Draft Water Resources Management Plan

Statement of Response

Prepared by the Water Resources Strategy Team
03 September 2018

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Statement of Response

We published our draft Water Resources Management Plan (WRMP) for consultation in February 2018. We were pleased to receive comments on our draft WRMP from 22 different stakeholders. We have reviewed each of these and, where appropriate, we have used the feedback to update and improve our plan. We are confident that these changes do not materially alter the recommendations made in our draft WRMP.

This Statement of Response document follows a 12-week consultation process and includes:

- A summary of the key messages we received from our stakeholders.
- An overview of the improvements we've made to our WRMP both as a result of this feedback and better information becoming available.
- The impact of these changes on our plan.
- Supporting appendices A and B which provide more technical detail where required and include any updates to the draft WRMP text.
- Supporting appendix C which lists all of the stakeholder comments we received and shows how we have responded.

We expect to publish our final WRMP in early 2019. In our final WRMP, we will take the opportunity to align the boundaries of Severn Trent Water and Dee Valley Water to the national boundaries of England and Wales. We will also take the opportunity to improve the links between our WRMP and PR19 Plan which we will submit to Ofwat on 3 September 2018. These two regulatory submissions are aligned, with the PR19 Plan recognising the need to protect customers from the inherent uncertainty of long term forecasts and the transition to converged definitions for leakage and per capita consumption.

1 Summary of the key messages from the consultation process

Our draft WRMP described our long term plans to maintain secure water supplies to customers while ensuring that our abstractions do not damage the environment and we adapt to climate change risk. We used an adaptive planning approach to develop a package of best-value interventions to address a projected supply / demand balance shortfall of 164Ml/d by 2025, growing to around 320Ml/d by 2030. These interventions covered both demand and supply, and recognised the need to work more widely with other stakeholders to ensure our customers received an environmentally sustainable and reliable water supply now and in the future.

We encouraged a wide range of stakeholders to respond to our draft WRMP. While we did not receive any objections to our supply and demand proposals, there were some important topics where stakeholders challenged us to do more for our final WRMP. Table 1.1 overleaf summarises those topics into key themes, and sets out the action we have taken for our final WRMP.

Table 1.1. Key themes important to our stakeholders

Theme	Position in our draft WRMP	Action we have taken	Materiality of the changes we have made
Underlying assumptions – customers & engagement	Our draft WRMP was informed by deliberative customer research into supply / demand needs and options.	We've continued with our customer engagement through our PR19 investment planning process, and we have used this further insight to inform our final WRMP thinking.	We've introduced measures to protect customers from the risks around a large scale investment programme that is driven by climate change uncertainty.
Demand management - Leakage	Reduce leakage by 15% in AMP7, with modest reductions in later AMPs depending on supply / demand need	We've increased our leakage ambition to achieve a 50% leakage reduction over 25 years. In AMP7 we will prioritise leakage reduction in the areas of greatest supply / demand need. In AMP8 and beyond we will expand our leakage reduction activities into all of our Water Resource Zones (WRZs) regardless of supply / demand need.	This is the largest change to our draft WRMP. We move from a 19% leakage reduction over 25 years to a 50% reduction.
Demand management - Metering & water efficiency	Adopting an enhanced metering programme to achieve 100% coverage by end AMP9.	We've benchmarked our planning assumptions against other companies' reported experience. We've initiated an enhanced metering trial to reduce uncertainty around our delivery plan. We've introduced measures to protect customers from the delivery risks associated with a large metering programme.	No change to our ambition of 100% meter coverage by end AMP9
Underlying assumptions – Water Industry National Environment Programme (WINEP) version 3	Based on the understanding of sustainability reductions indicated in WINEP2.	We've completed our AMP6 investigations into environmental impacts of abstraction, and we've updated our understanding of WFD deterioration risk. These conclusions were reflected in the Environment Agency's release of WINEP3 in April 2018. We've updated our supply / demand assessment to incorporate any changes between WINEP2 and WINEP3.	Minor changes to the supply / demand balance in our Forest & Stroud WRZ and our Nottinghamshire WRZ.

Theme	Position in our draft WRMP	Action we have taken	Materiality of the changes we have made
Supply – Water trading	We considered a number of potential new water trading options, but we did not include any new active trade in our draft WRMP. The preferred programme of options in our draft plan included an option that had consequences for the existing raw water export arrangements to Yorkshire Water.	We've revised the scope of our option to increase output from Derwent Valley Reservoirs so that it no longer impacts on Yorkshire Water's WRMP. We've continued to explore feasible new trading options with neighbouring companies. We have ensured that trading assumptions are aligned across different' companies' final WRMPs.	The overall preferred programme of options is not materially different from our draft WRMP.
Supply – Water supply options	Enhancements to a number of existing water treatment works plus new strategic transfer capacity to provide 307Ml/d of new deployable output over 15 years.	We've revised the timing and scope of the programme of our supply-side options described in our draft WRMP to take account of our latest understanding of impacts on others, WINEP3 requirements and the costs and benefits of the supply-side options.	The overall preferred programme options is not materially different from our draft WRMP. We have introduced measures to protect customers against the risks of such a large infrastructure investment programme and the associated uncertainties.

