



# Our Revised Water Resources Position Statement

February 2021



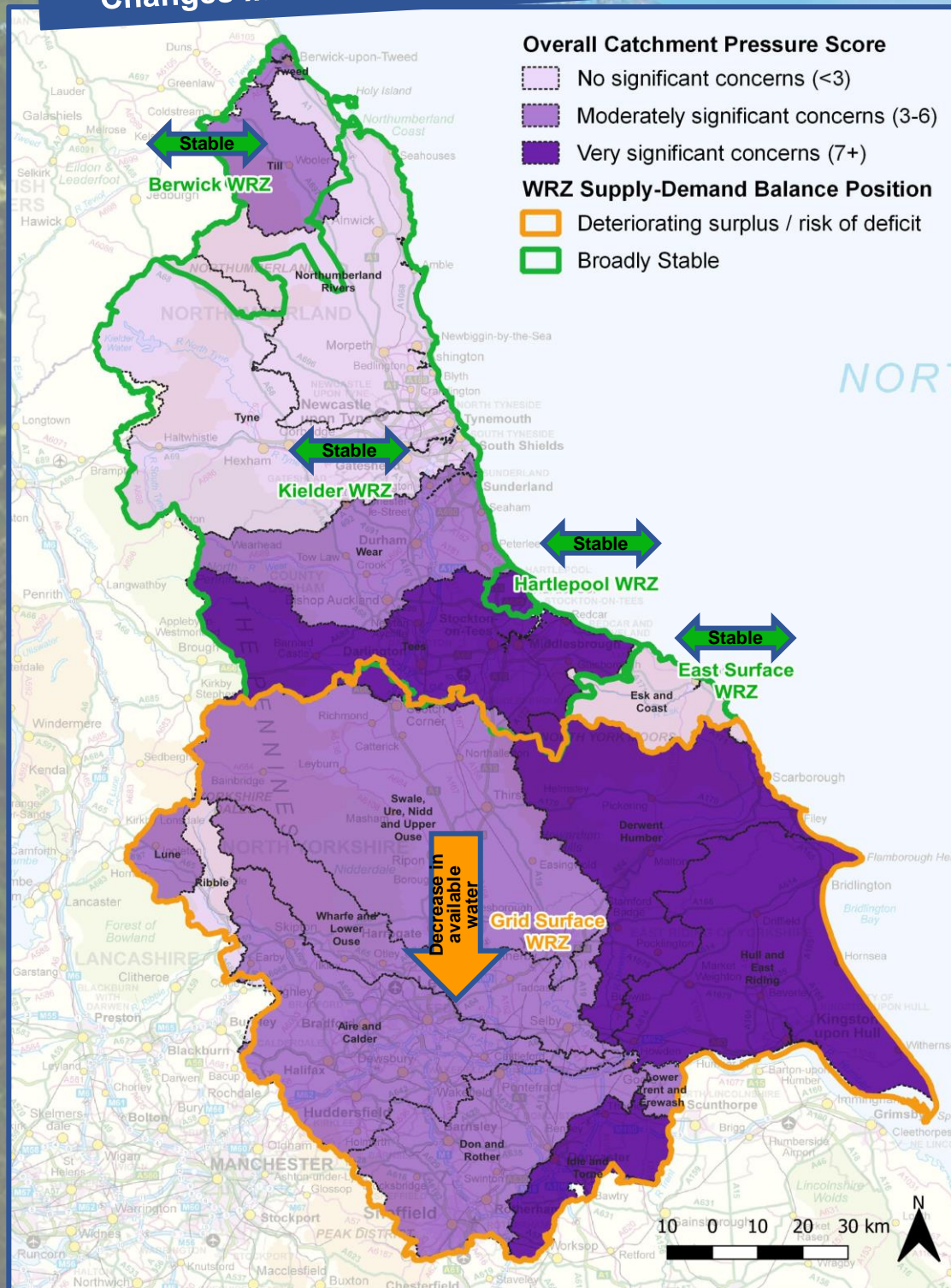


# February 2021 Revised Water Resources Position Statement: Summary on a Page

Our Revised Water Resources Position Statement (RRPS21) presents an update on our regional position as of February 2021 and summary of our progress towards our first Regional Plan. It outlines our progress since March 2020, when we published our Initial Resources Position (IRP20). This set out an early view of water resources in our region. This is a high level summary to complement the main report.

**WReN**  
Water Resources North

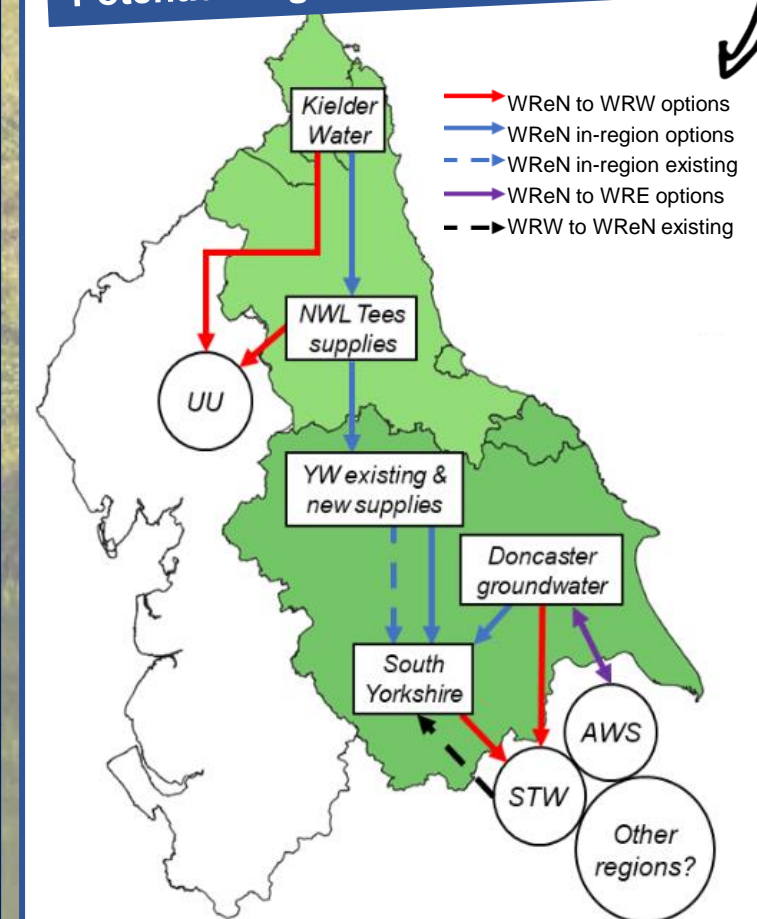
## Changes in water resources pressures since IRP20



## What do we know now?

National resilience	Our IRP20 showed we currently have a water resources surplus at a regional level. However, we expect there to be upward pressure on demand in the future, with increased in population and growth of water use in other sectors such as energy and agriculture. We have calculated scores to highlight catchments that are experiencing multiple concerns for priority further study, shown in purple shades on the map. However, at a regional scale we expect to remain in surplus and are investigating transfer options that might help to support other regions and national resilience.
Public water supply	In the Yorkshire Grid, the dual impacts of increased demand and climate change are indicating a reduced surplus and potentially a deficit. In our Berwick zone, supplies remain stable but they are sensitive our environmental destination. For both zones, we expect that the likely scale of any deficits will be modest. Kielder, Hartlepool and Yorkshire East are expected to remain in surplus.
Other sectors	In our IRP20, we presented data for sectors that abstract their own water from the environment, based on information that was included in the Water Resource National Framework. We expect future needs for these sectors to increase, but this is very uncertain, so we have been working closely with key stakeholders over the last year to better understand their future needs.
Environment	For our region, we may experience potential long-term reductions in abstraction from 74 MI/d ('Business as Usual' scenario), to 336 MI/d ('Enhanced' scenario), although this is very high level. This is an key area for us to further refine with all sectors, as we develop our Regional Plan.
Climate change & drought	For the our Regional Plan, we will update our assessment of drought & climate impacts using the latest UKCP18 projections. We expect that the impact of climate change will be more severe compared to previous assessments, although not as great as will affect other regions. In the future there will be a greater chance of hotter, drier summers and warmer, wetter winters.

## Potential Regional Transfer Options





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# 1. WReN and Regional Planning update

## 1.1. Introduction to WReN

Water Resources North (WReN) is one of five regional water resources groups working under the National Framework for Water Resources. We are developing a regional water resources plan for Yorkshire and the North East of England. Our ambition is to help to facilitate sustainable growth across Yorkshire, the Humber and the North East, whilst also protecting and enhancing our valuable natural environment. Our aim is to ensure that the region has a sustainable, long-term plan for water resources that protects our region's resilience (environment and multi-sectorial water supply) in the face of challenges such as climate change and population growth. We are a region with a surplus of water and so we are also working with other regions (principally Water Resources West and Water Resources East) to help secure resilient water supplies for the country as a whole.

Although our core members and funders are Yorkshire Water (YW), Northumbrian Water (NWL) and Hartlepool Water (HW), we are actively engaging with and involving those who have an interest in water resources in our region. This includes sectors other than public water supply who make beneficial use of the water in our environment, such as agriculture, industry and energy. The importance of water to our region's environment, ecology and biodiversity will also play a key role in shaping our future plans.

We are working with water companies and their customers, other water dependent sectors of the economy such as the agriculture and power sectors, and environmental groups and regulators. Our aim is to develop a long-term plan for managing water resources in the region, which will be published for consultation in early 2022.

Where this plan impacts on public water supply – the drinking water that is supplied by the water companies in our region – it will be reflected in the water companies' statutory draft Water Resource Management Plans (WRMPs) which will be submitted to Defra in August 2022 and consulted on shortly afterwards. Where this plan affects other sectors, we will look to work with those sectors to understand how they can also support long term water resources resilience in the north, including looking for opportunities for collaborative solutions.

## 1.2. Revised Water Resources Position Statement February 2021

This Revised Water Resources Position Statement (RRPS) presents an update on our regional position as of February 2021 and summary of our progress towards our first Regional Plan. It outlines our progress since March 2020, when we published our Initial Resources Position (IRP). This set out an early view of water resources in our region. Since then, we have made good progress towards our first Regional Plan. This has included work on the technical aspects of water resources planning for public water supply, as well as engagement with other sectors and environmental stakeholders to understand how we can ensure that non-public water supply is appropriately included in our Regional Plan.

Alongside this document, we have also published a simple 'plan on a page', as well as a non-technical summary, both of which are available on our website<sup>1</sup>.

## 1.3. Progress since March 2020

### In March 2020...

We published an Initial Resource Position (IRP) for our region. This set out a view of our regional situation with regards to water resources, using information from two key sets of sources. For public water supply, we used information from water companies' latest WRMPs, published in 2019. In addition, we referred to the Water Resources National Framework (WRNF), which was published by the Environment Agency in March 2020<sup>2</sup>. As well as summary information about public water supply, the WRNF included information about water abstraction and use in other sectors, such as agriculture, energy and other industry.

<sup>1</sup> <http://www.waterresourcesnorth.org>

**In July 2020...**

We published a methodology for our plan. This set out at a high level our aspirations for the plan and how we intend to develop the plan. Some aspects of the methodology were necessarily technical, as they reflect how we will ensure that our regional plan aligns with the next round of water company WRMPs which in turn are developed following detailed Environment Agency guidance. However, we also recognised that the next round of water resources plans will be different in the way that they will account for other sectors, where the process for planning for future needs is far less mature than it is for public water supply.

**Since July 2020...**

We have developed more detailed methodologies and have made significant progress with the technical work required to develop a regional supply / demand balance – this will help inform the options and priorities for our regional plan. For public water supply, we have worked to ensure that methods used by water companies within our region are compatible. In some cases, this means that we will use identical methods across the three water companies, but for other aspects of the planning process there are good reasons why methods taken might differ slightly. Our priority is to ensure that we can create and communicate a coherent regional plan that sets out our overall position and priorities whilst also ensuring that plans prepared at the regional level are compatible with the requirements of the WRMP process. In parallel, we have been engaging with regulators and key stakeholders in our region in order to help shape our plan.

2 <https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources>

**At a high level, our March 2020 IRP concluded that:**

- At present, our public water supply is very resilient to drought, and at a regional level we appear to have a significant surplus of water.
- However, there is uncertainty around how resilient our position will remain into the future, in particular given the potential impacts of climate change. When this is taken into account, the actual surplus in WReN may not be as large as current data indicates. We will further develop our regional supply and demand forecasts and our long term environmental destination over the coming weeks. We will then have greater clarity in terms of whether there is a regional water surplus that is available to support other regions.
- We already have a number of 'in-region' supply and demand options potentially available from company WRMPs, but we also need to understand other options within our region that water companies are not yet aware of or which the market may choose to offer to us. This demonstrates that further water trading may be possible through the deployment of new options.
- Water use by other sectors is a relatively small proportion of overall regional use when compared to public water supply, but we need to better understand the areas or catchments where other use is most significant, and focus our efforts on engaging with other sectors in those areas. We are engaging with industry where we are aware of new water demands (e.g. Teesside). However, there is significant uncertainty around the forecasts for future water use in other sectors, which needs further study.



