstream catchments has no water available at any flows. The part of the water body downstream of the Wayoh reservoir (including the Jumbles reservoir) has water available at low flows (Q95 and Q70), but no water available at high flows (Q50 and Q30).</p> <p>It is likely the compensation flows from the reservoirs help to maintain water availability at low flows, and as such a reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction in compensation releases compared to the total volume, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.</p>	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Good	Good by 2015				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Good	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015					
	Priority substances	Good	Good by 2015					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).</p>
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<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx</p> <p>EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a></p>
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		Water body ID:	GB112069064570	Scheme:	Group 1 - Improved reservoir compensation release control – DELPH & SPRINGS DINGLE			
		Water body Name:	Eagley Brook	Scheme Phase:	WR159			
		RBMP:	North West	Reference:	Construction	Operational		
		Operational catchment:	Croal Irwell	Impact potential:	Direct	Direct		
		Designation (and uses):	Heavily Modified					
		Relevant upstream water body(ies)						
		Downstream water body(ies)	Tonge					
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	<p>Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Delph and Springs Dingle reservoirs from 24.3 Ml/d to 23.6 Ml/d, a reduction of 0.7 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS shows that:</p> <p>The part of the surface water body that contains the Springs reservoir and its upstream catchment has no water available at any flows.</p> <p>The part of the surface water body that contains the Dingle reservoir and its upstream catchment has water available at low flows (Q95 and Q70), limited water available at medium flows (Q50), and no water available at high flows (Q30).</p> <p>The part of the surface water body that contains the Delph reservoir and its upstream catchment has water available at low flows (Q95 and Q70), and no water available at higher flows (Q50 and Q30).</p> <p>The remaining part of the catchment, downstream of the reservoirs has water available at low flows (Q95 and Q70), limited water available at medium flows (Q50), and no water available at high flows (Q30).</p> <p>It is likely the compensation flows from the reservoirs help to maintain water availability at low flows, and as such a reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction in compensation releases compared to the total volume, the availability of water at lower flows, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.</p>	
		Macrophytes	-					
		Macrophytes and phytobenthos	Good	Good by 2015				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Moderate	Moderate by 2015				
	Hydromorphology	Hydrological regime	-	-				<p>Installation of new automatic penstock arrangements. No or minimal impact.</p>
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB112069064710		Scheme:		Group 1 - Improved reservoir compensation release control – ASHWORTH MOOR, GREENBOOTH, LOWER NADEN AND MIDDLE NADEN	
Water body Name:		Naden Brook		Scheme Phase:		WR159	
RBMP:		North West		Reference:		Construction	
Operational catchment:		Roch Irk Medlock		Impact potential:		Operational	
Designation (and uses):		Heavily Modified				Direct	
Relevant upstream water bodies:		-					
Downstream water bodies:		Roch (Spodden to Irwell)					
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good			Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b> Minor level of impact. Reduction of compensation flow from Ashworth Moor, Greenbooth, Lower and Middle Naden reservoirs from 18.9 Ml/d to 18.0 Ml/d, a reduction of 0.9 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS shows that: The part of the surface water body that contains the Ashworth Moor reservoir and its immediate catchment has no water available at any flows. The part of the surface water body that contains the Greenbooth and Naden reservoirs and their upstream catchments has water available at low flows (Q95 and Q70), and no water available at higher flows (Q50 and Q30). The remaining part of the catchment, downstream of the reservoirs has water available at low flows (Q95 and Q70), limited water available at higher flows (Q50 and Q30).</p> <p>It is likely the compensation flows from the reservoirs help to maintain water availability at low flows, and as such a reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction in compensation releases compared to the overall compensation release, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.</p>
		Macrophytes	-				
		Macrophytes and phytobenthos	Good	Good by 2015			
		Benthic invertebrates	Good	Good by 2015			
		Fish	-	-			
	Hydromorphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Good	Good by 2015			
		Specific pollutants:	-				
Priority hazardous substances		Does not require assessment	Does not require assessment				
WFD elements for Rivers: Chemical	Priority substances	Does not require assessment	Does not require assessment				
	Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A		
		Chemical	Good	Good by 2015	N/A		
		Overall	Moderate	Moderate by 2015	N/A		

<b>Assumptions</b>
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).</p>

<b>Evidence</b>
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx</p> <p>EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a></p>



Water body ID:		GB112069064730		Scheme:		Group 1 - Improved reservoir compensation release control – SPRING MILL & COWM		
Water body Name:		Spodden		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Roch Irk Medlock		Impact potential:		Operational		
Designation (and uses):		Heavily Modified				Direct		
Relevant upstream water bodies:								
Downstream water bodies:		Roch (Spodden to Irwell)						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Spring Mill and Cowm reservoirs from 18.9 Ml/d to 18.0 Ml/d, a reduction of 0.9 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that: The part of the surface water body that contains the Spring Mill reservoir and its upstream catchment has no water available at lower flows (Q95 and Q70), and limited water available at higher flows (Q50 and Q30). The part of the surface water body that contains the Cowm reservoir and its upstream catchment has no water available at low flows (Q95 and Q70), but water available at higher flows (Q50 and Q30). The remaining part of the catchment, downstream of the reservoirs has no water available at low flows (Q95 and Q70), but water available at higher flows (Q50 and Q30).  A reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However given the small reduction compared to the overall compensation release, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	-	-				
		Fish	Moderate	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Good	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB112069064720		Scheme:		Group 1 - Improved reservoir compensation release control – WATERGROVE & BLACKSTONE EDGE		
Water body Name:		Roch (Source to Spodden)		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Roch Irk Medlock		Impact potential:		Operational		
Designation (and uses):		Heavily Modified				Direct		
Relevant upstream water bodies:								
Downstream water bodies:		Roch (Spodden to Irwell)						
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Watergrove Reservoir from 18.9 Ml/d to 18.0 Ml/d, plus reduction of compensation flow from Blackstone Edge Reservoir from 16.8 Ml/d to 15.7 Ml/d. Total combined reduction of 2 Ml/d. (Note: Total reduction for the reservoir Aquator groups assumed to take place in this water body.)	
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Moderate	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	High	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015					
	Priority substances	Good	Good by 2015					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx</p> <p>EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a></p>	

		Water body ID:	GB112071065090	Scheme:	Group 1 - Improved reservoir compensation release control – HURSTWOOD, CANT CLOUGH, SWINDEN 1 & 2		
		Water body Name:	Brun - headwaters to conf Don	Scheme Phase:	WR159		
		RBMP:	North West	Reference:	Construction		Operational
		Operational catchment:	Calder	Impact potential:	Direct		Direct
		Designation (and uses):	Heavily Modified				
		Relevant upstream water bodies:	-				
		Downstream water bodies:	Brun - conf Don to conf Calder				
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b>                      Minor level of impact. Reduction of compensation flow from Hurstwood, Cat Clough, and Swinden reservoirs from 9.1 Ml/d to 8.1 Ml/d, a reduction of 1.0 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS states that:                      The part of the surface water body that contains the Swinden reservoirs and their upstream catchment has no water available at any flows.                      The part of the surface water body that contains the Hurstwood and Cant Clough reservoirs and their upstream catchments has water available at low flows (Q95 and Q70), but no water available at higher flows (Q50 and Q30).                      The remaining part of the catchment, downstream of the reservoirs has water available at low flows (Q95), limited water available at medium flows (Q70), and no water available at higher flows (Q50 and Q30). It is likely that compensation flows from the reservoirs are supporting the low flow water availability.</p> <p>A reduction in the compensation flow is could effect the hydrological regime of the surface water body and cause a reduction in ecological status, however given the availability of water at low flows, the impacts would be localised and temporary.</p>
		Macrophytes	-				
		Macrophytes and phytobenthos	Good	Good by 2015			
		Benthic invertebrates	-	-			
		Fish	Good	Good by 2015			
	Hydro-morphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
		General physico-chemical	High	Good by 2015			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

<b>Assumptions</b>
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

<b>Evidence</b>
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a>

Water body ID:		GB112071065210		Scheme:		Group 1 - Improved reservoir compensation release control – LANESHAW	
Water body Name:		Colne Water (Laneshaw)		Scheme Phase:		WR159	
RBMP:		North West		Reference:		Construction	
Operational catchment:		Colne Water		Impact potential:		Direct	
Designation (and uses):		Heavily Modified				Operational	
Relevant upstream water bodies:						Direct	
Downstream water bodies:		Colne Water - Laneshaw to Trawden Bk					
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b> Minor level of impact. Reduction of compensation flow from Laneshaw reservoir from 9.1 Ml/d to 8.1 Ml/d, a reduction of 1.0 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS states that: The part of the surface water body that contains the Laneshaw reservoir and its upstream catchment has water available at all flows apart from Q70 when there is limited water available. The remaining part of the catchment, downstream of the reservoir has no water available at low flows (Q95 and Q70), limited water available at medium flows (Q50), and water available at high flows (Q30).</p> <p>The heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.</p>
		Macrophytes	-				
		Macrophytes and phytobenthos	High	Good by 2015			
		Benthic invertebrates	Good	Good by 2015			
		Fish	Moderate	Good by 2027			
	Hydromorphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Good	Good by 2015			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf</a>

Water body ID:		GB112071065130		Scheme:		Group 1 - Improved reservoir compensation release control – COLDWELL UPPER & LOWER		
Water body Name:		Walverden Water		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Colne Water		Impact potential:		Operational		
Designation (and uses):		Heavily Modified				Direct		
Relevant upstream water bodies:								
Downstream water bodies:		Calder - Pendle Water to conf Ribble						
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Coldwell Upper and Lower reservoirs from 9.1 Ml/d to 8.1 Ml/d, a reduction of 1.0 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS states that: The part of the surface water body that contains the Coldwell Upper reservoir and its upstream catchment has water available at all flows. The part of the surface water body that contains the Coldwell Lower reservoir and its upstream catchment has water available at low flows (Q95), but restricted water availability at medium to high flows (Q70 to Q30). The remaining part of the catchment, downstream of the reservoirs has water available at all flows.  Given the availability of water in the downstream catchment, and assuming low flow compensation flows would be maintained, any impacts of the hydrological regime of the water body would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	-	-				
		Fish	Good	Good by 2015				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

Water body ID:		GB112071065230		Scheme:		Group 1 - Improved reservoir compensation release control – OGDEN UPPER & LOWER			
Water body Name:		Pendle Water - headwaters to Colne Water		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Colne Water		Impact potential:		Direct			
Designation (and uses):		not designated artificial or heavily modified				Operational			
Relevant upstream water bodies:		-				Direct			
Downstream water bodies:		Pendle Water - Colne Water to Walverden Water							
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Ogdon Upper and Lower reservoirs from 9.1 M/d to 8.1 M/d, a reduction of 1.0 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS states that: The part of the surface water body that contains the Ogdon Reservoirs and their immediate catchment has no water available at all flows. Most of the remaining part of the catchment, downstream of the reservoirs has water available at the lowest flows (Q95), no water available at low flows (Q70), restricted water available at medium flows (Q50), and water available at high flows (Q30). It is likely that the compensation flows from the Ogdon reservoirs are supporting the water availability at the lowest flows. In addition there is water available at all flows in areas associated with the headwaters of the water body.  The heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.	High	
		Macrophytes	-						
		Macrophytes and phytobenthos	Good	Good by 2015					
		Benthic invertebrates	High	Good by 2015					
		Fish	Good	Good by 2015					
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015					
		River continuity							
		Morphological conditions	Supports Good						
	Physico-chemical	General physico-chemical	Good	Good by 2015					
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Good	Good by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

		Water body ID:	GB112071065140	Scheme:	Group 1 - Improved reservoir compensation release control – CHURN CLOUGH		
		Water body Name:	Sabden Brook	Scheme Phase:	WR159		
		RBMP:	North West	Reference:	Construction		Operational
		Operational catchment:	Calder	Impact potential:	Direct		Direct
		Designation (and uses):	not designated artificial or heavily modified				
		Relevant upstream water bodies:					
		Downstream water bodies:					
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	Medium
		Macrophytes	-				
		Macrophytes and phytobenthos	Good	Good by 2015			
		Benthic invertebrates	Good	Good by 2015			
		Fish	-	-			
	Hydro-morphology	Hydrological regime	Supports Good	Supports Good by 2015			
		River continuity					
		Morphological conditions	Supports Good				
	Physico-chemical	General physico-chemical	Good	Good by 2015			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

Water body ID:		GB112071065390		Scheme:		Group 1 - Improved reservoir compensation release control – STOCKS			
Water body Name:		Hodder- Stocks Reservoir to conf Croasdale Bk		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Ribble		Impact potential:		Direct			
Designation (and uses):		Heavily modified							
Relevant upstream water bodies:		Bottoms Beck and Hodder-headwaters to Stocks Reservoir							
Downstream water bodies:		Hodder- conf Croasdale Bk to conf Easington Bk							
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Stocks reservoir from 19.2 Ml/d to 18.1 Ml/d, a reduction of 1.1 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has water available at low flows (Q95), but no water available at medium and high flows (Q70, Q50 and Q30). It is likely that the compensation release from the reservoir is supporting the water availability at low flows.  However, the reduction is relatively small compared to the total compensation release, and the heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.	High	
		Macrophytes	-						
		Macrophytes and phytobenthos	High	Good by 2015					
		Benthic invertebrates	High	Good by 2015					
		Fish	-	Not assessed					
	Hydromorphology	Hydrological regime	-	Not assessed					
		River continuity							
		Morphological conditions	-						
	Physico-chemical	General physico-chemical	All high	Good by 2015					
		Specific pollutants:	All high	High by 2015					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015						
	Priority substances	Good	Good by 2015						
Overall Status/Potential	Ecological	Moderate	Good by 2021	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2021	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919x3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919x3_f881c4.pdf)



Water body ID:		GB112069064690		Scheme:		Group 1 - Improved reservoir compensation release control – PIETHORNE, NORMAN HILL, KITCLIFFE, OGDEN MILNROW, HANGING LEES & ROODEN		
Water body Name:		Beal		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Roch Irk Medlock		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
	WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Piethorne, Norman Hill, Kitcliffe, Ogdon Milnrow, Hanging Lees and Rooden reservoirs from 16.8 Ml/d to 15.7 Ml/d, a reduction of 1.1 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Moderate	Moderate by 2015				
		Fish	Moderate	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Good	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB104027062600		Scheme:		Group 1 - Improved reservoir compensation release control – WARLAND, WHITE HOLME, AND LIGHT HAZZLES	
Water body Name:		Walsden Water from Source to River Calder		Scheme Phase:		WR159	
RBMP:		North West		Reference:		Construction	
Operational catchment:		Calder Upper		Impact potential:		Direct	
Designation (and uses):		Heavily Modified				Operational	
Relevant upstream water bodies:						Direct	
Downstream water bodies:							
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	<p>Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Warland, White Holme and Light Hazzles reservoirs from 16.8 M/d to 15.7 M/d, a reduction of 1.1 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS shows that the part of the surface water body that contains the reservoirs and their upstream catchments has no water available at lower flows (Q95 and Q70), limited water available at medium flows (Q50), and water available at high flows (Q30). Most of the remaining part of the catchment, downstream of the reservoirs has water available at all flows (there is a small area in the west of the waterbody associated with another reservoir not included in this assessment that has limited water availability at all flows).</p> <p>A reduction in the compensation flow could effect the hydrological regime of the surface water body and cause a reduction in ecological status. However, given the relatively small size of the reduction compared to the overall compensation release, the availability of water in the surface water body as a whole, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.</p>	Medium
		Macrophytes	-				
		Macrophytes and phytobenthos	Good	Good by 2027			
		Benthic invertebrates	Good	Good by 2015			
		Fish	Good	Good by 2015			
	Hydromorphology	Hydrological regime	-				
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	All high, except Phosphate which is Moderate	Good by 2027			
		Specific pollutants:	High				
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015				
	Priority substances	Good	Good by 2015				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Aire and Calder): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/297445/LIT\\_7862\\_7e45bb.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297445/LIT_7862_7e45bb.pdf)

		Water body ID:	GB112069064741	Scheme:	Group 1 - Improved reservoir compensation release control – CASTLESHAW UPPER & LOWER, READYCON DEAN, CROOKGATE, DOWRY AND NEW YEARS BRIDGE		
		Water body Name:	Tame (Source to Chew Brook)	Scheme Phase:	WR159		
		RBMP:	North West	Reference:	Construction		Operational
		Operational catchment:	Goyt Etherow Tame	Impact potential:	Direct		Direct
		Designation (and uses):	Heavily Modified				
		Relevant upstream water bodies:					
		Downstream water bodies:					
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytoplankton	-			High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b>                      Minor level of impact. Reduction of compensation flow from Castleshaw Upper and Lower, Readycon Dean, Crookgate, Dowry and New Years Bridge reservoirs from 16.8 Mld to 15.7 Mld, a reduction of 1.1 Mld. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS states that:                      The part of the surface water body that contains the Readycon Dean, Crookgate, Dowry and New Years Bridge reservoirs and their upstream catchment has no water available at any flows.                      The part of the surface water body that contains the Castleshaw Upper and Lower reservoirs and their upstream catchment has water available at low flows (Q95 and Q70), but no water available at medium to high flows (Q50 to Q30).                      The remaining part of the catchment, downstream of the reservoirs has water available at low and medium flows (Q95, Q70, and Q50) but no water available at high flows (Q30). It is likely that compensation flows from the reservoirs maintain the low and medium flows.</p> <p>The reduction in compensation flows could have an impact on the hydrological regime of the river, however given that water is generally available across the surface water body, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.</p>
		Macrophytes	-				
		Macrophytes and phytoplankton	Good	Good by 2015			
		Benthic invertebrates	Good	Good by 2015			
		Fish	Moderate	Good by 2027			
	Hydro-morphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Good	Good by 2015			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

Water body ID:		GB112069061300		Scheme:		Group 1 - Improved reservoir compensation release control – GREENFIELD, YEOMAN HEY, DOVESTONE & CHEW			
Water body Name:		Chew Brook		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Goyt Etherow Tame		Impact potential:		Direct			
Designation (and uses):		Heavily Modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:									
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	<p>Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Greenfield, Yeoman Hey, Dovestone, and Chew reservoirs from 20.7 M/d to 19.5 M/d, a reduction of 1.2 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS shows that the at medium and high flows (Q70, Q50 and Q30), there is no water available across the surface water body. At Q95 there is no water available in the part of the catchment that includes the Greenfield and Yeoman Hay reservoirs and their upstream catchment, but water is available in the downstream part of the water body and the tributary that includes the Chew Reservoir. It is likely that compensation releases from the reservoirs support the water availability at low flows.</p> <p>The heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. Fish passage was identified as an issue but this option is not making any changes to fish pass arrangements. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.</p>	High	
		Macrophytes	-						
		Macrophytes and phytobenthos	-						
		Benthic invertebrates	Good	Good by 2015					
		Fish	Moderate	Good by 2027					
	Hydromorphology	Hydrological regime	-	-					
		River continuity							
		Morphological conditions	-						
	Physico-chemical	General physico-chemical	Good	Good by 2015					
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

Water body ID:		GB112069061111		Scheme:		Group 1 - Improved reservoir compensation release control – BRUSHES, WALKERWOOD & SWINESHAW HIGHER & LOWER	
Water body Name:		Tame (Chew Brook to Swineshaw Brook)		Scheme Phase:		WR159	
RBMP:		North West		Reference:		Construction	
Operational catchment:		Goyt Etherow Tame		Impact potential:		Operational	
Designation (and uses):		Heavily Modified				Direct	
Relevant upstream water bodies:							
Downstream water bodies:							
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good			Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Brushes, Walkerwood, Swineshaw Higher and Lower reservoirs from 20.7 Ml/d to 19.5 Ml/d, a reduction of 1.2 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has water available at all flows (Q95, Q70, Q50 and Q30). Given the relatively small reduction compared to the total compensation release, that water is available across the surface water body at all flows, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.
		Macrophytes	-				
		Macrophytes and phytobenthos	-	-			
		Benthic invertebrates	Moderate	Good by 2027			
		Fish	-	-			
	Hydromorphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Good	Good by 2015			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Moderate by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

		Water body ID:	GB112069060970	Scheme:	Group 1 - Improved reservoir compensation release control – KINDER			
		Water body Name:	Sett	Scheme Phase:	WR159			
		RBMP:	North West	Reference:	Construction	Operational		
		Operational catchment:	Goyt Etherow Tame	Impact potential:	Direct	Direct		
		Designation (and uses):	not designated artificial or heavily modified					
		Relevant upstream water bodies:						
		Downstream water bodies:						
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b>                      Minor level of impact. Reduction of compensation flow from Kinder reservoir from 16.9 Ml/d to 15.5 Ml/d, a reduction of 1.4 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS states that the part of the surface water body that contains the Kinder Reservoir and its upstream catchment has no water available at any flows. The remainder of the water body has water available at high and medium flows (Q30 and Q50), but no water available at low flows (Q95 and Q70).</p> <p>However, the heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.</p>	High
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	High	Good by 2015				
		Fish	-	-				
	Hydromorphology	Hydrological regime	Does Not Support Good	Supports Good by 2027				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	High	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

Water body ID:		GB112069060850		Scheme:		Group 1 - Improved reservoir compensation release control – ERRWOOD & FERNILEE		
Water body Name:		Goyt (Source to Randall Carr Brook)		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Goyt Etherow Tame		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Errwood and Fernilee reservoirs from 16.9 M/d to 15.5 M/d, a reduction of 1.4 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS states that the part of the surface water body that contains the Errwood Reservoir and its upstream catchment has no water available at any flows. The remainder of the water body (which includes the Fernilee Reservoir) has water available at low flows (Q95 and Q70), but no water available high and medium flows (Q30 and Q50). It is likely that the availability of water at low flows is supported by compensation releases from both reservoirs.  A reduction in the compensation flow could have an effect the hydrological regime of the surface water body. However, given the size of the reduction compared to the overall compensation release, and that water is available at low flows, effects of the hydrological regime are not expected to be prolonged or widespread.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Good	Good by 2015				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Moderate	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	High	Good by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx</p> <p>EA Abstraction Licence Strategy (Upper Mersey): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf</a></p>	

Water body ID:		GB112069060920		Scheme:		Group 1 - Improved reservoir compensation release control – BOLLINHURST & HORSE COPPICE			
Water body Name:		Micker (Norbury) Brook		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Bollin Dean Mersey Upper		Impact potential:		Direct			
Designation (and uses):		Heavily Modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:									
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence				
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Bollinhurst and Horse Coppice reservoirs from 16.9 Ml/d to 15.5 Ml/d, a reduction of 1.4 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has no water available at all flows (Q95, Q70, Q50 and Q30). However, the heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	-	Not assessed					
		Benthic invertebrates	Good	Good by 2015					
		Fish	Bad	Good by 2027					
	Hydromorphology	Hydrological regime	-	-					
		River continuity							
		Morphological conditions	-						
		Physico-chemical	General physico-chemical	Moderate					Good by 2027
			Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)



Water body ID:		GB112069064650		Scheme:		Group 1 - Improved reservoir compensation release control – CALF HEY, OGDEN & HOLDEN WOOD	
Water body Name:		Ogden		Scheme Phase:		WR159	
RBMP:		North West		Reference:		Construction	
Operational catchment:		Croal Irwell		Impact potential:		Direct	
Designation (and uses):		Heavily Modified				Operational	
Relevant upstream water bodies:						Direct	
Downstream water bodies:							
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	<p><b>Reduction in compensation flows due to new penstock arrangements.</b>                      Minor level of impact: Reduction of compensation flow from Calf Hey, Ogden and Holden Wood reservoirs from 11.3 Mld to 9.8 Mld, a reduction of 1.5 Mld. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS states that the part of the surface water body that contains the Calf Hay Reservoir and its upstream catchment has no water available at any flows. The remainder of the water body (which includes the Ogden and Holden Wood Reservoirs) has water available at all flows.</p> <p>A reduction in the compensation flow could have an effect the hydrological regime of the surface water body. However, given the size of the reduction compared to the overall compensation release, and that water is available across the flow regime, effects on the hydrological regime are not expected to be prolonged or widespread.</p>	
		Macrophytes	-				
		Macrophytes and phytobenthos	-				
		Benthic invertebrates	Good	Good by 2015			
		Fish	Good	Good by 2015			
	Hydromorphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Moderate	Good by 2027			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a>

Water body ID:		GB112069064660		Scheme:		Group 1 - Improved reservoir compensation release control – COWPE & CRAGG HOLES		
Water body Name:		Irwell (Source to Whitewell Brook)		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Croal Irwell		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Cowpe and Cragg Holes reservoirs from 11.3 Ml/d to 9.8 Ml/d, a reduction of 1.5 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body generally has water available at all flows (Q95, Q70, Q50 and Q30). The only exception to this is the small area of the water body that contains the Cowpe Reservoir and its upstream catchment which has water available at low flows, but not at high and medium flows (Q30 and Q50).  Given the location of the reservoir of a small downstream tributary of the Irwell, that water is available across most of the surface water body at all flows, and the relatively small reduction compared to the total compensation release, effects of the hydrological regime of the water body would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Good	Good by 2015				
		Benthic invertebrates	Moderate	Good by 2027				
		Fish	Moderate	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB112069064620		Scheme:		Group 1 - Improved reservoir compensation release control – SCOUT MOOR			
Water body Name:		Irwell (Rosendale STW to Roch)		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Croal Irwell		Impact potential:		Direct			
Designation (and uses):		Heavily Modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:									
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Scout Moor reservoir from 11.3 Ml/d to 9.8 Ml/d, a reduction of 1.5 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body generally has water available at all flows (Q95, Q70, Q50 and Q30). The only exception to this is the small area of the water body that contains the Scout Moor Reservoir and its upstream catchment which has water available at low and medium flows, but limited water available at high flows (Q30).  A reduction in compensation flow could have an impact of the hydrological regime of the water body, however, given the availability of water throughout the catchment, and the relatively small reduction compared to the total compensation release and the size of the water body as a whole, any effects of the hydrological regime of the water body would be localised and temporary.	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	Moderate	Moderate by 2015					
		Benthic invertebrates	Good	Good by 2015					
		Fish	-	-					
	Hydromorphology	Hydrological regime	Supports Good	Supports Good by 2015					
		River continuity							
		Morphological conditions	-						
	Physico-chemical	General physico-chemical	Moderate	Moderate by 2015					
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB112069064670	Scheme:		Group 1 - Improved reservoir compensation release control – CLOUGH BOTTOM			
Water body Name:		Whitewell Brook	Scheme Phase:		WR159			
RBMP:		North West	Reference:		Construction		Operational	
Operational catchment:		Croal Irwell	Impact potential:		Direct		Direct	
Designation (and uses):		Heavily Modified						
Relevant upstream water bodies:								
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Clough Bottom reservoir from 11.3 Ml/d to 9.8 Ml/d, a reduction of 1.5 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS states that the part of the surface water body that contains the Clough Bottom Reservoir and its upstream catchment has no water available at any flows. The remainder of the water body downstream of the reservoir has water available at all flows.  A reduction in the compensation flow could have an effect the hydrological regime of the surface water body. However, given the size of the reduction compared to the overall compensation release, and that water is available across the flow regime, effects of the hydrological regime are not expected to be prolonged or widespread.	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	Moderate	Good by 2027				
		Fish	Good	Good by 2015				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
		Physico-chemical	General physico-chemical	Moderate				Good by 2027
			Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

		Water body ID:	GB112069064680	Scheme:	Group 1 - Improved reservoir compensation release control – CLOWBRIDGE		
		Water body Name:	Limy Water	Scheme Phase:	WR159		
		RBMP:	North West	Reference:	Construction		Operational
		Operational catchment:	Croal Irwell	Impact potential:	Direct		Direct
		Designation (and uses):	Heavily Modified				
		Relevant upstream water bodies:					
		Downstream water bodies:					
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	<p>Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Clowbridge reservoir from 11.3 Ml/d to 9.8 Ml/d, a reduction of 1.5 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)</p> <p>The ALS states that the part of the surface water body that contains the Clow Bridge Reservoir and its upstream catchment has water available at low flows (Q95), but no water available at medium and high flows (Q70 to Q30). The remainder of the water body downstream of the reservoir has water available at all flows.</p> <p>A reduction in the compensation flow could have an effect the hydrological regime of the surface water body. However, given the size of the reduction compared to the overall compensation release, and that water is available across the flow regime, effects of the hydrological regime are not expected to be prolonged or widespread.</p>
		Macrophytes	-				
		Macrophytes and phytobenthos	Moderate	Good by 2027			
		Benthic invertebrates	-	-			
		Fish	-	-			
	Hydromorphology	Hydrological regime	-	-			
		River continuity					
		Morphological conditions	-				
	Physico-chemical	General physico-chemical	Moderate	Good by 2027			
		Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment				
	Priority substances	Does not require assessment	Does not require assessment				
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB112069060780		Scheme:		Group 1 - Improved reservoir compensation release control – LONDENDALE (WOODHEAD, TORSIDE, RHODESWOOD, VALEHOUSE, BOTTOMS & ARNFIELD)			
Water body Name:		Etherow (Woodhead Res. to Glossop Bk.)		Scheme Phase:		WR159			
RBMP:		North West		Reference:		Construction			
Operational catchment:		Goyt Etherow Tame		Impact potential:		Direct			
Designation (and uses):		Heavily Modified				Operational			
Relevant upstream water bodies:						Direct			
Downstream water bodies:									
WFD Element (Receptor)		Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Londendale (Woodhead, Torside, Rhodeswood, Valehouse, Bottoms and Arnfield) reservoirs from 48.6 Ml/d to 45.4 Ml/d, a reduction of 3.2 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has no water available at all flows (Q95, Q70, Q50 and Q30). However, the heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	Good	Good by 2015					
		Benthic invertebrates	Good	Good by 2015					
		Fish	Poor	Moderate by 2027					
	Hydromorphology	Hydrological regime	-	-					
		River continuity							
		Morphological conditions	-						
	Physico-chemical	General physico-chemical	High	Good by 2015					
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment						
	Priority substances	Does not require assessment	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx</p> <p>EA Abstraction Licence Strategy (Upper Mersey): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf</a></p>	

Water body ID:		GB112069061060		Scheme:		Group 1 - Improved reservoir compensation release control – AUDENSHAW 1, 2 & 3		
Water body Name:		Platt Brook (Source to Fallowfield Bk)		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Bollin Dean Mersey Upper		Impact potential:		Operational		
Designation (and uses):		Heavily Modified				Direct		
Relevant upstream water bodies:								
Downstream water bodies:		Chorlton Brook (Princess Parkway to Mersey)						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Audenshaw 1, 2 and 3 reservoirs from 48.6 Ml/d to 45.4 Ml/d, a reduction of 3.2 Ml/d. It is not clear which WFD water body would be effected by the release (this water body or Tame (Swineshaw Brook to Mersey). (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	Good	Good by 2015				
		Benthic invertebrates	Bad	Good by 2027				
		Fish						
	Hydromorphology	Hydrological regime	Supports good	Supports good by 2015				Installation of new automatic penstock arrangements. No or minimal impact.
		River continuity						
		Morphological conditions						
	Physico-chemical	General physico-chemical	All high apart from phosphate which is poor and ammonia which is moderate	#REF!				
		Specific pollutants:	Triclosan: high	High by 2015				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment	Does not require assessment					
	Priority substances	Does not require assessment	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)