Each of these themes is explored in more detail in Section 3 and the associated appendix (Appendix A).

As well as these key themes, stakeholders also asked us for more detail on a number of technical aspects of our planning and decision making. We provide more detail on these topics in Appendix B of this Statement of Response, and we provide the additional narrative that will be included in our final WRMP publication. The main topics on which we provide additional technical detail are:

- Biodiversity and catchments
- Climate Change & uncertainty
- Decision making & assurance
- Demand forecast
- Drought risk
- Outage
- Resilience
- Working with retailers
- WRMP table corrections

2 Aligning the WRMP and PR19 processes

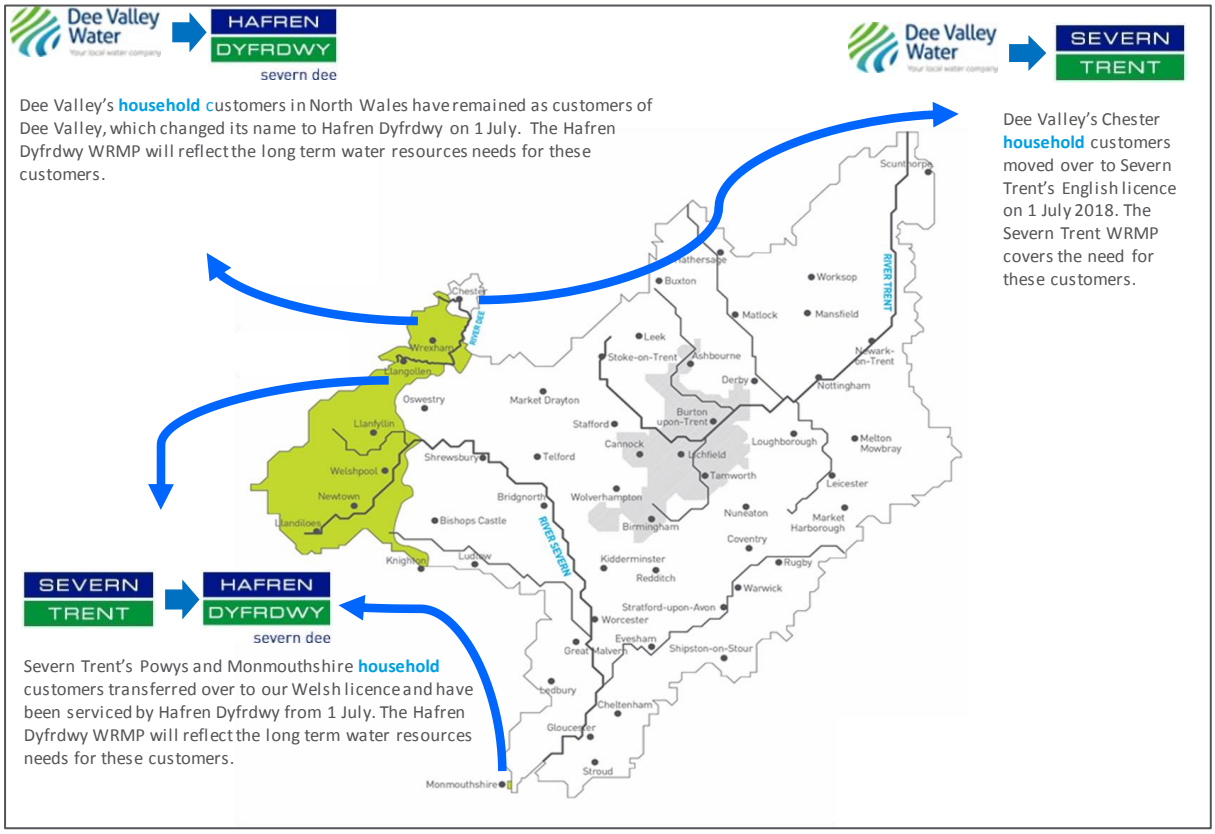
Alongside our WRMP, we are also finalising our PR19 Business Plan which we will be submitting to Ofwat, our economic regulator, in September 2018. Our PR19 Business Plan describes the long term investment requirements needed to achieve all of our water and waste-water performance commitments. There are important links between the WRMP and PR19 Business Plan and we have taken great care to make sure that any changes to our supply and demand proposals since we published our draft WRMP are reflected in both plans.

Impact of boundary changes

In February 2017, Dee Valley Water became part of the Severn Trent group. Earlier this year, Ofwat approval was received to align the boundaries of Severn Trent and Dee Valley Water to the national boundaries of Wales and England. In line with this approval, we launched Hafren Dyfrdwy on 1 July 2018 to serve our customers in Wales.

The diagram below shows how customers have moved between the two companies and how this impacts the final WRMPs which will be produced based on the new licences:

Figure 2.1 Severn Trent and Hafren Dyfrdwy boundary changes



Both Seven Trent and Hafren Dyfrdwy customers should expect their respective WRMPs to uphold the requirement to ensure there is sufficient water to meet demand over the long term.