### 1.3.1. Engagement update

We recognise that for WReN to be a truly regional plan we need to engage with and actively involve all of those who have an interest in water resources in the region. Since March 2020, we have significantly extended our stakeholder engagement activities, a summary of which is included below.

#### Stakeholder Steering Group

The WRNF outlines expectations for engagement, noting that “Water Resources North should engage the power generation sector, industry and the agricultural sector”. Representatives from these key sectors sit on our Stakeholder Steering Group (Energy UK, Canal & Rivers Trust, and Natural Farmers Union respectively), alongside representatives from Yorkshire and North East Catchment Groups, the Environment Agency, and Water Companies. Royal Society for the Protection of Birds and Natural England have a standing invite but have not yet been able to attend.

The Stakeholder Steering Group meets bi-monthly and has an advisory role to:

- provide direction and input into the development of methodologies, options and scenarios;
- inform and contribute to the development of WReN’s environmental destination; and
- facilitate spin off discussions where needed into specific sector or catchment issues

Additionally, we will engage with the Environment Agency and Natural England as well as other interested stakeholders during the formal environmental appraisal consultation process to be undertake later this year.

We will also engage with the Drinking Water Inspectorate (DWI) where appropriate, for example regarding prospective transfers should these have a high likelihood of being included in the preferred plan. In addition, potential drinking water quality impacts will be taken into account in our assessment of water trading impacts.

In January 2021, we held a meeting between senior representatives from Ofwat, Environment Agency, DWI RAPID, and Directors from WReN water companies. We anticipate that such meetings will be repeated at appropriate points through our plan development programme.

#### Director meetings

Our Directors’ Group, comprising Directors from all three water companies, meets quarterly to ensure that there is visibility of WReN activity at the highest level in each company, that there is company buy-in to the programme and activity. In due course, and recognising that the regulatory mechanism for delivering WRMP-linked investment is via water companies and the Price Review process, the Directors’ Group will be involved in signing off our first Regional Plan.

#### Wider engagement

Our website is now online at [www.waterresourcesnorth.org](http://www.waterresourcesnorth.org). We will follow this website launch with further engagement with stakeholders, to share the key messages from this RRPS, our methodology approach, and general updates throughout the remainder of the planning period to keep stakeholders informed.

Where options or other drivers identify the need for cross boundary discussions, we are engaging with existing groups such as the Idle & Torne working group and the Trent Working Group. Where a specific water company has a particular interest or relationship with a certain stakeholder or option, these discussions are led by the company on behalf of WReN. For example, discussions with the proposed Humber cluster of carbon capture and storage and hydrogen manufacture are being led by YW, whereas discussions with the Teesside cluster are being led by NWL.



Figure 1. WReN Stakeholder Steering Group members

#### Regulator engagement

We have an Environment Agency-WReN meeting in the alternate months between the stakeholder steering group meetings, to facilitate discussion and to obtain buy-in to specific technical methodologies.



Ultimately, our regional plan must inform, and be fully aligned to, each of the water company WRMP24 submissions, which remain a Statutory requirement and are to be published shortly after they have been submitted to Defra in draft form in August 2022. The WRMPs, along with the Company Business Plans, are critical to ensuring suitable investment for water company aspects. Consequently, it is important to ensure that proposals in the regional plan will be sufficiently supported by water customers. We are currently undertaking a detailed review of previous Company level customer research outputs associated with the last Business Planning round (known as PR19) to build an understanding of customer views at a regional scale. We are also currently scoping new research to inform the development of WReN's objectives and metrics to be used in options appraisal, along with gaining early qualitative customer insights on water trading and environmental destination.

#### 1.4. Purpose of document

The purpose of this document is to provide an 'Updated Resource Position' as per the WRNF. It is intended to be an externally facing, high level narrative of where we are in development and production of our first draft regional plan for August 2021. This position statement builds on and describes the work that has been completed since we published our 'Initial Resource Position' statement in March 2020. It provides an updated view on our environmental destination as well as engagement with stakeholders and other sectors and how this is influencing the development of our plan. It also provides an update of where we are with technical aspects of the planning process such as problem characterisation, supply-demand balance (SDB) and options identification.

#### Alignment with other plans

Our plan is developing in a way that enables alignment with water company WRMPs, other regional plans, and other stakeholder plans, building also on the work of the Regional Coordination Group and its subgroups. This thinking is a core part of our workstream-level methodology development and further information is included in our workstream methodology documents (available on request).

#### Supply-Demand Balance position statement

We have made excellent progress with our technical supply and demand forecasts. However, work is ongoing and so we are not publishing any updated data tables at this stage. New table data (format to be agreed) will be provided in the August 2021 draft

regional plan once the underpinning technical work has been completed.

While we are not providing updated tables as part of this RRPS, we have commented on emerging trends within the narrative where we have appropriate information from our technical work. In **Section 2.1**, we provide a high-level narrative of areas where we think that the balance between supply and demand could change based on what we know now and what looks worse or better. Where appropriate, information is presented using tables and graphical approaches.

We have set out our current understanding of water supply in **Section 2.2**, and demand in **Section 2.3**. This is informed from ongoing water company assessments as well as from information provided by non-public water supply sectors, particularly energy. We have provided narrative on how this will be integrated into the regional plan including regionally specific information where available and in particular with regards to emerging technology like carbon capture and hydrogen economy.

#### Environmental destination

The Environment Agency's guidance on environmental destination was published in October 2020 with further data being issued to WReN in January 2021. In **Section 3**, we set out our current position with regard to the development of a long-term environmental destination for our region. This is informed by outputs of our catchment mapping and the ongoing stakeholder engagement that is helping to focus activity and shape our regional long-term environmental destination (**Section 2.4**).

#### Options development

**Section 4** of this document sets out how we are identifying and developing options for inclusion in our plan. It also provides a summary of the key regional transfer options that we are developing, which could increase supplies and/or reduce demand to meet the regional and national supply deficits. The Water Available for Use (WAFU) gains and demand savings arising from WReN options will be confirmed later in the planning process. However, this document does contain narrative on how this is informed, for example leakage and per capita consumption (PCC) reductions (**Section 4.3**).

#### Programme and risks

In **Section 5**, we present our high-level programme including key tasks and next steps, along with a short risk register outlining key risks and our mitigation actions.

## 2. Plan Resource Needs / Risks

We are currently working on a full update of the supply and demand forecast data for our region which will be included in our initial draft plan to be published in August 2021. As our supply demand position is evolving, we are not in a position to publish any draft numbers as part of the RRPS. However, we have worked with water companies and other key abstractor groups across the region to develop our understanding of the pressures and influences on our future supply-demand balance and resource position. This is summarised below.

Due to the different ways in which supply and demand are calculated for each sector, we have calculated public water supply and non-public water supply positions separately. We have then presented a combined regional resource position to identify high-level strategic option needs.

This approach ensures that we are appraising public water supply systems using the appropriate regulatory technical guidance and UKWIR methodologies for the development of water company WRMPs. This approach also ensures that we have a close and strong alignment between our Regional Plan and the water companies' WRMPs (which remain the statutory document for public water supply). A key driver of regional planning is to support assessment of inter and intra-regional solutions and transfers in the WRMP process and therefore this alignment is essential.

Different sectors use different spatial water resources planning management units. For example, water company planning is undertaken using Water Resource Zones which are based on existing water

company infrastructure which has been developed to allow for cross-catchment transfers and connectivity to ensure supply resilience. However, other, non-potable water supply sectors tend to operate at a catchment or point abstraction scale.

We have therefore also considered these pressures at the management catchment scale, to identify where more localised pressures may drive smaller-scale options for development and/or further investigation.

We have then considered the two views together when exploring plan options and solutions.

### 2.1. Supply-demand and water availability position summary

#### Public water supply zones

In our March 2020 Initial Resources Position document, we summarised the supply-demand status for the water resource zones across our region, as shown in Table 1 below. At that stage, based on our previous WRMP data, all zones were in surplus. As outlined above, water companies are now updating their supply-demand forecasts both for the regional water resource plan and for their PR24 water company WRMPs. Early work indicates a number of material areas that will influence our supply-demand balance compared to previous in some zones. The potential change in resource position is outlined below:

Table 1. Comparison of water resource zone supply-demand balance position (March 2020 Statement of Resource Need vs Feb 2021 position)

Water Resources Zone		Previous Position (Mar 2020 submission)	Change in status at Feb 2021
RZ1	Hartlepool	Significant surplus	Broadly stable
RZ2	Berwick	Surplus	Broadly stable, subject to environmental destination
RZ3	Northumbrian Industrial (non-potable)	Significant surplus	Broadly stable
RZ4	Kielder	Significant surplus	Broadly stable
RZ5	Yorkshire East SWZ	Surplus	Broadly stable
RZ6	Yorkshire Grid SWZ	Surplus	Deteriorating surplus / risk of deficit



It should be noted that the above position is indicative, and subject to change as we further refine our assessments and agree our long term environmental destination. We have provided further detail on some of the key influences on our new supply-demand balance later in this section.

Whilst the Yorkshire Grid is now showing a risk of deficit, at this stage we expect that the likely scale of any deficit will be modest, such that in-region water resources options should be able to address any issues. The position also does not prohibit the potential for water trading from the region to support the national resilience position, as outlined further in **Section 4**.

### Catchments

We have also considered the water availability within each catchment, to incorporate non-public water supply demands and environmental needs. This is not something that we presented in our March 2020 IRP; instead our understanding has evolved through working with key stakeholders over the last year and through the provision of key datasets by the Environment Agency in late 2020.

We outlined our initial approach in the WReN July 2020 Methodology Summary<sup>2</sup>. The results that we present here have been reviewed and developed to separate out current and future (up to 2050) catchment risk factors. We scored catchment pressures to reflect the severity of the issue, and then combined these to provide an overall sense of the pressure on the catchment. The pressures considered include:

- abstraction availability (short<sup>3</sup> and long term)<sup>4</sup>
- Water Framework Directive (WFD) status<sup>5</sup>
- public water supply and non-public water supply current abstraction<sup>6</sup>
- likelihood of growth in sector abstractions<sup>7</sup>
- likelihood of abstraction reductions related to environmental destination<sup>8</sup>

Table 2 below summarises our present understanding of current and future pressures scores, and these are also illustrated in Figure 3 in **Section 2.4**. Whilst some catchments experience significant additional risk when looking to the future, others do not see any change compared to their current position. We have used this information to help characterise which catchments are experiencing multiple pressures, allowing us to identify priority catchments and explore the issues in these catchments further through our Stakeholder Steering Group and sector specific discussions. Catchments have been clipped to within the WReN area.

It is important to note that whilst growth in abstractions is considered in the 'Future pressures' scores, at present this is based on growth in recent actual abstractions and does not take into account new abstractions that may develop in the future. This is particularly relevant for the energy sector in the region, where there may be significant changes in future water requirements through developments in the hydrogen economy and with carbon capture and storage. We are working with key energy stakeholders to understand how best to incorporate these future demands into our plan. This is discussed further in **Section 2.3**.