Water body ID:		GB112069061112		Scheme:		Group 1 - Improved reservoir compensation release control – AUDENSHAW 1, 2 & 3		
Water body Name:		Tame (Swineshaw Brook to Mersey)		Scheme Phase:		WR159		
RBMP:		North West		Reference:		Construction		
Operational catchment:		Goyt Etherow Tame		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Audenshaw 1, 2 and 3 reservoirs from 48.6 Ml/d to 45.4 Ml/d, a reduction of 3.2 Ml/d. It is not clear which WFD water body would be effected by the release (this water body or Platt Brook (Source to Fallowfield Bk). (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS shows that the surface water body has water available at all flows (Q95, Q70, Q50 and Q30). Given the small reduction compared to the total compensation release, that water is available across most of the surface water body at all flows, and assuming low flow compensation flows would be maintained, any impacts on the hydrological regime of the surface water body would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate	Moderate by 2015				
		Benthic invertebrates	Moderate	Moderate by 2015				
		Fish	Poor	Good by 2027				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Moderate by 2015				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015					
	Priority substances	Good	Good by 2015					
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Moderate by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Upper Mersey): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300491/LIT\\_7883\\_7c60f1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300491/LIT_7883_7c60f1.pdf)



Water body ID:		GB112075070430		Scheme:		Group 2 - Improved reservoir compensation release control – Thirlmere					
Water body Name:		St John's Beck		Scheme Phase:		WR159					
RBMP:		North West		Reference:		Construction					
Operational catchment:		Derwent		Impact potential:		Direct					
Designation (and uses):		Heavily Modified				Operational					
Relevant upstream water bodies:						Direct					
Downstream water bodies:											
	WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence		Confidence				
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Thirlmere reservoir from 15.0 Ml/d to 13.6 Ml/d, a reduction of 1.4 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	High				
		Macrophytes	-								
		Macrophytes and phytobenthos	High	Good by 2015							
		Benthic invertebrates	High	Good by 2015							
		Fish	High	Good by 2015							
	Hydromorphology	Hydrological regime	-	-					Installation of new automatic penstock arrangements. No or minimal impact.	The ALS shows that the surface water body has no water available at all flows (Q95, Q70, Q50 and Q30). However, the heavily modified water body (HMWB) investigations undertaken by UU and the EA on this water body have not identified any problems with fish passage, downstream flow, downstream habitat/morphology, or downstream water quality, taking both actual and consented compensation flows into account. As such, the reduction in flows are unlikely to have prolonged or widespread effects of the hydrological regime of the surface water body.	High
		River continuity									
		Morphological conditions	-								
	Physico-chemical	General physico-chemical	High	Good by 2015							
		Specific pollutants:	-								
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015								
	Priority substances	Good	Good by 2015								
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A							
	Chemical	Good	Good by 2015	N/A							
	Overall	Moderate	Good by 2027	N/A							

<b>Assumptions</b>
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).</p>

<b>Evidence</b>
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx</p> <p>EA Abstraction Licence Strategy (Derwent and West Cumbria): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300487/LIT_7890_cb5a1e.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300487/LIT_7890_cb5a1e.pdf</a></p>

Water body ID:		GB112070064850	Scheme:		Group 2 - Improved reservoir compensation release control – RIVINGTON			
Water body Name:		Douglas - Upper	Scheme Phase:		WR159			
RBMP:		North West	Reference:		Construction		Operational	
Operational catchment:		Douglas OC	Impact potential:		Direct		Direct	
Designation (and uses):		Heavily Modified						
Relevant upstream water bodies:								
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Rivington Reservoirs from 26.6 Ml/d to 24.7 Ml/d, a reduction of 1.9 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)  The ALS states that: The part of the surface water body that contains Rivington Reservoirs and their immediate catchment, and the headwater catchment to the east have limited water available at low flows (Q95), water available at Q70, and no water available at medium and high flows (Q50 ad Q30). The southern, lowest most part of the water body, and the headwaters above the Rivington Reservoir have water available at all flows.  A reduction in the compensation flow could effect the hydrological regime of the surface water body. However given the small size of the reduction compared to the total compensation release, and that the water body downstream of the Rivington Reservoirs has water available across all flows, and assuming low flow compensation flows would be maintained, any impacts would be localised and temporary.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	High	Good by 2015				
		Benthic invertebrates	Good	Good by 2015				
		Fish	-	-				
	Hydromorphology	Hydrological regime	-	-				
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	Moderate	Good by 2027				
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015					
	Priority substances	Good	Good by 2015					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

Water body ID:		GB10207607020		Scheme:		Group 2 - Improved reservoir compensation release control – HAWESWATER		
Water body Name:		Haweswater Beck		Scheme Phase:		WR159		
RBMP:		Solway Tweed		Reference:		Construction		
Operational catchment:		Eamont		Impact potential:		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:		Lowther (Lower)						
WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Haweswater reservoir from 24.0 Ml/d to 21.8 Ml/d, a reduction of 2.2 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	High
		Macrophytes	-					
		Macrophytes and phytobenthos	Good	Good by 2015				
		Benthic invertebrates	Good	Good by 2015				
		Fish	-					
	Hydromorphology	Hydrological regime	-					
		River continuity						
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	All high, except Phosphate which is Moderate	Good by 2027				
		Specific pollutants:	High					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good	Good by 2015					
	Priority substances	Good	Good by 2015					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159\_Compensation control - Group 1.docx  
 EA Abstraction Licence Strategy (Eden and Esk): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300486/LIT\\_7889\\_1384b1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300486/LIT_7889_1384b1.pdf)

		Water body ID:	GB109054049880	Scheme:	Group 2 - Improved reservoir compensation release control – VYRNWY					
		Water body Name:	Vrynwy - Lake Vrynwy to conf Afon Cownwy	Scheme Phase:	WR159					
		RBMP:	Severn	Reference:	Construction		Operational			
		Operational catchment:	Severn Uplands	Impact potential:	Direct		Direct			
		Designation (and uses):	Heavily Modified							
		Relevant upstream water bodies:	Afon Nadroedd - source to Lake Vrynwy, Afon Cedig - source to Lake Vrynwy, Eunant - source to Lake Vrynwy (Pont Eunant)							
		Downstream water bodies:	Afon Vrynwy - conf Afon Cownwy to conf Afon Banwy							
		WFD Element (Receptor)	Status	RBMP Objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos				Installation of new automatic penstock arrangements. No or minimal impact.	High	Reduction in compensation flows due to new penstock arrangements. Minor level of impact. Reduction of compensation flow from Vrynwy reservoir from 48.4 Ml/d to 45.0 Ml/d, a reduction of 3.4 Ml/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	Medium	
		Macrophytes								
		Macrophytes and phytobenthos								
	Hydromorphology	Benthic invertebrates								
		Fish	High							
		Hydrological regime	-							
		River continuity								
Physico-chemical	Morphological conditions									
	General physico-chemical	All high or good								
	Specific pollutants:	Moderate								
WFD elements for Rivers: Chemical	Chemical	Priority hazardous substances								
		Priority substances	Good							
Overall Status/Potential	Overall	Ecological	Moderate	Good by 2021						
		Chemical	Good	Good by 2015						
		Overall	Moderate	Good by 2021						

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Licensed compensation flows have been set to maintain flows at or above the environmental flow index (EFI).

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: \\war-fs1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Regional\WR159\WR159_Compensation control - Group 1.docx EA Abstraction Licence Strategy (Sever Corridor): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291406/LIT_7848_c0b50e.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291406/LIT_7848_c0b50e.pdf</a>

		Water body ID:	GB112073071070	Scheme:	River Bela to Thirlmere Aqueduct								
		Water body Name:	Bela	Reference	WR800								
		RBMP:	Kent and Leven	Scheme Phase	Construction		Operational						
		Operational catchment:	Bela	Impact potential	Direct		Direct						
		Designation (and uses):	Heavily modified										
		Relevant upstream water bodies:	Holme Beck, Peasey Beck and Stainton Beck										
		Downstream water bodies:	Kent										
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence						
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided			Transfer pipe line on land. No or minimal impact.	Use of new transfer pipe line, pumping station and surface water intake. No or minimal impact.						
		Macrophytes	Not provided										
		Macrophytes and phytobenthos	Not provided										
		Benthic invertebrates	Good										
		Fish	High										
	Hydro-morphology	Hydrological regime	Not provided					Transfer pipe line with water course crossings. Minor level of impact.	High	New surface water abstraction quantity. Minor level of impact. New surface water abstraction from the River Bela near Milnthorpe of 4.5 Ml/d.			
		River continuity	Not provided										
		Morphological conditions	Not provided										
		General physico-chemical	All high/good										
		Specific pollutants:	All high										
WFD elements for Rivers: Chemical	Priority hazardous substances	All good			New surface water intake. Minor level of impact.	New pumping station. Minor level of impact.	In the ALS, water is identified as available at all of the flow ranges. The abstraction is relatively small in size and the new abstraction would be obtained through abstraction licence trading. It is assumed that the trading licence is located on the same reach of river, minimising any changes to the hydrological regime of the surface water body.						
	Priority substances	All good											
Overall Status/Potential	Ecological	Good	Good by 2015	N/A									Low
	Chemical	Good	Good by 2015	N/A									
	Overall	Good	Good by 2015	N/A									

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proformas: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stock>

EA Abstraction Licence Strategy (South Cumbria): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LI](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LI)

Water body ID:		GB41202G102100		Scheme:		River Bela to Thirlmere Aqueduct			
Water body Name:		Palaeozoic and Carboniferous Aquifers		Reference		WR800			
RBMP:		North West GW		Scheme Phase		Construction			
Operational catchment:		Cumbria South Lower Palaeozoic and Carboniferous Aq		Impact potential		Operational			
Designation (and uses):		No designation				Direct			
Relevant upstream water bodies:		Not identified				Direct			
Downstream water bodies:		Not identified							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			<p><b>New surface water intake.</b> No or minimal impact.</p> <p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> No or minimal impact.</p> <p><b>New pumping station.</b> No or minimal impact.</p>	<p><b>High</b></p>	<p><b>Use of new transfer pipe line, pumping station and surface water intake</b> No or minimal impact.</p> <p><b>New surface water abstraction quantity.</b> No or minimal impact. New surface water abstraction from the River Bela near Milnthorpe of 4.5 M/d.</p> <p>In the ALS, no groundwater management unit is defined for this area. For the surface water body, water is identified as available across the flow regime. The abstraction is relatively small in size, and is unlikely to cause any changes to the wetted area of the River Bela. This secondary aquifer is unlikely to be highly dependent on surface water courses to sustain its quantitative status. Given the minor level of impact expected for the surface water body, no or minimal impact is expected for the groundwater body.</p>	<p><b>Medium</b></p>
		Quantitative GWDTEs test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor						
		Chemical Drinking Water Protected Area	Good						
		Chemical GWDTEs test	Good						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Good						
		Prevent and Limit Objective	Not provided						
Overall Status/Potential	Supporting Elements	Trend Assessment	No trend						
		Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Poor	Good by 2027	N/A				
Overall		Poor	Good by 2027	N/A					

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body. 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proformas: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/WRZWR075/WR075_Stocks_Reservoir.xlsx">http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Feasible_Options/WRZWR075/WR075_Stocks_Reservoir.xlsx</a> EA Abstraction Licence Strategy (South Cumbria): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccfa86.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccfa86.pdf</a>

		Water body ID:	GB30328860	Scheme:	THIRD PARTY OPTION: Cow Green IR to Haweswater via Heltondale aqueduct						
		Water body Name:	Cow Green Reservoir	Reference:	WR810						
		RBMP:	Northumbria	Scheme Phase:	Construction		Operational				
		Operational catchment:	Tees Upper	Impact potential:	Direct		Direct				
		Designation (and uses):	Heavily modified								
		Relevant upstream water bodies:									
		Downstream water bodies:									
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence				
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	High			New surface water intake. Minor level of impact.	High	New surface water abstraction quantity. No or minimal impact. New abstraction of 40 M/d from Cow Green Reservoir, transfer via pipeline to Haweswater Reservoir via Heltondale Aqueduct. It is assumed that the Cow Green Reservoir has capacity for the new abstraction, the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the River Tees. A new abstraction licence would be required to be granted by the Environment Agency.	Low		
		Macrophytes	-								
		Phytobenthos	-								
		Macrophytes and phytobenthos	-								
		Chironomids (CPET)	-								
	Hydro-morphology	Fish	-								
		Hydrological regime	-								
		River continuity	-								
		Physico-chemical	Morphological conditions	-							
			General physico-chemical	Salinity - High Total Phosphorus - Good							
Specific pollutants:	Copper - High										
WFD elements for Lakes/Reservoirs: Chemical	Priority hazardous substances	Does not require assessment									
	Priority substances	Does not require assessment									
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A							
	Chemical	Good	Good by 2015	N/A							
	Overall	Moderate	Good by 2027	N/A							

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR810\WR810  
 EA Abstraction Licence Strategy (Tees): <https://www.gov.uk/government/publications/tees-abstraction-licensing-strategy>

Water body ID:		GB103025076080	Scheme:	THIRD PARTY OPTION: Cow Green IR to Haweswater via Heltondale aqueduct				
Water body Name:		Tees from Trout Beck	Reference:	WR810				
RBMP:		Northumbria	Scheme Phase:	Construction		Operational		
Operational catchment:		Tees Upper	Impact potential:	Direct		Direct		
Designation (and uses):		Heavily modified						
Relevant upstream water bodies:								
Downstream water bodies:								
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos			High	New surface water abstraction quantity. No or minimal impact. New abstraction of 40 M/d from Cow Green Reservoir, transfer via pipeline to Haweswater Reservoir via Heltondale Aqueduct.	Low	
		Macrophytes						
		Macrophytes and phytobenthos						
		Benthic invertebrates						
		Fish						
	Hydro-morphology	Hydrological regime						Transfer pipe line on land. No or minimal impact.
		River continuity						Transfer pipe line with water course crossings. Minor level of impact.
		Morphological conditions						New surface water intake. Minor level of impact.
	Physico-chemical	General physico-chemical						New pumping station. Minor level of impact.
		Specific pollutants:						
WFD elements for Rivers: Chemical	Priority hazardous substances							
	Priority substances							
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which wo
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR810\W  
 EA Abstraction Licence Strategy (Tees): <https://www.gov.uk/government/publications/tees-abstraction-licensing-strategy>



Water body ID:		GB40302G700300		Scheme:		THIRD PARTY OPTION: Cow Green IR to Haweswater via Heltondale aqueduct			
Water body Name:		Tees Carb Limestone & Millstone Grit		Reference		WR810			
RBMP:		Northumbria		Scheme Phase		Construction Operational			
Operational catchment:		Tees Carb Limestone & Millstone Grit		Impact potential		Direct Direct			
Designation (and uses):		No designation							
Relevant upstream water bodies:									
Downstream water bodies:									
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			New surface water intake. No or minimal impact.  Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New pumping station. No or minimal impact.	High	New surface water abstraction quantity No or minimal impact. New abstraction of 40 M3/d from Cow Green Reservoir, transfer via pipeline to Haweswater Reservoir via Heltondale Aqueduct.  The abstraction is from the reservoir, not a natural water course within the water body. It is assumed that Cow Green Reservoir has capacity for the new abstraction, the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the River Tees. Therefore significant changes in the status of the groundwater body are unlikely. A new abstraction licence would be required to be granted by the Environment Agency.  New Transfer Pipe Line and Pumping Station No or minimal impact.	Medium
		Quantitative GWDTEs test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor						
		Chemical Drinking Water Protected Area	Good						
		Chemical GWDTEs test	Good						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Good						
		Supporting Elements (Groundwater)	Prevent and Limit Objective	-					
	Trend Assessment	No trend							
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A					
	Chemical (GW)	Poor	Poor by 2015	N/A					
	Overall	Poor	Poor by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't hav
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of est
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR810\WR810\\_T](\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR810\WR810_T)  
 EA Abstraction Licence Strategy (Tees): <https://www.gov.uk/government/publications/tees-abstraction-licensing-strategy>

Water body ID:		GB30327698		Scheme:		THIRD PARTY OPTION: Kielder Water IR transfer			
Water body Name:		Kielder Water		Reference:		WR812			
RBMP:		Northumbria		Scheme Phase:		Construction			
Operational catchment:		North Tyne Upper		Impact potential:		Direct			
Designation (and uses):		(reservoir)				Operational			
Relevant upstream water bodies:		-				Direct			
Downstream water bodies:		-							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good		Confidence	Confidence		
WFD elements for Lakes/Reservoirs: Ecological	Biology	Phytoplankton	Not assessed		New surface water intake. Minor level of impact.	High	<p><b>New surface water abstraction quantity.</b> No or minimal impact. New abstraction of 100 Ml/d from Kielder Water. Transfer via pipe line to Haweswater Reservoir via Heltondale Aqueduct.</p> <p>It is assumed that Kielder Water has capacity for the new abstraction, the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the River North Tyne. A new abstraction licence would be required to be granted by the Environment Agency.</p>		
		Macrophytes	Not assessed						
		Phytobenthos	Not assessed						
		Macrophytes and phytobenthos	Not assessed						
		Chironomids (CPET)	Not assessed						
	Hydro-morphology	Littoral invertebrates	Not assessed						
		Hydrological regime	Not assessed						
		River continuity	Not assessed						
		Physico-chemical	Morphological conditions	Not assessed					
			General physico-chemical	Not assessed					
Specific pollutants:	Not assessed								
WFD elements for Lakes/Reservoirs: Chemical	Expert Judgement	Moderate	Good by 2027						
	Mitigation Measures Assessment	Moderate or less	Good by 2027						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR812W  
 EA Abstraction Licence Strategy (Tyne): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/307287/ir\\_7873\\_84be79.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307287/ir_7873_84be79.pdf)

		Water body ID:	GB40302G702700	Scheme:	THIRD PARTY OPTION: Kielder Water IR transfer			
		Water body Name:	Tyne Carboniferous Limestone	Reference	WR812			
		RBMP:	Northumbria	Scheme Phase	Construction		Operational	
		Operational catchment:	Tyne Carboniferous Limestone	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	-					
		Downstream water bodies:	-					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>New surface water abstraction quantity</b> No or minimal impact. New abstraction of 100 M/d from Kielder Water. Transfer via pipe line to Haweswater Reservoir via Heltondale Aqueduct.</p> <p>The abstraction is from the reservoir, not a natural water course within the water body. It is assumed that Kielder Water has capacity for the new abstraction (the ALS indicates that the River North Tyne has water available for abstraction licencing across all flows), the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the River North Tyne. Therefore significant changes in the status of the groundwater body are unlikely. A new abstraction licence would be required to be granted by the Environment Agency.</p> <p><b>Use of new transfer pipe line and pumping station</b> No or minimal impact.</p>	Low
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTes test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Supporting Elements (Groundwater)	Prevent and Limit Objective	-				
		Trend Assessment	No trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.glabal.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR812\WFA Abstraction Licence Strategy (Tyne): <https://www.gov.uk/government/publications/tyne-abstraction-licensing-strategy>

Water body ID:		GB30431243 - GB112073071100		Scheme:		THIRD PARTY OPTION: Scammonden IR to Buckton Castle via Huddersfield Narrows Canal	
Water body Name:		Scammonden Water		Reference:		WR813	
RBMP:		Humber		Scheme Phase:		Construction	
Operational catchment:		Calder Middle		Impact potential:		Direct	
Designation (and uses):		heavily modified				Operational	
Relevant upstream water bodies:		-				Direct	
Downstream water bodies:		-					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence
Phytoplankton	-			New surface water intake. Minor level of impact.	High	New surface water abstraction quantity No or minimal impact. New abstraction of 5 M/d from Scammonden Reservoir, transfer via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW. It is assumed that Scammonden Reservoir has capacity for the new relatively small abstraction, the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the Black Brook. A new abstraction licence would be required to be granted by the Environment Agency.	Low
Macrophytes	-						
Phytobenthos	-						
Macrophytes and phytobenthos	-						
Chironomids (CPET)	-						
Fish	-						
Hydrological regime	-						
River continuity	-						
Morphological conditions	-						
General physico-chemical	-						
Specific pollutants:	-						
WFD elements for Lakes/Reservoirs: Ecological							
WFD elements for Lakes/Reservoirs: Biological							
WFD elements for Lakes/Reservoirs: Hydro-morphology							
WFD elements for Lakes/Reservoirs: Physico-chemical							
WFD elements for Lakes/Reservoirs: Chemical							
Priority hazardous substances	Does not require assessment						
Priority substances	Does not require assessment						
Overall Status at Present	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR813\WR813\_TPO\_Scammonden IR to Buckton Castle.docx

EA Abstraction Licence Strategy (Aire and Calder): <https://www.gov.uk/government/publications/abstraction-licensing-aire-and-calder-strategy>

Water body ID:		GB104027062570		Scheme:		THIRD PARTY OPTION: Scammonden IR to Buckton Castle via Huddersfield Narrows Canal			
Water body Name:		Black Brook from Source to River Calder		Reference:		WR813			
RBMP:		Humber		Scheme Phase:		Construction			
Operational catchment:		Calder Middle		Impact potential:		Operational			
Designation (and uses):		heavily modified				Direct			
Relevant upstream water bodies:		None.							
Downstream water bodies:		Calder from Ryburn Confluence to River Colne							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  New /modified surface water intake. Minor level of impact.  New/modified pumping station. Minor level of impact.	High	Use of new transfer pipe line and pumping station. No or minimal impact.  New surface water abstraction quantity No or minimal impact. New abstraction of 5 Ml/d from Scammonden Reservoir, transfer via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW. The abstraction is from the reservoir within this surface water body, not a natural water course within the water body. It is assumed that Scammonden Reservoir has capacity for the new relatively small abstraction (the ALS indicates that the Black Brook as water available for abstraction licencing across all flows), the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the Black Brook. A new abstraction licence would be required to be granted by the Environment Agency.		
		Macrophytes	-						
		Macrophytes and phytobenthos	Good	Good by 2015				Low	
		Benthic invertebrates	Good	Good by 2015					
		Fish	Good	Good by 2015					
	Hydromorphology	Hydrological regime	Not assessed						
		River continuity	Not assessed						
		Morphological conditions	Not assessed						
		Physico-Chemical	General physico-chemical	All high apart from phosphate which is moderate				Good by 2015, apart from phosphate which is moderate by 2015.	
			Specific pollutants:	Not assessed					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have :
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estua
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR813\WR813\_TP  
 EA Abstraction Licence Strategy (Aire and Calder): <https://www.gov.uk/government/publications/abstraction-licensing-aire-and-calder-strategy>

Water body ID:		GB71210268		Scheme:		THIRD PARTY OPTION: Scammonden IR to Buckton Castle via Huddersfield Narrow Canal			
Water body Name:		Huddersfield Narrow Canal west section		Reference:		WR813			
RBMP:		Humber		Scheme Phase:		Construction			
Operational catchment:		Calder canals		Impact potential:		Operational			
Designation (and uses):		Artificial				Direct			
Relevant upstream water bodies:		-							
Downstream water bodies:		-							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		New surface water intake. Minor level of impact.	High	Transfer of water via canal. Minor level of impact.  New surface water abstraction quantity. Minor level of impact. New abstraction of 5 Ml/d from Huddersfield Narrow Canal near Buckton WTW (water is abstracted from Scammonden Reservoir, and transferred via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW).  The abstraction is of water that has been discharged upstream in the canal. It is assumed the canal will be managed to maintain flows which support the hydrological regime, so no long term or widespread impacts on the status of the canal are anticipated. A new abstraction licence would be required to be granted by the Environment Agency.	Low	
		Macrophytes	-						
		Macrophytes and phytobenthos	-						
		Benthic invertebrates	-						
		Fish	-						
	Hydro-morphology	Hydrological regime	-						
		River continuity	-						
		Morphological conditions	-						
		General physico-chemical	-						
		Specific pollutants:	-						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Good	Good by 2027	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estu
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR813\WR813\_TF  
 EA Abstraction Licence Strategy (Upper Mersey): <https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy>

Water body ID:		GB112069061111		Scheme:		THIRD PARTY OPTION: Scammonden IR to Buckton Castle via Huddersfield Narrows Canal	
Water body Name:		Tame (Chew Brook to Swineshaw Brook)		Reference:		WR813	
RBMP:		Humber		Scheme Phase:		Construction	
Operational catchment:		Goyt Etherow Tame		Impact potential:		Operational	
Designation (and uses):		heavily modified				Direct	
Relevant upstream water bodies:		Chew Brook, Tame (Source to Chew Brook)					
Downstream water bodies:		Tame (Swineshaw Brook to Mersey)					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	<p>Use of new transfer pipe line and pumping station. No or minimal impact.</p> <p>Transfer of water via canal. No or minimal impact.</p> <p>New surface water abstraction quantity. No or minimal level of impact. New abstraction of 5 M/d from Huddersfield Narrow Canal near Buckton WTW (water is abstracted from Scammonden Reservoir, and transferred via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW).</p> <p>The abstraction is from the canal, a managed water course within this water body. It is assumed that there is limited interaction between the canal and the "natural" water courses, so there will not be any significant change to the status of the surface water body. A new abstraction licence would be required to be granted by the Environment Agency.</p>
		Macrophytes	-				
		Macrophytes and phytobenthos	-				
		Benthic invertebrates	Moderate	Good by 2017			
		Fish	-				
	Hydromorphology	Hydrological regime	-				
		River continuity	-				
		Morphological conditions	-				
		General physico-chemical	All high apart from phosphate which is good	Good by 2015			
		Specific pollutants:	Triclosan - high	High by 2015			
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Moderate by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't be affected by the watercourse.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of existing water courses would be installed via a trench and cover technique within a dry working area.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR813\WR813 EA Abstraction Licence Strategy (Upper Mersey): <https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy>

		Water body ID:	GB40402G700400	Scheme:	THIRD PARTY OPTION: Scammonden IR to Buckton Castle via Huddersfield Narrows Canal				
		Water body Name:	Aire and Calder Carb Limestone - Millstone Grit Coal - Measures	Reference	WR813				
		RBMP:	Humber	Scheme Phase	Construction		Operational		
		Operational catchment:	Aire and Calder Carb Limestone - Millstone Grit Coal - Measures	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	-						
		Downstream water bodies:	-						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> No or minimal impact.</p> <p><b>New surface water intake.</b> No or minimal impact.</p> <p><b>New pumping station.</b> No or minimal impact.</p> <p><b>New outfall to canal.</b> No or minimal impact.</p>	<p><b>New surface water abstraction quantity</b> No or minimal impact. New abstraction of 5 M<sup>3</sup>/d from Scammonden Reservoir, transfer via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW.</p> <p>The abstraction is from the reservoir, not a natural water course within the water body. It is assumed that Scammonden Reservoir has capacity for the new relatively small abstraction (the ALS indicates that the Black Brook as water available for abstraction licencing across all flows), the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the Black Brook. Therefore significant changes in the status of the groundwater body are unlikely. A new abstraction licence would be required to be granted by the Environment Agency.</p> <p><b>Use of new transfer pipe line, pumping station, surface water intake, and outfall</b> No or minimal impact.</p>	Medium
		Quantitative GWDTes test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor			High	<p><b>New surface water intake.</b> No or minimal impact.</p> <p><b>New pumping station.</b> No or minimal impact.</p> <p><b>New outfall to canal.</b> No or minimal impact.</p>	<p><b>New surface water abstraction quantity</b> No or minimal impact. New abstraction of 5 M<sup>3</sup>/d from Scammonden Reservoir, transfer via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW.</p> <p>The abstraction is from the reservoir, not a natural water course within the water body. It is assumed that Scammonden Reservoir has capacity for the new relatively small abstraction (the ALS indicates that the Black Brook as water available for abstraction licencing across all flows), the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the Black Brook. Therefore significant changes in the status of the groundwater body are unlikely. A new abstraction licence would be required to be granted by the Environment Agency.</p> <p><b>Use of new transfer pipe line, pumping station, surface water intake, and outfall</b> No or minimal impact.</p>	Medium
		Chemical Drinking Water Protected Area	Good						
		Chemical GWDTes test	Good						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Poor						
		Supporting Elements (for groundwater)	Prevent and Limit Objective	-					
Overall Status/Potential	Supporting Elements (for groundwater)	Trend Assessment	Upward trend			High	<p><b>New surface water intake.</b> No or minimal impact.</p> <p><b>New pumping station.</b> No or minimal impact.</p> <p><b>New outfall to canal.</b> No or minimal impact.</p>	<p><b>New surface water abstraction quantity</b> No or minimal impact. New abstraction of 5 M<sup>3</sup>/d from Scammonden Reservoir, transfer via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW.</p> <p>The abstraction is from the reservoir, not a natural water course within the water body. It is assumed that Scammonden Reservoir has capacity for the new relatively small abstraction (the ALS indicates that the Black Brook as water available for abstraction licencing across all flows), the volume and surface area of the reservoir will not be significantly changed, and that compensation flows will be maintained to the Black Brook. Therefore significant changes in the status of the groundwater body are unlikely. A new abstraction licence would be required to be granted by the Environment Agency.</p> <p><b>Use of new transfer pipe line, pumping station, surface water intake, and outfall</b> No or minimal impact.</p>	Medium
		Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Poor	Poor by 2015	N/A				
		Overall	Poor	Poor by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't be affected by the watercourse.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of water courses will be installed via a trench and cover technique within a dry working area. New pipe line crossings of water courses will be installed via a trench and cover technique within a dry working area.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR813\WR813\_1  
 EA Abstraction Licence Strategy (Aire and Calder): <https://www.gov.uk/government/publications/abstraction-licensing-aire-and-calder-strategy>



		<b>Water body ID:</b>	GB41202G102900	<b>Scheme:</b>	THIRD PARTY OPTION: Scammonden IR to Buckton Castle via Huddersfield Narrow Canal		
		<b>Water body Name:</b>	Manchester and East Cheshire Carboniferous Aquifers	<b>Reference</b>	WR813		
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction		Operational
		<b>Operational catchment:</b>	Manchester and East Cheshire Carboniferous Aquifers	<b>Impact potential</b>	Direct		Direct
		<b>Designation (and uses):</b>	No designation				
		<b>Relevant upstream water bodies:</b>	-				
		<b>Downstream water bodies:</b>	-				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good	Good by 2015		High	Use of new transfer pipe line, pumping station, surface water intake, and transfer of water via canal. No or minimal impact.  New surface water abstraction quantity. No or minimal level of impact. New abstraction of 5 Ml/d from Huddersfield Narrow Canal near Buckton WTW (water is abstracted from Scammonden Reservoir, and transferred via the Huddersfield Narrow Canal for re-abstraction at Buckton Castle WTW).  The abstraction is from the canal, a managed water course within this water body. It is assumed that there is limited interaction between the canal and the secondary aquifers in the groundwater body, so there will not by any significant change to the status of the groundwater body. A new abstraction licence would be required to be granted by the Environment Agency.
		Quantitative GWDTes test	Good	Good by 2015			
		Quantitative Saline Intrusion	Good	Good by 2015			
		Quantitative Water Balance	Good	Good by 2015			
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good	Good by 2015			
		Chemical Drinking Water Protected Area	Poor	Good by 2027			
		Chemical GWDTes test	Good	Good by 2015			
		Chemical Saline Intrusion	Good	Good by 2015			
		General Chemical Test	Good	Good by 2015			
		Prevent and Limit Objective	-				
		Trend Assessment	Upward trend				
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't h
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of e
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\Design\Feasible Options\Third Party Options\WR813\WR813\_  
 EA Abstraction Licence Strategy (Upper Mersey): <https://www.gov.uk/government/publications/upper-mersey-abstraction-licensing-strategy>

		Water body ID:	GB41101G202400	Scheme:	Increased Abstraction Capacity At Heronbridge				
		Water body Name:	Dee Permo-Triassic Sandstone	Reference	WR814a				
		RBMP:	Dee GW	Scheme Phase	Construction		Operational		
		Operational catchment:	Gee Permo-Triassic Sandstone	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	Not identified						
		Downstream water bodies:	Not identified						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			Modified water treatment works. No or minimal impact.	High	Modified water treatment works. No or minimal impact.	High
		Quantitative GWDTEs test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good						
		Chemical Drinking Water Protected Area	Good						
		Chemical GWDTEs test	Good						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Good						
	Supporting Element	Prevent and Limit Objective	Not provided						
Trend Assessment		No trend							
Overall Status/Potential		Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Good	Good by 2015	N/A				
		Overall	Good	Good by 2015	N/A				