We recognise that the draft WRMPs were published based on the old licence boundaries with the subsequent consultations carried out on this basis. The final WRMPs will respond to feedback received on the new boundaries. This statement of response refers to consultation comments received on our Severn Trent Water draft WRMP. A separate Statement of Response will be prepare for consultation comments made on the Dee Valley Water draft WRMP.

Managing uncertainty - climate change projections

An important feature of both our WRMP and our PR19 business plan is our approach to managing uncertainty. In infrastructure industries, managing uncertainty appropriately is critical to delivering the best outcome for customers. Investment lead times can be quite long, with investment decisions being based on forecasts which inevitably carry an inherent degree of risk.

Specifically in terms of our WRMP, we plan to protect customers' security of supply from the long term impacts of climate change. However, while we have followed recommended best practice on factoring climate change assumptions into our thinking, we recognise there is significant uncertainty around the timing of these impacts.

We recognise that if this uncertainty is managed in the wrong way, there is a risk that we may commit our customers to pay for investments that are otherwise not required, or we could face risks to delivering our performance outcomes and obligations. Through the PR19 process, failure to protect customers from these cost and performance risks could result in Ofwat rejecting our business case for the additional supply / demand investment needed to deliver our WRMP.

In order to meet the needs of both the WRMP and PR19 Business Plan processes, we have made improvements to our business planning approach to deliver two objectives for the AMP7 period:

- Protect the interests of customers by not exposing them to the risk of unnecessary upward pressure on bills, and;
- Improve our ability to respond to new information that reduces uncertainty.

The key features of our approach are:

- Our WRMP will continue to follow a twin-track approach with an ambitious demand-side strategy and 22 supply-side options to address the future challenges modelled in-line with best practice guidance.
- Our PR19 business plan will include the investment for the three highest confidence supply-side options – these are required to start in AMP7 (period 2020-25) under any future scenario regardless of climate change uncertainty;
- During AMP7 we will use an uncertainty mechanism as the means to deliver the additional supply-side options as our understanding of the need improves when updated climate change projections (UKCP18) become available. We will use Ofwat's in-period Outcome Delivery Incentive (ODI) process to access funding;
- Our approach will not expose customers to a significant increase in risk – we have taken reasonable steps to ensure new supply-side options can still be delivered in the AMP7 period if needed. As well as the full investment for the three certain options, our PR19 plan will include investment to carry out feasibility and detailed design on the remaining supply-side options in our preferred programme.

Our approach is an example of 'adaptive pathways' thinking. This allows for better decision making and creates a more transparent dialogue with customers and stakeholders on managing climate change uncertainty. We will use our annual performance report to monitor trends and describe the resulting actions that we will take. We will also work with other organisations to develop clearer lead indicators for climate change.

Managing uncertainty – water metering

Feedback on our draft WRMP included comments on the deliverability of our metering programme, and we respond to these in this Statement of Response. We have also created an ODI around the metering programme for inclusion in our PR19 plan. This ODI is designed to protect customers from the uncertainty of achieving the increased meter installation rate described in our WRMP.

The design of the ODI means that customers' AMP7 bills will reflect investment for around two-thirds of the 2020-25 meter volumes included in the WRMP. The remaining one-third will be reflected in bills at the end of the 2020-25 period (i.e. effectively customers will be paying for these meters in arrears rather than upfront).

The WRMP is not affected by this mechanism. Our PR19 plan will reflect the outcomes of the metering programme (including the projected impact on Per Capita Consumption), but not the full investment associated with the metering programme.

Convergence of leakage reporting methods

Our WRMP and PR19 plans address leakage performance in different ways. Our PR19 plan will contain performance commitments based on new industry reporting guidelines for leakage and Per Capita Consumption (PCC) whereas our WRMP has retained our current definition. Following Ofwat's guidelines, our PR19 leakage performance commitment will be expressed as a three-year average, while the WRMP quotes future leakage targets as annual figures.

While the PR19 plan and the WRMP express our leakage performance commitments and targets using different methods, we have worked hard to ensure that the effects to the supply / demand balance are aligned.

Building resilient water supplies – a joint letter

In August 2018, Defra, the Environment Agency, Drinking Water Inspectorate and Ofwat jointly set out the actions needed to ensure that water companies are on track to build resilience in water resources management in England. Their letter called for companies to own the challenge of meeting customers' water needs in a safe, resilient and efficient way while balancing the need to protect the environment, respecting good supply practice and meeting the needs of other water users. We welcomed this joint statement from our regulators as it reinforced the need for many of the water supply and demand actions already included in our WRMP and PR19 plans.

The joint letter set out regulators' expectations around the following challenges:

- Increasing ambition in the forthcoming business plans.
- Regional water resource planning.
- Greater use of markets and competition.
- A clear direction from government.
- A responsive regulatory approach.