<sup>2</sup> Water Resource North, Regional Plan Methodology Summary FINAL, July 2020

<sup>3</sup> EA CAMS & EA Groundwater Management Units

<sup>4</sup> climate change impact source tbc

<sup>5</sup> WFD Cycle 2 Classifications (2015)

<sup>6</sup> Water Resources National Framework dataset (2020) (v5) – recent actual abstraction

<sup>7</sup> Water Resources National Framework dataset (2020) (v5) – best estimate growth abstraction

<sup>8</sup> Environmental Destination 2050 Enhanced scenario. Business As Usual scenario was also assessed but there was very little difference between the two scenarios due to the nature of the catchment based scoring

Table 2. Current and future catchment pressures for each WReN catchment

Catchment	Catchment pressure score				
	Current pressures		Future pressures		Change in status
<b>Aire and Calder</b>	2	No significant concerns	5	Moderately significant concerns	Deteriorating / increased risk of deficit
<b>Derwent (Humber)</b>	3	Moderately significant concerns	7	Very significant concerns	Deteriorating / increased risk of deficit
<b>Don and Rother*</b>	3	Moderately significant concerns	6	Very significant concerns	Deteriorating / increased risk of deficit
<b>Esk and Coast</b>	1	No significant concerns	1	No significant concerns	Broadly stable
<b>Hull and East Riding</b>	3	Moderately significant concerns	7	Very significant concerns	Deteriorating / increased risk of deficit
<b>Idle &amp; Torne*</b>	7	Very significant concerns	10	Very significant concerns	Deteriorating / increased risk of deficit
<b>Lower Trent &amp; Erewash*</b>	2	No significant concerns	3	Moderately significant concerns	Slightly Deteriorating / increased risk of deficit
<b>Lune*</b>	3	Moderately significant concerns	3	Moderately significant concerns	Broadly stable
<b>Northumberland Rivers</b>	2	No significant concerns	2	No significant concerns	Broadly stable
<b>Ribble*</b>	1	No significant concerns	1	No significant concerns	Broadly stable
<b>Swale, Ure, Nidd &amp; Upper Ouse</b>	1	No significant concerns	3	Moderately significant concerns	Slightly Deteriorating / increased risk of deficit
<b>Tees</b>	4	Moderately significant concerns	7	Very significant concerns	Deteriorating / increased risk of deficit
<b>Till/Tweed</b>	0	No significant concerns	3	Moderately significant concerns	Deteriorating / increased risk of deficit
<b>Tyne</b>	2	No significant concerns	2	No significant concerns	Broadly stable
<b>Wear</b>	3	Moderately significant concerns	3	Moderately significant concerns	Broadly stable
<b>Wharfe and Lower Ouse</b>	2	No significant concerns	4	Moderately significant concerns	Slightly Deteriorating / increased risk of deficit

\*These catchments straddle WReN and other areas; pressures are calculated based on proportion of catchment within WReN region. Catchments are clipped to the WReN area.



## 2.2. Supply availability

The availability of future water supply is influenced by a range of factors, although climate change is a particularly significant influence on the level of risk and long-term availability across parts of our region. In some areas, supply availability is constrained by asset or licence factors; in others, variability in climate is the greatest influence on future supplies. The following sections outline the some of the primary influences expected on our future supply availability.

### Climate change impacts

The potential impacts of climate change on water resources for public water supply have been considered in all WRMPs published since 1999. In the 2019 WRMPs, water companies used UK Climate Projections 2009 (UKCP09) data. For the development of our regional plan and the next WRMPs, we will update our assessment of the potential impacts using the latest UK Climate Projections 2018 (UKCP18) projections.

Broadly speaking, the meteorological impacts of climate change in UKCP18 are consistent with UKCP09, although UKCP18 does project a greater chance of hotter, drier summers and warmer, wetter winters. However, when specific scenarios are fed through our models, we could see a material change to both the severity and uncertainty of the impacts of climate change on water resources. Rainfall patterns across the UK are not uniform; they vary on seasonal and regional scales and will continue to do so in the future. Like other regions, our focus on the first draft of our regional plan will be on applying the Regional Climate Models (RCMs) data, which is spatially coherent and allows for consistent assessment across regional modelling. In addition, we will use a sample of probabilistic projections to further inform our understanding of climate change uncertainties.

Our expectations are that, compared to UKCP09 based assessments applied previously, the impact of climate change will be more severe; this is partly because the RCM data is based on a high emissions scenario rather than medium. There may also be drier autumn conditions observed, which is of importance to winter reservoir refill, but with wetter springs and winters.

A recent national study by Atkins<sup>9</sup> indicated that for our region, the reduction in summer precipitation by the 2070s (2061-2080) varies significantly between scenarios; most scenarios showed reductions

between 10-49%. Significantly greater reductions are expected in some other regions. Figure 2 on the next page shows the range of 12 RCM scenarios across the country for the 2070s compared with the 1981-2000 baseline, along with percentile impacts from the probabilistic projections (P50 being the mid impact, showing between a 10-29% reduction in summer precipitation for our region). Whilst significant reductions in precipitation are observed in the Water Resources North area, loosely covered by the Northumbria and Humber areas of the maps, it can be seen that in most situations other areas of the country suffer from more severe reductions.

Ongoing work at national level and with regulators will influence how we scale climate impacts over time into our plans in time for the August draft; it is too early to draw firm conclusions on the impacts at this stage.



<sup>9</sup> Regional Water Resources Planning: Climate Data Tools Draft Operational Framework for implementing the EA Supplementary

Guidance on Climate Change Sutton and East Surrey Water on behalf of WRSE – 28<sup>th</sup> January 2021

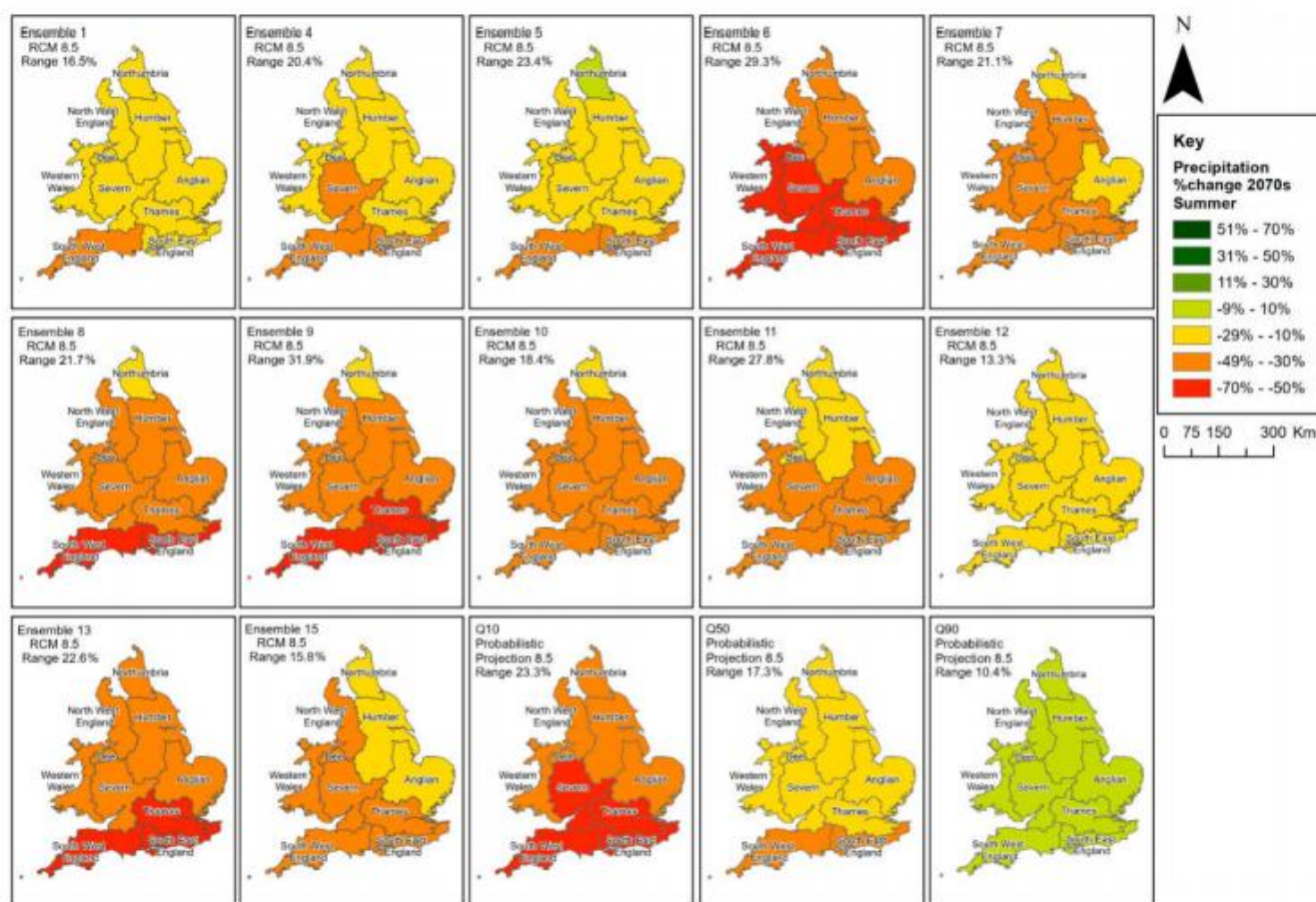


Figure 2. Regional variations in summer precipitation change (%) for UKCP18 RCM and probabilistic projections (Provided courtesy of and with permission from Atkins & WRSE)

### Assessment of 1 in 500-year drought resilience

We are using new, more sophisticated methods for our public water supply forecasts for the next round of planning. We are doing this in order to better inform our understanding of drought resilience, which is a potential key question when considering water transfers to other regions, and to specifically assess our region against the 1 in 500-year average frequency for Level 4 restrictions (i.e. standpipes, rota cuts or in the case of some areas of the region, pressures reductions) required in the WRMP planning guidelines.

In particular, once we have updated our water company hydrological models, we will be applying long-periods of 'stochastic hydrological' data (plausible synthetic scenarios based on historical hydrological patterns) to water company water resources models, to better assess supply availability under severe and extreme drought events. This is particularly important for the Kielder and Yorkshire areas, given the potential for water exports or inter-regional transfers to be considered, and so our work

helps support the work being done in conjunction with other regions. At this stage, it is too early to determine the final impact on the supply-demand balance.

### Transfers of water

Our work to explore both inter and intra-regional transfers of water is explained further in Section 4. However, with respect to existing transfers, a material impact on supplies in the Yorkshire area is possible through reduction, or cessation, of an existing transfer of water from the Water Resources West area. We are in dialogue about the future availability of this transfer, but a final position is only expected to be known later in the regional plan process. For this reason, given that this could have a material impact on our resource position and the need for future options to meet a deficit, we expect this to at least feature in our plan as a future supply-demand scenario.

### Environmental protection and sustainable abstraction

The WReN water companies are currently undertaking abstraction sustainability investigations under their part of the Environment Agency's Water Industry National Environment Programme (WINEP). Where these investigations conclude that an abstraction is unsustainable, a sustainability reduction



may be required to reduce abstraction licence licensed quantities to a sustainable level to protect the environment. The outcomes of YW, NWL and HW's WINEP will be reflected (where necessary) in risks and options identified through their respective WRMPs. Non-public water supply licences are also subject to licence reviews and reductions to ensure abstraction continues at a sustainable level. At present, no significant changes to supply availability are anticipated since last year. However, our long-term environmental destination process could have a significant influence on the future supply-demand balance. Our work in this area is further described in **Section 3**.

### Catchment scale water availability

We have also considered wider catchment water availability, through the Environment Agency's Catchment Abstraction Management Strategies (CAMS), which feeds into the catchment pressure assessments described in **Section 2**. We have reviewed CAMS Assessment Points for each catchment in our region, to obtain an indication of the catchment's water stress. We are currently considering the best way of linking this position with climate change scenarios to understand the likely impact of water availability in the future and to inform the wider supply-demand balance.

## 2.3. Demand forecasts

Due to the complex and differing nature of calculating demands, we are considering public water supply and non-public water supply demand forecasts separately in our WReN regional plan.

### Public water supply systems

The WReN water companies are currently working through revised demand forecasts for each of their water resource zones (WRZ) which in turn will inform the development of our regional plan. The overall demand forecast is influenced by a range of forecasting sub-components, and at this stage in the process we have only updated some of these. However, our work to date does give good insight into influences upon future demand.

Overall, at this early stage of the plan development process, we are seeing a number of upward pressures in the projections of future demand, although the extent and resulting impact of these on the overall supply-demand balance will differ in individual WRZs. When completed, we are expecting that modest increases in the base demand forecasts are possible

compared to our previous resource position, and at least in the short term. It should be noted that this is before we consider the extent of further demand management interventions in the regional plan. Even when we complete forecasts later this year such forecasts are always subject to significant uncertainty, and therefore we will present scenarios in our plan to demonstrate the resilience of our plan to change in future demand from central estimates.

### Base year demand and dry year uplifts

The base year for the public water supply forecasts will be 2019/20, and companies have been re-basing their demand forecasts to this new base year. This typically increases the starting demand for the forecasts (with other factors applied, broadly this is of the order of a 2-4% increase). However, caution should be applied in interpreting this at this stage, as demand in any single year is influenced at least in part by weather patterns observed in the period; we are currently working on revising the dry year uplifts to apply to this new base year, which could alter the final position.

### Property and population forecast updates

We have been working on revising our population and property forecasts to feed into our demand forecasts, and draft outputs from this work has started to be delivered. We have been working with a common specialist consultancy across the region to drive consistency of forecasting between companies. These reflect changes in Local Authority Plans.

In terms of the overall population across the region, our initial updated forecasts are showing slightly lower forecasts than those included in our previous plans; populations are around 2.1% lower than previous forecasts by 2044/45. However, it is important to recognise that this overall picture masks underlying regional spatial variations, with some areas<sup>10</sup> of the region observing increases in population, or shorter-term increases that are eroded or reversed in the long-term. We are still exploring the underlying drivers behind the regional variations so that these are better understood as part of finalising our data. Property growth is an even more complex picture, and detailed analysis to draw regional comparisons and understanding is still underway.