Assumptions

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?k=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=3">http://maps.environment-agency.gov.uk/wiyby/wiybyController?k=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=3</a> EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?k=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=3">http://maps.environment-agency.gov.uk/wiyby/wiybyController?k=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=e&amp;topic=floodmap#x=3</a> BGS Geology Mapping: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a> Dee Catchment Abstraction Management Strategy: <a href="https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf">https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf</a>

<b>Water body ID:</b>		GB111067057080		<b>Scheme:</b>		Increased Abstraction Capacity At Heronbridge	
<b>Water body Name:</b>		Dee- Chester Weir to Ceiriog		<b>Reference</b>		WR814a	
<b>RBMP:</b>		Dee		<b>Scheme Phase</b>		Construction Operational	
<b>Operational catchment:</b>		Dee		<b>Impact potential</b>		Direct Direct	
<b>Designation (and uses):</b>		Heavily modified water body					
<b>Relevant upstream water bodies:</b>		Ceiriog - confluence Dee to Teirw, Dee - Ceiriog to Alwen, Shell Brook, Dungrey Brook, Worthenbury Brook - lower, Clywedog - Dee to Gwenfro, Alyn - Hope to Dee, Pulford Brook, Aldford Brook, Henlake Brook					
<b>Downstream water bodies:</b>		N/A					
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>		<b>Confidence</b>	<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Good		Modified water treatment works. No or minimal impact.	High	Modified water treatment works. No or minimal level of impact.  Changed surface water abstraction quantity. No or minimal impact. Increase abstraction for Huntington WTW by 24 MI/d. Additional licence volume is a result of a proposed licence trade from an existing industrial use abstraction located at Heron Bridge of 35 MI/d. The licence trade results in an overall reduction in abstraction quantity from the River Dee of 11 MI/d. The Dee AMS indicates there is no new water available for abstraction but it may be possible to trade water with an existing abstractor. Given the short distance between the old and new abstraction locations, no significant change in water body status will occur. The reduced overall licence quantity may have a positive benefit on the hydrological regime of the lower reaches of the water body.
		Macrophytes	Poor				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	Moderate				
		Fish	Not provided				
	Hydromorphology	Hydrological regime	Not provided				
		River continuity	N/A				
		Morphological conditions	Not provided				
	Physico-chemical	General physico-chemical	All reported elements high or good				
		Specific pollutants:	All reported elements high or good				
WFD elements for Rivers: Chemical	Priority hazardous substances	All reported elements good apart from Tributyltin Compounds Nonylphenol which fail					
	Priority substances	All reported elements good					
Overall Status/Potential	Ecological	Moderate	Good by 2021	N/A			
	Chemical	Fail	Good by 2021	N/A			
	Overall	Moderate	Good by 2021	N/A			

Assumptions

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=rm">http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=rm</a> EA Historical Landfill: <a href="http://maps.environment">http://maps.environment</a> Dee Catchment Abstraction Management Strategy: <a href="https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf">https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf</a>

Water body ID:		GB111067052060		Scheme:				Increased treatment capacity at Hurlston WTW via Canal	
Water body Name:		Dee - Ceiriog to Alwen		Reference		WR814b			
RBMP:		Dee		Scheme Phase		Construction		Operational	
Operational catchment:		Dee		Impact potential		Direct		Direct	
Designation (and uses):		Heavily Modified							
Relevant upstream water bodies:		Dee - Alwen to Llyn Tegid, Alwen - Dee to Ceirw, Camddwr, Eglwyseg, Trefnant Brook, Eitha							
Downstream water bodies:		Dee - Chester Weir to Ceiriog							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Good		Transfer of water via canal. No or minimal impact, no construction necessary.	High	Transfer of water via canal. Minor level of impact. Increased flow in canal likely to be balanced by reduction in the Canal and River Trust abstraction.	Low	
		Macrophytes	Good						
		Macrophytes and phytobenthos	Not applicable						
		Benthic invertebrates	High						
		Fish	Not provided						
	Hydro-morphology	Hydrological regime	Not provided						
		River continuity	Not provided						
		Morphological conditions	Not provided						
		Physico-chemical	General physico-chemical	All reported substances good or high.					
			Specific pollutants:	All reported substances good or high.					
WFD elements for Rivers: Chemical	Priority hazardous substances	All reported substances good or high apart from Tributyltin Compounds which Fail.							
	Priority substances	All reported substances good or high.							
Overall Status\ Potential	Ecological	Good	Good by 2015	N/A					
	Chemical	Fail	Good by 2021	N/A					
	Overall	Moderate	Good by 2021	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR075\WR075 Stocks Reservoir.xlsx  
 EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiwyby/wiwybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lanq=e&topic=floodmap&x=344705&y=511476&lq=1.2.10.&scale=7>  
 EA Historical Landfill: [http://maps.environment-agency.gov.uk/wiwyby/wiwybyController?topic=waste&layerGroups=default&lang=\\_e&ep=map&scale=1&x=357682.99999999994&y=355133.99999999994&x=322374&y=497910&lg=1,2,3,10.&scale=7](http://maps.environment-agency.gov.uk/wiwyby/wiwybyController?topic=waste&layerGroups=default&lang=_e&ep=map&scale=1&x=357682.99999999994&y=355133.99999999994&x=322374&y=497910&lg=1,2,3,10.&scale=7)  
 Dee Catchment Abstraction Management Strategy: [https://naturalresources.wales/media/674759/dee\\_cams\\_2015\\_english.pdf](https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf)

		Water body ID:	GB41102G200200	Scheme:	Increased treatment capacity at Hurlleston WTW via Canal			
		Water body Name:	Dee Silurian/Ordovician	Reference	WR814b			
		RBMP:	Dee	Scheme Phase	Construction		Operational	
		Operational catchment:	Dee Silurian/Ordovician	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	Not identified					
		Downstream water bodies:	Not identified					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>Transfer of water via canal.</b> No or minimal impact. No change in the interaction between the canal and groundwater body expected.</p> <p><b>Increased quantity of surface water abstraction.</b> Minor level of impact. Change in flow regime in the River Dee may have an impact on interactions between surface water and groundwater (i.e. leakage of river water to groundwater). However as the River Dee is regulated to support abstraction and environmental needs, and the increase in abstraction may be balanced by a reduction in other abstractions, there is likely to be a significant impact on the groundwater body. Also Silurian and Ordovician strata are not typically primary aquifers or have high permeability and transmissivity, reducing the sensitivity of the groundwater body.</p>	Low
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
WFD elements for Groundwater: Supporting Elements	Supporting Elements	Prevent and Limit Objective	Not provided					
		Trend Assessment	Not provided					
Overall Status \ Potential	Quantitative	Good	N/A	N/A				
	Chemical (GW)	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

Assumptions	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p> <p>8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.</p>	
Evidence	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR075\WR075 Stocks Reservoir.xlsx</p> <p>EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=_e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lg=1,2,10,&amp;scale=7">http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang=_e&amp;topic=floodmap#x=344705&amp;y=511476&amp;lg=1,2,10,&amp;scale=7</a></p> <p>EA Historical Landfill: <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=waste&amp;layerGroups=default&amp;lang=_e&amp;ep=map&amp;scale=1&amp;x=357682.9999999994&amp;y=355133.9999999994&amp;x=322374&amp;y=497910&amp;lg=1,2,3,10,&amp;scale=7">http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=waste&amp;layerGroups=default&amp;lang=_e&amp;ep=map&amp;scale=1&amp;x=357682.9999999994&amp;y=355133.9999999994&amp;x=322374&amp;y=497910&amp;lg=1,2,3,10,&amp;scale=7</a></p> <p>BGS Geology Mapping: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a></p> <p>Dee Catchment Abstraction Management Strategy: <a href="https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf">https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf</a></p>	

Water body ID:		GB111067052060		Scheme:		Increased treatment capacity at Hurlston WTW via Canal		
Water body Name:		Dee - Ceiriog to Alwen		Reference:		WR814b		
RBMP:		Dee		Scheme Phase		Construction		
Operational catchment:		Dee		Impact potential		Direct		
Designation (and uses):		Heavily Modified				Operational		
Relevant upstream water bodies:		Dee - Alwen to Llyn Tegid, Alwen - Dee to Ceirw, Camddwr, Eglwyseg, Trefnant Brook, Eitha				Direct		
Downstream water bodies:		Dee - Chester Weir to Ceiriog						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Good		High	<p><b>Transfer of water via canal.</b> Minor level of impact. Increased flow in canal likely to be balanced by reduction in the Canal and River Trust abstraction.</p> <p><b>Increased quantity of surface water abstraction.</b> Medium level of impact. Increase in licenced quantity of abstraction from 50 Ml/d to 74 Ml/d from the River Dee at Llantisilio. Additional licence volume a result of a proposed licence trade from an existing industrial use abstraction located at Heron Bridge of 35 Ml/d.</p> <p>The licence trade results in an overall reduction in abstraction quantity from the River Dee of 11 Ml/d, but relocates 24 Ml/d of abstraction into the upper reaches of the river.</p> <p>The Dee AMS indicates there is no new water available for abstraction but it may be possible to trade water with an existing abstractor.</p> <p>It is unclear if 24 Ml/d would be available at Llantisilio, or if flow restrictions would apply. Flows in the River Dee are regulated to allow public water supply abstraction. The increase in abstraction at Llantisilio may be balanced by a reduction in abstraction by the Canal and River Trust.</p>	Low	
		Macrophytes	Good					
		Macrophytes and phytobenthos	Not applicable					
		Benthic invertebrates	High					
		Fish	Not provided					
	Hydro-morphology	Hydrological regime	Not provided					<p><b>Transfer pipe line on land.</b> No or minimal impact.</p> <p><b>Transfer pipe line with water course crossings.</b> Minor level of impact.</p>
		River continuity	Not provided					
		Morphological conditions	Not provided					
		General physico-chemical	All reported substances good or high.					
			Specific pollutants:	All reported substances good or high.				
WFD elements for Rivers: Chemical	Priority hazardous substances	All reported substances good or high apart from Tributyltin						
	Priority substances	All reported substances good or high.						
Overall Status/Potential at	Ecological	Good	Good by 2015	N/A				
	Chemical	Fail	Good by 2021	N/A				
	Overall	Moderate	Good by 2021	N/A				

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR814c\WR814c_Increased treatment capacity at Hurlston WTW via pipeline.docx</p> <p>Dee Catchment Abstraction Management Strategy: <a href="https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf">https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf</a></p>	

		Water body ID:	GB41102G200200	Scheme:	Increased treatment capacity at Hurlleston WTW via Canal			
		Water body Name:	Dee Silurian/Ordovician	Reference	WR814b			
		RBMP:	Dee	Scheme Phase	Construction		Operational	
		Operational catchment:	Dee Silurian/Ordovician	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	Not identified					
		Downstream water bodies:	Not identified					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	<p><b>Transfer of water via canal.</b> No or minimal impact. No change in the interaction between the canal and groundwater body expected.</p> <p><b>Increased quantity of surface water abstraction.</b> Minor level of impact. Change in flow regime in the River Dee may have an impact on interactions between surface water and groundwater (i.e. leakage of river water to groundwater). However as the River Dee is regulated to support abstraction and environmental needs, and the increase in abstraction may be balanced by a reduction in other abstractions, there is likely to be a significant impact on the groundwater body. Also Silurian and Ordovician strata are not typically primary aquifers or have high permeability and transmissivity, reducing the sensitivity of the groundwater body.</p>	Low
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good					
Quantitative Water Balance	Good							
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good		Transfer pipe line on land. No or minimal impact.			
		Chemical Drinking Water Protected Area	Good		Transfer pipe line with water course crossings. No or minimal impact.			
		Chemical GWDTes test	Good					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Good					
		Prevent and Limit Objective	Not provided					
WFD elements for Groundwater: Supporting Element	Supporting Element	Trend Assessment	Not provided					
		Quantitative	Good	N/A	N/A			
Overall Status \ Potential		Chemical (GW)	Good	Good by 2015	N/A			
		Overall	Good	Good by 2015	N/A			

Assumptions	
1-	Application of standard best practice construction and pollution prevention methods.
2-	Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3-	Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4-	New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5-	A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6-	Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7-	Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
8-	Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

Evidence	
Catchment Data Explorer:	<a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proformas:	\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR814c\WR814c_Increased treatment capacity at Hurlleston WTW via pipeline.docx
BGS Geology Mapping:	<a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a>
Dee Catchment Abstraction Management Strategy:	<a href="https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf">https://naturalresources.wales/media/674759/dee_cams_2015_english.pdf</a>

Water body ID:		GB112069060840		Scheme:		THIRD PARTY OPTION: Manchester Bolton Bury Canal to integrated zone			
Water body Name:		Irwell (Roch to Croal)		Reference:		WR816			
RBMP:		North West		Scheme Phase:		Construction			
Operational catchment:		Croal Irwell		Impact potential:		Direct			
Designation (and uses):		heavily modified				Operational			
Relevant upstream water bodies:		Irwell (Rossendale STW to Roch), Roch (Spodden to Irwell)				Direct			
Downstream water bodies:		Irwell (Croal to Irk)							
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		New surface water intake. Minor level of impact.  New water treatment works. No or minimal impact.  New pumping station. Minor level of impact.  Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.	High	New surface water abstraction quantity No or minimal level of impact. New surface water abstraction from the Manchester, Bolton and Bury Canal near Elton Reservoir of 10 M/d.  The abstraction is from the canal (assumed to be supplied by Elton Reservoir), rather than from rivers within the surface water body. It is assumed the canal will be managed to maintain flows which support the hydrological regime, so no long term or widespread impacts on the status of the surface water body as a whole are anticipated. A new abstraction licence would be required to be issued by the Environment Agency.  Use of new transfer pipe line, pumping station, surface water intake, and water treatment works No or minimal impact.	Medium	
		Macrophytes	-						
		Macrophytes and phytobenthos	Moderate						
		Benthic invertebrates	Poor						
		Fish	-						
	Hydro-morphology	Hydrological regime	Supports good						
		River continuity	-						
		Morphological conditions	-						
		Physico-chemical	General physico-chemical	Moderate					
			Specific pollutants:	High					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a signi
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR816\WR816 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)



<b>Water body ID:</b>		GB71210501		<b>Scheme:</b>		THIRD PARTY OPTION: Manchester Bolton Bury Canal to integrated zone		
<b>Water body Name:</b>		Manchester, Bolton and Bury Canal (North)		<b>Reference:</b>		WR816		
<b>RBMP:</b>		North West		<b>Scheme Phase:</b>		Construction		
<b>Designation (and uses):</b>		Croal Irwell Canals		<b>Impact potential:</b>		Direct		
<b>Relevant upstream water bodies:</b>		artificial						
<b>Downstream water bodies:</b>								
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		New surface water intake. Minor level of impact.	High	New surface water abstraction quantity Minor level of impact. New surface water abstraction from the Manchester, Bolton and Bury Canal near Elton Reservoir of 10 M/d.  It is assumed that the canal is supplied with water from Elton Reservoir, therefore the new abstraction would be matched by a corresponding discharge from the reservoir. It is assumed the canal will be managed to maintain flows which support the hydrological regime, so no long term or widespread impacts on the status of the canal are anticipated. A new abstraction licence would be required to be issued by the Environment Agency.	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
	Hydro-morphology	Benthic invertebrates	-					
		Fish	-					
		Hydrological regime	-					
		River continuity	-					
Physico-chemical	Morphological conditions	-						
	General physico-chemical	-						
	Specific pollutants:	-						
WFD elements for Rivers: Chemical	Chemical	Priority hazardous substances	Does not require assessment					
		Priority substances	Does not require assessment					
Overall Status/Potential	Potential	Ecological	Moderate	Moderate by 2015	N/A			
		Chemical	Good	Good by 2015	N/A			
		Overall	Moderate	Moderate by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't hav
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of est
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR8 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		Groundwater	Scheme:	THIRD PARTY OPTION: Manchester Bolton Bury Canal to integrated zone				
Water body Name:		Northern Manchester Carboniferous Aquifers	Reference	WR816				
RBMP:		North West	Scheme Phase		Construction		Operational	
Operational catchment:		Northern Manchester Carboniferous Aquifers	Impact potential		Direct		Direct	
Designation (and uses):		No designation						
Relevant upstream water bodies:								
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	Good		<p>New surface water intake. No or minimal impact.</p> <p>Transfer pipe line on land. No or minimal impact.</p> <p>Transfer pipe line with water course crossings. No or minimal impact.</p> <p>New pumping station. No or minimal impact.</p> <p>New water treatment works. No or minimal impact.</p>	High	<p>New surface water abstraction quantity No or minimal level of impact. New surface water abstraction from the Manchester, Bolton and Bury Canal near Elton Reservoir of 10 Ml/d.</p> <p>The abstraction is from the canal (assumed to be supplied by Elton Reservoir), rather than from rivers within the surface water body. The canal and the groundwater body are unlikely to be hydraulically connected, and this secondary aquifer is unlikely to be heavily dependent on surface water bodies to maintain its quantitative water balance. Therefore there are unlikely to be widespread or prolonged effects on the status of the groundwater body. A new abstraction licence would be required to be issued by the Environment Agency.</p> <p>Use of new transfer pipe line, pumping station, surface water intake, and water treatment works. No or minimal impact.</p>	Medium	
	Quantitative GWDEs test	Good						
	Quantitative Saline Intrusion	Good						
	Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Dependent Surface Water Body Status	Poor						
	Chemical Drinking Water Protected Area	Good						
	Chemical GWDEs test	Good						
	Chemical Saline Intrusion	Good						
	General Chemical Test	Good						
	Prevent and Limit Objective	-						
Supporting Elements (Groundwater)	Trend Assessment	Upward trend						
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't h
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of e
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1-global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\Wf  
 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.px](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.px)

Water body ID:		GB112069061230		Scheme:		THIRD PARTY OPTION: Carr Mill Dam to Integrated Resource Zone		
Water body Name:		Black Brook (Mersey Estuary)		Reference:		WR817		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Sankey		Impact potential:		Operational		
Designation (and uses):		Heavily Modified				Direct		
Relevant upstream water bodies:		-						
Downstream water bodies:		to Mersey)						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		New surface water intake. Minor level of impact.  New water treatment works. No or minimal impact.  New pumping station. Minor level of impact.  Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.	High	New surface water abstraction quantity. No or minimal impact. New surface water abstraction from the St Helens Canal near Carr Mill Dam of 23 Ml/d.  The abstraction is from the canal (assumed to be supplied by Carr Mill Dam), rather than from rivers within the surface water body. It is assumed the canal will be managed to maintain flows which support the hydrological regime, so no long term or widespread impacts on the status of the surface water body as a whole are anticipated. A new abstraction licence would be required to be issued by the Environment Agency.  Use of new transfer pipe line, pumping station, surface water intake, and water treatment works No or minimal impact.	Medium
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	Moderate					
		Fish	Moderate					
	Hydro-morphology	Hydrological regime	Supports good					
		River continuity	-					
		Morphological conditions	-					
		General physico-chemical	Good					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuari
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR817\  
 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

Water body ID:		GB71210088		Scheme:		THIRD PARTY OPTION: Carr Mill Dam to Integrated Resource Zone		
Water body Name:		St Helens Canal		Reference:		WR817		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Sankey Canals		Impact potential:		Direct		
Designation (and uses):		heavily modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		New surface water intake. Minor level of impact.	High	New surface water abstraction quantity Minor level of impact. New surface water abstraction from the St Helens Canal near Carr Mill Dam of 23 Ml/d.  It is assumed that the canal is supplied with water from Carr Mill Dam, therefore the new abstraction would be matched by a corresponding discharge from the reservoir. It is assumed the canal will be managed to maintain flows which support the hydrological regime, so no long term or widespread impacts on the status of the canal are anticipated. A new abstraction licence would be required to be issued by the Environment Agency.	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	-					
		Fish	-					
	Hydro-morphology	Hydrological regime	-					
		River continuity	-					
		Morphological conditions	-					
		Physico-chemical	General physico-chemical	-				
			Specific pollutants:	-				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which wo
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Option  
 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3)

Water body ID:		GB41202G100100	Scheme:		THIRD PARTY OPTION: Carr Mill Dam to Integrated Resource Zone			
Water body Name:		Sankey and Glaze Carboniferous aquifers	Reference		WR817			
RBMP:		North West	Scheme Phase		Construction		Operational	
Operational catchment:		Sankey and Glaze Carboniferous aquifers	Impact potential		Direct		Direct	
Designation (and uses):		No designation						
Relevant upstream water bodies:		-						
Downstream water bodies:		-						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	Good		<p>New surface water intake. No or minimal impact.</p> <p>Transfer pipe line on land. No or minimal impact.</p> <p>Transfer pipe line with water course crossings. No or minimal impact.</p> <p>New pumping station. No or minimal impact.</p> <p>New water treatment works. No or minimal impact.</p>	<p><b>High</b></p>	<p><b>New surface water abstraction quantity</b> No or minimal impact. New surface water abstraction from the St Helens Canal near Carr Mill Dam of 23 Ml/d.</p> <p>The abstraction is from the canal (assumed to be supplied by Carr Mill Dam), rather than from rivers within the surface water body. The canal and the groundwater body are unlikely to be hydraulically connected, and this secondary aquifer is unlikely to be heavily dependent on surface water bodies to maintain its quantitative water balance. Therefore there are unlikely to be widespread or prolonged effects on the status of the groundwater body. A new abstraction licence would be required to be issued by the Environment Agency.</p> <p><b>Use of new transfer pipe line, pumping station, surface water intake, and water treatment works.</b> No or minimal impact.</p>	<p><b>Medium</b></p>	
	Quantitative GWDTes test	Good						
	Quantitative Saline Intrusion	Good						
	Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Dependent Surface Water Body Status	Poor						
	Chemical Drinking Water Protected Area	Good						
	Chemical GWDTes test	Good						
	Chemical Saline Intrusion	Good						
	General Chemical Test	Poor						
	Prevent and Limit Objective	-						
	Trend Assessment	No trend						
Overall Status-Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Poor by 2015	N/A				
	Overall	Poor	Poor by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't ha
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of e
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1-global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR  
 EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300490/LIT\\_7881\\_35d3ed.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300490/LIT_7881_35d3ed.pdf)

		Water body ID:	GB71210133 <th>Scheme:</th> <td colspan="3">THIRD PARTY OPTION: Shropshire Union Canal to Integrated Resource Zone</td>	Scheme:	THIRD PARTY OPTION: Shropshire Union Canal to Integrated Resource Zone			
		Water body Name:	Shropshire Union Canal, Market Drayton to Ellesmere	Reference:	WR820			
		RBMP:	North West	Scheme Phase:	Construction		Operational	
		Operational catchment:	Weaver Upper Canals	Impact potential:	Direct		Direct	
		Designation (and uses):	Artificial (Canal)					
		Relevant upstream water bodies:						
		Downstream water bodies:						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-			High	Transfer of water via canal. Minor level of impact.	
		Macrophytes	-					
		Macrophytes and phytobenthos	-					
		Benthic invertebrates	-					
		Fish	-					
	Hydro morphology	Hydrological regime	-					Modified surface water intake. Minor level of impact.
		River continuity	-					
		Morphological conditions	-					
	Physico-chemical	General physico-chemical	High					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on the watercourse.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal water courses would be installed via a trench and cover technique within a dry working area.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR820\WR820\_THIRD PARTY Options\EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319959/lit\\_7884\\_52dcff.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_52dcff.pdf)

Water body ID:		GB112068055340		Scheme:		THIRD PARTY OPTION: Shropshire Union Canal to Integrated Resource Zone		
Water body Name:		Rookery Brook, Burland and Brindley Bk. (		Reference:		WR820		
RBMP:		North West		Scheme Phase:		Construction		
Operational catchment:		Weaver upper		Impact potential:		Direct		
Designation (and uses):		modified				Operational		
Relevant upstream water bodies:						Direct		
Downstream water bodies:								
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	-		High	Increased surface water abstraction quantity. Minor level of impact. Increased abstraction of 15.5 Ml/d from existing pumps on the Shropshire Union Canal. The abstraction will be on the canal, a managed water course and not directly from the Rookery Brook.	Medium	
		Macrophytes	-					
		Macrophytes and phytobenthos	Moderate					
		Benthic invertebrates	Moderate					
		Fish	-					
	Hydro-morphology	Hydrological regime	Supports good					
		River continuity	-					
		Morphological conditions	Supports good					
		General physico-chemical	Moderate					
		Specific pollutants:	-					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2021	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2021	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant ir
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coast
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party Options\WR820\WR820\_TH EA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319959/lt\\_7884\\_52d4ff.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lt_7884_52d4ff.pdf)

		Water body ID:	GB41202G991700	Scheme:	THIRD PARTY OPTION: Shropshire Union Canal to Integrated Resource Zone			
		Water body Name:	Weaver and Dane Qu	Reference	WR820			
		RBMP:	North West GW	Scheme Phase	Construction		Operational	
		Operational catchment:	Weaver and Dane Qu	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:						
		Downstream water bodies:						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	Use of transfer pipe line, surface water intake, water treatment works, transfer of water via a canal No or minimal impact.	Medium
		Quantitative GWDTEs test	Good					
		Quantitative Saline Intrusion	Good					
		Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor					
		Chemical Drinking Water Protected Area	Good					
		Chemical GWDTEs test	Poor					
		Chemical Saline Intrusion	Good					
		General Chemical Test	Poor					
		Supporting Elements (for groundwater)	Prevent and Limit Objective	-				
		Trend Assessment	Upward trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time when flows are low.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings would be installed via a trench and cover technique within a dry working area.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\Third Party OEA Abstraction Licence Strategy (xxx): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319959/lit\\_7884\\_5](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/319959/lit_7884_5)



		Water body ID:	GB112068055340	Scheme:	Shropshire Union Canal				
		Water body Name:	Rookery Brook, Burland and Brindley Bk. To Weaver	Reference	WR821				
		RBMP:	Weaver Goway	Scheme Phase	Construction	Operational			
		Operational catchment:	Weaver Upper	Impact potential	Direct	Direct			
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	Burland and Brindley Brook and Weaver (Marbury Brook to Dane)	Rookery Brook, Source to Burland and Brindley Bk					
		Downstream water bodies:	Weaver (Marbury Brook to Dane)						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	Medium		
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	Moderate						
		Benthic invertebrates	Moderate						
		Fish	Not provided						
	Hydro-morphology	Hydrological regime	Supports good					Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. Minor level of impact.  Modified surface water intake. Minor level of impact.  New / modified water treatment works. Minor level of impact.	New surface water abstraction quantity and transfer of water via the canal. No or minimal impact. New abstraction of 30 Ml/d from the Shropshire Union Canal, Middlewich branch. A new abstraction licence would be required.  It is assumed the canal does not interact hydrologically with the Rookery Brook and so there would be no or minimal impacts on WFD status of this water body. The ALS (Abstraction Licensing Strategy) indicates that there is water available at all flow regimes (Q95, Q70, Q50 and Q30).  Use of new pipe lines, surface water intake and water treatment works. No or minimal impact.
		River continuity	Not provided						
		Morphological conditions	Supports good						
		General physico-chemical	All high/good except: Phosphate- poor						
		Specific pollutants:	Not provided						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Good by 2021	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Good by 2021	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\LR2\WR075\WR075 Stocks Reservoir.xls  
 EA Flood Maps (WYBY): <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&lq=1.2,10.8>  
 EA Historical Landfill: <http://maps.environment-agency.gov.uk/wyby/wybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&lq=1.2,10.8>  
 Abstraction Licensing Strategies (Weaver and Dane): <https://www.gov.uk/government/publications/weaver-and-dane-abstraction-licensing-strategy>

		Water body ID:	GB71210133	Scheme:	Shropshire Union Canal				
		Water body name:	Shropshire Union Canal, Mar	Reference	WR821				
		RBMP:	North West	Scheme Phase	Construction		Operational		
		Operational catchment:	Weaver Upper Canals	Impact potential	Direct		Direct		
		Designation (and uses):	Artificial						
		Relevant upstream water bodies:	N/A						
		Downstream water bodies:	N/A						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos				Modified surface water intake. Minor level of impact.	High	New surface water abstraction quantity and transfer of water via the canal. Minor level of impact. New abstraction of 30 Ml/d from the Shropshire Union Canal, Middlewich branch. A new abstraction licence would be required.  It is unclear from the information provided, but it is likely the abstraction would be supported by water sourced from elsewhere (i.e. the canal is used as a transfer) and flows within the canal managed, so there would only be minor change in the flow regime of the canal.	Low
		Macrophytes							
		Macrophytes and phytobenthos							
		Benthic invertebrates							
		Fish							
	Hydro-morphology	Hydrological regime							
		River continuity							
		Morphological conditions							
	Physico-chemical	General physico-chemical	High						
		Specific pollutants:							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A					
	Chemical	Good	Good by 2027	N/A					
	Overall	Good	Good by 2027	N/A					

Assumptions
1- Application of standard best practice pollution prevention methods e.g. the GPPs 2- Small scale shallow dewatering would take place 3- Stockpiling of resources or spoil near watercourse maybe required 4- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required 5- Assumed all over ground pipelay will be along roads and over water crossings along existing bridges 6- An abstraction licence can be granted that will ensure there is no significant environmental impact from the abstraction 7- A discharge license would need to be sought to meet environmental regulations for WFD for New discharge scour into Rochdale Canal
Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZWR049b">http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Feasible_Options/IRZWR049b</a> EA Abstraction Licence Strategy (Ribble, Douglas & Crossens)

		Water body ID:	GB41202G9 and Dane Quaternary	Scheme: Reference	Shropshire Union Canal						
		Water body Name:	North West	Construction Phase	WR821						
		Operational catchment:	and Dane	Impact potential	Direct		Operational Direct				
		Designation (and uses):	No designation								
		Relevant upstream water bodies:	Not identified								
		Downstream water bodies:	Not identified								
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence				
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			High	New surface water abstraction quantity and use of canal for water transfer. No or minimal impact. A new abstraction licence of up to 30 Ml/d from the Shropshire Union Canal. It is unclear from the information provided, but it is likely the abstraction would be supported by water sourced from elsewhere (i.e. the canal is used as a transfer). Overall significant reductions in flow are unlikely so impacts on surface water - groundwater interactions will be minimal.	Low			
		Quantitative GWDTes test	Good								
		Quantitative Saline Intrusion	Good								
		Quantitative Water Balance	Good								
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor						High	Use of new pipe lines, surface water intake and water treatment works. No or minimal impact.	Low
		Chemical Drinking Water Protected Area	Good								
		Chemical GWDTes test	Poor								
		Chemical Saline Intrusion	Good								
		General Chemical Test	Poor								
		Prevent and Limit Objective	Not provided								
		Trend Assessment	Upward trend								
Overall Status/Potential	Supporting Element	Quantitative	Good	Good by 2015	N/A						
		Chemical (GW)	Poor	Good by 2027	N/A						
		Overall	Poor	Good by 2027	N/A						

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a> Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IR2\WR075\WR075 Stocks Reservoir.xlsx EA Flood Maps (WIYBY): <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang_e&amp;topic=floodmapfx=344705&amp;y=5114768">http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&amp;y=355134.0&amp;scale=1&amp;layerGroups=default&amp;ep=map&amp;textonly=off&amp;lang_e&amp;topic=floodmapfx=344705&amp;y=5114768</a> EA Historical Landfill: <a href="http://maps.environment">http://maps.environment</a> Abstraction Licensing Strategies (Weaver and Dane): <a href="https://www.gov.uk/government/publications/weaver-and-dane-abstraction-licensing-strategy">https://www.gov.uk/government/publications/weaver-and-dane-abstraction-licensing-strategy</a>