We are fully supportive of meeting these challenges. We have already committed to reducing leakage by 15% over the next five years alongside a stretching commitment on reducing water consumption. We are planning to retain this momentum, which together with other measures such as legislative change on water efficiency standards for new homes and technological improvements on our network, will see a halving of leakage and consumption rates over the coming decades. Our WRMP contains an ambitious step-up in metering rates, an essential tool in reducing consumption. We know there are delivery risks, so we've sought to ensure the onus is on us to deliver rather than place the risk on customers. Our approach to demand management also includes a novel new way of ensuring future generations understand and value water.

Defra's letter emphasises the need to turn thinking into action. We have been actively looking at cross-sector solutions and want to build on the success of already having secured the largest ever abstraction rights trade between two utility sectors in 2016. As well as including a mechanism in our PR19 Plan to enable us to make real progress on an interconnector to transfer water from the North West to the South East, we'll continue to contribute to regional and multi-sector water resources planning. We are active participants in all regional groups; Water Resources East, Water Resources South East, Water Resources North and most recently West Country Water Resources.

We have initiated two multi-sector working groups on the primary river transfer routes that run through our region; the River Severn Working Group and the River Trent Working Group. The purpose of these groups is to understand the potential in-combination impacts of transfer and new abstractors on the rivers. Critically, we have included investment in our plan to carry out meaningful feasibility on our water resource options as we build towards the next price review and water resource management plan.

In our PR19 plan we have put forward an innovative approach to managing the uncertainty around the impacts of climate change on our water resources investment needs. Our adaptive pathways approach will allow us to respond to new information about climate change risks and uncertainty in a way that protects customers from unnecessary bill impacts.

Another area of note is the need to make plans easier to understand to improve engagement with customers and other water users. We are committing to including analysis of potential climate change impacts in our Annual Performance Report. Until now, this has largely been a technical and academic debate but we believe more should be done to make customers part of the decision making process. Our approach is linked to the mechanism we have developed to manage climate change uncertainty. We will look into whether we can do more to share information on other key assumptions regional economic and population forecasts as these are critical in determining risks and the pace at which we should adapt and change to ensure we can meet customers' water needs in a safe, resilient and efficient way.

3 Changes to our draft WRMP

3.1 Customers and engagement

Throughout the process of preparing our draft WRMP, our thinking and decision making was shaped by ongoing engagement with customers, stakeholders and our Water Forum. We explained our approach in Chapter 7 of our draft WRMP.

What stakeholders told us:
The Consumer Council for Water (CCWater), Ofwat and the Environment Agency all asked for more information on how customers had informed our draft WRMP and our decision making. In particular, they asked for more information on how customers had been consulted on their willingness to pay for different supply / demand options and in particular how customers had informed our leakage strategy.

We were also asked to make our WRMP more accessible to a non-technical customer audience, and to provide a clearer summary of our overall strategy to meet the future supply / demand balance challenges.

What we've done:
Since our draft WRMP was published, we have continued our customer research using face to face constructive, collaborative discussions with our customers about how we should approach delivering water supply and demand improvements. To ensure we gained appropriate understanding of our customer views we used a variety of different approaches, including deliberative research. One of the biggest advantages of using deliberative research is that is allows for in-depth discussion with customers not just about needs and outcomes, but also approach. Customers gained in understanding as our day-long workshops and sessions progressed. This enabled a more meaningful exploration of issues that could not be achieved using more traditional qualitative and quantitative approaches.

We have also used innovative techniques to gain insight from social media on customers' views and priorities. We also commissioned some additional customer research in response to the stakeholder responses to our draft WRMP.

Our insight into customers' views on water supply and demand is now even richer than at the time of writing our draft WRMP, and comes from a number of sources. Issues such as leakage tend to be top of mind and our evidence sources include our analysis of customer contacts, social media scraping and numerous research projects. For other aspects such as metering and water efficiency we have used co-creation to work with customers to understand how they can be part of the solution.

Since customers are not always aware of the future pressures on water availability we have used our deliberative research to explore perceptions of water stress and the best way we can meet these challenges. It is only when prompted that customers recognise the pressures of ensuring there is sufficient availability of water for future generations and understand that everyone has to play their part to make this happen.

Our deliberative research tells us that customers have a strong moral viewpoint when thinking about water usage, resulting in an emphasis on personal and corporate responsibility to use less water. Because of this, our customers tend to favour demand management approaches over supply-side approaches, but they recognise that any solution will need to include a blend of both approaches.

Overall, there is a clear expectation from customers that we should have plans in place to ensure a continuous water supply, both now and in the future. As part of this, customers expect us to be prepared to address any long term challenges which could affect water supply, such as climate change or population growth. Customers also expect us to meet our statutory obligations, including those related to restoring unsustainable abstraction and ensuring no environmental deterioration.

Customers want Severn Trent to pursue the best value supply/demand options, not necessarily just the lowest cost ones, and questions of value and bill impact were particularly important to customers when thinking about solutions that will take a number of years to implement. While most customers are happy to contribute to the cost of long-term water security, they are clear this should be spread out over time, so as not to cause undue financial burden for customers.

More detail on our customer engagement approach and what we have learned is provided in Appendix A1

We have reviewed the format of our WRMP to try and make it more accessible to a non-technical audience. When we publish our final WRMP we will also publish an accompanying more customer-friendly summary of our strategy.