### Non-public water supply systems

Non-public water supply sectors do not have the same well-developed demand forecasting processes as water companies.

<sup>10</sup> In our smaller water resource zones

For our March 2020 IRP, we presented other sector demand data that represented information provided by the WRNF by Wood<sup>11</sup>. Work carried out for the WRNF has estimated that certain sectors are likely to see growth in their abstractions in the period to 2050. These growth factors applied to WReN show a total increase in non-public water supply abstraction of 26.1 MI/d by 2050 (Table 3).

**Table 3. Non-public water sector demands estimated over 2020-2050**

Sector	2020 Baseline demand MI/d	2050 Best Estimate MI/d	Forecast growth MI/d
<b>Spray Irrigation</b>	25.9	37.3	11.4
<b>Other Agriculture</b>	7.1	7.2	0.2
<b>Power</b>	60.1	73.3	13.2
<b>Paper and Pulp</b>	6.5	7.3	0.8
<b>Chemicals</b>	2.9	3.6	0.6
<b>Food &amp; Drink</b>	13.4	16.7	3.3
<b>Other Industry</b>	37.6	35.6	- 1.9
<b>Private water supply</b>	3.8	3.7	- 0.1
<b>"Other" non-public water supply sectors</b>	7.2	7.2	-
<b>Total other sectors</b>	<b>164.3</b>	<b>191.9</b>	<b>27.5</b>

The significance of this growth will be dependent on local factors including whether there is sufficient resource available to meet this need whilst also protecting the needs of the environment (i.e. in individual water bodies). This growth is also highly uncertain. For example, climate change, changes to agricultural subsidy policies following Brexit and the global nature of food markets will influence how much water agriculture will need. National and international policies, such as 'net zero carbon', will affect the amount of water needed for energy generation. The emergence of new technologies will also influence future water needs. The absence of coherent, overarching plans for non-public water supply sectors, together with strict competition law, makes it

extremely difficult for many of these sectors to accurately plan for their future water needs at a sectoral level.

We have therefore been working closely with non-public water supply stakeholders over the last year to better understand how well the above data represents reality and seek to ensure any new abstractions are accounted for as accurately as possible. We have held specific discussions with the energy sector, seeking to further understand the development of hydrogen and carbon capture and storage plants in clusters on the Humber and Teesside, as well as potential inland demands. Energy UK are currently working to produce a report which provides further insight into the likely energy sector water demand trajectory over a number of possible scenarios. We expect this to be published in spring 2021 and we will use this to inform/update the WRNF dataset as needed.

We are aware of a number of unlicensed agricultural abstractions within the North East area which can pose challenges in order to accurately capture the current and future agricultural demands of this region, and are supporting discussions on this with the Environment Agency and National Farmers' Union (NFU) as required.

As this is an ongoing process, we have continued to use the WRNF dataset for the purposes of this February 2021 update, as this represents the best dataset we currently have.



<sup>11</sup> Understanding future water demand outside of the water industry, Water Resources National Framework 2020



## 2.4. Strategic Needs/Risks

### Water Company system “problem characterisation”

As part of developing their next WRMPs, each water company has completed an exercise called a “problem characterisation”. This is a technical term for what is essentially a risk assessment, carried out at Water Resource Zone level, to guide which methods companies should appropriately apply to their planning.

In line with the latest view of the supply-demand balance as described previously, at a strategic level most of the WRZs in our region remain unchanged compared to the previous round of planning. As shown in Table 4, we have assessed them as low risk in terms of both strategic needs and complexity factors. The Yorkshire Grid, however, is deemed to be of high complexity given a blend of supply and demand influences.

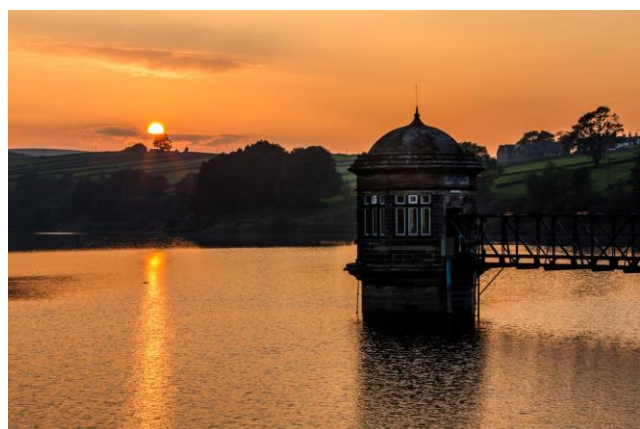
Table 4. Current “Problem Characterisation” position for Water Resources North resource zones

		Strategic Needs Score (“How big is the problem”)			
		0-1 (None)	2-3 (Small)	4-5 (Medium)	6 (Large)
Complexity Factors Score (“How difficult is it to solve”)	Low (<7)	All other WRZs			
	Medium (7-11)				
	High (11+)		Yorkshire Grid		

The Grid zone, covering most of the population of Yorkshire, has a heightened risk of a significant supply-demand deficit due to climate change reducing available resources in a dry year. The severity of the impact of climate change is uncertain and there are numerous potential scenarios. There are also near-term risks and uncertainties due to COVID-19 impacting on household and non-household demand.

Policy requirements to reduce leakage and per capita consumption have the potential to close a baseline deficit. However, an alternative solution may need to be identified depending on the timing of any deficit and the uncertainties of demand side solutions that rely on new technologies and customer behaviours.

It is also likely there will be additional problems to address, including a potential loss/reduction in the Severn Trent Water import and use of reservoirs for flood alleviation (e.g. Hebden Bridge). These could create a need for further solutions, as demand reduction may not provide a secure solution to fully replace the loss of existing resources in these areas.



Strategic transfer requirements – both inter- and intra-regional – and third-party needs could also further influence the Yorkshire Grid zone, as well as that of the Kielder zone (albeit to a lesser extent). In all cases, strategic water trading has the potential to influence the strategic needs scores, and we have developed our methodologies to ensure suitable testing of relevant factors in the plan (e.g. drought resilience and climate change as described earlier in this section).

### Catchment scale “problem characterisation”

Based on the catchment pressure mapping (Section 2.1), several catchments can be identified as having very significant concerns, particularly under the future pressures scenario. These catchments are:

- Derwent (Humber)
- Hull & East Riding
- Idle & Torne
- Tees

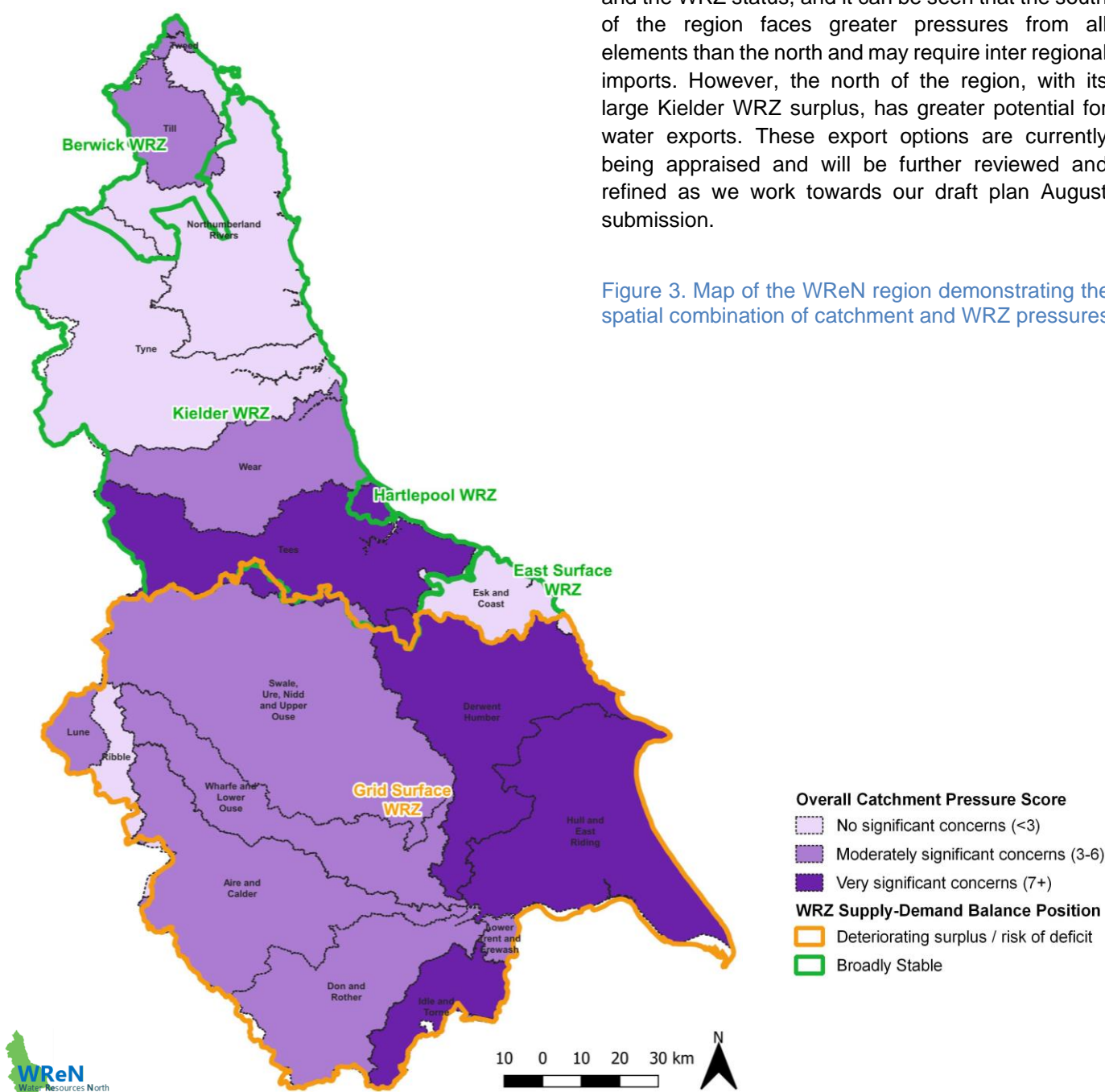
These are highlighted in dark purple on the map in Figure 3. These catchments experience a number of significant combined pressures including lack of water availability, Water Framework Directive (WFD) concerns, moderate-high growth in abstraction demand as well as moderate-high risk of abstraction reductions. Therefore, we have identified these as “priority” catchments for further exploration.

### How we are combining catchment and WRZ risks

It is evident from the work described above that our region faces a number of pressures, both public water supply and non-public water supply. All of these need to be considered in a combined manner to ensure we develop a holistic regional plan, and will influence option identification and development. The WRZ characterisation helps to align the regional plan to WRMP needs, and feeds into strategic option development. The catchment characterisation provides further detail at a smaller scale and will inform smaller scale options.

The overall aim of the regional plan is to facilitate inter- and intra- regional trading to provide greater resilience in terms of the environment and water supply. Figure 3 demonstrates the spatial coverage of the catchments facing the highest combined pressures and the WRZ status, and it can be seen that the south of the region faces greater pressures from all elements than the north and may require inter regional imports. However, the north of the region, with its large Kielder WRZ surplus, has greater potential for water exports. These export options are currently being appraised and will be further reviewed and refined as we work towards our draft plan August submission.

Figure 3. Map of the WReN region demonstrating the spatial combination of catchment and WRZ pressures





### 3. Environmental Destination

Our March 2020 IRP outlined our ambitions for the environment and presented our initial thinking on how our regional plan can help to protect and enhance the environment. This included consideration of:

- flexible compensation flow regimes
- impact of abstraction on chalk stream habitats
- how the regional plan can support other activity to deliver against Defra's priority catchments which, in our region, are the Idle and Torne, and Till and Tweed.
- sustainable farming with a focus on water quality and quantity
- restoration of blanket bogs, a key habitat in the region
- commitment to an environmentally stable abstraction regime

Since then, thinking has developed at a national level around what regional plans' environmental destination needs to look like. The Environment Agency issued 'Environmental Destination' guidance<sup>12</sup> in October 2020 which sets out an expectation for all regional groups to follow a broadly consistent approach, whilst reflecting local and regional priorities.

The guidance outlines stages needed to propose a long-term environmental destination, which we have summarised in **Table 5**. Our regional plan will be developed in line with this, and we have already been working closely with key stakeholders to start shaping our long-term environment destination.

The guidance is based around future water resources scenarios which provide an illustration of the changes in abstraction that may be required to ensure the water environment is sufficiently protected in the long-term. These range from 'Business as Usual', through to an 'Enhanced' scenario in which ecologically valuable or sensitive sites are afforded a greater level of protection. Licences which are likely to be at risk of not meeting environmental objectives linked to abstraction pressures are identified for potential reductions by 2050.