		Water body ID:	GB103023075580	Scheme:	Third Party Option: Blenkinsopp Mine			
		Water body Name:	Tipalt Burn from Source to South Tyne	Reference	WR824			
		RBMP:	Tyne	Scheme Phase	Construction	Operational		
		Operational catchment:	South Tyne Lower	Impact potential	Direct	Direct		
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	Not identified					
		Downstream water bodies:	South Tyne from Tipalt Burn to Allen					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			High	Medium	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Poor					
		Benthic invertebrates	High					
		Fish	High					
	Hydro-morphology	Hydrological regime	Supports good					
		River continuity	Not provided					
		Morphological conditions	Supports good					
		Physico-chemical	General physico-chemical	All high				
			Specific pollutants:	All high				
Priority hazardous substances	All good							
Priority substances	All good							
Overall Status at Potential	Ecological	Poor	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

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- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- 8- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proformas: <\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx>

EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&lq=1,2,10,&scale=1>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=511476&lq=1,2,10,&scale=1>

Abstraction Licencing Strategy (Tyne): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/307287/lit\\_7873\\_84be79.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307287/lit_7873_84be79.pdf)

		Water body ID:	GB40201G100400	Scheme:	Third Party Option: Blenkinsopp Mine				
		Water body Name:	Eden Valley and Carlisle Basin Permo-Triassic sandstone aquifers	Reference	WR824				
		RBMP:	Solway Tweed GW	Scheme Phase	Construction		Operational		
		Operational catchment:	Eden Valley and Carlisle Basin Permo-Triassic sandstone aquifers	Impact potential	Direct		Direct		
		Designation (and uses):	No designation						
		Relevant upstream water bodies:	Not identified						
		Downstream water bodies:	Not identified						
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good			Transfer pipe line on land. No or minimal impact.  Transfer pipe line with water course crossings. No or minimal impact.	High	New groundwater abstraction quantity. No or minimal impact. New abstraction of 2.2 Ml/d from Blenkinsopp Mine. The abstraction licensing strategy (ALS) indicates that there is water available in the groundwater body, and the abstracted water would be discharging from the mine without the abstraction.	Medium
		Quantitative GWDTes test	Good						
		Quantitative Saline Intrusion	Good						
		Quantitative Water Balance	Good						
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Good						
		Chemical Drinking Water Protected Area	Poor						
		Chemical GWDTes test	Poor						
		Chemical Saline Intrusion	Good						
		General Chemical Test	Good						
		Supporting Element	Prevent and Limit Objective	Not provided					
Trend Assessment	Upward trend								
Overall Potential		Quantitative	Good	Good by 2015	N/A				
		Chemical (GW)	Poor	Good by 2027	N/A				
		Overall	Poor	Good by 2027	N/A				

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
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- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.
- Construction, refurbishment, and testing of groundwater abstraction wells will be undertaken under consent from the EA/NRW. Wells will be designed, constructed, and tested in such a way as to prevent groundwater becoming polluted, and in line with best practice.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proformas: [\\WAR-FS1\\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx](\\WAR-FS1_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Feasible Options\IRZ\WR075\WR075 Stocks Reservoir.xlsx)

EA Flood Maps (WIYBY): <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=355134.0>

EA Historical Landfill: <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=e&topic=floodmap#x=344705&y=355134.0>

Abstraction Licencing Strategy (Tyne): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/307287/lit\\_7873\\_84be79.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307287/lit_7873_84be79.pdf)



# Appendix D

## Summary of Level 1 Screening and Level 2 Detailed Assessments for Resilience Options

Option	WFD Water Body Information														Option Detail										Impacts			
	Ref	Solutions	Option Description	ID	Type	Hydro - morphological Designation	Name	Operational Catchment	Ecological Status	Ecological Objective	Quantitative Status	Quantitative Objective	Chemical Status	Chemical Objective	Overall Status	Overall Objective	Pipe line and associated infrastructure on land	Pipe line with water source in coverage	New tunnel/buried pipe (m)	New / modified surface water (l/s) intake	New pumping station	New / modified water treatment works	New / increased surface water abstraction quantity	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Confidence	Combined Screening Result
3	C	HA to Raw: 2 Stage filtration Woodgate Hill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	Y	N	No or minimal impact	N	-	High	No or minimal impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB112069064641	River	heavily modified	Irwell (Cowpe Bk to Rossendale STW)	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB112069064620	River	heavily modified	Irwell (Rossendale STW to Roch)	Croal Irwell	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB112069064600	River	heavily modified	Roch (Spoddon to Irwell)	Roch Irk Medlock	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB41202G101800	GroundWaterBod	not applicable	Northern Manchester Carboniferous Aquifers	Manchester Northern Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB112071065490	River	heavily modified	Calder - Pendle Water to conf Ribble	Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB112071065040	River	heavily modified	Hyndburn	Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB112069064650	River	heavily modified	Ogden	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-38	B	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	GB41202G100300	GroundWaterBod	not applicable	Douglas, Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064641	River	heavily modified	Irwell (Cowpe Bk to Rossendale STW)	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064620	River	heavily modified	Irwell (Rossendale STW to Roch)	Croal Irwell	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064600	River	heavily modified	Roch (Spoddon to Irwell)	Roch Irk Medlock	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G101800	GroundWaterBod	not applicable	Northern Manchester Carboniferous Aquifers	Manchester Northern Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065490	River	heavily modified	Calder - Pendle Water to conf Ribble	Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065040	River	heavily modified	Hyndburn	Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064650	River	heavily modified	Ogden	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G100300	GroundWaterBod	not applicable	Douglas, Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065520	River	not designated artificial or h	Bashall Brook	Ribble Middle - Settle to Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112072066050	River	not designated artificial or h	Hyndburn	Wenning	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065430	River	not designated artificial or h	Whitendale river	Hodder and Loud	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065560	River	not designated artificial or h	Hodder - conf Easington Bk to conf Ribble	Hodder and Loud	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G100300	GroundWaterBod	not applicable	Ribble Carboniferous Aquifers	Ribble Carboniferous Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071090	River	heavily modified	Peasey Beck	Bela	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112072071690	River	not designated artificial or h	Lune - conf Rawthey to conf Greta	Lune - Rawthey to Greta	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071080	River	not designated artificial or h	Lupton (Farleton) Beck	Bela	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G102100	GroundWaterBod	not applicable	South Cumbria Lower Palaeozoic and Carboniferous Aquifers	Cumbria South Lower Palaeozoic and Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G102700	GroundWaterBod	not applicable	Lune and Wyre Carboniferous Aquifers	Lune and Wyre Carboniferous Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071370	River	not designated artificial or h	Mint	Kent	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071340	River	not designated artificial or h	Flooder Beck	Kent	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071100	River	not designated artificial or h	Stainton Beck	Bela	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
46	A, E	WELM Upgrade to 150M/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	N	N	No or minimal impact	N	-	High	No or minimal impact
112	B, D	HA Outage (4 weeks) for installation of connections	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	N	N	No or minimal impact	N	-	High	No or minimal impact
212	C	HA to Raw: Fober Barn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	Y	N	No or minimal impact	N	-	High	No or minimal impact
213	C	HA to Raw: Martholme	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	Y	N	No or minimal impact	N	-	High	No or minimal impact
214	C	HA to Raw: Townsend Fold	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	Y	N	No or minimal impact	N	-	High	No or minimal impact
215	E	Alternative Supply: Raw water transfer and WTW at Martholme BSP	GB112071065500	River	heavily modified	Ribble - conf Calder to tidal	Big Ribble	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	Y	N	Y	Y	Y	Y	Y	Medium level of impact	Y	Medium level of impact	Medium	Medium level of impact
215	E	Alternative Supply: Raw water transfer and WTW at Martholme BSP	GB41202G103000	GroundWaterBod	not applicable	Ribble Carboniferous Aquifers	Ribble Carboniferous Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	Y	N	Y	Y	Y	Y	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
216	A, E	Alternative Supply: Raw water abstraction and WTW at Townsend Fold BSP	GB112069064641	River	heavily modified	Irwell (Cowpe Bk to Rossendale STW)	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	Y	Y	Y	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
216	A, E	Alternative Supply: Raw water abstraction and WTW at Townsend Fold BSP	GB41202G101800	GroundWaterBod	not applicable	Northern Manchester Carboniferous Aquifers	Manchester Northern Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	Y	N	Y	Y	Y	Y	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact
217	E	Alternative Supply: Raw water transfer and WTW at Fober Barn BSP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	N	N	N	Y	N	Minor level of impact	N	-	High	Minor level of impact
218	E	Alternative Supply: Raw water transfer and WTW at Mill Lane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	N	N	N	Y	N	Minor level of impact	N	-	High	Minor level of impact
238	B	Metals & UV treatment of bulk supply points (BSPs): Woodgate Hill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	Y	N	No or minimal impact	N	-	High	No or minimal impact
260	A	Ribblesdale South Well isolation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	N	N	No or minimal impact	N	-	High	No or minimal impact
261	A	Townsend Fold South Well isolation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	N	N	No or minimal impact	N	-	High	No or minimal impact
296	A	T05 targeted repair 2025	GB112069064641	River	heavily modified	Irwell (Cowpe Bk to Rossendale STW)	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	N	N	Y	N	N	N	N	N	Medium level of impact	Y	Minor level of impact	Low	Minor level of impact
296	A	T05 targeted repair 2025	GB41202G101800	GroundWaterBod	not applicable	Nor																						



# Appendix E

## Level 2 Detailed Assessments for Resilience Options



Water body ID:		GB112069064641	Scheme:		Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)		
Water body Name:		Irwell (Cowpe Bk to Rossendale STW)	Reference		Option - 37-38		
RBMP:		North West	Scheme Phase		Construction	Operational	
Operational catchment:		Croal Irwell	Impact potential		Direct	Direct	
Designation (and uses):		Heavily modified					
Relevant upstream water bodies:		Irwell (Source to Whitewell Brook), Limy Water and Whitewell Brook					
Downstream water bodies:		Irwell (Rossendale STW to Roch)					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b></p> <p>Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b></p> <p>Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G101800). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Moderate	Good by 2027			
		Benthic invertebrates	Good	Good by 2015			
		Fish	Not provided				
	Hydro-morphology	Hydrological regime	Supports good	Supports good by 2015			
		River continuity	Not provided				
		Morphological conditions	Not provided				
	Physico-chemical	General physico-chemical	All high except: Phosphate-moderate and pH- moderate	Phosphate and pH good by 2027			
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	NA			
	Chemical	Good	Good by 2015	NA			
	Overall	Moderate	Good by 2027	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shares/Projects/38671\\_UU/WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Turne\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).pdf](http://www.fs1.global.amec.com/shares/Projects/38671_UU/WRMP_Support/5_Design/Resilience_Options/WRMP/C11_New_Turne_EA_Abstraction_Licence_Strategy_(Northern_Manchester).pdf); [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LT\\_7\\_Coal\\_Authority\\_-\\_mapcops2\\_bgs.ac.uk/coalauthority/home.html](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LT_7_Coal_Authority_-_mapcops2_bgs.ac.uk/coalauthority/home.html)

<b>Water body ID:</b>		GB112069064620		<b>Scheme:</b>		Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)			
<b>Water body Name:</b>		Irwell (Rossendale STW to Roch)		<b>Reference</b>		Option - 37-38			
<b>RBMP:</b>		North West		<b>Scheme Phase</b>		Construction			
<b>Operational catchment:</b>		Croal Irwell		<b>Impact potential</b>		Direct			
<b>Designation (and uses):</b>		Heavily modified				Direct			
<b>Relevant upstream water bodies:</b>		Irwell (Cowpe Bk to Rossendale STW), Kirklees Brook and Ogden							
<b>Downstream water bodies:</b>		Irwell (Roch to Croal)							
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>		<b>Confidence</b>	<b>Confidence</b>		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised to the vicinity of the shaft locations, and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	Low		
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	Moderate	Moderate by 2015					
		Benthic invertebrates	Good	Good by 2015					
		Fish	Not provided						
	Hydro-morphology	Hydrological regime	Supports good	Supports good by 2015					
		River continuity	Not provided						
		Morphological conditions	Not provided						
		Physico-chemical	General physico-chemical	All high/good except: Phosphate- poor				Phosphate poor by 2015	
			Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Does not require assessment							
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A					
	Chemical	Good	Good by 2015	N/A					
	Overall	Moderate	Moderate by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Tun](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_Options/WRMP/C11_New_Tun)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LI](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LI)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>

<b>Water body ID:</b>		GB112069064600	<b>Scheme:</b>		Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)			
<b>Water body Name:</b>		Roch (Spodden to Irwell)	<b>Reference</b>		Option - 37-38			
<b>RBMP:</b>		North West	<b>Scheme Phase</b>		Construction		Operational	
<b>Operational catchment:</b>		Roch Irk Medlock	<b>Impact potential</b>		Direct		Direct	
<b>Designation (and uses):</b>		Heavily modified						
<b>Relevant upstream water bodies:</b>		Naden Brook, Roch (Source to Spodden), Spodden and Whittle Brook (Irwell)						
<b>Downstream water bodies:</b>		Irwell (Roch to Croal)						
<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>		<b>Confidence</b>		<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p>The option includes a conduit bridge over the Gypsy Brook. In channel works may reduce the chemical status due to deterioration in water quality due to disturbance of soils and sediments, particularly if contaminated, or due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery. The ecological status may reduce due to smothering of habitats or reduction in light due to release of sediments, or changes to in hydrological regime, river continuity or morphological conditions due to impoundments or changes to the structure of the channel. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	Low	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Not provided					
		Benthic invertebrates	Moderate	Good by 2027				
		Fish	Not provided					
	Hydro-morphology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high/good except: Phosphate- poor	Phosphate poor by 2015				
		Specific pollutants:	Iron- High					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Pentachlorophenol- good						
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	NA				
	Chemical	Good	Good by 2015	NA				
	Overall	Moderate	Moderate by 2015	NA				

<b>Assumptions</b>
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>

<b>Evidence</b>
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: <a href="http://www.fs1.global.amec.com/shared/Projects/38671/1/1/WRMP_Support/5_Design/Resilience_Options/WRMP/C11_New_Tunnel_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm">http://www.fs1.global.amec.com/shared/Projects/38671/1/1/WRMP_Support/5_Design/Resilience_Options/WRMP/C11_New_Tunnel_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm</a></p> <p>EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7</a></p> <p>Coal Authority: <a href="http://mapapps2.bas.ac.uk/coalauthority/home.html">http://mapapps2.bas.ac.uk/coalauthority/home.html</a></p>

Water body ID:		GB41202G101800		Scheme:		Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)		
Water body Name:		Northern Manchester Carboniferous Aquifers		Reference		Option - 37-38		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Manchester Northern Carboniferous Aq		Impact potential		Direct		
Designation (and uses):		No designation				Operational		
Relevant upstream water bodies:		N/A				Direct		
Downstream water bodies:		N/A						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence		
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good	Good by 2015	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, but this would be localised and temporary. Accidental leakages or spills from construction machinery may affect the chemical status of the groundwater body, but construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the groundwater body.</p> <p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Temporary shafts every 3 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the tunnel and shafts may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Although temporary in nature, due to the length of the tunnel, and number and depth of shafts, the impacts could be widespread.</p> <p><b>Chemical status:</b> There is the potential for the interception of shallow contaminated land or deeper coal mine workings in the Carboniferous strata. The option information indicates a landfill at the surface, and information from The Coal Authority shows mine entries and abandoned mine workings close to the route of the tunnel. Interception of these features may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	Low	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> No dewatering of the tunnel or shafts would take place post construction, and groundwater ingress is expected to be minimal (the tunnels would be designed and maintained to prevent groundwater ingress in order to protect raw water quality).</p> <p>The tunnel will be constructed within the saturated zone of the aquifer and the presence of a low permeability linear structure may alter groundwater flows and levels, particularly where the tunnel is shallower and within the zone of active groundwater flow, or if the orientation of the tunnel is perpendicular to the direction of groundwater flow. In addition disturbance of the strata surrounding the tunnels and shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow).</p> <p><b>Chemical Status:</b> The tunnel would be used to transfer raw water of potable standard. Any leakages from the tunnel to the groundwater body would locally alter the groundwater chemistry, but it is assumed the potable standard water would be free from hazardous and priority hazardous substances and other pollutants, and would therefore not have a significant negative effect on the chemical status of the groundwater body.</p>	Low
		Quantitative GWDTes test	Good	Good by 2015				
		Quantitative Saline Intrusion	Good	Good by 2015				
		Quantitative Water Balance	Good	Good by 2015				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor	Good by 2027	<p><b>Chemical Status:</b> There is the potential for the interception of shallow contaminated land or deeper coal mine workings in the Carboniferous strata. The option information indicates a landfill at the surface, and information from The Coal Authority shows mine entries and abandoned mine workings close to the route of the tunnel. Interception of these features may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	Low		
		Chemical Drinking Water Protected Area	Good	Good by 2015				
		Chemical GWDTes test	Good	Good by 2015				
		Chemical Saline Intrusion	Good	Good by 2015				
		General Chemical Test	Good	Good by 2015				
	Supporting Elements (for groundwater)	Prevent and Limit Objective	Not provided					
Trend Assessment		Upward trend						
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>
Engineers Proforma: <a href="http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_EA_AbstractionLicenceStrategy_(NorthernManchester).htm">WAR-FS1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_EA_AbstractionLicenceStrategy_(NorthernManchester).htm</a>
Coal Authority: <a href="http://mapapps2.bgs.ac.uk/coalauthority/home.html">http://mapapps2.bgs.ac.uk/coalauthority/home.html</a>
BGS Geology Viewer: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a>

Water body ID:		GB112071065490	Scheme:	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)			
Water body Name:		Calder - Pendle Water to conf Ribble	Reference	Option - 37-38			
RBMP:		North West	Scheme Phase	Construction		Operational	
Operational catchment:		Calder	Impact potential	Direct		Direct	
Designation (and uses):		Heavily modified					
Relevant upstream water bodies:		Calder- conf Brun to Pendle Water, Green Brook, Hyndburn Brook- Lower, Pendle Water - Colne Water to Walverden Water, Sadden Brook and Walverden Water					
Downstream water bodies:		Ribble- conf Calder to tidal					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided		<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b></p> <p>Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Wall and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b></p> <p>Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Wall and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G100300). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	<p><b>Low</b></p>
		Macrophytes	Not provided				
		Macrophytes and phytoplankton	Moderate	Good by 2027			
		Benthic invertebrates	Good				
		Fish	Good				
	Hydrogeomorphology	Hydrological regime	Not provided				
		River continuity	Not provided				
		Morphological conditions	Not provided				
	Physico-chemical	General physico-chemical	All high/good except: Phosphate- poor	Phosphate good by 2027			
		Specific pollutants:	All high				
WFD elements for Rivers: Chemical	Priority hazardous substances	Good					
	Priority substances	Good					
Overall Status Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience/Options/WRMP/C11\\_New\\_Tunnel\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).htm](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience/Options/WRMP/C11_New_Tunnel_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm)

Coal Authority: <http://maps.coal.gov.uk/coalauthority/home.html>

BGS Geology Viewer: <http://maps.bgs.ac.uk/geologyofbritain/home.html>

<b>Water body ID:</b>		GB112071065040		<b>Scheme:</b>		Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)	
<b>Water body Name:</b>		Hyndburn		<b>Reference</b>		Option - 37-38	
<b>RBMP:</b>		North West		<b>Scheme Phase</b>		Construction	
<b>Operational catchment:</b>		Calder		<b>Impact potential</b>		Operational	
<b>Designation (and uses):</b>		Heavily modified		<b>Direct</b>		Direct	
<b>Relevant upstream water bodies:</b>		Not provided					
<b>Downstream water bodies:</b>		Hyndburn Brook - Lower					
<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>			<b>Confidence</b>	<b>Confidence</b>
<b>WFD elements for Rivers: Ecological</b>	<b>Biology</b>	<b>Phytoplankton</b>	Not provided		<b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.	<b>Low</b>	<b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km.  Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G100300). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.
		<b>Macrophytes</b>	Not provided				
		<b>Macrophytes and phytoplankton</b>	Not provided				
	<b>Benthic invertebrates</b>	Good					
	<b>Fish</b>	Good					
	<b>Hydrology</b>	<b>Hydrological regime</b>	Supports good				
<b>River continuity</b>		Not provided					
<b>Morphological conditions</b>		Not provided					
<b>Physico-chemical</b>	<b>General physico-chemical</b>	All high except: Phosphate-moderate	Phosphate good by 2027	<b>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</b>			
	<b>Specific pollutants:</b>	Not provided					
<b>WFD elements for Rivers: Chemical</b>	<b>Priority hazardous substances</b>	Does not require assessment					
	<b>Priority substances</b>	Does not require assessment					
<b>Overall Status/Potential</b>	<b>Ecological</b>	Moderate	Good by 2027	N/A			
	<b>Chemical</b>	Good	Good by 2015	N/A			
	<b>Overall</b>	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Tu](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_Options/WRMP/C11_New_Tu)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/L](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/L)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

		<b>Water body ID:</b>	GB112069064650	<b>Scheme:</b>	Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)		
		<b>Water body Name:</b>	Ogden	<b>Reference:</b>	Option - 37-38		
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction		Operational
		<b>Operational catchment:</b>	Croal Irwell	<b>Impact potential</b>	Direct		Direct
		<b>Designation (and uses):</b>	Heavily modified				
		<b>Relevant upstream water bodies:</b>	Not provided				
		<b>Downstream water bodies:</b>	Irwell (Rossendale STW to Roch)				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			Low	Low
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Not provided				
		Benthic invertebrates	Good				
		Fish	Good				
	Hydrology	Hydrological regime	Not provided				
		River continuity	Not provided				
		Morphological conditions	Not provided				
	Physico-chemical	General physico-chemical	All high except: Phosphate-moderate	Good by 2027			
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Tun](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_Options/WRMP/C11_New_Tun)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/11](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/11)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Water body ID:		GB41202G100300	Scheme:		Haweswater Aqueduct section T05 to T06 (Ribblesdale SW to Woodgate Hill)						
Water body Name:		Douglas, Darwen and Calder Carboniferous Aquifer	Reference:		Option - 37-38						
RBMP:		North West	Scheme Phase		Construction	Operational					
Operational catchment:		Douglas Darwen and Calder Carboniferous Aq	Impact potential		Direct	Direct					
Designation (and uses):		No designation									
Relevant upstream water bodies:		N/A									
Downstream water bodies:		N/A									
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence						
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, but this would be localised and temporary. Accidental leakages or spills from construction machinery may affect the chemical status of the groundwater body, but construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the groundwater body.</p>	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft, 12.5 m diameter, 6 m deep. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, but this would be localised.</p>	<p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p>				
		Quantitative GWDTes test	Good					<p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Ribblesdale South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 19.2 km. Temporary shafts every 3 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p>	<p><b>Quantitative Status:</b> No dewatering of the tunnel or shafts would take place post construction, and groundwater ingress is expected to be minimal (the tunnels would be designed and maintained to prevent groundwater ingress in order to protect raw water quality). The tunnel will be constructed within the saturated zone of the aquifer and the presence of a low permeability linear structure may alter groundwater flows and levels, particularly where the tunnel is shallower and within the zone of active groundwater flow, or if the orientation of the tunnel is perpendicular to the direction of groundwater flow. In addition disturbance of the strata surrounding the tunnels and shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow).</p>		
		Quantitative Saline Intrusion	Good							<p><b>Chemical Status:</b> There is the potential for the interception of shallow contaminated land or deeper coal mine workings in the Carboniferous strata. Information from The Coal Authority shows mine entries and abandoned mine workings close to the route of the tunnel. Interception of these features may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body.</p>	<p><b>Chemical Status:</b> The tunnel would be used to transfer raw water of potable standard. Any leakages from the tunnel to the groundwater body would locally alter the groundwater chemistry, but it is assumed the potable standard water would be free from hazardous and priority hazardous substances and other pollutants, and would therefore not have a significant negative effect on the chemical status of the groundwater body.</p>
		Quantitative Water Balance	Good								
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor	Good by 2027	<p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	<p><b>Low</b></p>	<p><b>Low</b></p>				
		Chemical Drinking Water Protected Area	Good								
		Chemical GWDTes test	Good								
		Chemical Saline Intrusion	Good								
		General Chemical Test	Good								
		Prevent and Limit Objective	Not provided								
Supporting Elements (Groundwater)	Trend Assessment	Upward trend									
Overall Status/Potential	Quantitative	Good	Good by 2015	NA							
	Chemical (GW)	Poor	Good by 2027	NA							
	Overall	Poor	Good by 2027	NA							

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).htm](http://www.fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>



<b>Water body ID:</b>		GB112069064641		<b>Scheme:</b>		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)			
<b>Water body Name:</b>		Irwell (Cowpe Bk to Rossendale STW)		<b>Reference</b>		Option - 37-38			
<b>RBMP:</b>		North West		<b>Scheme Phase</b>		Construction			
<b>Operational catchment:</b>		Croal Irwell		<b>Impact potential</b>		Operational			
<b>Designation (and uses):</b>		Heavily modified		<b>Construction</b>		Direct			
<b>Operational catchment:</b>		Croal Irwell		<b>Direct</b>		Operational			
<b>Designation (and uses):</b>		Heavily modified		<b>Direct</b>		Direct			
<b>Relevant upstream water bodies:</b>		Irwell (Source to Whitewell Brook), Limy Water and Whitewell Brook							
<b>Downstream water bodies:</b>		Irwell (Rossendale STW to Roch)							
<b>WFD Element (Receptor)</b>		<b>Status</b>		<b>RBMP objective</b>		<b>Alternate Objective if less than Good</b>			
<b>Phytobenthos</b>		Not provided				<b>Confidence</b>			
<b>Macrophytes</b>		Not provided				<b>Confidence</b>			
<b>Macrophytes and phytobenthos</b>		Moderate		Good by 2027		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regimes.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>			
<b>Benthic invertebrates</b>		Good		Good by 2015				<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G101800). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	
<b>Fish</b>		Not provided							
<b>Hydrological regime</b>		Supports good		Supports good by 2015					
<b>River continuity</b>		Not provided							
<b>Morphological conditions</b>		Not provided							
<b>General physico-chemical</b>		All high except: Phosphate-moderate and pH- moderate		Phosphate and pH good by 2027					
<b>Specific pollutants:</b>		Not provided							
<b>Priority hazardous substances</b>		Does not require assessment							
<b>Priority substances</b>		Does not require assessment							
<b>Ecological</b>		Moderate		Good by 2027		<b>Low</b>			
<b>Chemical</b>		Good		Good by 2015		<b>Low</b>			
<b>Overall</b>		Moderate		Good by 2027		<b>Low</b>			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.fs1.global.amec.com/shared/Projects/38671\\_UU/WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMP/CI11\\_New\\_Tunnel\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).htm](http://www.fs1.global.amec.com/shared/Projects/38671_UU/WRMP_Support/5_Design/Resilience_Options/WRMP/CI11_New_Tunnel_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm)  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LT\\_7\\_Coal\\_Authority\\_home.html](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LT_7_Coal_Authority_home.html)

<b>Water body ID:</b>		GB112069064620		<b>Scheme:</b>		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
<b>Water body Name:</b>		Irwell (Rossendale STW to Roch)		<b>Option - 37-38</b>				
<b>RBMP:</b>		North West		<b>Scheme Phase</b>		<b>Construction</b>		
<b>Operational catchment:</b>		Croal Irwell		<b>Impact potential</b>		<b>Operational</b>		
<b>Designation (and uses):</b>		Heavily modified		<b>Direct</b>		<b>Direct</b>		
<b>Relevant upstream water bodies:</b>		Irwell (Cowpe Bk to Rossendale STW), Kirklees Brook and Ogden						
<b>Downstream water bodies:</b>		Irwell (Roch to Croal)						
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>		<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>Construction of new tunnel.</b></p> <p>Minor level of impact. Construction of new tunnel. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p><b>Presence and operation of new tunnel.</b></p> <p>Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p><b>Low</b></p> <p>Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G101800). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p> <p><b>Low</b></p>	<p><b>Low</b></p>		
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Moderate	Moderate by 2015				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Not provided					
	Hydro-morphology	Hydrological regime	Supports good	Supports good by 2015				
		River continuity	Not provided					
		Morphological conditions	Not provided					
		Physico-chemical	General physico-chemical	All high/good except: Phosphate-poor			Phosphate poor by 2015	
			Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Moderate by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Tun](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_Options/WRMP/C11_New_Tun)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/IT](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/IT)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>

Water body ID:		GB112069064600		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)			
Water body Name:		Roch (Spodden to Irwell)		Reference		Option - 37-38			
RBMP:		North West		Scheme Phase		Construction			
Operational catchment:		Roch Irk Medlock		Impact potential		Direct			
Designation (and uses):		Heavily modified				Operational			
Relevant upstream water bodies:		Naden Brook, Roch (Source to Spodden), Spodden and Whittle Brook (Irwell)				Direct			
Downstream water bodies:		Irwell (Roch to Croal)							
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated.</p> <p>However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p>The option includes a conduit bridge over the Gypsy Brook. In channel works may reduce the chemical status due to deterioration in water quality due to disturbance of soils and sediments, particularly if contaminated, or due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery. The ecological status may reduce due to smothering of habitats or reduction in light due to release of sediments, or changes to in hydrological regime, river continuity or morphological conditions due to impoundments or changes to the structure of the channel. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G101800). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	<p><b>Low</b></p>	<p><b>Low</b></p>	
		Macrophytes	Not provided						
		Macrophytes and phytobenthos	Not provided						
		Benthic invertebrates	Moderate	Good by 2027					
		Fish	Not provided						
	Hydromorphology	Hydrological regime	Not provided						
		River continuity	Not provided						
		Morphological conditions	Not provided						
	Physico-chemical	General physico-chemical	All high/good except: Phosphate-poor	Phosphate poor by 2015					
Specific pollutants:		Iron- High							
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment							
	Priority substances	Pentachlorophenol- good							
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	NA					
	Chemical	Good	Good by 2015	NA					
	Overall	Moderate	Moderate by 2015	NA					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.dbla.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Tunnel\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).htm](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_Options/WRMP/C11_New_Tunnel_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LIT\\_7\\_Coal\\_Authority.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7_Coal_Authority.pdf)  
 Coal Authority: <http://mapapps2.bas.ac.uk/coalauthority/home.html>

Water body ID:		GB41202G101800		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	
Water body Name:		Northern Manchester Carboniferous Aquifers		Reference		Option - 37-38	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Manchester Northern Carboniferous Aq		Impact potential		Direct	
Designation (and uses):		No designation				Operational	
Relevant upstream water bodies:		N/A				Direct	
Downstream water bodies:		N/A					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good	Good by 2015	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, but this would be localised and temporary. Accidental leakages or spills from construction machinery may affect the chemical status of the groundwater body, but construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the groundwater body.</p> <p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the tunnel and shafts may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Although temporary in nature, due to the length of the tunnel, and number and depth of shafts, the impacts could be widespread.</p> <p><b>Chemical status:</b> There is the potential for the interception of shallow contaminated land or deeper coal mine workings in the Carboniferous strata. The option information indicates a landfill at the surface, and information from The Coal Authority shows mine entries and abandoned mine workings close to the route of the tunnel. Interception of these features may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	Low	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> No dewatering of the tunnel or shafts would take place post construction, and groundwater ingress is expected to be minimal (the tunnels would be designed and maintained to prevent groundwater ingress in order to protect raw water quality).</p> <p>The tunnel will be constructed within the saturated zone of the aquifer and the presence of a low permeability linear structure may alter groundwater flows and levels, particularly where the tunnel is shallower and within the zone of active groundwater flow, or if the orientation of the tunnel is perpendicular to the direction of groundwater flow. In addition disturbance of the strata surrounding the tunnels and shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow).</p> <p><b>Chemical Status:</b> The tunnel would be used to transfer raw water of potable standard. Any leakages from the tunnel to the groundwater body would locally alter the groundwater chemistry, but it is assumed the potable standard water would be free from hazardous and priority hazardous substances and other pollutants, and would therefore not have a significant negative effect on the chemical status of the groundwater body.</p>
		Quantitative GWDTes test	Good	Good by 2015			
		Quantitative Saline Intrusion	Good	Good by 2015			
		Quantitative Water Balance	Good	Good by 2015			
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor	Good by 2027			
		Chemical Drinking Water Protected Area	Good	Good by 2015			
		Chemical GWDTes test	Good	Good by 2015			
		Chemical Saline Intrusion	Good	Good by 2015			
		General Chemical Test	Good	Good by 2015			
		Supporting Elements (for groundwater)	Prevent and Limit Objective	Not provided			
	Trend Assessment	Upward trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