How we've changed our plan:
The additional customer insight gives us confidence that we are making the right improvements to our WRMP.

Our new, more ambitious long term leakage targets are in keeping with customers' views on how we should prioritise leakage reduction.

Our new PR19 mechanism for managing investment uncertainty reflects customers' desire for inter-generational fairness and protection from unnecessary spending decisions.

3.2 Demand management – Leakage

In our draft WRMP we proposed leakage targets that were based on an economic appraisal of supply and demand needs and intervention options. As a result, our draft WRMP included a long term leakage reduction profile that comprised a 15% reduction in AMP7 followed by modest reductions in subsequent AMPs.

What stakeholders told us:
Through the draft WRMP consultation process, customers and stakeholders challenged our long term leakage ambition, and pressed us to continue with significant multi-AMP leakage reductions. Separately, the National Infrastructure Commission (NIC) has set out a challenge that the water industry should reduce leakage by 50% over the next 25 years.

What we've done:
In response to the challenges to our draft WRMP, we have considered a range of options for setting more ambitious long term leakage targets for our final WRMP that go beyond the traditional economic appraisal approach. We have also compared our leakage ambitions with the long term leakage profiles proposed in other companies' draft WRMPs. As a result we are adopting new, more challenging leakage reduction targets for our final WRMP.

How we've changed our plan:

Having listened to the feedback from stakeholders and our ongoing engagement with customers, we have changed our long term leakage ambition for the final WRMP. In AMP7 and AMP8 we will continue to prioritise leakage reduction activities to benefit customers in the zones with the greatest supply / demand balance challenges, but we will also extend our ambition into zones with a lower supply / demand balance risk. Our ambition is to reduce leakage by 50% over the next 25 years, and we will set targets that will drive our leakage technology and innovation thinking.

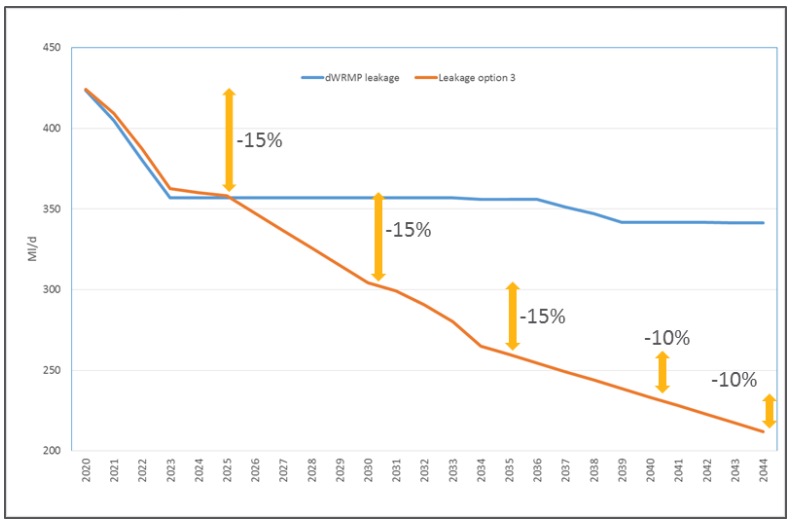
This approach means we continue to prioritise AMP7 leakage reductions targeted in the two zones with a supply / demand balance deficit. However, we would extend AMP8 / AMP9 leakage reduction into the remaining zones to maintain an overall AMP by AMP target reduction of 15%. In the very long term, the zonal reduction targets will not be set based on supply / demand balance need, but will be distributed across all zones based on short-run costs and ease of finding and fixing leaks.

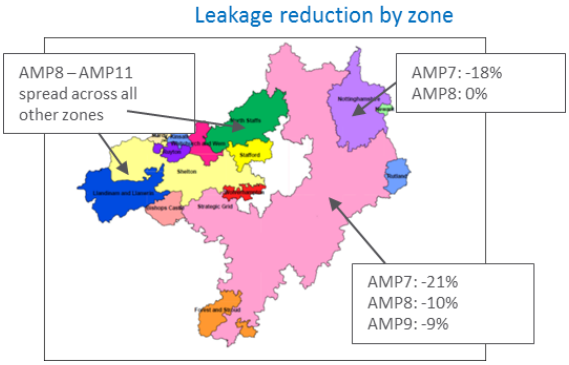
Our new AMP by AMP leakage reduction numbers are shown in Table 3.1 and illustrated in Figure 3.1. Note that for WRMP purposes these numbers are pre-leakage convergence data changes, and are annual average targets. Our separate PR19 plan will contain performance commitments based on new leakage and per capita consumption reporting guidelines and will state the leakage performance commitment as a three-year average.

Table 3.1 Recommended leakage targets for final WRMP / PR19 performance commitment

	2020	2025	2030	2035	2040	2045
Total Leakage (Ml/d)	424	360	306	260	234	210
Percentage Reduction	-	15%	15%	15%	10%	10%

Figure 3.1: Long term 50% leakage reduction target over 25 years - company wide and by WRZ (inset).