#### Review of the scenarios<sup>13</sup>

##### Business as Usual

In this scenario, the potential long-term required abstraction reductions in each WFD management catchment range between <5Ml/d to 10-20Ml/d, with a total regional deficit of 74Ml/d<sup>14</sup>. Nationally, WReN appears to have the lowest long-term deficit of all regions. The deficit volumes vary within our region and are not specific to certain areas.

##### Enhanced

In this scenario, the regional long-term deficit increases significantly above Business as Usual, from 74Ml/d to 336Ml/d. The Enhanced scenario drives up the deficits by giving further protection to the high ecological value and sensitivity of water or water dependant habitats in protected catchments. The resulting abstraction reduction is predicted by the model to ensure sufficient water is retained to protect them. Nationally, WReN appears to have the second lowest long-term deficit of all regions.

Table 5. Core environmental destination requirements outlined in the guidance

'Stages needed to propose a long-term environmental destination'	'What your environmental destination should look like'
<ol style="list-style-type: none"> <li>1. Review WRNF</li> <li>2. Use scenarios to identify catchments at risk</li> <li>3. Engage with stakeholders</li> <li>4. Develop a proposal to be included in regional plans</li> <li>5. Test your proposed destination with regulators</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the outcomes relating to abstraction you are proposing for the region, including an outcome for each catchment, protected area, SSSI or groundwater body</li> <li>• Explain the decision-making process</li> <li>• Be ambitious</li> <li>• Set out the short, medium and long-term priorities</li> <li>• Clearly state if the proposed actions will achieve the destination (and if not, what further work is needed to help make this happen)</li> </ul>

<sup>12</sup> Environment Agency (2020) Long-term water resources environmental destination: Guidance for regional groups and water companies

<sup>13</sup> We have taken the 'future predicted' BAU and Enhanced scenarios as a reasonable planning scenarios. This is based on

'recent actual' abstraction plus an uplift factor to account for future growth in each sector.

<sup>14</sup> This excludes Idle and Thorne

At this stage in the regional planning process, it is important to note that the data and scenarios used here are a high level, nationally derived tool to inform initial discussions. The long-term abstraction reductions stated in the model should not be taken as exact, rather they are there to facilitate engagement and to prioritise further investigation based on local knowledge.

In line with the guidance, we are using these scenarios to:

1. understand the potential scale and extent of long-term abstraction pressures;
2. identify the catchments with the most significant long-term abstraction pressures through integration into our catchment pressure mapping; and
3. inform the identification, assessment and prioritisation of regional water resources solutions, in parallel with our options appraisal and environmental assessment processes **(Section 4.3)**.

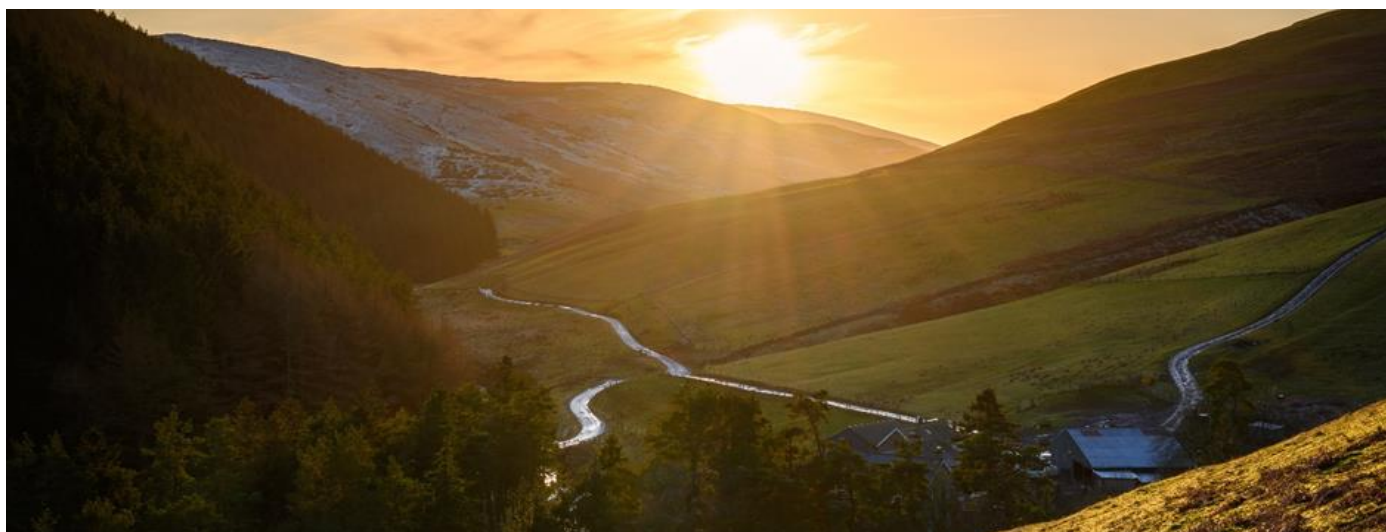
So far, we have completed draft analysis of steps 1 and 2, looking into the abstraction pressures on different sectors across each of the WFD management catchments. This has identified the following areas for further consideration:

- Public water supply impacts: Derwent, Hull, Idle & Torne, Till
  - ~75% of the Enhanced public water supply scenario 'deficit' is linked to 2 large abstractions
- Agriculture impacts: Aire & Calder, Derwent, Hull, Idle & Torne, Tees, Wharfe & Lower Ouse
- Industry impacts: Don & Rother, Hull, Tees
- Power: no impacts other than in Idle & Torne (however this does not reflect expected growth in abstractions in the Humber and Tees catchments as a result of hydrogen and carbon capture storage developments).

These results have been combined with other catchment pressures and reflected in the catchment mapping scores described in Section 2.1 to identify key catchments at risk for further consideration. As the other regional plans develop in parallel, this local knowledge may then inform broader decision making in relation to regional and national solutions.

We are taking an evidence-based approach to environmental destination, working across our key sectors and with regional and local groups, such as catchment partnerships, to identify environmental improvements that are meaningful to our region and its catchments. In addition, we will seek to align the regional planning process to support existing plans, where relevant to water resources, such as the NFU's Integrated Management Strategy. This will be identified through continued engagement with relevant stakeholders. Through this approach, we can coalesce themes from those existing plans, particularly where they have commonality that can be shared at a regional level, or where they exist in high priority catchments.

Given the focus of the regional plan on water resources, our environmental destination is, necessarily, to ensure that our plan reflects other plans and actions where they are relevant to water resources specifically. However, by opening up more routes for external stakeholders to enter into dialogue with water companies, we recognise that there may be other issues or concerns that could be considered for inclusion in investment programmes that go beyond water resources. Our engagement may therefore provide a route for capturing these other concerns and feeding them into other parts of water company business plans.



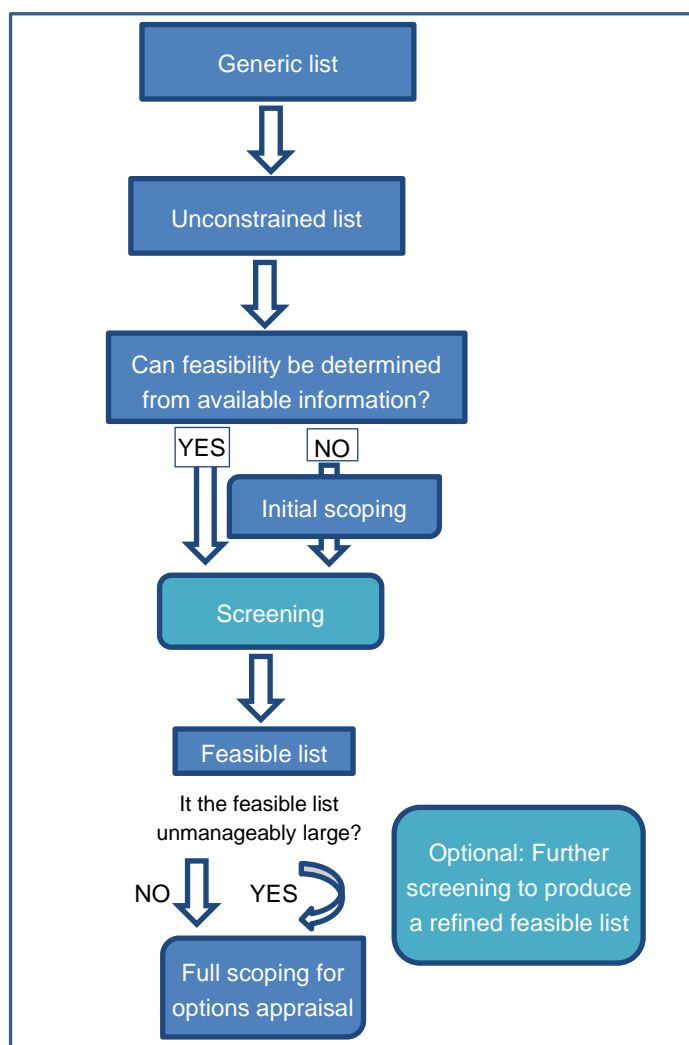


## 4. Regional option development

### 4.1. Options Identification

The options identification methodology follows the process defined in the UKWIR WR27 *Water resources Planning Tools report* (2012) to determine our regional list of feasible options. As a region we will consider options for meeting demand reduction policy requirements, but each WReN water company is considering the demand options that are feasible for their areas. Supply side options will be developed to meet the needs of the region which could be for public water supply, non-public water supply or environmental improvements.

Figure 4. Options Identification process



Our WReN options identification process is outlined in Figure 4, adapted from the WRPG24 Supplementary guidelines on Environmental and Social Decision Making. The generic list of options consider all possible option types for reducing demand and increasing supply. As water companies already review options for WRMPs, their identified options provide

generic regional options that can form the basis of this assessment. However, it is important that these options are assessed against the regional needs in total, across all sectors, as a water company might screen out an option as not feasible for its public water supply needs but if it is assessed against a different need it may be feasible. Similarly, new options could be identified that are derived from a regional need and were not identified as a public water supply option.

In line with the UKWIR WR27 *Water resources Planning Tools report* (2012), an initial or 'unconstrained' list of options are identified where a future deficit is identified. These options are not constrained by factors that would make them undeliverable or unacceptable, such as detrimental environmental impacts, planning constraints or customer standards. Options that meet public water supply needs are appraised in accordance with the Environment Agency's draft *Water Resource Planning Agency's guidelines for WRMP24 (WRPG24)* and any updates once finalised. Non-public water supply needs are considered as part of this process and to ensure we consider a full range of potential options to meet non-public water supply needs, we are reviewing the unconstrained options against the specific need and not limiting the solution to options identified for public water supply needs.

We are also working collaboratively with the other regions and non-public water supply stakeholders in the WReN area to identify opportunities that not only deliver a water resources benefit but also help to contribute to wider regional resilience (e.g. such as flood mitigation). Depending on the need and available solutions there could be an impact on the supply demand balance of a non-public water supply abstractor. It is possible that regional transfer options (RTOs) and WRMP supply-side options could also meet some of these needs and therefore non-public water supply needs will be considered at the option level and the programme level when determining the best value solution. This is considered in the options appraisal methodology.

However, as non-public water supply needs and solutions are not part of the traditional process or water company funding mechanisms, further consultation with other sectors and regulators is required to understand how cross-sector schemes can be progressed towards delivery.

## Development of an unconstrained list of WReN supply options

- Review of companies' WRMP19 supply-side options for meeting supply-demand deficits and transferring to other water companies
- Ongoing engagement with other regions to understand their needs and where there is potential for transfers between WReN and other regions
- Identifying other sector (energy, agriculture, flood mitigation etc.) needs and the potential for collaborative development of options to meet cross-sector needs
- Interpreting and developing the Environment Agency's environmental destination data
- Understanding future availability of resources and if there are any non-PWS resources that could be developed into regional options
- Water companies review of their WRMP19 demand reduction options for decreasing leakage and customer use (household and non-household) although there will be much uncertainty and the risks will need to be considered in the final decision making:
  - Leakage target: a 50% reduction in leakage levels compared to 2017 by 2050 - the target agreed by Water UK is to be achieved at a national level and the WReN water companies will explore options for meeting at a regional level which may be subject to available funding and reliant on innovation.
  - Per capita consumption target: a PCC of 110 litres/head/day by 2050 - likely to be made more challenging as a result of the coronavirus pandemic. This has led to a significant increase in PCC during 2020/21 and will also require Government intervention through appliance water labelling and building regulation changes.