- Assumptions**
- 1- Application of standard best practice construction and pollution prevention methods.
  - 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
  - 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
  - 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
  - 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
  - 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
  - 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).htm](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Water body ID:		GB112071065490		Scheme: Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)				
Water body Name:		Calder - Pendle Water to conf Ribble		Option - 37-38				
RBMP:		North West		Construction				
Operational catchment:		Calder		Operational				
Designation (and uses):		Heavily modified		Direct				
Relevant upstream water bodies:		Calder- conf Brun to Pendle Water, Green Brook, Hyndburn Brook- Lower, Pendle Water - Colne Water to Walverden Water, Salden Brook and Walverden Water						
Downstream water bodies:		Ribble- conf Calder to tidal						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided		<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b></p> <p>Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	Low	
		Macrophytes	Not provided					
		Macrophytes and phytoplankton	Moderate	Good by 2027				
		Benthic invertebrates	Good					
		Fish	Good					
	Hydro-morphology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
		General physico-chemical	All high/good except: Phosphate- poor	Phosphate good by 2027				
		Specific pollutants:	All high					
WFD elements for Rivers: Chemical	Priority hazardous substances	Good						
	Priority substances	Good						
Overall Status Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671/00\\_WRMP\\_Support5\\_Design/Resilience\\_Options/WRMP/C11\\_New\\_Tunnel\\_EA\\_Abstraction\\_Licence\\_Strategy\\_\(Northern\\_Manchester\).htm](http://www.global.amec.com/shared/Projects/38671/00_WRMP_Support5_Design/Resilience_Options/WRMP/C11_New_Tunnel_EA_Abstraction_Licence_Strategy_(Northern_Manchester).htm)  
 Coal Authority: <http://mapsapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapsapps.bgs.ac.uk/geologyofbritain/home.html>

		<b>Water body ID:</b>	GB112071065040	<b>Scheme:</b>	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)			
		<b>Water body Name:</b>	Hyndburn	<b>Reference</b>	Option - 37-38			
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction	Operational		
		<b>Operational catchment:</b>	Calder	<b>Impact potential</b>	Direct			
		<b>Designation (and uses):</b>	Heavily modified					
		<b>Relevant upstream water bodies:</b>	Not provided					
		<b>Downstream water bodies:</b>	Hyndburn Brook - Lower					
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-38 - GB41202G100300). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	Low	Low	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Not provided					
		Benthic invertebrates	Good					
		Fish	Good					
	Hydrology	Hydrological regime	Supports good					<p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p>
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high except: Phosphate-moderate	Phosphate good by 2027				<p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>
		Specific pollutants:	Not provided					
Priority hazardous substances		Does not require assessment						
WFD elements for Rivers: Chemical	Priority substances	Does not require assessment						
	Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
		Chemical	Good	Good by 2015	N/A			
		Overall	Moderate	Good by 2027	N/A			

<b>Assumptions</b>	
<p>1- Application of standard best practice construction and pollution prevention methods.</p> <p>2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.</p> <p>3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.</p> <p>4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.</p> <p>5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.</p> <p>6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.</p> <p>7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>	
<b>Evidence</b>	
<p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a></p> <p>Engineers Proforma: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tur EA Abstraction Licence Strategy (Northern Manchester): <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/L11_Coal_Authority.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/L11_Coal_Authority.pdf</a></p> <p>Coal Authority: <a href="http://mapapps2.bgs.ac.uk/coalauthority/home.html">http://mapapps2.bgs.ac.uk/coalauthority/home.html</a></p> <p>BGS Geology Viewer: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a></p>	

Water body ID:		GB112069064650		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Ogden		Reference:		Option - 37-38		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Croal Irwell		Impact potential		Operational		
Designation (and uses):		Heavily modified		Direct		Direct		
Relevant upstream water bodies:		Not provided						
Downstream water bodies:		Irwell (Rossendale STW to Roch)						
WFD Element (Receptor)		Status		RBMP objective		Alternate Objective if less than Good		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			Confidence	Confidence	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Not provided					
		Benthic invertebrates	Good					
		Fish	Good					
	Hydrology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high except: Phosphate-moderate	Good by 2027				
		Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.war-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMPC11\\_New\\_Tun](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_Options/WRMPC11_New_Tun)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LI](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LI)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Water body ID:		GB41202G100300		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	
Water body Name:		Douglas, Darwen and Calder Carboniferous Aquifer		Option - 37-38			
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Douglas Darwen and Calder Carboniferous Aq		Impact potential		Operational	
Designation (and uses):		No designation		Direct		Direct	
Relevant upstream water bodies:		N/A					
Downstream water bodies:		N/A					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent Surface Water Body Status	Good		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, but this would be localised and temporary.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the groundwater body, but construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the groundwater body.</p>	Low	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft, 12.5 m diameter, 6 m deep. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> No dewatering of the tunnel or shafts would take place post construction, and groundwater ingress is expected to be minimal (the tunnels would be designed and maintained to prevent groundwater ingress in order to protect raw water quality).</p> <p>The tunnel will be constructed within the saturated zone of the aquifer and the presence of a low permeability linear structure may alter groundwater flows and levels, particularly where the tunnel is shallower and within the zone of active groundwater flow, or if the orientation of the tunnel is perpendicular to the direction of groundwater flow. In addition disturbance of the strata surrounding the tunnels and shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow).</p> <p><b>Chemical Status:</b> The tunnel would be used to transfer raw water of potable standard. Any leakages from the tunnel to the groundwater body would locally alter the groundwater chemistry, but it is assumed the potable standard water would be free from hazardous and priority hazardous substances and other pollutants, and would therefore not have a significant negative effect on the chemical status of the groundwater body.</p>
		Quantitative GWDTes test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
WFD elements for Groundwater: Chemical	Chemical Status Element	Chemical Dependent Surface Water Body Status	Poor	Good by 2027	<p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. Solid geology is Carboniferous Millstone Grit, and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the tunnel and shafts may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Although temporary in nature, due to the length of the tunnel, and number and depth of shafts, the impacts could be widespread.</p> <p><b>Chemical status:</b> There is the potential for the interception of shallow contaminated land or deeper coal mine workings in the Carboniferous strata. Information from The Coal Authority shows mine entries and abandoned mine workings close to the route of the tunnel. Interception of these features may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	Low	
		Chemical Drinking Water Protected Area	Good				
		Chemical GWDTes test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
	Supporting Elements (groundwater)	Prevent and Limit Objective	Not provided				
		Trend Assessment	Upward trend				
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Poor	Good by 2027	N/A			
	Overall	Poor	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in-channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [WAR-FS1.global.amec.com/shared/Projects/38671\\_UU WRMP Support5 Design/Resilience](http://www.war-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/314442/ea-abstraction-licence-strategy-northern-manchester.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/314442/ea-abstraction-licence-strategy-northern-manchester.pdf)  
 Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>



Water body ID:		GB112071065520	Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Bashall Brook	Reference		Option - 37-42		
RBMP:		North West	Scheme Phase		Construction		Operational
Operational catchment:		Ribble Middle - Settle to Calder	Impact potential		Direct		Direct
Designation (and uses):		Not designated					
Relevant upstream water bodies:		Not provided					
Downstream water bodies:		Ribble DS Stock Beck					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b></p> <p>Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available at all flows.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. Impacts are likely to be temporary and localised however, and the availability of water in the water body indicates that temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>New connections to Haweswater Aqueduct.</b></p> <p>Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b></p> <p>Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-42-GB412025G103000). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that the surface water body has water available at all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	<p><b>Low</b></p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Moderate	Good by 2015			
		Benthic invertebrates	Not provided				
		Fish	Not provided				
	Hydrogeomorphology	Hydrological regime	Supports good				
		River continuity	Not provided				
		Morphological conditions	Supports good				
	Physico-chemical	General physico-chemical	All high/good except: Phosphate- poor	Phosphate good by 2027			
Specific pollutants:		Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Moderate	Good by 2027	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDA\037 Duplication of T06 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDA\038 Duplication of T05 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDA\039 Duplication of T04 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDA\040 Duplication of T03 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDA\041 Duplication of T02 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDA\042 Duplication of T01 tunnel and conduit.xlsx  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LIT\\_7918\\_ccfa86.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccfa86.pdf)  
 Coal Autho <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 Catchment <http://environment.data.gov.uk/catchment-planning/>

Water body ID:		GB112072066050		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	
Water body Name:		Hindburn		Reference		Option - 37-42	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Wenning		Impact potential		Direct	
Designation (and uses):		Not designated				Operational	
Relevant upstream water bodies:		Roeburn				Direct	
Downstream water bodies:		Wenning- Lower					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. The ALS states that the surface water body has water available at high flows (Q30), but limited water availability at low and medium flows (Q95 - Q50).</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. Impacts are likely to be temporary and localised however, and the availability of water in the water body indicates that temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p>The option includes a conduit bridge over the Welbeck and Millbeck. In channel works may reduce the chemical status due to deterioration in water quality due to disturbance of soils and sediments, particularly if contaminated, or due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery. The ecological status may reduce due to smothering of habitats or reduction in light due to release of sediments, or changes to in hydrological regime, river continuity or morphological conditions due to impoundments or changes to the structure of the channel. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	Low
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	High				
	Hydro-morphology	Fish	Good				
		Hydrological regime	High				
		River continuity	Not provided				
		Morphological conditions	Supports good				
Physico-chemical	General physico-chemical	All high					
	Specific pollutants:	All high					
WFD elements for Rivers: Chemical	Priority hazardous substances	All good					
	Priority substances	All good					
Overall Status/Potential	Ecological	Good	Good by 2015	NA			
	Chemical	Good	Good by 2015	NA			
	Overall	Good	Good by 2015	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

- Engineers Prc \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PB03\037 Duplication of T06 tunnel and conduit.xlsx
- Engineers Prc \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PB03\038 Duplication of T05 tunnel and conduit.xlsx
- Engineers Prc \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PB03\039 Duplication of T04 tunnel and conduit.xlsx
- Engineers Prc \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PB03\040 Duplication of T03 tunnel and conduit.xlsx
- Engineers Prc \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PB03\041 Duplication of T02 tunnel and conduit.xlsx
- Engineers Prc \\WAR-FS1\_global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PB03\042 Duplication of T01 tunnel and conduit.xlsx
- EA Abstractio [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_1a7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_1a7980.pdf)
- EA Abstractio [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7917v3\\_161114.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7917v3_161114.pdf)
- EA Abstractio [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)
- EA Abstractio [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LIT\\_7918\\_ccf86.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccf86.pdf)
- Coal Authority <http://mapapps2.bgs.ac.uk/coalauthority/home.html>
- Catchment Di <http://environment.data.gov.uk/catchment-planning/>

		Water body ID:	GB112071065420	Scheme:	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)			
		Water body Name:	Whitendale River	Reference	Option - 37-42			
		RBMP:	North West	Scheme Phase	Construction	Operational		
		Operational catchment:	Hodder and Loud	Impact potential	Direct		Direct	
		Designation (and uses):	Not designated					
		Relevant upstream water bodies:	Not identified					
		Downstream water bodies:	Dunsop					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided			Low	Low	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	High	Good by 2015				
		Benthic invertebrates	High	Good by 2015				
		Fish	Good	Good by 2015				
	Hydrological regime	Hydrological regime	Supports good	Supports Good by 2015				
		River continuity	Not provided					
		Morphological conditions	Supports good	-				
	Physico-chemical	General physico-chemical	All high	Good by 2015				
		Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Good	Good by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in-channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBs\037 Duplication of T06 tunnel and conduit.xlsx

Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBs\038 Duplication of T05 tunnel and conduit.xlsx

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EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/200484/LIT7919v2\\_1881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200484/LIT7919v2_1881c4.pdf)

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Coal Author <http://mapapps2.bgs.ac.uk/coalauthority/home.html>

Catchment <http://environment.data.gov.uk/catchment-planning/>

Water body ID:		GB112071065560	Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Hodder - conf Easington Bk to conf Ribble	Reference		Option - 37-42		
RBMP:		North West	Scheme Phase		Construction	Operational	
Operational catchment:		Hodder and Loud	Impact potential		Direct		Direct
Designation (and uses):		Not designated					
Relevant upstream water bodies:		Dunsop, Easington Brook, Hodder - conf Croasdale Bk to conf Easington Bk, Langden Brook and Loud - Lower					
Downstream water bodies:		Ribble DS Stock Beck					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has no water available at low flows (Q35 and Q70, limited water available at medium flows (Q50), and water available at high flows (Q30).</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. Reductions in baseflow are likely to be temporary and localised, however the lack of availability of water in the water body at low flows indicates that a temporary reduction in baseflow could cause a prolonged deterioration in WFD status.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p>The option includes a conduit bridge over the Bonstone Brook near Hodder SW. In channel works may reduce the chemical status due to deterioration in water quality due to disturbance of soils and sediments, particularly if contaminated, or due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery. The ecological status may reduce due to smothering of habitats or reduction in light due to release of sediments, or changes to in hydrological regime, river continuity or morphological conditions due to impoundments or changes to the structure of the channel. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-42- GB412025G103000). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that the surface water body has no water available at low flows (Q35 and Q70, limited water available at medium flows (Q50), and water available at high flows (Q30), and the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	High				
		Fish	Not provided				
	Hydromorphology	Hydrological regime	Supports good				
		River continuity	Not provided				
		Morphological conditions	Supports good				
	Physico-chemical	General physico-chemical	All high				
Specific pollutants:		Copper- high					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Good	Good by 2015	NA			
	Chemical	Good	Good by 2015	NA			
	Overall	Good	Good by 2015	NA			

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">Engineers F \\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDs\037 Duplication of T06 tunnel and conduit.xlsx</a> <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT7919v3_f81c1.pdf">Engineers F \\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDs\038 Duplication of T05 tunnel and conduit.xlsx</a> <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161211.pdf">Engineers F \\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDs\039 Duplication of T04 tunnel and conduit.xlsx</a> <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161211.pdf">Engineers F \\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDs\040 Duplication of T03 tunnel and conduit.xlsx</a> <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ct1a86.pdf">Engineers F \\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDs\041 Duplication of T02 tunnel and conduit.xlsx</a> <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ct1a86.pdf">Engineers F \\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\PBDs\042 Duplication of T01 tunnel and conduit.xlsx</a> EA Abstrac <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a> EA Abstrac <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT7919v3_f81c1.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT7919v3_f81c1.pdf</a> EA Abstrac <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161211.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161211.pdf</a> EA Abstrac <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ct1a86.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ct1a86.pdf</a> Coal Author <a href="http://mapapp2.bgs.ac.uk/coalauthority/home.html">http://mapapp2.bgs.ac.uk/coalauthority/home.html</a> Catchment <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>

		Water body ID:	GB41202G103000	Scheme:	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
		Water body Name:	Ribble Carboniferous Aquifers	Reference	Option - 37-42		
		RBMP:	North West	Scheme Phase	Construction	Operational	
		Operational catchment:	Ribble Carboniferous Aq	Impact potential	Direct	Direct	
		Designation (and uses):	No designation				
		Relevant upstream water bodies:	N/A				
		Downstream water bodies:	N/A				
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			Low	Low
		Quantitative GWDEs test	Good				
		Quantitative Saline Intrusion	Good				
		Quantitative Water Balance	Good				
		Chemical Dependent	Good				
	Chemical Status Element	Chemical Drinking Water Protected Area	Good				
		Chemical GWDEs test	Good				
		Chemical Saline Intrusion	Good				
		General Chemical Test	Good				
		Prevent and Limit Objective	Not provided				
Supporting Elements (Qualitative)	Trend Assessment	No trend					
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A			
	Chemical (GW)	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

Assumptions
1- Application of standard best practice construction and pollution prevention methods.
2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPDs\037 Duplication of T06 tunnel and conduit.xlsx
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Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPDs\039 Duplication of T04 tunnel and conduit.xlsx
Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPDs\040 Duplication of T03 tunnel and conduit.xlsx
Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPDs\041 Duplication of T02 tunnel and conduit.xlsx
Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPDs\042 Duplication of T01 tunnel and conduit.xlsx
EA Abstrac <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a>
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Catchment <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>

Water body ID:		GB112073071090		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Peasey Beck		Reference		Option - 37-42		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Bela		Impact potential		Direct		
Designation (and uses):		Heavily modified						
Relevant upstream water bodies:		Lupton (Farleton) Beck						
Downstream water bodies:		Bela						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-42-GB41202G102100). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	<p><b>Low</b></p>	<p><b>Low</b></p>
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Good					
		Benthic invertebrates	High					
		Fish	Not provided					
	Hydro-morphology	Hydrological regime	Not provided					
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high/good					
Specific pollutants:		Not provided						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Good by 2027	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

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 Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\038 Duplication of T05 tunnel and conduit.xlsx  
 Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\039 Duplication of T04 tunnel and conduit.xlsx  
 Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\040 Duplication of T03 tunnel and conduit.xlsx  
 Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\041 Duplication of T02 tunnel and conduit.xlsx  
 Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\042 Duplication of T01 tunnel and conduit.xlsx  
 EA Abstract [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7819\\_Ta7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7819_Ta7980.pdf)  
 EA Abstract [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v2\\_R81c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v2_R81c4.pdf)  
 EA Abstract [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)  
 Coal Autho <http://mapapps2.bes.ac.uk/coalauthority/home.html>  
 Catchment <http://environment.data.gov.uk/catchment-planning/>

Water body ID:		GB112072071690	Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Lune- conf Rawthey to conf Greta	Reference		Option - 37-42		
RBM:		North West	Scheme Phase		Construction		Operational
Operational catchment:		Lune- Rawthey to Greta	Impact potential		Direct		Direct
Designation (and uses):		Not designated					
Relevant upstream water bodies:		Barbon Beck (Barkin Beck), Leck Beck (Ease Gill), Lune- conf Birk Beck to conf Rawthey and Rawthey- Lower					
Downstream water bodies:		Lune- conf Greta to conf Wenning					
WFD Element (Receptor)		Status	RBM objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available at high flows (Q30), but limited water availability at low and medium flows (Q95 - Q50).</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. Impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-42- GB41202G102700). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available at high flows (Q30), and limited water availability at low and medium flows (Q95 - Q50), but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	<p><b>Low</b></p>
		Macrophytes	Not provided				
		Macrophytes and phytoplankton	Good				
		Benthic invertebrates	High				
		Fish	Good				
	Hydrology	Hydrological regime	Supports good				
		River continuity	Not provided				
		Morphological conditions	Supports good				
	Physico-chemical	General physico-chemical	All high				
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

- Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\037 Duplication of T06 tunnel and conduit.xlsx
- Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\038 Duplication of T05 tunnel and conduit.xlsx
- Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\039 Duplication of T04 tunnel and conduit.xlsx
- Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\040 Duplication of T03 tunnel and conduit.xlsx
- Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\041 Duplication of T02 tunnel and conduit.xlsx
- Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\042 Duplication of T01 tunnel and conduit.xlsx
- EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7949\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7949_fa7980.pdf)
- EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919a\\_1881a3.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919a_1881a3.pdf)
- EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)
- EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LIT\\_7918\\_cfa86.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_cfa86.pdf)
- Coal Author <http://mapapps2.bas.ac.uk/coalauthority/home.html>
- Catchment <http://environment.data.gov.uk/catchment-planning/>

				Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	
Water body ID:		GB112073071080					
Water body Name:		Lupton (Farleton) Beck		Reference		Option - 37-42	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Bela		Impact potential		Direct	
Designation (and uses):		Not designated				Direct	
Relevant upstream water bodies:		Not identified					
Downstream water bodies:		Peasey Beck					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good			Confidence	Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tabs 37-42-GB41202G102100 and 37-42 - GB41202G102700). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	<p><b>Low</b></p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	High				
		Benthic invertebrates	High				
		Fish	Not provided				
	Hydromorphology	Hydrological regime	High				
		River continuity	Not provided				
		Morphological conditions	Supports good				
	Physico-chemical	General physico-chemical	All high				
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Good	Good by 2015	N/A			
	Chemical	Good	Good by 2015	N/A			
	Overall	Good	Good by 2015	N/A			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers | \WAR-FS1.global.amec.com\shared\Projects\38671.UU.WRMP.Support\5.Design\Resilience.Options\WRMP\C11.New.Tunnels\PRDs\037.Duplication.of.T06.tunnel.and.conduit.xlsx

Engineers | \WAR-FS1.global.amec.com\shared\Projects\38671.UU.WRMP.Support\5.Design\Resilience.Options\WRMP\C11.New.Tunnels\PRDs\038.Duplication.of.T05.tunnel.and.conduit.xlsx

Engineers | \WAR-FS1.global.amec.com\shared\Projects\38671.UU.WRMP.Support\5.Design\Resilience.Options\WRMP\C11.New.Tunnels\PRDs\039.Duplication.of.T04.tunnel.and.conduit.xlsx

Engineers | \WAR-FS1.global.amec.com\shared\Projects\38671.UU.WRMP.Support\5.Design\Resilience.Options\WRMP\C11.New.Tunnels\PRDs\040.Duplication.of.T03.tunnel.and.conduit.xlsx

Engineers | \WAR-FS1.global.amec.com\shared\Projects\38671.UU.WRMP.Support\5.Design\Resilience.Options\WRMP\C11.New.Tunnels\PRDs\041.Duplication.of.T02.tunnel.and.conduit.xlsx

Engineers | \WAR-FS1.global.amec.com\shared\Projects\38671.UU.WRMP.Support\5.Design\Resilience.Options\WRMP\C11.New.Tunnels\PRDs\042.Duplication.of.T01.tunnel.and.conduit.xlsx

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EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)

EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/LIT\\_7918\\_ccfa86.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccfa86.pdf)

Coal Autho <http://mapaaps2.bes.ac.uk/coalauthority/home.html>

Catchment <http://environment.data.gov.uk/catchment-planning/>



Water body ID:		GB41202G102100	Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)			
Water body Name:		South Cumbria Lower Palaeozoic and Carboniferous Aquifers	Reference		Option - 37-42			
RBMP:		North West Cumbria South Lower Palaeozoic and Carboniferous Aq	Scheme Phase		Construction	Operational		
Operational catchment:		No designation	Impact potential		Direct	Direct		
Designation (and uses):		N/A						
Relevant upstream water bodies:		N/A						
Downstream water bodies:		N/A						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Groundwater: Quantitative	Quantitative dependent	Good			<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, but this would be localised and temporary. Accidental leakages or spills from construction machinery may affect the chemical status of the groundwater body, but construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the groundwater body.</p> <p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. Solid geology is Silurian Rocks (undifferentiated) - sandstone and conglomerate, a secondary B aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the tunnel and shafts may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Although temporary in nature, due to the length of the tunnel, and number and depth of shafts, the impacts could be widespread.</p> <p><b>Chemical status:</b> Interception of shallow contaminated land may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body. Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	Low	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Solid geology is Silurian Rocks (undifferentiated) - sandstone and conglomerate, a secondary B aquifer.</p> <p><b>Quantitative Status:</b> No dewatering of the tunnel or shafts would take place post construction, and groundwater ingress is expected to be minimal (the tunnels would be designed and maintained to prevent groundwater ingress in order to protect raw water quality). The tunnel will be constructed within the saturated zone of the aquifer and the presence of a low permeability linear structure may alter groundwater flows and levels, particularly where the tunnel is shallower and within the zone of active groundwater flow, or if the orientation of the tunnel is perpendicular to the direction of groundwater flow. In addition disturbance of the strata surrounding the tunnels and shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baselaw).</p> <p><b>Chemical Status:</b> The tunnel would be used to transfer raw water of potable standard. Any leakages from the tunnel to the groundwater body would locally alter the groundwater chemistry, but it is assumed the potable standard water would be free from hazardous and priority hazardous substances and other pollutants, and would therefore not have a significant negative effect on the chemical status of the groundwater body.</p>	Low
	Quantitative GWDTes test	Good						
	Quantitative Saline Intrusion	Good						
	Quantitative Water Balance	Good						
	Chemical dependent	Poor						
	Chemical Drinking Water Protected Area	Good						
	Chemical GWDTes test	Good						
	Chemical Saline Intrusion	Good						
	General Chemical Test	Good						
	Prevent and Limit Objective	Not provided						
Trend Assessment	No trend							
Overall Status/Chemical	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Poor	Good by 2027	N/A				
	Overall	Poor	Good by 2027	N/A				

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\Cl1 New Tunnels\PBDA\037 Duplication of T06 tunnel and conduit.xlsx  
 Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\Cl1 New Tunnels\PBDA\038 Duplication of T05 tunnel and conduit.xlsx  
 Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\Cl1 New Tunnels\PBDA\039 Duplication of T04 tunnel and conduit.xlsx  
 Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\Cl1 New Tunnels\PBDA\040 Duplication of T03 tunnel and conduit.xlsx  
 Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\Cl1 New Tunnels\PBDA\041 Duplication of T02 tunnel and conduit.xlsx  
 Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\Cl1 New Tunnels\PBDA\042 Duplication of T01 tunnel and conduit.xlsx  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)  
 EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)  
 Coal Autho <http://mapapps2.bas.ac.uk/coalauthority/home.html>  
 Catchment <http://environment.data.gov.uk/catchment-planning/>

		Water body ID:	GB41202G102700	Scheme:	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)			
		Water body Name:	Lune and Wyre Carboniferous Aquifers	Reference	Option - 37-42			
		RBMP:	North West	Scheme Phase	Construction	Operational		
		Operational catchment:	Lune and Wyre Carboniferous Aq	Impact potential	Direct	Direct		
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good			<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, but this would be localised and temporary.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the groundwater body, but construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the groundwater body.</p> <p><b>Construction of new tunnel.</b> Medium level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. Solid geology is Silurian Rocks (undifferentiated) - sandstone and conglomerate, a secondary B aquifer, and Carboniferous Millstone Grit a secondary A aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the tunnel and shafts may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Although temporary in nature, due to the length of the tunnel, and number and depth of shafts, the impacts could be widespread.</p> <p><b>Chemical status:</b> There is the potential for the interception of shallow contaminated land or deeper coal mine workings in the Carboniferous strata. Information from The Coal Authority shows mine entries and abandoned mine workings close to the route of the tunnel between Lunesdale SW and Hodder NW. Interception of these features may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Solid geology is Silurian Rocks (undifferentiated) - sandstone and conglomerate, a secondary B aquifer, and Carboniferous Millstone Grit a secondary A aquifer.</p> <p><b>Quantitative Status:</b> No dewatering of the tunnel or shafts would take place post construction, and groundwater ingress is expected to be minimal (the tunnels would be designed and maintained to prevent groundwater ingress in order to protect raw water quality).</p> <p>The tunnel will be constructed within the saturated zone of the aquifer and the presence of a low permeability linear structure may alter groundwater flows and levels, particularly where the tunnel is shallower and within the zone of active groundwater flow, or if the orientation of the tunnel is perpendicular to the direction of groundwater flow. In addition disturbance of the strata surrounding the tunnels and shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow).</p> <p><b>Chemical Status:</b> The tunnel would be used to transfer raw water of potable standard. Any leakages from the tunnel to the groundwater body would locally alter the groundwater chemistry, but it is assumed the potable standard water would be free from hazardous and priority hazardous substances and other pollutants, and would therefore not have a significant negative effect on the chemical status of the groundwater body.</p>	Low
		Quantitative GWDEs test	Good					
Quantitative Saline Intrusion	Good							
Quantitative Water Balance	Good							
Chemical dependent	Good							
Chemical Drinking Water Protected Area	Good							
Chemical GWDEs test	Poor							
Chemical Saline Intrusion	Good							
General Chemical Test	Good							
Prevent and Limit Objective	Not provided							
Trend Assessment	Upward trend							
Overall Status/Potential	Quantitative	Good	Good by 2015	N/A				
	Chemical (GW)	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\037 Duplication of T06 tunnel and conduit.xlsx

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Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\041 Duplication of T02 tunnel and conduit.xlsx

Engineers f \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDA\042 Duplication of T01 tunnel and conduit.xlsx

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EA Abstrac [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/LIT7917v1\\_161231.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf)

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Catchment <http://environment.data.gov.uk/catchment-planning/>

Water body ID:		GB112073071370		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Mint		Reference		Option - 37-42		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Kent		Impact potential		Direct		
Designation (and uses):		Not designated				Operational		
Relevant upstream water bodies:		Flodder Beck and Mint- Upper				Direct		
Downstream water bodies:		Kent- conf Sprint to tidal						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence			
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel.</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Penstock shaft. The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised.</p> <p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-42-GB41202G102100). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>	Low
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	High					
		Benthic invertebrates	High					
		Fish	Not provided					
	Hydromorphology	Hydrological regime	High					
		River continuity	Not provided					
		Morphological conditions	Supports good					
	Physico-chemical	General physico-chemical	All high					
		Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status Potential	Ecological	Good	Good by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Good	Good by 2015	N/A				

Assumptions
1- Application of standard best practice construction and pollution prevention methods. 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings. 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities. 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed. 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required. 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works. 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

Evidence
<a href="#">Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\037 Duplication of T06 tunnel and conduit.xlsx</a> <a href="#">Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\038 Duplication of T05 tunnel and conduit.xlsx</a> <a href="#">Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\039 Duplication of T04 tunnel and conduit.xlsx</a> <a href="#">Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\040 Duplication of T03 tunnel and conduit.xlsx</a> <a href="#">Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\041 Duplication of T02 tunnel and conduit.xlsx</a> <a href="#">Engineers F \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C11 New Tunnels\VPBDs\042 Duplication of T01 tunnel and conduit.xlsx</a> EA Abstract <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf</a> EA Abstract <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_1881c4.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_1881c4.pdf</a> EA Abstract <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/LIT7917v1_161231.pdf</a> EA Abstract <a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccf486.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/LIT_7918_ccf486.pdf</a> Coal Autho <a href="http://mapapps2.bis.ac.uk/coalauthority/home.html">http://mapapps2.bis.ac.uk/coalauthority/home.html</a> Catchment <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>

Water body ID:		GB112073071340		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	
Water body Name:		Flodder Beck		Reference		Option - 37-42	
RBMP:		North West		Scheme Phase		Construction Operational	
Operational catchment:		Kent		Impact potential		Direct	
Designation (and uses):		Not designated					
Relevant upstream water bodies:		Not identified					
Downstream water bodies:		Mint					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytoplankton	Not provided		<p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. Temporary shafts every 3 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	<p><b>Presence and operation of new tunnel.</b> Medium level of impact. Part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km.</p> <p>Disruption of groundwater flows and levels may occur (see tab 37-42-GB41202G102100). This may result in long term or widespread changes to baseflow to watercourses. The ALS states that there is water available across all flows, but the potential magnitude of impacts are at present poorly understood. If reductions in baseflow are of a large magnitude there could be a deterioration in the hydrological regime of the surface water body.</p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Good				
		Benthic invertebrates	High				
		Fish	Not provided				
	Hydrology	Hydrological regime	High				
		River continuity	Not provided				
		Morphological conditions	Supports good				
		General physico-chemical	All high				
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Good	Good by 2015	NA			
	Chemical	Good	Good by 2015	NA			
	Overall	Good	Good by 2015	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers F:\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\VPBs\037 Duplication of T06 tunnel and conduit.xlsx

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Catchment <http://environment.data.gov.uk/catchment-planning/>