We understand that due to the challenges posed by such stretching leakage targets, traditional leakage management techniques are unlikely to be able to deliver the required reduction in an efficient manner. We also understand that with new innovation there is a risk involved in any new approach being unable to deliver or delivering at a lesser rate than expected. Due to these challenges our leakage delivery plan will use a balanced approach to leakage reduction that embraces new technologies whilst maintaining some more traditional leakage management approaches.

More information on our leakage approach can be found in Appendix A2.

3.3 Demand management – Metering

In our draft WRMP we set out our proposals to take a more proactive approach to metering in order to accelerate the proportion of household customers who pay by metered charge. We proposed a metering growth strategy that would accelerate the rate of meter coverage through AMP7, AMP8 and AMP9 to achieve universal metering over around three AMP periods.

What stakeholders told us:
The main challenge to our metering strategy was around our ability to achieve 100% meter penetration over three AMP periods, and the risks around not doing so. Other comments asked for more clarification on what our plans are for our supply areas in Wales; a clear demonstration that we have assessed all metering options, and; the impact of our plans on PCC and the wider PCC ambition.

What we've done:
In response to the comments on our draft WRMP, we have re-assessed our metering strategy and the underlying assumptions. We have reviewed the learning from other water companies' recent experiences of metering and we have benchmarked the costs and benefits used to inform our approach. We recognise that by using existing technologies and methods, no company has achieved 100% meter coverage (Southern Water have achieved 93% meter coverage, Anglian Water have achieved 88% meter coverage with 92% ambition by 2020 and 95% ambition by 2040). However, given the timeframe for delivery we also recognise the potential for innovation in more advanced metering technology, including non-intrusive metering and flow measurement that will provide additional options and opportunities to install meters in currently challenging locations.

To give us even more confidence in our metering plan, we have initiated an extended metering trial for 2018-19. The trial will deliver full meter coverage in two District Metered Areas (DMAs) and in the process will help our understanding of:

- Customer communications (pre, during & post installation)
- Customer acceptability
- Installation and delivery options
- Meter technology options
- Data communications process (hardware & software)
- Demand management benefits (Water efficiency, supply side leakage, customer side leakage)
- Network management benefits
- Links to our lead-pipe replacement strategy
- Links to our shared supply strategy
- Links to our mains renewal strategy

The outputs from this trial will be available in time to inform our AMP7 enhanced metering delivery plans.

To complement our metering plans, we continue to actively engage with the wider industry and Defra to explore the potential for long term national targets for PCC in line with the proposals in the Government's 25 year Environment Plan. To help the deliver the changes in customer attitudes and behaviours needed to achieve these ambitions PCC targets we are working with Defra and the wider industry on recommendations to introduce water efficiency labelling to white goods.

We are investigating what can be learned from the recent 2018 hot summer, during which we recorded exceptionally high demand for water, with the July 2018 peak use equivalent to 100 litres/person/day extra.

How we've changed our plan:
We have not changed our ambition to achieve 100% metering coverage by the end of AMP9.

When we publish our final WRMP, we will be separating our plans for England and Wales. Based on the views of customers and stakeholders we have aligned the metering strategies for the two plans, proactively installing meters in England and Wales.

Based on the benchmarking of benefits reported by other companies, we believe that achieving full meter coverage could deliver up to 80Ml/d of demand benefit. Our current thinking is that to secure the full 80Ml/d reduction would require us to adopt an external metering policy and combine this with a policy of helping customers tackle supply pipe leakage on their properties. For our final WRMP we have explicitly captured the consumption benefits that our household metering plans should achieve and we have used the recently updated Table 6 of the WRMP data tables to capture the underground supply pipe leakage benefits.

We have not changed our PCC ambition from that described in the draft WRMP. We expect our metering and water efficiency programme to achieve a forecast PCC 113 l/p/d (normal year) by 2045, which is ahead of the recommended 118 l/p/d target described in the 2018 National Infrastructure Commission report. Achieving this level of reduction will be extremely ambitious and will require significant partnership working with a wide range of stakeholders. Whilst we welcome the desire for further ambition, we also have to recognise the challenges of influencing consumer behaviour. Driving towards even lower PCC targets cannot be achieved by the water industry in isolation. We need the participation of a wide range of stakeholders (LAs, Housebuilders, NGOs, Manufacturers) and customers.

We recognise that to achieve this metering and demand management ambition will require us to significantly increase our metering activities and to more than treble the amount of annual meter installations that we have historically achieved. Delivering this scale of increase carries some risk, and so we have put a mechanism in place that will help manage the uncertainty around delivering such a large programme and will protect customers from incurring unnecessary costs.

In our PR19 Business Plan we have included an AMP7 Outcome Delivery Incentive (ODI) around our metering proposals. This ODI is designed to protect customers from the uncertainty of achieving the increased meter installation rate described in our WRMP. The design of the ODI means that customers' AMP7 bills will reflect investment for around two-thirds of the 2020-25 meter volumes included in the WRMP. The remaining one-third will be reflected in bills at the end of the 2020-25 period (i.e. effectively customers will be paying for these meters in arrears rather than upfront). We will report annually on progress with delivering our meter installation target.