## 4.2. Regional Transfer Options

### 4.2.1. Background to water transfers

We believe that regional water resources planning, alongside water company WRMP planning will help facilitate and improve the assessment of strategic and / or large-scale water transfers. Working at the coarser 'regional' scale will enable all the regions to explore the wider opportunities associated with transfers and promote subsequently greater alignment in WRMPs than in previous planning rounds. This is an important area of activity for us in defining our resource needs, and one that we are actively engaging with other

regions and organisations upon on a 'no regrets' basis.

Regional transfer options may be offered to other regions and potentially become Strategic Regional Options (SROs) if a recipient water company includes the transfer in its preferred solution of its WRMP and relevant regional water resource plan. The term SROs is applied if the proposed cross company transfer is selected through Ofwat's price review process and additional funding allocated to those companies involved in the transfers to help them further develop the schemes. Ofwat created a 'gated process' for developing SROs which requires an option to progress through four gates from concept stage before it can be considered ready for construction. A combined regulatory body known as RAPID has been formed to regulate the gated process. It should be noted that WReN does not currently have options included in the gated process from Ofwat's price review 2019 process but is developing transfer options for consideration in the 2022 regional plans or possibly entering the current gated process if a suitable option is identified.

We are currently investigating potential transfer options and are in discussions with other regions (principally Water Resources West and Water Resources East). Current development of the transfer options includes understanding the sizing and potential likelihood of such schemes and the design and feasibility. It is possible additional resource options may be required to facilitate the feasible regional transfer options. This is dependent on availability of resources in a 1:500 drought scenario, to be agreed long term environmental destination and any public water supply deficit identified in our region.

Noting the differential risk and supply-demand balance position when looking at the spatial building blocks of our plan (as presented in Section 2), how water trades may be facilitated fall into two broad categories:

- **Use of an existing surplus:** Some systems may have a supply-demand surplus that could be available to export to other regions (e.g. Kielder area) under all planning scenarios. Such an export is deemed possible without deployment of further resource options to support it, although other impacts of the export will still need to be assessed (e.g. on the environment).
- **Transfers enabled by supporting options:** As shown earlier in this document, some areas of our region may have specific in-region needs or risks



to address, including resolving potential supply-demand deficits in the area (e.g. Yorkshire Grid). This does not prohibit water transfers, but means that further assessment of options may be required to facilitate a trade that may contribute to national or in-region needs. This still may represent lower cost alternatives than developing new resources in other more water scarce regions.

The following sections outline the transfer options we have been exploring and their current status.

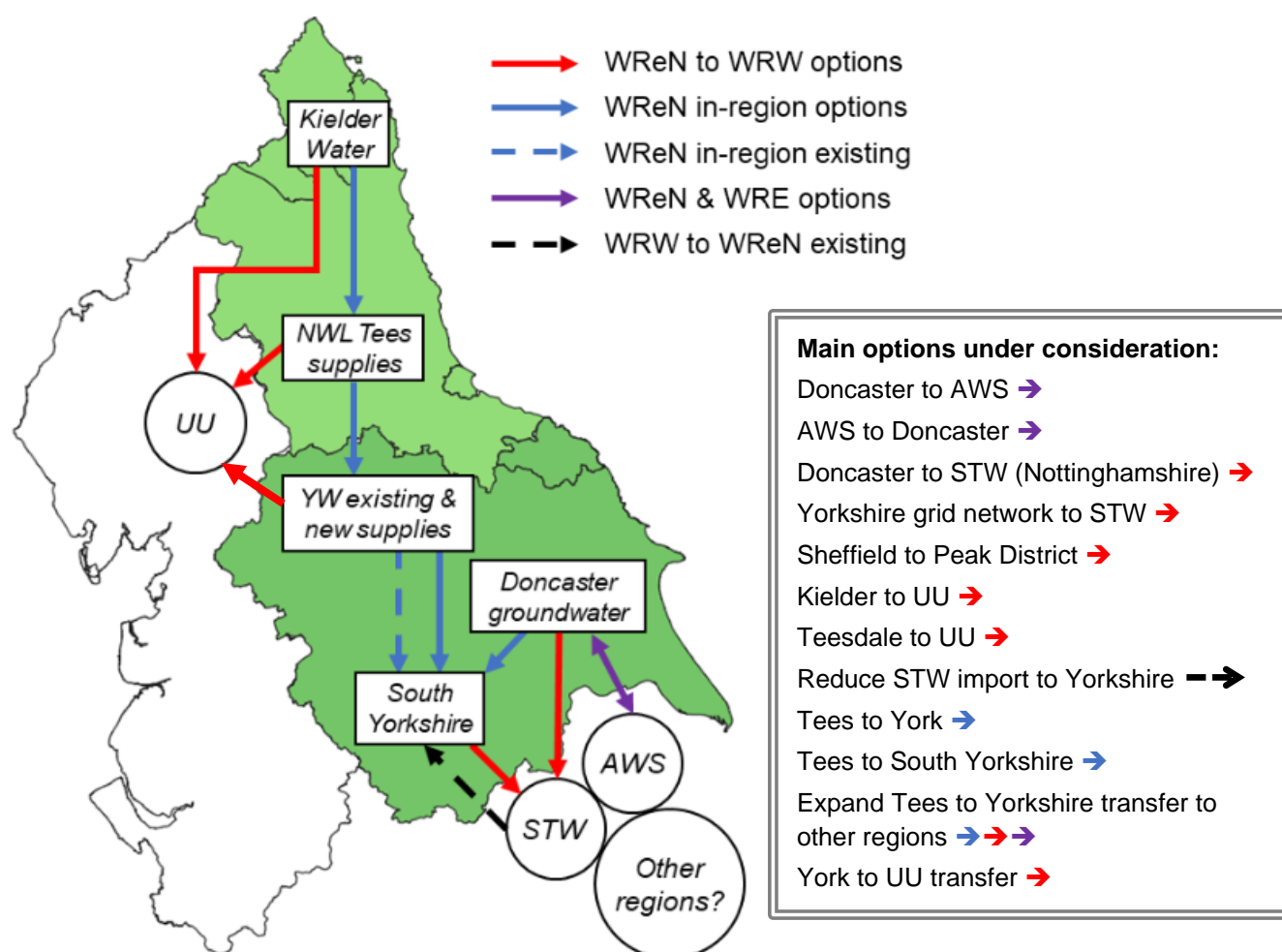
#### 4.2.2. Regional transfer options summary

**Figure 5** below provides a conceptual representation of the types of inter- and intra transfer opportunities that are being explored to meet national and in-region needs. A number of strategic and smaller localised<sup>15</sup> scale regional transfer options and variants are being considered. The main larger scale options are listed in the box below with further details and current

assessment of their feasibility provided in **Appendix 1**.

Further investigation, and scoping and modelling is required to confirm which of the transfers in **Figure 5** are feasible. This will be dependent on the needs of both donor and recipient regions or companies and will become clearer as planning scenarios are developed. We shall continue to work with other regions to confirm options in time for the August 2021 submission.

Figure 5. Inter- and intra- region transfer opportunities



<sup>15</sup> The Regional Plan will consider strategic transfers that have potential to contribute to national resilience. A number of smaller transfer options (e.g. HW potential imports and exports with NWL

or YW) will be assessed at WRMP level as they will address more local issues that would not influence the national strategy.

### 4.3. Options appraisal and environmental assessment

Options identified as feasible for meeting a defined need will be taken through an options appraisal. This process is summarised in Figure 6. We will carry out an options appraisal to meet several scenarios and use a multi criteria analysis approach to select the preferred plan. The multi criteria analysis approach assesses the alternative plans against a range of metrics. It is designed to produce a best value plan for the region as a whole, ensuring water needs are met whilst maintaining environmental protection. This process requires development of bespoke objectives, which will be developed through ongoing engagement with key stakeholders as well as water company customers (as it is being undertaken for WReN at the same time as water companies are developing WRMPs to meet their own company needs and objectives).

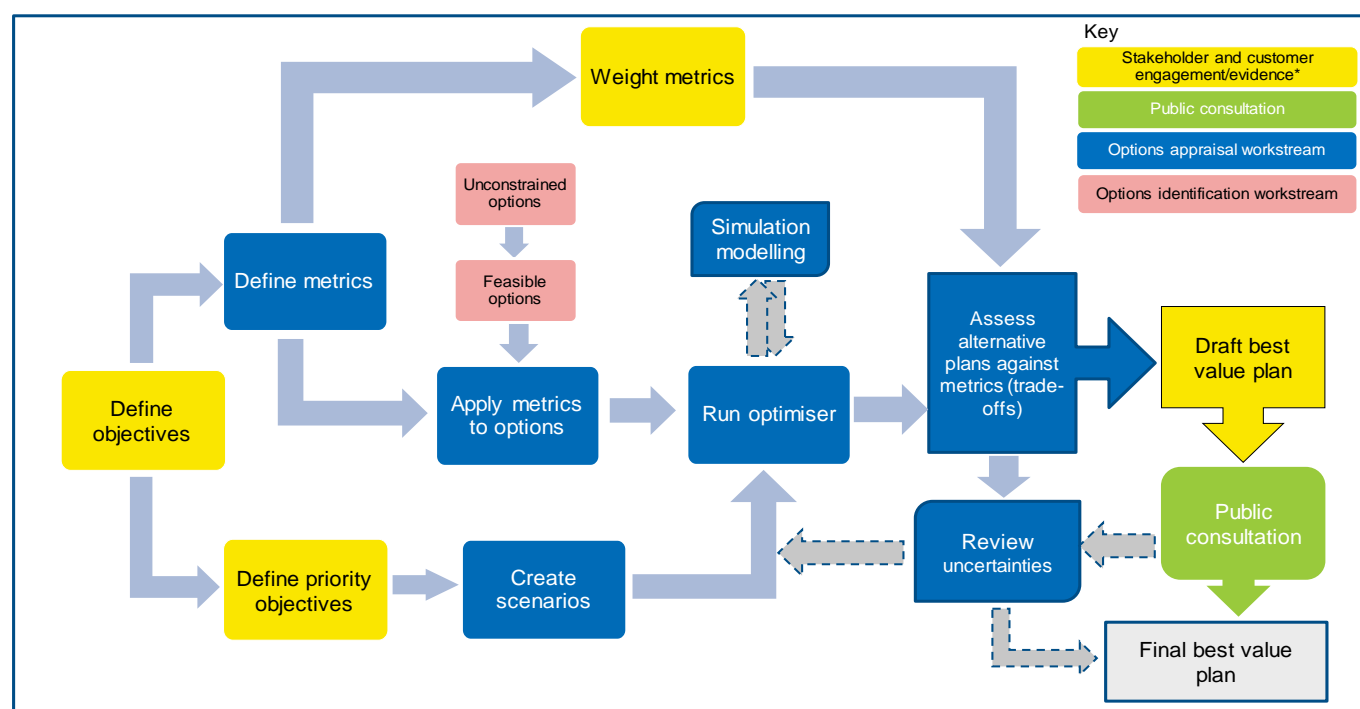
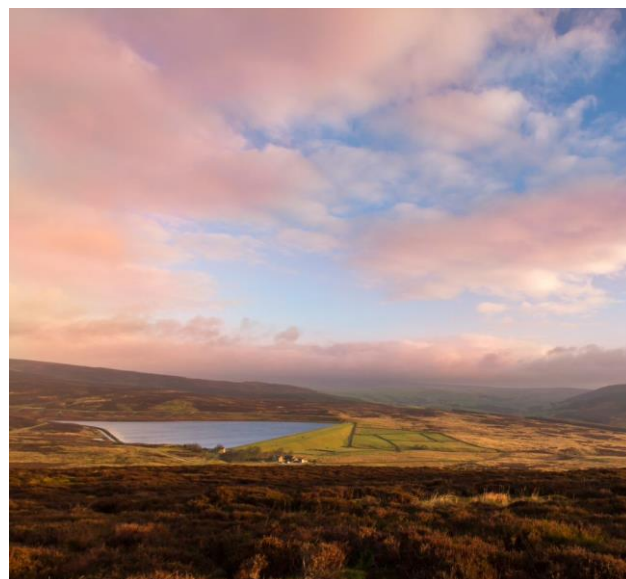


Figure 6. WReN options appraisal process

Regional water resource plans require a multi sector approach to be taken. The decision-making process for determining WReN solutions to regional and national needs will be developed following the Environment Agency Water Resource Planning Guidelines, supplementary guidelines on Best Value Planning and Environment and Social Decision Making and *UKWIR WRMP 2019 methods - Decision Making Process: Guidance*, Atkins 2016 (Decision Making Process). The regional plan looks at wider non-public water supply issues that may drive a supply demand balance need or may identify aspects to be considered when selecting the portfolio solution

for final inclusion in the plan (from the alternatives identified by the option appraisal process). Non-public water supply water resource issues will be very case specific, both in terms of regional plan scale and relevance, therefore the approach to addressing non-public water supply needs will also be case specific. It is important to note that although we will develop the WReN Regional Plan to consider non-public water supply needs, the actual implementation of the plan will be dependent on funding being available and this will be explored with regulators and stakeholders.