Water body ID:		QB12073071100		Scheme:		Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)		
Water body Name:		Stainton Beck		Reference:		Option - 37-42		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Bela		Impact potential		Direct		
Designation (and uses):		Not designated				Operational		
Relevant upstream water bodies:		Not identified				Direct		
Downstream water bodies:		Bela						
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good		Confidence		Confidence	
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New connections to Haweswater Aqueduct.</b> Minor level of impact. Construction of penstock chamber around existing aqueduct. Open cut pipe construction between penstock chamber and new tunnel</p> <p>Temporary coffer dam, excavations, and associated dewatering may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised and temporary. It is assumed that no water courses would be crossed or diverted for the new connection.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p><b>Construction of new tunnel.</b> Minor level of impact. Construction of part of new 2.6 m diameter conduit and 2.85 m diameter tunnel between Mealbank South Well and Woodgate Hill, including associated temporary and permanent shafts. Tunnel depth is up to 120 m and has a total length of 51.8 km. The ALS states that the surface water body has water available across all flow regime.</p> <p>Dewatering of the tunnel and shafts may affect groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This could result in a reduction in ecological or chemical status. However impacts are likely to be temporary and localised and the availability of water in the water body indicates some temporary reduction in baseflow could be tolerated.</p> <p>Accidental leakages or spills from construction machinery at the surface may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p> <p>The option includes two conduit bridges on the Crake Hall Gill and Mill Rigg Gill. In channel works may reduce the chemical status due to deterioration in water quality due to disturbance of soils and sediments, particularly if contaminated, or due to accidental spillage or leakage of fuels, oils and other chemicals associated with construction machinery. The ecological status may reduce due to smothering of habitats or reduction in light due to release of sediments, or changes to in hydrological regime, river continuity or morphological conditions due to impoundments or changes to the structure of the channel. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	Low	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Good					
		Fish	Not provided					
	Hydromorphology	Hydrological regime	High					
		River continuity	Not provided					
		Morphological conditions	Supports good					
	Physico-chemical	General physico-chemical	All high					
		Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	NA				
	Chemical	Good	Good by 2015	NA				
	Overall	Moderate	Good by 2027	NA				

**Assumptions**

- Application of standard best practice construction and pollution prevention methods.
- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Engineers F:\WAR-FS1\_global\_amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDS\037 Duplication of T06 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1\_global\_amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDS\038 Duplication of T05 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1\_global\_amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDS\039 Duplication of T04 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1\_global\_amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDS\040 Duplication of T03 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1\_global\_amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDS\041 Duplication of T02 tunnel and conduit.xlsx  
 Engineers F:\WAR-FS1\_global\_amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMPC11 New Tunnels\PBDS\042 Duplication of T01 tunnel and conduit.xlsx  
 EA Abstract [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/IT\\_7949\\_fa7980.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/IT_7949_fa7980.pdf)  
 EA Abstract [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300485/IT7919v3\\_f881c4.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300485/IT7919v3_f881c4.pdf)  
 EA Abstract [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300489/IT\\_7918\\_ccfa86.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300489/IT_7918_ccfa86.pdf)  
 Coal Author <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 Catchment <http://environment.data.gov.uk/catchment-planning/>

<b>Water body ID:</b>		<b>GB112071065500</b>		<b>Scheme:</b>		<b>Alternative Supply: Raw water transfer and WTW at Martholme BSP</b>		
<b>Water body Name:</b>		<b>Ribble - conf Calder to tidal</b>		<b>Reference</b>		<b>Option- 215</b>		
<b>RBMP:</b>		<b>North West</b>		<b>Scheme Phase</b>		<b>Construction</b>		
<b>Operational catchment:</b>		<b>Big Ribble</b>		<b>Impact potential</b>		<b>Operational</b>		
<b>Designation (and uses):</b>		<b>Heavily modified</b>		<b>Direct</b>		<b>Direct</b>		
<b>Relevant upstream water bodies:</b>		<b>Calder - Pendle Water to conf Ribble, Duddel Brook, Ribble DS Stock Beck and Showley Brook</b>						
<b>Downstream water bodies:</b>		<b>Ribble</b>						
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>		
<b>WFD elements for Rivers: Ecological</b>	<b>Biology</b>	<b>Phytobenthos</b>	Not provided		<b>High</b>	<b>Use of new transfer pipe line, pumping station, and water treatment works.</b> No or minimal impact.  <b>New surface water abstraction quantity.</b> Medium level of impact. New surface water abstraction from the River Ribble near Old Langho of a maximum of 41 M/d. Likely to be operational for six monthly periods, every two years during repair work, then every five years for maintenance.  In the ALS water is identified as available at all flows (Q30, Q50, Q70 and Q95) however the abstraction is relatively large in size and could have a widespread impact on the hydrological regime of the River Ribble. The six month limit on the operation period may limit the degree of impact, particularly if abstraction is limited to times of high flow, but not enough is known about the operation patterns to lower the predicted impact to minor at this stage.  A new abstraction licence would be required to be issued by the Environment Agency.		
		<b>Macrophytes</b>	Not provided					
		<b>Macrophytes and phytobenthos</b>	Moderate	Good by 2027				
		<b>Benthic invertebrates</b>	Good	Good by 2015				
		<b>Fish</b>	Not provided					
	<b>Hydrology</b>	<b>Hydrological regime</b>	Supports good					
		<b>River continuity</b>	Not provided					
		<b>Morphological conditions</b>	Not provided					
	<b>Physico-chemical</b>	<b>General physico-chemical</b>	All high except: Phosphate-poor	Phosphate good by 2027				
		<b>Specific pollutants:</b>	All high	High by 2015				
<b>Priority hazardous substances</b>		All good	Good by 2015					
<b>WFD elements for Rivers: Chemical</b>	<b>Priority substances</b>	All good	Good by 2015					
	<b>Overall Status/Potential</b>	<b>Moderate</b>	<b>Good by 2027</b>	<b>N/A</b>				
<b>Overall Status/Potential</b>		<b>Good</b>	<b>Good by 2015</b>	<b>N/A</b>				
<b>Overall</b>		<b>Moderate</b>	<b>Good by 2027</b>	<b>N/A</b>				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMPC17\\_Full\\_Dupl](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_Options/WRMPC17_Full_Dupl)  
 EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/38671](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/38671)

		Water body ID:	GB41202G103000	Scheme:	Alternative Supply: Raw water transfer and WTW at Martholme BSP			
		Water body Name:	Ribble Carboniferous Aquifers	Reference	Option - 215			
		RBMP:	North West	Scheme Phase	Construction		Operational	
		Operational catchment:	Ribble Carboniferous Aq	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative Dependent	Good			High	Use of new transfer pipe line, pumping station and water treatment works. No or minimal impact.	Medium
		Quantitative GWDTes test	Good					
		Quantitative Saline Intrusion	Good		Transfer pipe line on land. No or minimal impact.			
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good		Transfer pipe line with water course crossings.			
		Chemical Dependent	Good					
		Chemical Drinking Water Protected Area	Good		New surface water intake. No or minimal impact.			
WFD elements for Groundwater: Supporting Elements	Supporting Element	Chemical GWDTes test	Poor		New surface water intake. No or minimal impact.			
		Chemical Saline Intrusion	Good		New pumping station. No or minimal impact.			
		General Chemical Test	Poor		New water treatment works. No or minimal impact.			
		Prevent and Limit Objective	Not provided					
Overall Status/Potential		Trend Assessment	No trend					
		Quantitative	Good	Good by 2015	N/A			
		Chemical (GW)	Poor	Good by 2015	N/A			
Overall	Poor	Good by 2015	N/A					

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.ar-fs1.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_Options/WRMPC17\\_Full\\_Duplication\\_Plus\\_Volumetric/Scopebooks/215 - Raw transfer EA Abstraction Licence Strategy \(Ribble, Douglas and Crossens\): http://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300484/LIT7919v3\\_f881c4.pdf](http://www.ar-fs1.global.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_Options/WRMPC17_Full_Duplication_Plus_Volumetric/Scopebooks/215 - Raw transfer EA Abstraction Licence Strategy (Ribble, Douglas and Crossens): http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300484/LIT7919v3_f881c4.pdf)

<b>Water body ID:</b>		GB112069064641	Scheme:	Alternative Supply: Raw water abstraction and WTW at Townsend Fold BSP				
<b>Water body Name:</b>		Irwell (Cowpe Bk to Rossendale STW)	Reference	Option - 216				
<b>RBMP:</b>		North West	Scheme Phase	Construction		Operational		
<b>Operational catchment:</b>		Croal Irwell	Impact potential	Direct		Direct		
<b>Designation (and uses):</b>		Heavily modified						
<b>Relevant upstream water bodies:</b>		Irwell (Source to Whitewell Brook), Limy Water and Whitewell Brook						
<b>Downstream water bodies:</b>		Irwell (Rossendale STW to Roch)						
<b>WFD Element (Receptor)</b>		<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		Transfer pipe line on land. No or minimal impact.	High	Use of new transfer pipe line, pumping station and water treatment works. No or minimal impact.	
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Moderate	Good by 2027				
		Benthic invertebrates	Good	Good by 2015				
		Fish	Not provided					
	Hydromorphology	Hydrological regime	Supports good	Supports good by 2015				
		River continuity	Not provided					
		Morphological conditions	Not provided					
	Physico-chemical	General physico-chemical	All high except: Phosphate-moderate and pH- moderate	Phosphate and pH good by 2027				
		Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Does not require assessment						
Overall Status/Potential	Ecological	Moderate	Good by 2027	NA				
	Chemical	Good	Good by 2015	NA				
	Overall	Moderate	Good by 2027	NA				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.global.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support5\\_Design/Resilience\\_Options/WRMPC17\\_Full\\_Dupl](http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_Options/WRMPC17_Full_Dupl)  
 EA Abstraction Licence Strategy (Northern Manchester): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/L1](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/L1)



		Water body ID:	GB41202G101800	Scheme:	Alternative Supply: Raw water abstraction and WTW at Townsend Fold BSP			
		Water body Name:	Northern Manchester Carboniferous Aquifers	Reference	Option - 216			
		RBMP:	North West	Scheme Phase	Construction		Operational	
		Operational catchment:	Manchester Northern Carboniferous Aq	Impact potential	Direct		Direct	
		Designation (and uses):	No designation					
		Relevant upstream water bodies:	N/A					
		Downstream water bodies:	N/A					
		WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Status Element	Quantitative dependent	Good	Good by 2015				
		Quantitative GWDTes test	Good	Good by 2015				
		Quantitative Saline intrusion	Good	Good by 2015				
WFD elements for Groundwater: Chemical	Chemical Status Element	Quantitative Water Balance	Good	Good by 2015				
		Chemical Dependent Surface Water Body Status	Poor	Good by 2027		High	Use of new transfer pipe line, pumping station and water treatment works. No or minimal impact.  New surface water abstraction quantity. Minor level of impact. New surface water abstraction from the River Inwell near Haslingden of a maximum of 5.1 M/d. The ALS does not define a groundwater management unit for this water body, but there is no restricted or non availability of surface water in the overlying water body. Due to the relatively small size of the proposed abstraction any reductions in leakage from the river to the aquifer would be localised, and the secondary aquifer is unlikely to be highly dependent on leakage from surface water courses to maintain its quantitative water balance.	Medium
		Chemical Drinking Water Protected Area	Good	Good by 2015				
		Chemical GWDTes test	Good	Good by 2015				
		Chemical Saline Intrusion	Good	Good by 2015				
		General Chemical Test	Good	Good by 2015				
		Prevent and Limit Objective	Not provided					
Trend Assessment	Upward trend							
Overall Status/Potential	Quantitative	Good	Good by 2015	NA				
	Chemical (GW)	Poor	Good by 2027	NA				
	Overall	Poor	Good by 2027	NA				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: [\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C17 Full Duplication Plus Volumetric\Scopebooks\216 - Raw transfer EA Abstraction Licence Strategy \(Northern Manchester\): https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/300488/LIT\\_7849\\_fa7980.pdf](\\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\WRMP\C17 Full Duplication Plus Volumetric\Scopebooks\216 - Raw transfer EA Abstraction Licence Strategy (Northern Manchester): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300488/LIT_7849_fa7980.pdf)

Water body ID:		GB112069064641		Scheme:		T05 targeted repair 2025	
Water body Name:		Irwell (Cowpe Bk to Rossendale STW)		Reference		Option - 296	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Croal Irwell		Impact potential		Operational	
Designation (and uses):		Heavily modified		Direct		Direct	
Relevant upstream water bodies:		Irwell (Source to Whitewell Brook), Limy Water and Whitewell Brook					
Downstream water bodies:		Irwell (Rossendale STW to Roch)					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New Tunnel Lining to Haweswater Aqueduct.</b> Minor level of impact. Installation of 100 m of steel tunnel liner within the existing aqueduct, including two new access shafts. The ALS states that the surface water body has water available across all flow regime.</p> <p>Temporary dewatering of shafts may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This would be localised and temporary, and the availability of water in the surface water body indicates that some reduction in baseflow could be tolerated. It is assumed that no water courses would be crossed or diverted.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	<p><b>New Tunnel Lining to Haweswater Aqueduct.</b> Minor level of impact. Presence of 100 m of new tunnel liner. Presence of two new access shafts.</p> <p>The presence of a new concrete lined shaft may disrupt groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised. (see tab 296-GB41202G101800).</p>	<p><b>Low</b></p>
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Moderate				
	Hydro-morphology	Benthic invertebrates	Good				
		Fish	Not provided				
		Hydrological regime	Supports good				
		River continuity	Not provided				
Physico-chemical	Morphological conditions	Not provided					
	General physico-chemical	Ammonia and Dissolved oxygen- high, pH and Phosphate- poor	pH and Phosphate good by 2027				
	Specific pollutants:	Not provided					
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Good by 2027	NA			
	Chemical	Good	Good by 2015	NA			
	Overall	Moderate	Good by 2027	NA			

<p><b>Assumptions</b></p> <p>1- Application of standard best practice construction and pollution prevention methods.                  2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.                  3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.                  4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.                  5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.                  6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.                  7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.</p>	
<p><b>Evidence</b></p> <p>Catchment Data Explorer: <a href="http://environment.data.gov.uk/catchment-planning/">http://environment.data.gov.uk/catchment-planning/</a>                  Engineers Proforma: <a href="http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_Options/Received_13.12.17/296_Coal_Authority_Interactive_Map">http://www.global.amec.com/shared/Projects/38671_UU_WRMP_Support5_Design/Resilience_Options/Received_13.12.17/296_Coal_Authority_Interactive_Map</a>                  Coal Authority Interactive Map: <a href="http://mapapps2.bgs.ac.uk/coalauthority/home.html">http://mapapps2.bgs.ac.uk/coalauthority/home.html</a>                  BGS Geology Viewer: <a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a></p>	

Water body ID:		GB41202G101800		Scheme:		T05 targeted repair 2025	
Water body Name:		Northern Manchester Carboniferous Aquifers		Reference		Option - 296	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Manchester Northern Carboniferous Aq		Impact potential		Direct	
Designation (and uses):		No designation				Operational	
Relevant upstream water bodies:		N/A					
Downstream water bodies:		N/A					
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence
WFD elements for Groundwater: Quantitative	Quantitative Dependent	Good			<p><b>New Tunnel Lining to Haweswater Aqueduct.</b> Medium level of impact. Installation of 100 m of steel tunnel liner within the existing aqueduct, including two new access shafts. Solid geology is Carboniferous Millstone Grit, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the shafts may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Impacts would be temporary, limited to the construction phase, and localised as only two shafts are included in the option. Shaft T05-08 is within approximately 50 m of the River Irwell and dewatering could impact upon river flows.</p> <p><b>Chemical status:</b> Interception of shallow contaminated land may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body. Information from The Coal Authority shows mine entries and shallow mine workings in the vicinity of the proposed shafts.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	<p><b>New Tunnel Lining to Haweswater Aqueduct.</b> Minor level of impact. Presence of 100 m of new tunnel liner. Presence of two new access shafts.</p> <p><b>Quantitative Status:</b> No dewatering of the shafts would take place post construction. Groundwater ingress to the tunnel would be reduced due to the improved liner. Disturbance of the strata surrounding the shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow), however impacts would be localised, and it is assumed the shafts would not be located within close proximity to GWDTE.</p> <p><b>Chemical Status:</b> Any existing leakages from the tunnel to the groundwater body would be reduced due to the improved liner. Impacts would be no or minimal, or positive.</p>	<p><b>Low</b></p>
	Quantitative GWDTes test	Good					
	Quantitative Saline intrusion	Good					
	Quantitative Water Balance	Good					
	Chemical Dependent	Poor	Good by 2027				
	Chemical Drinking Water Protected Area	Good					
	Chemical GWDTes test	Good					
	Chemical Saline intrusion	Good					
	General Chemical Test	Good					
	Prevent and Limit Objective	Not provided					
WFD elements for Groundwater: Chemical	Supporting Elements (aroundwater)				<p><b>Low</b></p>		
	Trend Assessment	Upward trend					
Overall Status Potential	Quantitative	Good	Good by 2015	NA	<p><b>Low</b></p>		
	Chemical (GW)	Poor	Good by 2027	NA			
	Overall	Poor	Good by 2027	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proforma: [http://www.amec.com/shared/Projects/38671\\_UU\\_WRMP\\_Support/5\\_Design/Resilience\\_Options/Received\\_13.12.17/296\\_Lining\\_T05\\_targeted\\_repair\\_2025.xls](http://www.amec.com/shared/Projects/38671_UU_WRMP_Support/5_Design/Resilience_Options/Received_13.12.17/296_Lining_T05_targeted_repair_2025.xls)  
 Coal Authority Interactive Map: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>  
 BGS Geology Viewer: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

		<b>Water body ID:</b>	GB112069064620	<b>Scheme:</b>	T06 targeted repair 2025		
		<b>Water body Name:</b>	Irwell (Rossendale STW to Roch)	<b>Reference</b>	Option - 297		
		<b>RBMP:</b>	North West	<b>Scheme Phase</b>	Construction	Operational	
		<b>Operational catchment:</b>	Croal Irwell	<b>Impact potential</b>	Direct		Direct
		<b>Designation (and uses):</b>	Heavily modified				
		<b>Relevant upstream water bodies:</b>	Irwell (Cowpe Bk to Rossendale STW), Kirklees Brook and Ogden				
		<b>Downstream water bodies:</b>	Irwell (Roch to Croal)				
		<b>WFD Element (Receptor)</b>	<b>Status</b>	<b>RBMP objective</b>	<b>Alternate Objective if less than Good</b>	<b>Confidence</b>	<b>Confidence</b>
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New Tunnel/Conduit Lining to Haweswater Aqueduct.</b> Minor level of impact. Installation of 200 m of steel tunnel liner within the existing aqueduct, including two new access shafts. The ALS states that the surface water body has water available across all flow regime.</p> <p>Temporary dewatering of shafts may have an impact on groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This would be localised and temporary and the availability of water indicates that some reduction in baseflow could be tolerated. It is assumed that no water courses would be crossed or diverted.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated.</p> <p>However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	Low
		Macrophytes	Not provided				
		Macrophytes and phytobenthos	Moderate				
		Benthic invertebrates	Good				
		Fish	Not provided				
	Hydromorphology	Hydrological regime	Supports good				
		River continuity	Not provided				
		Morphological conditions	Not provided				
	Physico-chemical	General physico-chemical	All high/good except: Phosphate- poor	Phosphate poor by 2015			
		Specific pollutants:	Not provided				
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment					
	Priority substances	Does not require assessment					
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	NA			
	Chemical	Good	Good by 2015	NA			
	Overall	Moderate	Moderate by 2015	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671\_UU WRMP Support\5 Design\Resilience Options\Received 13.12.17\297 Lining T06 targeted repair 2025.xlsx

Water body ID:		GB112069064600		Scheme:		T06 targeted repair 2025		
Water body Name:		Roch (Spodden to Irwell)		Reference		Option - 297		
RBMP:		North West		Scheme Phase		Construction		
Operational catchment:		Roch Irk Medlock		Impact potential		Operational		
Designation (and uses):		Heavily modified		Direct		Direct		
Relevant upstream water bodies:		Naden Brook, Roch (Source to Spodden), Spodden and Whittle Brook (Irwell)						
Downstream water bodies:		Irwell (Roch to Croal)						
WFD Element (Receptor)		Status	RBMP objective	Alternate Objective if less than Good	Confidence	Confidence		
WFD elements for Rivers: Ecological	Biology	Phytobenthos	Not provided		<p><b>New Tunnel/Conduit Lining to Haweswater Aqueduct.</b>                      Minor level of impact. Installation of 200 m of concrete conduit liner within the existing aqueduct, including two new access chambers. The ALS states that the surface water body has water available across all flow regime.</p> <p>Temporary dewatering of access chambers may have an impact on shallow groundwater levels and flows, which could in turn impact on baseflows to nearby water courses. This would be localised and temporary and the availability of water indicates that some reduction in baseflow could be tolerated. It is assumed that no water courses would be crossed or diverted, and that the Gypsy Brook conduit bridge does not need to be rebuilt.</p> <p>Accidental leakages or spills from construction machinery may affect the chemical status of the surface water body. Release of sediments from construction work may affect the ecological status due to smothering of habitats or reduction in light, or the chemical status of the surface water body, particularly if contaminated. However, construction best practice and pollution prevention measures would help prevent and/or mitigate against a prolonged or widespread impact on the surface water body.</p>	Low	<p><b>New Tunnel/Conduit Lining to Haweswater Aqueduct.</b>                      Minor level of impact. Presence of 200 m of new concrete conduit liner. Presence of two new access chambers.</p> <p>The presence of a new concrete lined access chambers may disrupt shallow groundwater levels and flows, which could in turn impact on baseflows to nearby water courses, but this would be localised. (see tab 297-GB41202G101800).</p>	Low
		Macrophytes	Not provided					
		Macrophytes and phytobenthos	Moderate					
	Hydromorphology	Benthic invertebrates	Not provided					
		Fish	Not provided					
		Hydrological regime	Not provided					
		River continuity	Not provided					
Physico-chemical	Morphological conditions	Not provided						
	General physico-chemical	All high/good except: Phosphate- poor	Phosphate poor by 2015					
	Specific pollutants:	High						
WFD elements for Rivers: Chemical	Priority hazardous substances	Does not require assessment						
	Priority substances	Good						
Overall Status/Potential	Ecological	Moderate	Moderate by 2015	N/A				
	Chemical	Good	Good by 2015	N/A				
	Overall	Moderate	Moderate by 2015	N/A				

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>

Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\Received 13.12.17\297 Lining T06 targeted repair 2025.xlsx

Water body ID:		GB41202G101800		Scheme:		T06 targeted repair 2025	
Water body Name:		Northern Manchester Carboniferous Aquifers		Reference		Option - 297	
RBMP:		North West		Scheme Phase		Construction	
Operational catchment:		Manchester Northern Carboniferous Aq		Impact potential		Direct	
Designation (and uses):		No designation					
Relevant upstream water bodies:		N/A					
Downstream water bodies:		N/A					
WFD Element (Receptor)	Status	RBMP objective	Alternate Objective if less than Good	Confidence		Confidence	
WFD elements for Groundwater: Quantitative	Quantitative Dependent Surface Water Body Status	Good		<p><b>New Tunnel/Conduit Lining to Haweswater Aqueduct.</b>                      Medium level of impact. Installation of 200 m of steel liner in tunnel section, including two new access shafts, and 200 m of concrete lining in conduit section with to new conduit access chambers. Solid geology is Carboniferous Millstone Grit and Pennine Lower Coal Measures, a secondary A aquifer.</p> <p><b>Quantitative Status:</b> Dewatering of the shafts and new access chambers may affect groundwater levels and flows and the quantitative water balance of the groundwater body. Impacts would be temporary, limited to the construction phase, and localised to the four shaft/chamber locations. Shaft T06-05 is within approximately 50 m of a minor watercourse and dewatering could impact upon river flows.</p> <p><b>Chemical status:</b> Interception of shallow contaminated land may result in vertical or lateral migration of contaminated groundwater or mine waters into previously unaffected parts of the groundwater body. Information from The Coal Authority shows mine entries and shallow mine workings in the vicinity of the proposed shafts.</p> <p>Leakages or spillages from construction machinery could affect the chemical status of the groundwater body. While construction best practice and pollution prevention measures would limit the occurrence of spillages and help mitigate their impact, any uncontrolled leak could rapidly transmit to the saturated zone. Although the construction phase is temporary, the effects of a deterioration in groundwater quality could be prolonged. Impacts would be localised, but could occur in several locations.</p>	Low	<p><b>New Tunnel/Conduit Lining to Haweswater Aqueduct.</b>                      Minor level of impact. Presence of new tunnel linings, access shafts, and conduit access chambers.</p> <p><b>Quantitative Status:</b> No dewatering of the shafts/access chambers would take place post construction. Groundwater ingress to the tunnel/conduit would be reduced due to the improved liner.</p> <p>Disturbance of the strata surrounding the shafts may result in altered or preferential groundwater flow pathways. Changes in shallow groundwater levels and flow may affect surface water bodies and groundwater dependent terrestrial ecosystems (i.e. reductions in baseflow), however impacts would be localised, and it is assumed the shafts would not be located within close proximity to GWDTE.</p> <p><b>Chemical Status:</b> Any existing leakages from the tunnel to the groundwater body would be reduced due to the improved liner. Impacts would be no or minimal, or positive.</p>	Low
	Quantitative GWDTes test	Good					
	Quantitative Saline Intrusion	Good					
	Quantitative Water Balance	Good					
WFD elements for Groundwater: Chemical	Chemical Dependent Surface Water Body Status	Poor	Good by 2027	<p><b>Prevent and Limit Objective</b></p> <p>Not provided</p>	<p><b>Trend Assessment</b></p> <p>Upward trend</p>		
	Chemical Drinking Water Protected Area	Good					
	Chemical GWDTes test	Good					
	Chemical Saline Intrusion	Good					
	General Chemical Test	Good					
	Supporting Elements (non-dewatering)						
Overall Status (Potential)	Quantitative	Good	Good by 2015	NA			
	Chemical (GW)	Poor	Good by 2027	NA			
	Overall	Poor	Good by 2027	NA			

**Assumptions**

- 1- Application of standard best practice construction and pollution prevention methods.
- 2- Pipe lines will cross water courses with existing roadways where possible to limit the amount of new watercourse crossings.
- 3- Laying of the pipeline across water courses will take no more than 30 days, and any in channel works will be undertaken at a time which won't have a significant impact on fish communities.
- 4- New pipe line water course crossings would be installed via a trench and cover technique within a dry working area. New pipe line crossings of estuaries or coastal waters would be installed via a technique that does not involve disturbance of the bed.
- 5- A ground investigation will be carried out and will identify any contaminated land and any mitigation that may be required.
- 6- Extensions, modifications, or new pumping stations, water treatment works, etc. would involve a relatively small footprint in the context of any WFD water body catchment, and would not involve the requirement for in-channel works.
- 7- Dewatering of excavations would not require a permit from the Environment Agency/Natural Resources Wales. Dewatering and a corresponding discharge of sufficient magnitude, duration, or sensitivity to require a permit may have a greater impact than assessed. Dewatering would be of uncontaminated water, and water would be discharged within the same water body.

**Evidence**

Catchment Data Explorer: <http://environment.data.gov.uk/catchment-planning/>  
 Engineers Proformas: \\WAR-FS1.global.amec.com\shared\Projects\38671 UU WRMP Support\5 Design\Resilience Options\Received 13.12.17\297 Lining T06 targeted repair 2025.xlsx



# Appendix F

## Results of the WFD Assessment of Supply-demand Preferred Plan Options at the Draft WRMP Stage

## Overview

UU's Preferred Plan for the Draft WRMP incorporated four strategic choices:

- ▶ Enhance leakage reduction by a total of 80 MI/d over the planning period;
- ▶ Improve levels of service for drought permits and orders from 1 in 20 years to 1 in 40 years (moving from 5% to 2.5% annual risk);
- ▶ Increase resilience to other hazards, through the Manchester and Pennine Resilience solution; and
- ▶ Continue to explore national water trading.

The Draft WRMP Preferred Plan comprised a combination of preferred resource management and demand management measures designed to achieve the four strategic choices outlined above. The preferred supply-demand resource management options were considered as part of this WFD assessment which informed the Draft WRMP and are included here for completeness.

**Table F.1** lists the supply-demand resource management options that comprised the Draft WRMP Preferred Plan together with their respective design capacity.

Table F.1 Summary of Draft WRMP Preferred Plan Options

Ref	Preferred Option	Description	Design Capacity	Implementation (AMP)
WR099b	Worsthorne Borehole (Hurstwood IR)	This option comprises the recommissioning and refurbishment of Worsthorne borehole in order to abstract a maximum capacity of 4 MI/d. Refurbishments would include a new pump, new/improved headworks and mechanical / electrical together with the construction of a new 1.1km main to transfer water to Hurstwood IR.	4	AMP8
WR101	Franklaw Z Site Plus Increased Franklaw WTW Treatment Capacity	This option would involve the reinstatement and refurbishment of two existing boreholes at the Franklaw Z site in order to abstract and transfer a maximum of 18 MI/d of raw ground water to the existing Franklaw WTW via an existing raw water pipeline. Additionally, new borehole pumps would be installed at 10 other existing/utilised Franklaw/Broughton boreholes in order to abstract an additional 12 MI/d and the capacity of Franklaw WTW would be increased.	30	AMP8
WR102e	Bold Heath boreholes to Prescott WTW	This option comprises the recommissioning of Bold Heath boreholes. Refurbishment would include new headworks, mechanical / electrical, new pumps, new kiosks at both boreholes, and the construction of a new 9km raw water main to Prescott WTW to provide up to 9 MI/d.	9	AMP8
WR113	Tytherington boreholes	This option would involve the replacement of an existing treated water main between Tytherington WTW and treated water storage to permit an additional 3MI/d treated water transfer to existing storage. It would also comprise the replacement of existing borehole pumps at Tytherington and modifications to the WTW. The option would have a capacity of 3 MI/d.	3	AMP8
WR114	Python Mill Borehole	This option comprises the reinstatement and refurbishment of Python Mill borehole and the transfer of raw water to Rochdale Canal, offsetting compensation from the Chelburn system. It would require a new borehole pump, rising main, headworks modifications and M&E equipment in addition to 3km of new transfer pipeline along a road from Python Mill to Rochdale Canal. A new discharge scour into the canal and new sewer connection at Python Mill would also be required. The option would have a capacity of 3 MI/d.	3	AMP8



Ref	Preferred Option	Description	Design Capacity	Implementation (AMP)
WR159	Group 1 - Improved reservoir compensation release control from 76 individual reservoirs	This option would involve the construction of new automated penstock arrangements at 76 reservoirs (Group 1) in order to provide compensation control in line with licence requirements. The proposed development scope would also include a new kiosk at each targeted reservoir. It is estimated that operation of the scheme would result in a cumulative design capacity of up to 13.2 MI/d.	13.2	AMP8
WR160	Group 2 - Improved reservoir compensation release control from Vyrnwy, Rivington, Thirlmere and Haweswater reservoirs	This option would involve the construction of new automated penstock arrangements at 4 reservoirs (Group 2: Lake Vyrnwy, Rivington, Thirlmere and Haweswater) in order to provide compensation control in line with licence requirements. The proposed development scope would also include a new kiosk at each targeted reservoir. It is estimated that operation of the scheme would result in a cumulative design capacity of up to 8.8 MI/d.	8.8	AMP8
WR821	Shropshire Union Canal	This option would involve increased abstraction from the Shropshire Union Canal for treatment to potable standards at Hurleston WTW and transfer to the Mid-Cheshire Main located near Nanney's Bridge. It would require additional abstraction infrastructure, a new/expanded WTW at Hurleston and a 6.9km treated water main.	30	AMP8
B2	Enabling works to support Thames Water Trading Option	In order to maintain supplies to UU's own customers when exporting water to Thames Water, Dee Aqueduct water would be diverted into Norton Water Tower on the Vyrnwy Aqueduct using existing aqueduct connections and would then be pumped up Line 3 of the Vyrnwy Aqueduct for additional treatment at Oswestry WTW which would be modified accordingly. Several existing bulk supply points would be switched to receive the Dee Aqueduct water, although this element of the scheme would not require any additional infrastructure. The option would require four new booster stations. A total of 26 km of pipeline on Line 3 of the Vyrnwy Aqueduct would be replaced, with slip lining along a further 21.5km of this line also required. Hydraulic controls would also be improved along Lines 1 and 2. Detailed design is required to confirm these proposals.	-	AMP8

## Level 1 Screening of Draft WRMP Preferred Plan Options

The Level 1 screening of the preferred options that comprised UU's Draft WRMP Preferred Plan identified 155 WFD water bodies that may be impacted by the eight Preferred Plan resource management options, and the enabling works (Option B2). Some of these water bodies could be impacted by more than one option, resulting in a total number of 202 option-water body combinations. The screening exercise was undertaken for each option and its related water bodies. The results of the screening exercise are summarised in **Table F.2** and presented in full in **Appendix G**.