The metering ambition described in our WRMP is not affected by the ODI mechanism. The leakage and demand management strategy described in our WRMP is based around delivering our enhanced metering programme. Our performance commitments around leakage and per capita consumption also reflect the outcomes of the full metering programme. However, the ODI mechanism means that our PR19 plan will not include the up-front investment associated with the full metering programme. As we report on annual progress, we will build the learning into our adaptive planning.

More information on our metering and water efficiency approach can be found in Appendix A3.

3.4 WINEP

Our draft WRMP includes short and long term measures to remove or offset the environmental impacts of damaging abstractions, and to help the associated water bodies achieve Water Framework Directive (WFD) objectives. We have worked closely with the Environment Agency throughout AMP6 to understand which of our sources of abstraction could be contributing to low flow problems, and which of our sources have potential to cause future deterioration.

During development of our draft WRMP, we based our plan on the list of abstraction changes and water body priorities that we expected to see in version 2 of the Environment Agency's Water Industry National Environment Programme (WINEP). Since we published our draft WRMP, the Environment Agency have updated their list of priorities and objectives in version 3, known as WINEP3. Information associated with WINEP3 was made available by the Environment Agency in April 2018.

What stakeholders told us:
Environmental stakeholders outlined their expectations that our final WRMP should reflect WINEP3 and the latest conclusions of our AMP6 investigations into sources of unsustainable abstraction. We have been asked to explain any variation between the assumptions we used in our draft WRMP and WINEP3 data, and make clear whether these have changed the proposals in our WRMP.

What we've done:
We have continued to work closely with the Environment Agency to agree how we best manage the risks around unsustainable abstraction. Through our ongoing dialogue we have been able to minimise the need for changes between our draft and final WRMPs.

Since we published our draft WRMP, we have completed our AMP6 investigations into the potential environmental impacts of our abstractions. The conclusion of these investigations in February 2018 included agreement with the Environment Agency on our priority sites for reducing unsustainable abstraction along with a range of agreed solutions for helping the associated water bodies improve their WFD status.

We have also continued to update our understanding of WFD deterioration risk, taking account of the Environment Agency's latest guidance on investigating the risk of WFD water body deterioration that was issued in January 2018. As a result, we have improved our understanding of WFD deterioration risk at our river abstractions that are subject to Hands Off Flow (HOF) restrictions. Through this additional modelling, we have explored how the timing of any variations to our Egginton abstraction licence on the River Dove could impact on our final WRMP.

Finally, we have continued to develop our thinking on how we can use environmental measures and river restoration techniques to help improve habitats and ecological resilience to low flows. We have also continued to assess the potential environmental impacts of our proposed new supply-side options.

The conclusions of our investigations and WFD risk assessments, along with any agreed actions were incorporated by the Environment Agency into WINEP3. We have included the WINEP3 changes into our final WRMP.

As a result, in our deployable output modelling we have updated the sustainable abstraction assumptions for the following sources to align with WINEP3:

- Buckshaft – revised abstraction licence changes to reflect our February 2018 conclusions.
- Peckforton - revised abstraction licence changes to reflect our February 2018 conclusions.
- Caunton – revised abstraction licence changes to reflect our understanding of WFD deterioration risk.

How we've changed our plan:
Making the WINEP3 updates described above results in some small changes to the size and timing of future abstraction reductions that we need to accommodate in our WRMP. Overall, WINEP3 does not materially change the proposals described in our draft WRMP.

The headline changes that WINEP3 has made to our WRMP are:

- A reduced supply / demand deficit in our Forest & Stroud WRZ. Our draft WRMP had previously assumed we would need to make permanent reductions in abstraction from our Buckshaft source. However, WINEP3 reflected the conclusions of our AMP6 environmental investigations which were that we should focus on in-river and habitat improvement measures in the Cinderford Brook rather than make long term reductions in abstraction. The impact of this is to remove the need for the Whaddon to Forest & Stroud transfer option that was included in the preferred programme of options in our draft WRMP.

- A small increase in the supply / demand balance deficit that we were already planning to address in the Nottinghamshire WRZ by 2030. This change follows the conclusions of our AMP6 investigations into unsustainable abstraction across a number of our Nottinghamshire groundwater sources, and our latest assessment of sources with the potential to cause future groundwater body deterioration. The impact of this, along with the updates to the costs and benefits of our different supply options, has led to changes in the timing of the new supply-side option proposed for the Nottinghamshire WRZ along with a revision to our long term leakage profile in this zone. These changes are described in Appendix A.

We have updated our WRMP text to reflect the WINEP3 changes. We have expanded the description to make clear the conclusions of our Restoring Sustainable Abstraction (RSA) investigations and to show the agreed solutions. When making these updates to the narrative, we have reflected on stakeholder feedback asking for more clarity.

The updated and expanded description of how WINEP3 has been incorporated into our WRMP can be found in Appendix A4.