#### 4.4. Environmental Assessment

A fundamental part of producing the Regional Plan and WRMPs is integrating environmental effects into the decision-making process to select the “best value” plan and also evidencing compliance with the environmental legislation.

The aim of the environmental appraisals is to provide for a high level of protection of the environment, integrating environmental considerations with a view to contributing to sustainable development. Our environmental appraisal will seek to identify, describe and evaluate the likely significant effects on the environment of implementing the plan, propose measures to avoid, manage or mitigate any significant adverse effects and to enhance any beneficial effects.

The Environment Agency’s WRNF sets out the requirement for development of regional plans. Appendix 2 ‘Regional Planning’ provides a framework for the plans and sets out the actions that ‘must, should and could’ feature in regional plans. Amongst the requirements are that it:

- must include enhanced environmental improvements;
- must also comply with SEA and HRA legislation;
- should look to use the natural capital approach in decision making where appropriate; and
- must include environmental net gain in decision making, to achieve measurable improvements for the environment on a regional and local level.

In addition to the expectations set out in the WRNF, there are a number of other guidelines that we will follow in preparing our environmental assessments, including WRPG and UKWIR methodologies.



For water resources planning purposes, our environmental assessments will consist of:

##### Strategic Environmental Assessment (SEA)

The Regional Plan is not currently a statutory plan and may not legally require SEA. However, the WRNF Appendix 2 identifies that the Regional Plan *must* comply with SEA and HRA legislation. In addition, water companies are required to undertake SEA at a WRMP level and many options for consideration at the regional plan will come from companies WRMPs. Therefore, to ensure consistency and allow comparable assessments, WRMP24 and WReN options will be assessed in an integrated way and an SEA of the Regional Plan will be undertaken.

##### Habitats Regulation Assessment (HRA)

Our HRA will also be aligned with WRMP24 approaches. It will be compliant with the appropriate Directive and Regulations and will take into account recent case law and best practice guidance.

##### Water Framework Directive (WFD) and Invasive Non-Native Species (INNS) assessments

WFD assessment is required for WRMPs and will also be undertaken for the Regional Plan. Our WFD appraisal will be compliant with the WFD and associated Directives. The assessment will include consideration of invasive non-native species risk in line with INNS legal requirements, regulatory guidance and regulatory position statements; as well as additional evidence needs and biosecurity risks.

##### Natural capital assessment (NCA)

We will include an assessment of natural capital including, as a minimum, the following five ecosystem services (as required by WRPG Supplementary Guidance): biodiversity, climate regulation (carbon storage), water purification, water regulation; and natural hazard regulation.

##### Net Gain (Biodiversity and Environmental)

When the Environment Bill 2020 passes into law, plans in England will be required to demonstrate Biodiversity Net Gain (BNG) for options requiring planning permission. While BNG is not yet mandatory, delivering net gain for the environment has become a policy requirement and the 25-Year Environment Plan speaks of embedding an environmental net gain principle for development, including infrastructure. The draft WRPG states that options should incorporate BNG into their design where reasonable and that at the Regional Plan/WRMP stage, BNG could be demonstrated at the overall programme level.

## 5. Next Steps: Building our Draft Regional Plan

### 5.1. August 2021 and January 2022 regional plan versions

In August 2022, we will publish a final draft version of our regional plan, around the same time that water companies also submit their draft WRMP24s. Leading up to the August 2022 date, we will produce two earlier versions of our plan.

The first version will be focussed on ensuring that our regional plan can be aligned with those of other regions, in particular with respect to water transfers between regions, so that a nationally coherent picture is created when all the plans are slotted together. The second version will be published for consultation to allow a wider group of stakeholders, customers and regulators significant opportunity to shape the plan. We have described these two key milestones in more detail below:



#### August 2021 'Initial draft plan':

- This will be the first initial draft version of our regional plan. It will present our latest update of the regional supply-demand balance position, taking into account the latest methods and approaches<sup>1</sup> for this planning round.
- We will present indicative options and plans, which will in particular focus upon regional needs for water resources, environmental destination and our future demand management strategy.
- The plan will have explored a range of prospective inter-regional water transfers, developed and explored with adjacent regions. However, at this stage they could only form 'scenarios' in readiness for the next phase of activity which takes place towards January 2022 (when other regions confirm whether these options may form part of their preferred plans).
- This version of the regional plan allows us to more firmly stake our needs and priorities as a region, prior to focussing further on WReN's role linked to the other regional plans.

#### January 2022 'Draft plan for informal consultation':

- Once the initial draft plans have been produced by each region, a series of iterations of the various regional plans will take place to align the various plans and seek to define an overall set of 'best value plans'.
- This process has the potential to be complex, despite the plans being strategic in nature (compared to WRMPs), and we have recently been heavily involved in joint sessions with other regions to define how this process will work at a national level.
- Following this process, we will develop our best-value plan, taking into account where other regions confirm that water exports from our region are part of their preferred plan. Even where such exports are not confirmed, if there is a reasonable probability that such a water transfer may be needed in future, we may present that as a plan scenario or 'pathway'.
- Following production of this draft plan, we will conduct an 'informal consultation<sup>1</sup>' on the plans with stakeholders, customers and regulators (recognising that they will also have been engaged prior to the submission of this plan).



## 5.2. Key planning questions

Our regional plan will ultimately take into account a vast range of considerations and drivers. However, there are some centrepiece planning questions that will require particular focus in the plan, including:

- Are there any **supply-demand deficits** in the region, and what is our **best-value adaptive plan** to address them? How resilient is our proposed plan to a range of **scenarios**?
- How far should we pursue **enhanced demand management** activities (to reduce leakage and consumption), and what pace should these be implemented taking into account customer affordability?
  - What is our future **environmental destination**, and our future approach to getting there?
  - Do we still consider ourselves resilient to the 1 in 500-year **drought risk** for Level 4 Emergency Plan standpipes and rota cuts by 2039, and if not, what is our plan to achieve this? How does climate change influence drought risk over time?
- Are there any candidate **water trading / exports** from the region being included in other regional preferred plans (defined through the autumn alignment process), and what would the options and impacts be of such exports? What future trading options might be considered feasible, and what might be involved in implementing them?
- Are there tangible **other sector resource needs or opportunities** that can be addressed in the plan, or where other sector options or joint solution development may deliver greater value in the plan?

The above list is not exhaustive of all the factors that we will need to look at to develop our plans, but they indicate the key areas of strategic focus relevant to the regional plan as we move towards our future submissions.

## 5.3. Risks and mitigations

The Regional Coordination Group (RCG) maintains a detailed Risk Register to cover risks that could impact the work of the regional groups in the development and implementation of regional plans, the gated process relating to strategic resource options and water resource management plans / business plans. The risks and mitigations specific to development and delivery of the WReN regional plan are presented in Appendix 2 but are reflective of risks and mitigation actions captured on the national RCG Risk Register. The key areas of risk for WReN in order to develop a plan that truly reflects regional priorities and that is widely adopted by the region and regulators are associated with:

- **alignment with other company and other regions plans** including methodologies, decision making, timelines and level of development to create visibility and uncertainty around available / suitable (trade) options, avoid rework and allow time to deliver best value plans;
- **availability of WReN resources and stakeholders** due to other business pressures and covid-19 impacts to deliver against challenging a timescales and deadlines;
- **lack of visibility in environmental destination source datasets** to develop representative scenarios and articulate a clearly defined and well-scoped environmental destination and developing scenarios; and
- **lack of data and understanding of future demand and supply for other sectors** to co-create and develop a collaborative regional plan.

Mitigation actions that have been undertaken to proactively manage the risks include:

- developing a clear governance process and a programme that is shared, regularly reviewed and tracked against delivery;
- prioritising activities, monitoring resources and employing specialist consultants to provide capacity and capability for delivery against the programme;
- creating an agreed stakeholder engagement plan and undertaking early dialogue to agree the plan and approach; and
- attending the RCG regularly with representatives from other regions and drawing on the wider network of Water Company contacts and groups to share, review and discuss approaches and progress.

## 5.4. Programme & future tasks

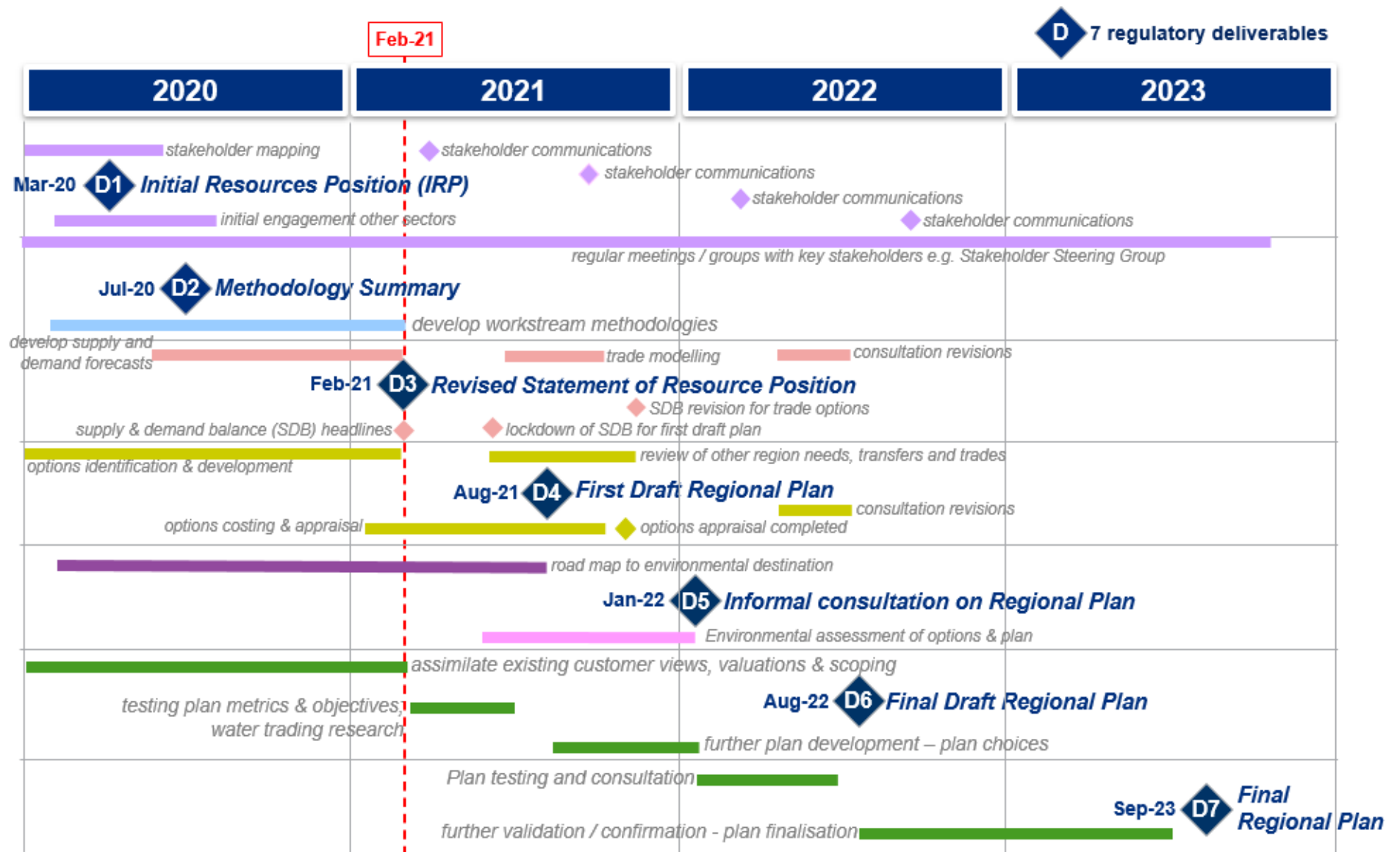


Figure 7. WReN forward look programme

# Appendix 1. Summary of WReN regional transfer options

AWS and Doncaster	
Receiving region:	WRE
Option description:	A transfer between AWS and YW's existing groundwater licences in the Doncaster area is being investigated. Both companies could benefit from a bi-directional pipeline transferring treated water. This would be for use in extreme drought events (1:200 and 1:500) dependent on water availability. Mutually exclusive with Doncaster to STW option.
Option sizes / variants:	12 – 20MI/d Further variant potential depending on confirmation of YW needs but would require additional infrastructure/asset investment.
Engineering scoping completed to date:	Assessment of water availability has identified additional treatment capacity would be required as well as the connecting pipeline.
Key specific constraints / barriers to explore:	Future local demand needs could limit the volume available. Benefit dependent on WINEP investigation to be complete 2025. Availability in drought years to be confirmed.
Current requirement for other resource options to support?	This will need to be determined through scenario analysis. There is potential for local demand to be met from alternative sources but would need to be considered once the supply demand balance is confirmed and subject to sensitivity testing.
Current assessment of feasibility:	WReN in discussions with WRE.