Table F.2 Summary of Level 1 Screening Exercise for Preferred Plan Options

	No of option–water body combinations	No of water bodies	No of options
<b>Total</b>	202	155	9
<b>High level of impact</b>	0	0	0
<b>Medium level of impact</b>	6	54	8

	No of option– water body combinations	No of water bodies	No of options
Minor level of impact	3	3	2
No or minimal impact	135	101	5

Note that a water body may have varying levels of impact from different options, and an option may have differing levels of impact on different water bodies. This means that some water bodies and options are counted more than once in the values in this table.

## Level 2 Assessment of Draft WRMP Preferred Plan Options

The Level 1 screening identified that none of the Preferred Plan options would have a high level of impact, but eight may have a medium level of impact. The water bodies related to these options that may be subject to a medium level of impact were subject to a Level 2 detailed assessment. This involved further consideration of the activities proposed within those water bodies and further review of baseline data. Following the Level 2 detailed assessment, the level of impact could reduce or increase depending on the judgement of the likely impact.

The results of the Level 2 detailed assessment were combined with the results of the Level 1 assessment to produce a combined assessment result which is summarised in **Table F.3** and **Table F.4**, and presented in full in **Appendix G**. The individual assessment spreadsheets are presented in **Appendix C**. In general terms, the Level 2 assessments resulted in a lowering of the level of impacts, a reflection on the conservative approach adopted in the Level 1 screening.

Table F.3 Summary of Combined Assessment Results for Preferred Plan Options

	No of option– water body combinations	No of water bodies	No of options
Total	202	155	9
High level of impact	0	0	0
Medium level of impact	8	8	2
Minor level of impact	59	50	8
No or minimal impact	135	101	5

Note that a water body may have varying levels of impact from different options, and an option may have differing levels of impact on different water bodies. This means that some water bodies and options are counted more than once in the values in this table.

Table F.4 Summary of Combined Assessment Results by Preferred Plan Option

Option Information		No of water bodies					Overall impact level	Confidence level	Option activities likely to cause a high or medium impact
Ref	Name	Total	High	Medium	Minor	No or Minimal			
WR099b	Worsthorne Borehole (Hurstwood IR)	2	0	0	2	0	Minor level of impact	Medium	n/a

Option Information		No of water bodies					Overall impact level	Confidence level	Option activities likely to cause a high or medium impact
Ref	Name	Total	High	Medium	Minor	No or Minimal			
WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	7	0	6	1	0	Medium level of impact	Low	Increase in abstraction quantities above recent actual rates, within existing licence.
WR102e	Bold Heath Boreholes to Prescott WTW	7	0	0	4	3	Minor level of impact	High	n/a
WR113	Tytherington Boreholes	2	0	0	2	0	Minor level of impact	Low	n/a
WR114	Python Mill Borehole	3	0	2	1	0	Medium level of impact	Low	Reinstatement of groundwater abstraction, new abstraction licence.
WR159	Group 1 - Improved reservoir compensation release control	116	0	0	35	81	Minor level of impact	Medium	n/a
WR160	Group 2 - Improved reservoir compensation release control	12	0	0	4	8	Minor level of impact	Medium	n/a
WR821	Shropshire Union Canal	4	0	0	3	1	Minor level of impact	Low	n/a
B2	Enabling Works	11	0	0	0	11	No or minimal impact	High	n/a

## 9.4 Cumulative Assessment

### Water Body Cumulative Assessment

Where two or more preferred options are located in the same water body, a high level assessment was undertaken to determine the potential cumulative effects on WFD objectives, should all the options be implemented. The same impact classification system was used for the cumulative assessments as for the Level 1 and Level 2 assessments (Table 3.1). The results are summarised in Table F.5 and presented in full in Appendix H.

Eight water bodies were identified as being impacted by two or more Preferred Plan options; however, for all of these the cumulative impact of those options would not exceed the maximum impact of the individual options. This is because:

- ▶ The activities from the options do not interact to produce a significant cumulative effect (e.g. pipe line construction from one option and a reduction in compensation release from a second option); or
- ▶ The individual reductions in flow from individual options are relatively small, so that even when combined, they are unlikely to result in a widespread or prolonged effect.

Table F.5 Summary of Water Body Cumulative Assessment Results

WFD Water Body Information			Option		Assessment Result		
ID	Type	Name	Ref	Option Name	Individual Option	Individual Confidence	Cumulative
GB109054049880	River	Vyrnwy - Lake Vyrnwy to conf Afon Cownwy	WR160	Group 2 - Improved reservoir compensation release control	Minor level of impact	Medium	Minor level of impact
			B2	Enabling Works	No or minimal impact	High	
GB112069061320	River	Bollin (Source to Dean)	WR113	Tytherington Boreholes	Minor level of impact	Low	Minor level of impact
			WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
GB112069064720	River	Roch (Source to Spodden)	WR114	Python Mill Borehole	Medium level of impact	Low	Medium level of impact
			WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	
GB112071065090	River	Brun - headwaters to conf Don	WR099b	Worsthorne Borehole (Hurstwood IR)	Minor level of impact	Medium	Minor level of impact
			WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
GB40202G102300	Groundwater	Eden and Esk Lower Palaeozoic and Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control	No or minimal impact	High	No or minimal impact
			WR160	Group 2 - Improved reservoir compensation release control	No or minimal impact	High	



WFD Water Body Information			Option		Assessment Result		
ID	Type	Name	Ref	Option Name	Individual Option	Individual Confidence	Cumulative
GB40902G205300	Groundwater	Severn Uplands - Lower Palaeozoic	WR160	Group 2 - Improved reservoir compensation release control	No or minimal impact	High	No or minimal impact
			B2	Enabling Works	No or minimal impact	High	
GB41202G100300	Groundwater	Douglas, Darwen and Calder Carboniferous Aquifers	WR099b	Worsthorne Borehole (Hurstwood IR)	Minor level of impact	Medium	Minor level of impact
			WR159	Group 1 - Improved reservoir compensation release control	No or minimal impact	High	
			WR160	Group 2 - Improved reservoir compensation release control	No or minimal impact	High	
GB41202G101800	Groundwater	Northern Manchester Carboniferous Aquifers	WR114	Python Mill Borehole	Medium level of impact	Low	Medium level of impact
			WR159	Group 1 - Improved reservoir compensation release control	No or minimal impact	High	

## Operational Catchment Cumulative Assessment

Where two or more Preferred Plan options, or different elements of a single Preferred Plan option, are located in multiple water bodies within one operational catchment, a high level assessment was undertaken to determine the potential cumulative effects on WFD objectives, should all the options be implemented. The same impact classification system was used for the cumulative assessments as for the Level 1 and Level 2 assessments. The results are summarised in **Table F.6** and presented in full in **Appendix I**.

A total of 17 operational catchments (including river catchments and regional aquifers) were identified as being impacted by two or more preferred options, or different elements of a single preferred option. For all of these, the cumulative impact on a catchment scale would not exceed the maximum impact on an individual water body. This is because:

- ▶ The individual option assessments often assumed a worst case scenario, particularly for Option WR159 where the reduction in compensation flow from a group of reservoirs was assigned to a single water body (due to no detailed information on the reduction in flows from each reservoir within the group). When a number of reservoirs in the same catchment are considered together, the reduction in flow is no greater than that assessed for an individual option;
- ▶ The activities from the options do not interact to produce a significant cumulative effect (e.g. pipe line construction from one option and a reduction in compensation release from a second option);
- ▶ For groundwater bodies affected by multiple reductions in reservoir compensation flows, the relatively small reductions in compensation flows are unlikely to reduce the wetted area of the reservoirs or downstream watercourses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.



Table F.6 Summary of Operational Catchment Cumulative Assessment

Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
<b>Colne Water</b>	GB112071065130	River	Walverden Water	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	Minor level of impact.
	GB112071065210	River	Colne Water (Laneshaw)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	
	GB112071065230	River	Pendle Water - headwaters to Colne Water	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	
<b>Sankey</b>	170*	River	Non reportable water body to north of River Mersey	WR102e	Bold Heath Boreholes to Prescott WTW	Minor level of impact	High	Minor level of impact
	GB112069060990	River	Whittle Brook (Mersey Estuary)	WR102e	Bold Heath Boreholes to Prescott WTW	No or minimal impact	High	
	GB112069061170	River	Sutton Brook	WR102e	Bold Heath Boreholes to Prescott WTW	Minor level of impact	High	
	GB112069061210	River	Hardshaw (Windle) Brook	WR102e	Bold Heath Boreholes to Prescott WTW	No or minimal impact	High	
<b>Aire and Calder Carb Limestone - Millstone Grit Coal - Measures</b>	GB40402G700400	Groundwater	Aire and Calder Carb Limestone / Millstone Grit / Coal Measures.	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	No or minimal impact	High	No or minimal impact
<b>Bollin Dean Mersey Upper</b>	GB112069060650	River	Dean (Lamaload to Bollington)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	Minor level of impact



Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
	GB112069060920	River	Micker (Norbury) Brook	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069061060	River	Platt Brook (Source to Fallowfield Bk)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069061320	River	Bollin (Source to Dean)	WR113	Tytherington Boreholes	Minor level of impact	Low	
	GB112069061320	River	Bollin (Source to Dean)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
<b>Brock and Trib</b>	GB112072065760	River	Woodplumpton Brook	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Medium level of impact	Low	Medium level of impact
	GB112072065790	River	New Draught Brook	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Medium level of impact	Low	
	GB112072065800	River	Barton (Westfield) Brook	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Medium level of impact	Low	
	GB112072065810	River	Brock	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Minor level of impact	Medium	
<b>Calder</b>	GB112071065040	River	Hyndburn	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	Minor level of impact
	GB112071065090	River	Brun- headwaters to conf Don	WR099b	Worsthorne Borehole (Hurstwood IR)	Minor level of impact	Medium	





Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
	GB112071065090	River	Brun - headwaters to conf Don	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	Minor level of impact	Medium	
	GB112071065140	River	Sabden Brook	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
Croal Irwell	GB112069064570	River	Eagley Brook	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	Minor level of impact	Medium	Minor level of impact
	GB112069064580	River	Bradshaw Brook	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069064620	River	Irwell (Rossendale STW to Roch)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069064650	River	Ogden	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069064660	River	Irwell (Source to Whitewell Brook)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069064670	River	Whitewell Brook	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	



Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
	GB112069064680	River	Limy Water	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
<b>Cumbria South Lower Palaeozoic and Carboniferous Aq</b>	GB41202G102100	Groundwater	South Cumbria Lower Palaeozoic and Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	No or minimal impact	High	No or minimal impact
<b>Eamont</b>	GB102076070690	River	Lowther (Upper)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	Minor level of impact
	GB102076070720	River	Haweswater Beck	WR160	Group 2 - Improved reservoir compensation release control	Minor level of impact	High	
<b>Goyt Etherow Tame</b>	GB112069060780	River	Etherow (Woodhead Res. to Glossop Bk.)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	Minor level of impact
	GB112069060850	River	Goyt (Source to Randall Carr Brook)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069060970	River	Sett	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	
	GB112069061111	River	Tame (Chew Brook to Swineshaw Brook)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	



Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
	GB112069061112	River	Tame (Swineshaw Brook to Mersey)	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
	GB112069061300	River	Chew Brook	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	
	GB112069064741	River	Tame (Source to Chew Brook)	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	Minor level of impact	Medium	
<b>Manchester and Cheshire East Carboniferous Aq</b>	GB41202G102900	Groundwater	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	No or minimal impact	High	No or minimal impact
<b>Morda and Severn North Shropshire</b>	GB109054055070	River	Morda - source to conf unnamed trib	B2	Enabling Works	No or minimal impact	High	No or minimal impact
	GB109054050010	River	Oswestry Bk	B2	Enabling Works	No or minimal impact	High	
<b>Ribble Carboniferous Aq</b>	GB41202G103000	Groundwater	Ribble Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	No or minimal impact	High	No or minimal impact
<b>Roch Irk Medlock</b>	GB112069064690	River	Beal	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	High	Medium level of impact



Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
	GB112069064710	River	Naden Brook	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	Minor level of impact	Medium	
	GB112069064720	River	Roch (Source to Spodden)	WR114	Python Mill Borehole	Medium level of impact	Low	
	GB112069064720	River	Roch (Source to Spodden)	WR159	Group 1 - Improved reservoir compensation release control - reductions in compensation flows from multiple reservoirs	Minor level of impact	High	
	GB112069064730	River	Spodden	WR159	Group 1 - Improved reservoir compensation release control	Minor level of impact	Medium	
Tanat	GB109054049920	River	Hirnant - source to conf Afon Tanat	B2	Enabling Works	No or minimal impact	High	No or minimal impact
	GB109054049960	River	Afon Tanat - conf Hirnant to conf Afon Rhaeadr	B2	Enabling Works	No or minimal impact	High	
	GB109054055040	River	Afon Rhaeadr - source to conf Afon Tanat	B2	Enabling Works	No or minimal impact	High	
	GB109054055050	River	Afon Iwrch - source to conf Afon Tanat	B2	Enabling Works	No or minimal impact	High	
	GB109054050050	River	Afon Tanat - conf Afon Rhaeadr to conf Afon Vyrnwy	B2	Enabling Works	No or minimal impact	High	
	GB109054055060	River	Afon Cynllaith - source to conf Afon Tanat	B2	Enabling Works	No or minimal impact	High	



Catchment	WFD Water Body Information			Option		Assessment Result		
Operational Catchment	ID	Type	WB Name	Ref	Option Name	Individual Option Assessment Result	Individual Options Assessment Confidence	Cumulative Assessment Result
Weaver Upper	GB112068055340	River	Rookery Brook, Burland and Brindley Bk. To Weaver	WR821	Shropshire Union Canal	Minor level of impact	Medium	Minor level of impact
	GB112068060460	River	Weaver (Marbury Brook to Dane)	WR821	Shropshire Union Canal	No or minimal impact	High	
Wyre and Calder	GB112072065822	River	Wyre DS Grizedale Brook confl	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Medium level of impact	Low	Medium level of impact
	GB112072066220	River	Calder (Wyre)	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Medium level of impact	Low	

Notes

\* Non-reportable water bodies do not have a WFD water body ID number. 170 is used in lieu of the water body ID number for the purposes of the WFD assessment.

## Protected Area Assessment

An assessment was undertaken for all habitat and species protected areas that are linked to a water body that contained a Draft WRMP Preferred Plan option. The list of protected areas requiring assessment was established by comparing the list of protected areas and the water bodies they are linked to<sup>28</sup>, to the list of water bodies affected by the preferred options (**Appendix G**).

Protected area assessments were undertaken for nine protected areas. The results are presented in **Table F.7**. For four protected areas, no hydrological pathway between the protected area and the options have been identified, so there is no potential for the options to impact on the protected area. The remaining five protected areas may be subject to a no or minimal, or minor level of impact.

Table F.7 Results of the Protected Area Assessment

Protected area	Designation	Preferred options	Summary of protected area assessment	Assessment Results
<b>South Pennine Moors</b>	SAC	WR099b: Worsthorne Borehole (Hurstwood IR)  WR159: Group 1 - Improved reservoir compensation release control: (Hurstwood, Cant Clough, Swinden 1 and 2, Coldwell Upper and Lower, Laneshaw, Warland, and Whiteholme)	Option WR099b and most of the reservoirs affected by Option WR159 are downstream of the upland SAC which is not designated for migratory fish.  Warland and Whiteholme reservoirs are within the SAC and reduction in flows could impact the SAC. The Level 2 detailed assessment of these options is minor (both in water body GB104027062600, Walsden Water from Source to R Calder)	Minor level of impact
<b>Rochdale Canal</b>	SAC	WR114: Python Mill Borehole  WR159: Group 1 - Improved reservoir compensation release control: (Watergrove and Blackstone Edge)	WR114 has been assessed as having a minor level of impact on the Rochdale Canal (water body GB71210517).  The reduction in compensation releases will not add to the impact as the reservoirs and downstream watercourses are not hydraulically connected to the canal.	Minor level of impact
<b>Bowland Fells</b>	SPA	WR101: Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity	Option WR101 is downstream of the SPA which is not designated for migratory fish. No hydrological pathway between the option and the designated features of the SPA.	n/a
<b>Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses</b>	SAC	WR821 Shropshire Union Canal	Option WR821 involves a new abstraction from the canal, located approximately 21 km from the SAC. Option WR821 and the SAC are connected by the groundwater body (GB41202G991700, Weaver and Dane Quaternary Sand and Gravel Aquifer). The Level 2 detailed assessment of Option WR821 is no or minimal level of impact which also applies to the SAC.	No or minimal impact
<b>River Derwent and Bassenthwaite Lake</b>	SAC	WR160: Group 2 - Improved reservoir compensation release control: (Thirlmere)	Thirlmere reservoir is located on St John's Beck which is part of the SAC. The SAC is designated for several types of	Minor level of impact.

<sup>28</sup> Downloaded from the EA's Catchment Data Explorer website October 2017:

<http://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/12>

Protected area	Designation	Preferred options	Summary of protected area assessment	Assessment Results
			migratory fish, which may be affected by reductions in river flows. The Level 2 detailed assessment for St John's Beck (GB112075070430) indicated a minor level of impact, which also applies to the SAC.	
<b>Lake District High Fells</b>	SAC	WR159: Group 1 - Improved reservoir compensation release control: (Wet Sleddale)  WR160: Group 2 - Improved reservoir compensation release control: (Thirlmere)	Both Wet Sleddale and Thirlmere are downstream of the upland SAC which is not designated for migratory fish. No hydrological pathway between the options and the designated features of the SAC.	n/a
<b>River Eden</b>	SAC	WR159: Group 1 - Improved reservoir compensation release control: (Wet Sleddale)  WR160: Group 2 - Improved reservoir compensation release control: (Haweswater)	Wet Sleddale and Haweswater are located on the River Lowther and the Haweswater Beck respectively, both headwaters of the River Eden. The SAC is designated for a range of migratory fish, aquatic mammals and crustaceans which may be affected by reductions in river flows.  The Level 2 detailed assessments of both options indicated a minor level of impact for the Upper Lowther (GB102076070690) and the Haweswater Beck (GB102076070720), which also applies to the SAC.	Minor level of impact.
<b>Asby Complex</b>	SAC	WR159: Group 1 - Improved reservoir compensation release control: (Wet Sleddale)	Wet Sleddale is downstream of the SAC which is not designated for migratory fish. No hydrological pathway between the options and the designated features of the SAC.	n/a
<b>Berwyn and South Clwyd Mountains</b>	SAC and SPA	WR160: Group 2 - Improved reservoir compensation release control: (Vyrnwy)  B2 Enabling Works	Wet Sleddale is downstream of the SAC which is not designated for migratory fish. No hydrological pathway between the options and the designated features of the SAC.	n/a



# Appendix G

## Summary of Level 1 Screening and Level 2 Detailed Assessment Results for Preferred Plan Options at Draft WRMP Stage









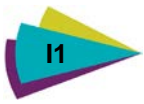


# Appendix H

## Water Body Cumulative Assessment for Preferred Plan Options at Draft WRMP Stage

WFD Water Body Information				Option														Impacts													
ID	Type	Hydro-morphological Designation	WB Name	Ref	Option Name	Pipe line on land	Pipe line with water course crossings	New / modified surface water (e.g. river) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / aqueduct	Transfer of water via river / canal / aqueduct	New / increased surface water abstraction quantity	Cessation of existing discharge to surface water	New abstraction well drilling / refurbishment	New abstraction well headworks / surface structures	New / increased groundwater abstraction quantity	Changed to reservoir compensation release	New reservoir / embankment risk	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result	Cumulative Assessment	Cumulative Screening Results				
GB109054049880	River	Heavily modified	Vrynwy - Lake Vrynwy to conf Afon Cowmwy	WR160	Group 2 - Improved reservoir compensation release control - VYRNWY	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Reduction of compensation flow from Vrynwy reservoir from 48.4 MI/d to 45.0 MI/d, a reduction of 3.4 MI/d. Pipe line construction.	Minor level of impact		
				B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact		N	No or minimal impact
GB112069061320	River	Heavily modified	Bollin (Source to Dean)	WR113	Tytherington Boreholes	Y	N	N	N	Y	N	N	N	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Minor level of impact	Low	Minor level of impact	Increased peak abstraction quantity of 3 MI/d at refurbished Tytherington Boreholes (within current licence quantities), and reduction of compensation flow from Ridgeway and Trentabank reservoirs from 2.1 MI/d to 1.8 MI/d, a reduction of 0.3 MI/d (consented compensation flows maintained).	Minor level of impact				
				WR159	Group 1 - Improved reservoir compensation release control - RIDGEGATE & TRENTABANK	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y		Minor level of impact	Medium	Minor level of impact	The ALS shows that the part of the surface water body which contains the reservoirs and their upstream catchments has no water available at any flows. Downstream of the reservoirs, the water body has water available at all flows.
GB112069064720	River	Heavily modified	Roch (Source to Spodden)	WR114	Python Mill Borehole	Y	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Increased peak abstraction quantity of 3 MI/d at refurbished Python Mill Boreholes, and reduction of compensation flow from Watergrove reservoir from 18.9 MI/d to 18.0 MI/d, plus a reduction of compensation flow from Blackstone Edge Reservoir from 16.8 MI/d to 15.7 MI/d, a combined reduction of 2 MI/d. (Note: Total reduction for the reservoir Aquator groups assumed to take place in this water body.)	Medium level of impact				
				WR159	Group 1 - Improved reservoir compensation release control - SPRING MILL, WATERGROVE & COWM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y		Minor level of impact	High	Minor level of impact	The ALS shows that the surface water body has no water available at any flow. No groundwater management unit is defined for this area.
				WR159	Group 1 - Improved reservoir compensation release control - LIGHT HAZZLES, WHITEHOLME & BLACKSTONE EDGE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y		Minor level of impact	High	Minor level of impact	The cumulative effect of the two options will not increase the level of impact on the water body, as the total potential reduction in water in the water body (5 MI/d) remains moderate. Total flows are unlikely to reduce by 5 MI/d as the full reduction from the Aquator group has been assumed to take place in this water body, and not all of the groundwater abstraction is likely to be translated to a reduction in surface water flows.
GB112071065090	River	Heavily modified	Brun - headwaters to conf Don	WR099b	Worsthorne Borehole (Hurstwood IR)	Y	N	N	N	N	N	Y	N	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Increased peak abstraction quantity of 4 MI/d at refurbished Worsthorne Boreholes (within current licence quantities), and reduction of compensation flow from Hurstwood, Cant Clough, and Swinden reservoirs from 9.1 MI/d to 8.1 MI/d, a reduction of 1.0 MI/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this water body.)	Minor level of impact				
				WR159	Group 1 - Improved reservoir compensation release control - HURSTWOOD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y		Minor level of impact	Medium	Minor level of impact	The ALS shows that part of the surface water body that contains the Swinden reservoirs and their upstream catchment has no water available at any flows. The part of the surface water body that contains the Hurstwood and Cant Clough reservoirs and their upstream catchments has water available at low flows (Q95 and Q70), but no water available at higher flows (Q50 and Q30). The remaining part of the catchment, downstream of the reservoirs and where the abstraction is located has water available at low flows (Q95), limited water available at medium flows (Q70), and no water available at higher flows (Q50 and Q30). It is likely that compensation flows from the reservoirs are supporting the low flow water availability.
				WR159	Group 1 - Improved reservoir compensation release control - CANT CLOUGH	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y		Minor level of impact	Medium	Minor level of impact	The cumulative effect of the two options will not increase the level of impact on the water body, due to the availability of water at low flows, that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, the small reduction in compensation flows, and that the increase in peak abstraction is within current licensed quantities.
				WR159	Group 1 - Improved reservoir compensation release control - SWINDEN 1 & 2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y		Minor level of impact	Medium	Minor level of impact	
GB40202G102300	Groundwater	No designation	Eden and Esk Lower Palaeozoic and Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - WET SLEDDALE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N	No or minimal impact	Reduction of compensation flow from Wet Sleddale and Haweswater reservoirs from 7.8 MI/d to 7.4 MI/d and 24.0 MI/d to 21.8 MI/d respectively, a total reduction of 2.6 MI/d.	No or minimal impact				
				WR160	Group 2 - Improved reservoir compensation release control - HAWESWATER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	The cumulative effect of the two options will not increase the level of impact on the groundwater body. The small reductions in compensation flows are unlikely to reduce the wetted area of the reservoirs or downstream water courses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.		
GB40902G205300	Groundwater	No designation	Severn Uplands - Lower Palaeozoic	WR160	Group 2 - Improved reservoir compensation release control - VYRNWY	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N	No or minimal impact	Reduction of compensation flow from Vrynwy reservoir from 48.4 MI/d to 45.0 MI/d, a reduction of 3.4 MI/d. Pipe line construction.	No or minimal impact				
				B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	No or minimal impact	N	No or minimal impact
GB41202G100300	Groundwater	No designation	Douglas, Darwen and Calder Carboniferous Aquifers	WR099b	Worsthorne Borehole (Hurstwood IR)	Y	N	N	N	N	N	Y	N	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Increased peak abstraction quantity of 4 MI/d at refurbished Worsthorne Boreholes (within current licence quantities), and reduction of compensation flow from:	Minor level of impact				
				WR159	Group 1 - Improved reservoir compensation release control - MITCHELLS HOUSE 1 & 2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	- Mitchells House 1 & 2 from 0.4 MI/d to 0.3 MI/d,		
				WR159	Group 1 - Improved reservoir compensation release control - FISHMOOR TOTAL	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	- Fishmoor from 2.0 MI/d to 1.7 MI/d,		
				WR159	Group 1 - Improved reservoir compensation release control - HURSTWOOD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	- Hurstwood, Cant Clough, Swinden 1 & 2, Laneshaw, Coldwell (upper & lower), Ogden (upper & lower) from 9.1 MI/d to 8.1 MI/d, and		
				WR159	Group 1 - Improved reservoir compensation release control - CANT CLOUGH	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	- Rivington 26.6 MI/d to 24.7 MI/d.		
				WR159	Group 1 - Improved reservoir compensation release control - SWINDEN 1 & 2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	This is a total compensation flow reduction of 3.3 MI/d. Note: Total reduction for the reservoir Aquator group assumed to take place in this groundwater body.		
				WR159	Group 1 - Improved reservoir compensation release control - LANESHAW	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	The cumulative effect of the three options will not increase the level of impact on the groundwater body beyond the minor level of impact assigned to WR099b. The relatively small reductions in compensation flows from options WR159 and WR160 (which are spread across a number of surface water bodies overlying the groundwater body) are unlikely to reduce the wetted area of the reservoirs or downstream water courses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.		
				WR159	Group 1 - Improved reservoir compensation release control - COLDWELL UPPER & LOWER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact			
				WR159	Group 1 - Improved reservoir compensation release control - OGDEN UPPER & LOWER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact			
				WR160	Group 2 - Improved reservoir compensation release control - RIVINGTON	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact			
WR114	River	Heavily modified	Roch (Source to Spodden)	WR114	Python Mill Borehole	Y	N	N	N	N	N	Y	Y	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Increased peak abstraction quantity of 3 MI/d at refurbished Python Mill Boreholes, and reduction of compensation flow from Blackstone Edge Reservoir from 16.8 MI/d to 15.7 MI/d, a combined reduction of 2 MI/d. (Note: Total reduction for the reservoir Aquator groups assumed to take place in this water body.)	Medium level of impact				
				WR159	Group 1 - Improved reservoir compensation release control - WAYOH, ENTWISTLE & JUMBLES	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact			
				WR159	Group 1 - Improved reservoir compensation release control - DELPH	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact			

WFD Water Body Information				Option														Impacts					Cumulative Assessment	Cumulative Screening Results						
ID	Type	Hydro-morphological Designation	WB Name	Ref	Option Name	Pipe line on land	Pipe line with water course crossings	New / modified surface water (e.g. river) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / aqueduct	Transfer of water via river / canal / aqueduct	New / increase surface water abstraction quantity	Cessation of existing discharge to surface water	New abstraction well drilling / refurbishment	New abstraction well headworks / surface structures	New / increased groundwater abstraction quantity	Changed to reservoir compensation release	New reservoir / embankment raising	Level 1 Screening Results	Level 2 Screening Required?			Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result			
G841202G101800	Groundwater	No designation	Northern Manchester Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - SPRINGS DINGLE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact	<p>Increased peak abstraction quantity of 3 Ml/d at refurbished Python Mill Boreholes, and reduction of compensation flow from:</p> <ul style="list-style-type: none"> <li>- Wayoh, Entwistle, Jumbles, Delph, Springs Dingle (Bolton IR's) from 24.3 Ml/d to 23.6 Ml/d,</li> <li>- Ashworth Moor, Greenbooth, 2 Nadens, Spring Mill, Watergrove, Cowm (Rochdale) from 18.9 Ml/d to 18.0 Ml/d,</li> <li>- Piethorne, Norman Hill, Kitcliffe, Ogden Milnrow, Hanging Lees, Rooden, Light Hazles, Whiteholme, Blackstone Edge (Oldham) from 16.8 Ml/d to 15.7 Ml/d, and</li> <li>- Call Hey, Ogden (Grane), Holdenwood, Cowpe, Cragg Holes, Scout Moor, Clough Bottom and Clowbridge (Rossendale) from 11.3 Ml/d to 9.8 Ml/d.</li> </ul> <p>This is a total reduction in compensation flows of 4.2 Ml/d. (Note: Total reduction for each reservoir Aquator group assumed to take place in within this groundwater body).</p> <p>The cumulative effect of the two options will not increase the level of impact on the groundwater body beyond the medium level of impact assigned to WR114. The relatively small reductions in compensation flows from option WR159 which are spread across a number of surface water bodies overlying the groundwater body) are unlikely to reduce the wetted area of the reservoirs or downstream water courses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.</p>	Medium level of impact		
				WR159	Group 1 - Improved reservoir compensation release control - ASHWORTH MOOR	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - GREENBOOTH & 2 NADENS	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - SPRING MILL, WATERGROVE & COWM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - PIETHORNE, NORMAN HILL, KITCLIFFE, OGDEN MILNROW, HANGING LEES & ROODEN	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - LIGHT HAZZLES, WHITEHOLME & BLACKSTONE EDGE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - CALF HEY, OGDEN (GRANE) & HOLDENWOOD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - COWPE & CRAGG HOLES	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - SCOUT MOOR	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
				WR159	Group 1 - Improved reservoir compensation release control - CLOUGH BOTTOM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N				No or minimal impact
WR159	Group 1 - Improved reservoir compensation release control - CLOWBRIDGE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	No or minimal impact	N		No or minimal impact						