Doncaster to STW (Nottinghamshire)	
Receiving region:	WRW
Option description:	Transfer to STW from YW existing groundwater licences in the Doncaster area. Mutually exclusive with AWS to Doncaster option
Option sizes / variants:	12 – 20MI/d Potentially raw or treated depending on water availability and new treatment infrastructure.
Engineering scoping completed to date:	Assessment of water availability has identified raw water potentially available and that additional treatment capacity could be installed but availability depending on YW's needs.
Key specific constraints / barriers to explore:	Future local demand needs. Benefit dependent on WINEP investigation to be complete 2025. Mutually exclusive with AWS option. Availability in drought years to be confirmed.
Current requirement for other resource options to support?	N/A
Current assessment of feasibility:	WReN in discussions with STW.



## Yorkshire grid network to STW

Receiving region:	WRW
Option description:	Treated water transfer to STW from Yorkshire grid network. YW's current conjunctive system could provide water to STW through duplication of an existing pipeline to South Yorkshire then additional main to STW .
Option sizes / variants:	20MI/d average, 25MI/d peak
Engineering scoping completed to date:	Assets and infrastructure scoped to WRMP level. May require review.
Key specific constraints / barriers to explore:	Modelling required to confirm availability in 1:500 scenario
Current requirement for other resource options to support?	Could require investment in new source of supply to substitute the volume transferred out of the grid network
Current assessment of feasibility:	Potentially feasible but dependent on modelling and would need to be considered once the supply demand balance is confirmed and subject to sensitivity testing.

## Sheffield to Peak District

Receiving region:	WRW
Option description:	Treated water transfer from YW Sheffield WTW to STW
Option sizes / variants:	50MI/d
Engineering scoping completed to date:	Pumps and pipeline routes scoped previously.
Key specific constraints / barriers to explore:	Would be dependent on Yorkshire Water providing alternative supply to the South Yorkshire area that did not require use of the Sheffield area WTW
Current requirement for other resource options to support?	An alternative treated source of supply to South Yorkshire
Current assessment of feasibility:	Constrained out as currently no alternative treated source identified for Yorkshire Water customers

## Kielder to UU

Receiving region:	WRW
Option description:	Raw water transfer from Kielder Water to UU. Will require construction of pumping station at Kielder and pipeline to recipient reservoir.
Option sizes / variants:	100MI/d and 150MI/d for 3 months per year
Engineering scoping completed to date:	Currently being undertaken by UU.
Key specific constraints / barriers to explore:	INNS risk and other environmental impacts of pipeline and other infrastructure requirements. NWL modelling to confirm availability
Current requirement for other resource options to support?	N/A
Current assessment of feasibility:	Feasible but dependant on outcome of NWL modelling to confirm available volumes.

## Teesdale to UU

Receiving region:	WRW
Option description:	Raw water transfer from NWL Cow Green reservoir to UU. Will require construction of pipeline to recipient reservoir.
Option sizes / variants:	45MI/d
Engineering scoping completed to date:	Currently being undertaken by UU
Key specific constraints / barriers to explore:	INNS risk and other environmental impacts of pipeline route and construction. Depending on other potential combinations of transfers may require upgrade of electricity supply to Riding Mill. NWL modelling to confirm availability.
Current requirement for other resource options to support?	N/A
Current assessment of feasibility:	Feasible but dependant on outcome of NWL modelling to confirm available volumes.

## Reduce STW import to Yorkshire

Receiving region:	WRW
Option description:	South Yorkshire currently reliant on an import from STW. STW may reduce or terminate the import within the terms of the contract. Alternative means of meeting the demand are being investigated. These include re-routing existing supplies and installing new connections to transfer existing and new supplies to the South Yorkshire area.
Option sizes / variants:	Investigating a range of options to provide between 25 - 50MI/d average and 34 – 68MI/d maximum.
Engineering scoping completed to date:	Pipeline route selection for new connections, assessment of ability to re-route existing supplies and the system constraints and assessment of the availability of alternative sources of supply.
Key specific constraints / barriers to explore:	Re-routing existing supplies could lead to a deficit in the 1:500 scenario. Requires modelling to confirm options and risks. Timescales will be a key constraint depending on when the import might reduce/cease and which options are needed to replace the loss of supply.
Current requirement for other resource options to support?	Potential for Yorkshire Water WRMP options to support any displacement of existing resources. This includes the in-region WReN transfer options - Tees to York or Tees to South Yorkshire.
Current assessment of feasibility:	Various combinations of options being investigated and expect feasible solution to be identified but may create risk to security of supply in the 1:500 scenario, particularly if full STW transfer volume is terminated. Timing of when any new assets or infrastructure are needed could be a constraining factor.

## Tees to York

Receiving region:	In-region
Option description:	In-region transfer from NWL Tees to YW York area. Variations on transfer route being considered including full pipeline or combination of river transfers and pipelines.
Option sizes / variants:	50, 80, 140MI/d
Engineering scoping completed to date:	Pipeline route selection, investment in NWL infrastructure at higher volumes and review of potential INNS mitigation options.
Key specific constraints / barriers to explore:	INNS risk and other environmental impacts of pipeline or river transfer. Availability of electricity supply to pump higher volumes from Kielder to support the Tees. NWL modelling to confirm availability.
Current requirement for other resource options to support?	N/A
Current assessment of feasibility:	Pipeline feasible but river transfer likely to be constrained out and volumes unconfirmed.



## Tees to South Yorkshire

Receiving region:	In-region
Option description:	In-region transfer from NWL Tees to YW South Yorkshire area. Variations on transfer route being considered including full pipeline or combination of river transfers and pipelines. Mutually exclusive with Tees to York in-region option.
Option sizes / variants:	50, 80, 140MI/d
Engineering scoping completed to date:	Pipeline route selection, investment in NWL infrastructure at higher volumes and review of potential INNS mitigation options.
Key specific constraints / barriers to explore:	INNS risk and other environmental impacts of pipeline or river transfer. Availability of electricity supply to pump higher volumes from Kielder to support the Tees. NWL modelling to confirm availability.
Current requirement for other resource options to support?	N/A
Current assessment of feasibility:	Pipeline feasible but river transfer likely to be constrained out and volumes unconfirmed

## Expand Tees to Yorkshire transfer to other regions

Receiving region:	TBC
Option description:	Transfer from NWL Tees to YW area could be expanded to other regions if a recipient location is identified. This could be transferred via either South Yorkshire or York before transfer to other regions. Variations on transfer route being considered including full pipeline or combination of river transfers and pipelines.
Option sizes / variants:	50, 80, 140MI/d
Engineering scoping completed to date:	Pipeline route selection, investment in NWL infrastructure at higher volumes and review of potential INNS mitigation options. This work has been carried out to assess feasibility of the Tees to York and Tees to South Yorkshire options and the same scope could be used to aid onwards transfer. Additional infrastructure/assets would be required.
Key specific constraints / barriers to explore:	INNS risk and other environmental impacts of pipeline or river transfer. Availability of electricity supply to pump higher volumes from Kielder to support the Tees. NWL modelling to confirm availability. YW modelling and option appraisal to confirm impact in its supply area and whether Sheffield or York routes best value
Current requirement for other resource options to support?	Unknown at present but exact scheme dependent on YW needs and recipient's needs.
Current assessment of feasibility:	Pipeline feasible but river transfer likely to be constrained out. Volumes unconfirmed at present.

York to UU transfer		
Receiving region:	WRW	
Option description:	UU is investigating the potential for YW to provide raw water from an existing river licence to UU. It will be transfer via a combination of new infrastructure, rivers and canal networks.	
Option sizes / variants:	50MI/d assumed but unconfirmed.	
Engineering scoping completed to date:	UU carrying out high level scoping to assess feasibility.	
Key specific constraints / barriers to explore:	<p>The availability of the resource is pending results of a WINEP investigation. 1:500 scenario modelling would need to be carried out to confirm the availability in drought years.</p> <p>It is not yet known if the transfer route is feasible.</p> <p>This is a critical resource for YW's future security of supply and alternative sources would need to be available if it was to be transferred to UU.</p>	
Current requirement for other resource options to support?	Subject to YW's supply-demand balance and future needs. The use of this source is likely to appear in YW's solution scenarios and possibly WReN solutions. An alternative source could be identified but further understanding of the risks is required.	
Current assessment of feasibility:	Unknown and subject to UU feasibility scoping outcome and the above constraints / barriers.	

## Appendix 2. Summary of WReN risks and mitigations

The table provides a summary of each risk, its potential impact and a current Red Amber Green (RAG) residual risk status (after mitigations). A summary of key mitigation actions is given below the table.

**Table 6. WReN risks and mitigations**

Id	Activity	Risk	Potential impact of risk	RAG
1	Stakeholder engagement	Delayed or curtailed engagement with regulators and other sectors / stakeholders due to impact of covid-19 and / or their availability with other business pressures	Plan does not truly reflect regional priorities and is not adopted widely within the region or by regulators.	♦
2	Co-creating with (non-PWS) other sectors	Lack of data and understanding of other sector future water demands and supply sources.	Plan does not truly reflect regional priorities and is not adopted widely within the region or by regulators.	♦
3	Development of methodologies	Lack of agreement within the region on methodologies	Misalignment across companies leading to lack of visibility, uncertainty and agreement on priorities and available / suitable options for the regional plan with potential rework and insufficient time to deliver a best value plans.	♦
4	Regional plan decision making	Lack of clarity on decision making process either within region or nationally	Misalignment with other company and regional plans including methodologies, timelines and level of development leading to lack of visibility and uncertainty around available / suitable (trade) options and late / lack of agreement, rework and insufficient time to deliver best value plans.	♦
5	Articulating environmental destination	Inability to articulate a clearly defined and well-scoped, environmental destination for the region	Environmental destination is too broad to be accommodated within the regional plan (i.e. too many issues to cover), or is too narrow and not seen as ambitious enough.	♦
6	Developing Environmental Destination scenarios	Lack of visibility in Environmental Destination source datasets. National level assessment.	Scenarios do not fully represent regional/local picture. Difficult to align Environmental Destination data WRNF data.	♦
7	Delivering against timeline	Challenging timescales for regional planning (and dependent WRMP & DP) with little float	Missed deadlines or incomplete tasks leading to a plan that is not truly reflective of regional priorities and is not adopted widely within the region or by regulators.	♦
8	Managing resources	Lack of resources due to reliance on key individuals to deliver company and regional planning, and DP, and the impact of Covid-19 and / or other business pressures such as dry weather or other operational support	Missed deadlines or incomplete tasks leading to a plan that is not truly reflective of regional priorities and is not adopted widely within the region or by regulators.	♦
9	Co-creating with (non-PWS) other sectors	Lack of data and understanding of other sector future water demands and supply sources.	Plan does not truly reflect regional priorities and is not adopted widely within the region or by regulators.	♦



The risks have been managed proactively with actions to reduce the likelihood and / or impact should they occur including:

- **Developing a governance process** within WReN including clear ownership of tasks, programme management, decision making, escalation routes and communication / stakeholder engagement plans;
- **Creating an agreed stakeholder engagement plan** based on priority catchment areas, in tandem with more generic engagement across whole region;
- **Undertaking early dialogue and engagement** to facilitate understanding of requirements and timelines and their contribution and constraints;
- **Planning and agreeing an approach with stakeholders** that works around existing restrictions (e.g. via email, WebEx) with early scheduling of key and regular consultation points / meetings as appropriate;
- **Attending the Regional Coordination Group (RCG) regularly** with representatives from other regions to share and debate approaches and progress and facilitate alignment;
- **Drawing on the wider network of Water Company contacts and groups** to share, review and discuss approaches and progress;
- **Developing a clear programme** of tasks / activities, milestones and task owners to track against progress and create visibility of each contributors input, their dependencies and critical paths;
- **Planning and regularly reviewing the resources** against the programme including:
  - *monitoring other work commitments* with early escalation if dry weather or other operational support requires a significant diversion of effort; and
  - *employing specialist consultants* for certain tasks (such a programme management) to support and provide additional capacity and flexibility; and
- **Prioritising activities** (e.g. relating to key components / areas of uncertainty) that are most likely to impact on supply and demand balance and delivery of the Plan.

# How to find out more

More information about Water Resources North, including our publications and how you can contact us, is available on our website, [www.waterresourcesnorth.org](http://www.waterresourcesnorth.org).