# Appendix I

## Operational Catchment Cumulative Assessment for Preferred Plan Options at Draft WRMP Stage

Catchment	WFD Water Body Information				Option	Option Detail														Impacts													
	ID	Type	Hydro - morphological Designation	WB Name		Ref	Option Name	Pipe line on land	Pipe line with water course crossings	New / modified surface water (e.g. river) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / aqueduct	Transfer of water via river / canal / aqueduct	New / increased surface water abstraction quantity	Cessation of existing discharge to surface water	New abstraction well drilling / refurbishment	New abstraction well headworks / surface structures	New / increased groundwater abstraction quantity	Changed to reservoir compensation release	New reservoir / embankment raising	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result	Cumulative Assessment	Cumulative Screening Results				
Operational Catchment	GB112071065130	River	Heavily modified	Walverden Water	WR159	Group 1 - Improved reservoir compensation release control - COLDWELL UPPER & LOWER																Y				Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Reduction of compensation flow from Coldwell Upper and Lower, Laneshaw, and Ogden Upper and Lower reservoirs from 9.1 M/d to 8.1 M/d, a reduction of 1.0 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this catchment.)	Minor level of impact	
	GB112071065210	River	Heavily modified	Colne Water (Laneshaw)	WR159	Group 1 - Improved reservoir compensation release control - LANESHAW																Y				Medium level of impact	Y	Minor level of impact	High	Minor level of impact			The cumulative effect of the reduction of compensation flows from multiple reservoirs located in three water bodies in this operational catchment will not increase the level of impact in the operational catchment as a whole. This is because the individual water body assessments assumed a worst case compensation flow reduction for each water body. As the reservoirs are all in the same Aquator group the worst case reduction applies to the operational catchment as a whole.
	GB112071065230	River	No designation	Pendle Water - headwaters to Colne Water	WR159	Group 1 - Improved reservoir compensation release control - OGDEN UPPER & LOWER																	Y				Medium level of impact	Y	Minor level of impact	High			Minor level of impact
Sankey	170	River	No designation	Non reportable water body to north of River Mersey	WR102e	Bold Heath Boreholes to Prescott WTW	Y	Y														Y	Y	Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	New groundwater abstraction of 6.5 to 9 M/d peak capacity from the Bold Heath boreholes, plus pipe line construction activities. The cumulative effect of the activities within the four water bodies within this operational catchment will not increase the level of impact on the operational catchment as a whole. This is because an increase in abstraction quantity only occurs in one water body, and pipe line construction in several water bodies will not have a prolonged or widespread impact.	Minor level of impact	
	GB112069060990	River	Heavily modified	Whittle Brook (Mersey Estuary)	WR102e	Bold Heath Boreholes to Prescott WTW	Y																			No or minimal impact	N			No or minimal impact			
	GB112069061170	River	Heavily modified	Sutton Brook	WR102e	Bold Heath Boreholes to Prescott WTW	Y	Y																		Minor level of impact	N			Minor level of impact			
	GB112069061210	River	Heavily modified	Hardshaw (Windle) Brook	WR102e	Bold Heath Boreholes to Prescott WTW	Y																			No or minimal impact	N			No or minimal impact			
Aire and Calder Carb Limestone - Millstone Grit Coal - Measures	GB40402700400	Groundwater	No designation	Aire & Calder Carb Limestone / Millstone Grit / Coal Measures.	WR159	Group 1 - Improved reservoir compensation release control - WARLAND																			Y		No or minimal impact	N			No or minimal impact	Reduction of compensation flow from Warland, White Holme, Blackstone Edge and Light Hazles reservoirs from 16.8 M/d to 15.7 M/d, a reduction of 1.1 M/d. (Note: Total reduction for the reservoir Aquator group assumed to take place in this operational catchment.) The cumulative effect of the two options will not increase the level of impact on the groundwater operational catchment. The small reductions in compensation flows are unlikely to reduce the wetted area of the reservoirs or downstream water courses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.	No or minimal impact
	GB40402700400	Groundwater	No designation	Aire & Calder Carb Limestone / Millstone Grit / Coal Measures.	WR159	Group 1 - Improved reservoir compensation release control - LIGHT HAZZLES, WHITEHOLME & BLACKSTONE EDGE																			Y		No or minimal impact	N			No or minimal impact		
Bollin Dean Mersey Upper	GB112069060650	River	Heavily modified	Dean (Lamaload to Bollington)	WR159	Group 1 - Improved reservoir compensation release control - LAMALOAD																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Increased peak abstraction quantity of 3 M/d at refurbished Tytherington Boreholes (no overall increase in licence quantity), plus reduction of compensation flow from: -Ridggate, Trentabank, and Lamaload reservoirs from 2.1 M/d to 1.8 M/d, -Bollinhurst and Horse Coppice reservoirs from 16.9 M/d to 15.5 M/d, and -Audenshaw 1, 2 and 3 reservoirs from 48.6 M/d to 45.4 M/d. This would be a total reduction in compensation flow of 4.9 M/d. Note: Total reduction for each reservoir Aquator group assumed to take place in this operational catchment. The cumulative effect of the reduction of compensation flows from multiple reservoirs located in multiple water bodies in this operational catchment, plus the potential reduction in baseflow due to increased groundwater abstraction at Tytherington is not anticipated to increase the level of impact on the operational catchment as a whole. This is because no issues are identified with fish passage, downstream flows, downstream habitats/morphology or downstream water quality in these water bodies as a result of LU's and the EA's investigations into heavily modified water bodies (HMWB). Also the assessments for WR159 is precautionary (total reduction for each reservoir Aquator group assumed to take place in this operational catchment).	Minor level of impact
	GB112069060920	River	Heavily modified	Micker (Norbury) Brook	WR159	Group 1 - Improved reservoir compensation release control - BOLLINHURST & HORSE COPPICE																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069061060	River	Heavily modified	Platt Brook (Source to Fallowfield BA)	WR159	Group 1 - Improved reservoir compensation release control - LONDENDALE (WOODHEAD, TORSIDE, RHODESWOOD, VALEHOUSE, BOTTOMS & ARNFIELD) & AUDENSHAW 1, 2 & 3																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069061320	River	Heavily modified	Bollin (Source to Dean)	WR113	Tytherington Boreholes	Y											Y	Y	Y						Medium level of impact	Y	Minor level of impact	Low	Minor level of impact			
	GB112069061320	River	Heavily modified	Bollin (Source to Dean)	WR159	Group 1 - Improved reservoir compensation release control - RIDGEGATE & TRENTABANK																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
Brock and Trib	GB112072065760	River	No designation	Woodplumpton Brook	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity																			Y	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Increased abstraction of 30 M/d (from approximately 98 M/d recent use, to approx. 128 M/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 M/d). The cumulative effect of the increased abstraction in several water bodies will not increase the level of impact in the operational catchment as a whole. This is because due to a lack of information about at which borehole sites the increase in abstraction would occur, a worst case abstraction increase was assumed for each individual water body.	Medium level of impact
	GB112072065790	River	No designation	New Draught Brook	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity																			Y	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact		
	GB112072065800	River	No designation	Barton (Westfield) Brook	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity																			Y	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact		
	GB112072065810	River	No designation	Brock	WR101	Franklaw Z Site plus Increased Franklaw WTW Treatment Capacity					Y														Y	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
Calder	GB112071065040	River	Heavily modified	Hyndburn	WR159	Group 1 - Improved reservoir compensation release control - MITCHELLS HOUSE 1 & 2																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Increased peak abstraction quantity of 4 M/d at refurbished Worsthorne Boreholes (within current licence quantities), and reduction of compensation flow from: -Mitchells House reservoirs from 0.4 M/d to 0.3 M/d, and -Hurstwood, Cant Clough, Swinden 1 & 2 and Churn Clough reservoirs from 9.1 M/d to 8.1 M/d. This would be a total reduction in compensation flow of 1.2 M/d. Note: Total reduction for each reservoir Aquator group assumed to take place in this operational catchment. The cumulative effect of the two options in the three water bodies in this operational catchment will not increase the level of impact on the operational catchment as a whole. This is due to the availability of water at low flows, that there are unlikely to be strong dependencies between the secondary aquifer and the surface watercourses, the relatively small reduction in compensation flows, and that the increase in peak abstraction is within current licensed quantities.	Minor level of impact
	GB112071065090	River	Heavily modified	Brun - headwaters to conf Don	WR099b	Worsthorne Borehole (Hurstwood IR)	Y																		Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112071065090	River	Heavily modified	Brun - headwaters to conf Don	WR159	Group 1 - Improved reservoir compensation release control - HURSTWOOD																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112071065090	River	Heavily modified	Brun - headwaters to conf Don	WR159	Group 1 - Improved reservoir compensation release control - CANT CLOUGH																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112071065090	River	Heavily modified	Brun - headwaters to conf Don	WR159	Group 1 - Improved reservoir compensation release control - SWINDEN 1 & 2																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112071065140	River	No designation	Sabden Brook	WR159	Group 1 - Improved reservoir compensation release control - CHURN CLOUGH																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
Croal Inwell	GB112069064570	River	Heavily modified	Eagley Brook	WR159	Group 1 - Improved reservoir compensation release control - DELPH																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	Reduction of compensation flow from the following reservoirs: -Delph, Springs Dingle, Wayoh, Entwistle and Jumbles reservoirs from 24.3 M/d to 23.6 M/d, and -Scout Moor, Calf Hey, Ogden (Grane), Holdenwood, Cowpe, Cragg Holes, Clough Bottom and Clowbridge from 11.3 M/d to 9.8 M/d. This is a total reduction of 2.2 M/d. The cumulative effect of the reduction of compensation flows from multiple reservoirs located in seven water bodies in this catchment will not increase the level of impact in the operational catchment as a whole. This is because the reservoirs form part of two Aquator Groups only, and a worst case flow reduction was assumed for each water body. The total reduction in compensation flow is relatively small, and the ALS indicates that there is some water availability in most of the catchment.	Minor level of impact
	GB112069064570	River	Heavily modified	Eagley Brook	WR159	Group 1 - Improved reservoir compensation release control - SPRINGS DINGLE																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069064580	River	Heavily modified	Bradshaw Brook	WR159	Group 1 - Improved reservoir compensation release control - WAYOH, ENTWISTLE & JUMBLES																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069064620	River	Heavily modified	Inwell (Rossendale STW to Roch)	WR159	Group 1 - Improved reservoir compensation release control - SCOUT MOOR																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069064650	River	Heavily modified	Ogden	WR159	Group 1 - Improved reservoir compensation release control - CALF HEY, OGDEN (GRANE) & HOLDENWOOD																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069064660	River	Heavily modified	Inwell (Source to Whitwell Brook)	WR159	Group 1 - Improved reservoir compensation release control - COWPE & CRAGG HOLES																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069064670	River	Heavily modified	Whitwell Brook	WR159	Group 1 - Improved reservoir compensation release control - CLOUGH BOTTOM																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
	GB112069064680	River	Heavily modified	Limy Water	WR159	Group 1 - Improved reservoir compensation release control - CLOWBRIDGE																			Y		Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		



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	ID	Type	Hydro - morphological Designation	WB Name		Ref	Option Name	Pipe line on land	Pipe line with water course crossings	New / modified surface water (e.g. river) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / aqueduct	Transfer of water via river / canal / aqueduct	New / increased surface water abstraction quantity	Cessation of existing discharge to surface water	New abstraction well / drilling / refurbishment	New abstraction well headworks / surface structures	New / increased groundwater abstraction quantity	Changed to reservoir compensation release	New reservoir / embankment raising	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result	Cumulative Assessment	Cumulative Screening Results					
Operational Catchment																																		
Cumbria South Lower Palaeozoic and Carboniferous Aq	GB412026102100	Groundwater	No designation	South Cumbria Lower Palaeozoic and Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - POAKA BECK, PENNINGTON & HARLOCK	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact	N	No or minimal impact	Reduction of compensation flow from Poaka Beck, Pennington, Harlock and Levers Water reservoirs from 2.9 Ml/d to 2.6 Ml/d, a reduction of 0.3 Ml/d.	No or minimal impact					
	GB412026102100	Groundwater	No designation	South Cumbria Lower Palaeozoic and Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - LEVERS WATER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact	N	No or minimal impact	The cumulative effect of the reduction in compensation flows will not increase the level of impact on the groundwater operational catchment. The small reductions in compensation flows are unlikely to reduce the wetted area of the reservoirs or downstream water courses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.	No or minimal impact			
Eamont	GB102076070690	River	Heavily modified	Lowther (Upper)	WR159	Group 1 - Improved reservoir compensation release control - WET SLEDDALE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact	Reduction of compensation flow from Wet Sleddale and Haweswater reservoirs from 7.8 Ml/d to 7.4 Ml/d, and 24.0 Ml/d to 21.8 Ml/d respectively, a total reduction of 2.6 Ml/d.	Minor level of impact		
	GB102076070720	River	Heavily modified	Haweswater Beck	WR160	Group 2 - Improved reservoir compensation release control - HAWESWATER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact	The cumulative effect of the reduction of compensation flows from two reservoirs located in two water bodies in this operational catchment will not increase the level of impact on the operational catchment as a whole. This is because of the relatively small decrease in compensation flows compared to the total compensation flow which will be maintained (29.2 Ml/d), and that tM&B investigations undertaken by UU and the EA have not identified any issues with compensation releases from either reservoir.	Minor level of impact	
Goyt Etherow Tame	GB112069060780	River	Heavily modified	Etherow (Woodhead Res. to Glossop Bk.)	WR159	Group 1 - Improved reservoir compensation release control - LONDENDALE (WOODHEAD, TORSIDE, RHODESWOOD, VALEHOUSE, BOTTOMS & ARNFIELD) & AUDENSHAW 1, 2 & 3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact				
	GB112069060850	River	Heavily modified	Goyt (Source to Randall Carr Brook)	WR159	Group 1 - Improved reservoir compensation release control - ERREOOD & FERNILEE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact			
	GB112069060970	River	No designation	Sett	WR159	Group 1 - Improved reservoir compensation release control - Kinder	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact	Reduction of compensation flow from the following reservoirs: -Woodhead, Torside, Rhodeswood, Valehouse, Bottoms & Arnfield and Audenshaw 1, 2 & 3 reservoirs from 48.6 Ml/d to 45.4 Ml/d, a reduction of 3.2 Ml/d.		
	GB112069061111	River	Heavily modified	Tame (Chew Brook to Swineshaw Brook)	WR159	Group 1 - Improved reservoir compensation release control - BRUSHES, WALKERWOOD & SWINESHAW HIGHER & LOWER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	- Erwood, Fernilee, and Kinder from 16.9 Ml/d to 15.5 Ml/d, a reduction of 1.4 Ml/d. -Brushes, Walkerwood, Swineshaw (higher & lower), Greenfield Valley- Greenfield, Yeoman Hey, Dovestone and Chew from 20.7 Ml/d to 19.5 Ml/d, a reduction of 1.2 Ml/d. - Castleshaw (upper & lower), Readycon Dean, Crookgate, Dowry and New Years Bridge from 16.8 Ml/d to 15.7 Ml/d, a reduction of 1.1 Ml/d. A total reduction of 1.1 Ml/d.		
	GB112069061112	River	Heavily modified	Tame (Swineshaw Brook to Mersey)	WR159	Group 1 - Improved reservoir compensation release control - LONDENDALE (WOODHEAD, TORSIDE, RHODESWOOD, VALEHOUSE, BOTTOMS & ARNFIELD) & AUDENSHAW 1, 2 & 3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	This would be a total reduction in compensation flow of 6.9 Ml/d. Note: Total reduction for each reservoir Aquator group assumed to take place in this operational catchment.		
	GB112069061300	River	Heavily modified	Chew Brook	WR159	Group 1 - Improved reservoir compensation release control - GREENFIELD VALLEY-GREENFIELD, YEDMAN HEY, DOVESTONE & CHEW	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact	The cumulative effect of the reduction of compensation flows from multiple reservoirs located in seven water bodies in this operational catchment will not increase the level of impact on the operational catchment as a whole. This is because of the relatively small decrease in compensation flows compared to the total compensation flow which will be maintained (96.1 Ml/d), and that there is some water availability in parts of the operational catchment.		
	GB112069064741	River	Heavily modified	Tame (Source to Chew Brook)	WR159	Group 1 - Improved reservoir compensation release control - CASTLESHAW UPPER & LOWER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact			
	GB112069064741	River	Heavily modified	Tame (Source to Chew Brook)	WR159	Group 1 - Improved reservoir compensation release control - READYCON DEAN, CROOKGATE, DOWRY & NEW YEARS BRIDGE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact			
Manchester and Cheshire East Carboniferous Aq	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - RIDGEGATE & TRENTABANK	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - LAMALOAD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - CASTLESHAW UPPER & LOWER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - READYCON DEAN, CROOKGATE, DOWRY & NEW YEARS BRIDGE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - GREENFIELD VALLEY-GREENFIELD, YEDMAN HEY, DOVESTONE & CHEW	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - BRUSHES, WALKERWOOD & SWINESHAW HIGHER & LOWER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - Kinder	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - ERREOOD & FERNILEE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
	GB412026102900	Groundwater	No designation	Manchester and East Cheshire Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - BOLLINHURST & HORSE COPPICE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact					
Morda and Severn North Shropshire	GB109054055070	River	No designation	Morda - source to conf unnamed trib	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact	N	No or minimal impact				
	GB109054050010	River	No designation	Oswestry Bk	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact	N	No or minimal impact	The cumulative effect of the construction of pipe lines and treatment works in two water bodies within this operational catchment will not have a significant effect on the operational catchment.	No or minimal impact	
	Ribble Carboniferous Aq	GB412026103000	Groundwater	No designation	Ribble Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - CHURN CLOUGH	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact	Reduction of compensation flow from Churn Clough reservoir from 9.1 Ml/d to 8.1 Ml/d, and Stocks reservoir from 19.2 Ml/d to 18.1 Ml/d. A total reduction of 2.1 Ml/d. Note: Total reduction for each reservoir Aquator group assumed to take place in this operational catchment.	No or minimal impact		
		GB412026103000	Groundwater	No designation	Ribble Carboniferous Aquifers	WR159	Group 1 - Improved reservoir compensation release control - STOCKS	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	No or minimal impact	N	No or minimal impact	The cumulative effect of the reduction in compensation flows will not increase the level of impact on the groundwater operational catchment. The small reductions in compensation flows are unlikely to reduce the wetted area of the reservoirs or downstream water courses (assuming that low flow compensation released are maintained), therefore any impact on groundwater surface water interaction on this secondary aquifer would be minimal.	No or minimal impact		
	Roch Irk Medlock	GB112069064690	River	Heavily modified	Beal	WR159	Group 1 - Improved reservoir compensation release control - PIETHORNE, NORMAN HILL, KITCLIFFE, OGDEN MILNROW, HANGING LEES & HODDEN	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact	New abstraction of up to 3 Ml/d from refurbished borehole at Python Mill, plus reduction of compensation flow from reservoirs at: -Piethorne, Norman Hill, Kitcliffe, Ogdon Milnrow, Hanging Lees, Rooden, Light Hazzles, Whiteholme and Blackstone Edge from 16.8 Ml/d to 15.7 Ml/d, and -Ashworth Moor, Greenbooth, 2 Naddens, Spring Mill, Watergrove and Cowm from 18.9 Ml/d to 18.0 Ml/d, a reduction of 0.9 Ml/d.	
		GB112069064710	River	Heavily modified	Naden Brook	WR159	Group 1 - Improved reservoir compensation release control - ASHWORTH MOOR	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact		
		GB112069064720	River	Heavily modified	Roch (Source to Spodden)	WR114	Python Mill Borehole	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	This is a total compensation flow reduction of 2 Ml/d. Note: Total reduction for each reservoir Aquator group assumed to take place in this operational catchment.	
		GB112069064720	River	Heavily modified	Roch (Source to Spodden)	WR159	Group 1 - Improved reservoir compensation release control - SPRING MILL, WATERGROVE & COWM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact		
		GB112069064720	River	Heavily modified	Roch (Source to Spodden)	WR159	Group 1 - Improved reservoir compensation release control - LIGHT HAZZLES, WHITEHOLME & BLACKSTONE EDGE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Medium level of impact	Y	Minor level of impact	High	Minor level of impact	The cumulative impact of the new groundwater abstraction and multiple reductions in compensation flows from reservoirs within the operational catchment will not increase the impact on the operational catchment as a whole. This is because of the relatively small reduction in compensation flows, especially when compared to the total maintained compensation flow of 33.7 Ml/d and that the ALS indicates there is some water availability within the catchment.	

Operational Catchment	WFD Water Body Information				Option		Option Detail															Impacts													
	ID	Type	Hydro - morphological Designation	WB Name	Ref	Option Name	Pipe line on land	Pipe line with water course crossings	New / modified surface water (e.g. river) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / aqueduct	Transfer of water via river / canal / aqueduct	New / increased surface water abstraction quantity	Cessation of existing discharge to surface water	New abstraction well drilling / refurbishment	New abstraction well headworks / surface structures	New / increased groundwater abstraction quantity	Changed to reservoir compensation release	New reservoir / embankment raising	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result	Cumulative Assessment	Cumulative Screening Results							
Tanat	GB112069064730	River	Heavily modified	Spodden	WR159	Group 1 - Improved reservoir compensation release control - SPING MILL, WATERGROVE & COWM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	The cumulative effect of the construction of pipe lines in six water bodies within this operational catchment will not have a significant effect on the operational catchment.	No or minimal impact					
	GB109054049930	River	No designation	Hernant - source to conf Afon Tanat	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact			N	No or minimal impact			
	GB109054049960	River	No designation	Afon Tanat - conf Hmamt to conf Afon Rhaeadr	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			No or minimal impact	N	No or minimal impact		
	GB109054055040	River	No designation	Afon Rhaeadr - source to conf Afon Tanat	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			N	No or minimal impact	N	No or minimal impact	
	GB109054055050	River	No designation	Afon hwrch - source to conf Afon Tanat	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			N	No or minimal impact	N	No or minimal impact	
	GB109054055000	River	No designation	Afon Tanat - conf Afon Rhaeadr to conf Afon Vymwy	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			N	No or minimal impact	N	No or minimal impact	
Weaver Upper	GB109054055060	River	No designation	Afon Cynlith - source to conf Afon Tanat	B2	Enabling Works	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact	N	No or minimal impact				
	GB112068055340	River	No designation	Rookery Brook, Burland and Brindley Bk. To Weaver	WR821	Shropshire Union Canal	Y	Y	Y	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Minor level of impact	Medium	Minor level of impact	New surface water abstraction of up to 30 Ml/d from the Shropshire Union Canal, plus construction of pipe lines, intake, and treatment works. The cumulative effect of the activities in two water bodies within this operational catchment will not increase the level of impact on the operational catchment as a whole, as the activities in each waterbody (new surface water abstraction and pipe line construction) will not interact to produce a cumulative effect.	Minor level of impact	
GB112068060460	River	No designation	Weaver (Marbury Brook to Dane)	WR821	Shropshire Union Canal	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	No or minimal impact	N	No or minimal impact					
Wyre and Calder	GB112072065822	River	No designation	Wyre DS Grizedale Brook conf	WR101	Franklaw Z Site plus increased Franklaw WTW Treatment Capacity	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Increased abstraction of 30 Ml/d (from approximately 98 Ml/d recent use, to approx. 128 Ml/d), split across several Franklaw and Broughton borehole sites. The increased abstraction quantity is within the current licence quantity for the borehole group (maximum aggregated daily peak of 190 Ml/d). The cumulative effect of the increased abstraction in several water bodies will not increase the level of impact in the operational catchment as a whole. This is because due to a lack of information about at which borehole sites the increase in abstraction would occur, a worst case abstraction increase was assumed for each individual water body.	Medium level of impact
	GB112072066220	River	Heavily modified	Calder (Wyre)	WR101	Franklaw Z Site plus increased Franklaw WTW Treatment Capacity	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact		



# Appendix J Summary of Level 1 Screening and Level 2 Detailed Assessment Results for Preferred Plan Options

Option			WFD Water Body Information											Option Detail							Impacts							
Ref	Solutions	Option Description	ID	Type	Hydro - morphological Designation	Name	Operational Catchment	Ecological Status	Ecological Objective	Quantitative Status	Quantitative Objective	Chemical Status	Chemical Objective	Overall Status	Overall Objective	Pipe line and associated infrastructure on land	Pipe line with water source crossing	New tunnel/underground works (inc. shafts)	New / modified surface water (e.g. river) intake	New pumping station	New / modified water treatment works	New / increased abstraction	New / increased abstraction quantity	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Confidence	Combined Screening Result
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064641	River	heavily modified	Irwell (Cowpe Bk to Rossendale STW)	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064620	River	heavily modified	Irwell (Rossendale STW to Roch)	Croal Irwell	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064600	River	heavily modified	Roch (Spodden to Irwell)	Roch Irk Medlock	Moderate	Moderate by 2015	n/a	n/a	Good	Good by 2015	Moderate	Moderate by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G101800	GroundWaterBody	not applicable	Northern Manchester Carboniferous Aquifers	Manchester Northern Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065490	River	heavily modified	Calder - Pendle Water to conf Ribble	Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065040	River	heavily modified	Hindburn	Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112069064650	River	heavily modified	Ogden	Croal Irwell	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G100300	GroundWaterBody	not applicable	Douglas, Darwen and Calder Carboniferous Aquifers	Douglas Darwen and Calder Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065520	River	not designated artificial or l	Bashall Brook	Ribble Middle - Settle to Calder	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112072066050	River	not designated artificial or l	Hindburn	Wenning	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065420	River	not designated artificial or l	Whitendale river	Hodder and Loud	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112071065560	River	not designated artificial or l	Hodder - conf Easington Bk to conf Ribble	Hodder and Loud	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G103000	GroundWaterBody	not applicable	Ribble Carboniferous Aquifers	Ribble Carboniferous Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071090	River	heavily modified	Peasey Beck	Bela	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112072071690	River	not designated artificial or l	Lune - conf Rawthey to conf Greta	Lune - Rawthey to Greta	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071080	River	not designated artificial or l	Lupton (Farleton) Beck	Bela	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G102100	GroundWaterBody	not applicable	South Cumbria Lower Palaeozoic and Carboniferous Aquifers	Cumbria South Lower Palaeozoic and Carboniferous Aq	n/a	n/a	Good	Good by 2015	Poor	Good by 2027	Poor	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB41202G102700	GroundWaterBody	not applicable	Lune and Wyre Carboniferous Aquifers	Lune and Wyre Carboniferous Aq	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071370	River	not designated artificial or l	Mint	Kent	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071340	River	not designated artificial or l	Flooder Beck	Kent	Good	Good by 2015	n/a	n/a	Good	Good by 2015	Good	Good by 2015	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
37-42	D, E	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	GB112073071100	River	not designated artificial or l	Stainton Beck	Bela	Moderate	Good by 2027	n/a	n/a	Good	Good by 2015	Moderate	Good by 2027	Y	N	Y	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact
112	B, D	HA Outage (4 weeks) for installation of connections	-	-	-	-	-	-	-	-	-	-	-	-	-	N	N	N	N	N	N	N	N	No or minimal impact	N	-	High	No or minimal impact



# Appendix K Operational Catchment Cumulative Assessment for Preferred Plan Options

Catchment	WFD Water Body Information				Option		Option Detail																Impacts						
	ID	Type	Hydro - morphological Designation	WB Name	Ref	Option Name	Pipe line and associated infrastructure on land	Pipe line with water course crossings	New tunnel/tunnel works (inc shafts)	New / modified surface water (e.g. rivers) intake	New pumping station	New / modified water treatment works	New storage reservoir	New outfall to river / reservoir / canal / aqueduct	Transfer of water via river / canal / aqueduct	New / increased surface water abstraction quantity	Cessation of existing discharge to surface water	New abstraction well drilling / refurbishment	New abstraction well headworks / surface structures	New / increased groundwater abstraction quantity	Changed to reservoir compensation release	New reservoir / embankment raising	Level 1 Screening Results	Level 2 Screening Required?	Level 2 Screening Results	Level 2 Screening Confidence	Combined Screening Result	Cumulative Assessment	Cumulative Screening Results
Bela	GB112073071090	River	heavily modified	Peasey Beck	37-42	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Construction and permanent presence of new conduit and tunnel, including associated temporary and permanent shafts, penstock chamber, and conduit bridges over the Crake Hall Gill and Mill Rigg Gill.	Medium level of impact
	GB112073071080	River	not designated artificial or heavily modified	Lupton (Farleton) Beck		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	The cumulative effect of the construction and presence of the new infrastructure will not increase the level of impact in the operational catchment above the medium level of impact assigned to each water body. This is because due to only high-level information about the design of the tunnel, the nature of the geological strata it will pass through, and the linkages between the groundwater and surface water environment being available, the individual water body assessments assumed a worst-case impact.	Medium level of impact
	GB112073071100	River	not designated artificial or heavily modified	Stainton Beck		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Although the new infrastructure will cross through the headwaters of three water bodies in this operational catchment, it is not anticipated that the combined impact would rise above a medium level, particularly as it is assumed that construction best practice and pollution prevention measures will be used during construction, and the ALS states that there is water available across all flows in all three water bodies, helping to mitigate any operational effects on baseflow.
Calder	GB112071065490	River	heavily modified	Calder - Pendle Water to conf Ribble	37-42	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Construction and permanent presence of new conduit and tunnel, including associated temporary and permanent shafts, penstock chamber.	Medium level of impact	
	GB112071065040	River	heavily modified	Hyndburn		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	The cumulative effect of the construction and presence of the new infrastructure will not increase the level of impact in the operational catchment above the medium level of impact assigned to each water body. This is because due to only high-level information about the design of the tunnel, the nature of the geological strata it will pass through, and the linkages between the groundwater and surface water environment being available, the individual water body assessments assumed a worst-case impact.	Medium level of impact
Coral Inwell	GB112069064641	River	heavily modified	Irwell (Cowepe Bk to Rossendale STW)	37-42	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Construction and permanent presence of new conduit and tunnel, including associated temporary and permanent shafts, penstock chamber.	Medium level of impact
	GB112069064620	River	heavily modified	Irwell (Rossendale STW to Roch)		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	The cumulative effect of the construction and presence of the new infrastructure will not increase the level of impact in the operational catchment above the medium level of impact assigned to each water body. This is because due to only high-level information about the design of the tunnel, the nature of the geological strata it will pass through, and the linkages between the groundwater and surface water environment being available, the individual water body assessments assumed a worst-case impact.	Medium level of impact
	GB112069064650	River	heavily modified	Oaden		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Although the new infrastructure will cross through the middle reaches of this operational catchment, it is not anticipated that the combined impact would rise above a medium level, particularly as it is assumed that construction best practice and pollution prevention measures will be used during construction, and the ALS states that there is water available across all flows in all three water bodies, helping to mitigate any operational effects on baseflow.	Medium level of impact
Hodder and Loud	GB112071065420	River	not designated artificial or heavily modified	Whitendale River	37-42	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Construction and permanent presence of new conduit and tunnel, including associated temporary and permanent shafts, penstock chamber, and conduit bridges over the Bonstone Brook.	Medium level of impact	
	GB112071065560	River	not designated artificial or heavily modified	Hodder - conf Easington Bk to conf Ribble		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	The cumulative effect of the construction and presence of the new infrastructure will not increase the level of impact in the operational catchment above the medium level of impact assigned to each water body. This is because due to only high-level information about the design of the tunnel, the nature of the geological strata it will pass through, and the linkages between the groundwater and surface water environment being available, the individual water body assessments assumed a worst-case impact.	Medium level of impact
Kent	GB112073071370	River	not designated artificial or heavily modified	Mint	37-42	Haweswater Aqueduct sections T01 to T06 (Mealbank South Well to Woodgate Hill)	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	Construction and permanent presence of new conduit and tunnel, including associated temporary and permanent shafts, penstock chamber.	Medium level of impact	
	GB112073071340	River	not designated artificial or heavily modified	Flodder Beck		Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Medium level of impact	Y	Medium level of impact	Low	Medium level of impact	The cumulative effect of the construction and presence of the new infrastructure will not increase the level of impact in the operational catchment above the medium level of impact assigned to each water body. This is because due to only high-level information about the design of the tunnel, the nature of the geological strata it will pass through, and the linkages between the groundwater and surface water environment being available, the individual water body assessments assumed a worst-case impact.	Medium level of impact