3.5 Water trading

Our draft WRMP included several potential options to increase trading of water between us and neighbouring companies. These options were shared between companies for consideration in their draft WRMP thinking. Now that all companies' draft WRMPs have been published, it has become clear that there are water trading options included in other organisation's WRMPs that don't fully align to our draft WRMP. We know that Anglian Water included a new scheme that would require additional treated water from Severn Trent, and we know that South Staffordshire Water included a new pipeline transfer from our system to theirs. Thames Water's draft WRMP stated that the potential River Severn to Thames transfer scheme was not needed until the 2080s.

Our draft WRMP proposed an option to increase the output from our water treatment works at the Derwent Valley reservoirs and we highlighted that this option was likely to impact on the current water export arrangements to Yorkshire Water. Our draft WRMP also highlighted our ongoing discussions with Thames Water and United Utilities regarding the potential future development of the River Severn to support Thames' long term plans.

What stakeholders told us:
We received a wide range of comments regarding water trading.

The Environment Agency and Ofwat recommended that we review our trading assumptions with neighbouring companies and that we make sure our final WRMPs are fully aligned. We were also asked to provide more information on how we had assessed new trading options alongside options to develop our own new sources of water supply.

A number of respondents asked us to commit to playing an active role in the development of national, regional and multi-sector water trading.

What we've done:
Following publication of our draft WRMP we have continued to meet all neighbouring companies to discuss options named in our draft plan, as well as their own, and explore any new opportunities. The outcome of these discussion have ensure that we have fully aligned our final WRMPs.

A summary of the updates that we have agreed with other companies is given in Table 3.2.

Table 3.2: Updated water trading options

Company	Draft WRMP position	Update	Date agreed
Anglian Water	We developed five viable water transfer options for consideration in Anglian Water's draft WRMP. The potable water bulk supply to an Anglian Water water treatment works near Oakham was included in their preferred plan.	Changes to the timing of Anglian Water's need for additional supply mean that the transfer option is no longer able to resolve their deficit due to the long construction period. Instead we have offered a further transfer option involving the transfer of Wanlip Final Effluent to Rutland Water for their consideration. Anglian Water have confirmed that none of the transfers that we offered are included in their revised preferred plan. We have committed to work together to develop an optimised transfer taking in the wider context of the Water Resources East needs. This joint work will involve water resources modelling of the River Trent system.	28th June 2018
South Staffs Water	A new transfer between our supply network and South Staffs Water's supply network was included in South Staffs Water's draft WRMP.	South Staffs have clarified that the proposed transfer is for resilience and planned maintenance use only. This transfer option will therefore no longer be reflected in their final WRMP tables.	8th June 2018

Company	Draft WRMP position	Update	Date agreed
Thames Water	We worked closely with Thames Water and United Utilities to develop the River Severn to River Thames transfer scheme, the purpose of which is to augment the flows in the River Severn for transfer to the River Thames near Oxford. The scheme would be used only during periods of dry weather in the Thames catchment. Our principle contribution to the scheme involves improving tertiary treatment of Minworth Wastewater Treatment Works final effluent, transferring the effluent to the River Avon (a tributary of the River Severn) by pipeline and then abstraction by Thames Water near Tewksbury on the River Severn. The scheme was not included in Thames Water's draft WRMP.	Since the draft WRMPs were published the requirement for Thames Water to provide a transfer of their own to the water companies in the Water Resources in the South East group (WRSE) has reduced from 130Ml/day to 100Ml/d, which means that the River Severn to River Thames transfer is unlikely to be selected in Thames Water's revised draft WRMP19. Given the national strategic importance of the River Severn to River Thames transfer scheme, we will continue to work on appropriate technical and environmental aspects in AMP7, for example ecological work, losses and reliability, water quality, regulation, river temperature, in partnership with United Utilities and Thames Water, regardless of whether the scheme is included in Thames Water's final WRMP. We have included a mechanism in our PR19 plan to manage the uncertainties around this nationally significant trading option and ensure that our customers are protected from any unnecessary expenditure.	19th June 2018
United Utilities	We have discussed with United Utilities the possibility of utilising water from Lake Vyrnwy into the River Severn for use at our existing treatment works downstream. Our draft WRMP explored investment scenarios that utilised this new trade. However, the uncertainty around the longer term River Severn to River Thames transfer scheme meant that we did not include it in our preferred plan.	Further joint analysis by United Utilities and ourselves has revealed that this option would not represent best value and it will therefore not be in our final WRMP preferred programme of options. The primary reason for exclusion is an erosion of our Birmingham resilience capability. The complex interaction with a possible River Severn to River Thames transfer scheme will also need more detailed analysis to ensure that we properly consider the wider national interest. We have agreed to work with United Utilities on further modelling in AMP7 to fully understand whether the scheme could work conjunctively with the River Severn to River Thames transfer scheme.	9th May 2018
Yorkshire Water	We proposed increasing our share of the raw water in the Derwent Valley Reservoirs by 20Ml/d to help support our future supply / demand balance needs and facilitate an eastwards transfer to Anglian Water.	Discussions with Yorkshire Water and Anglian water since the draft plan mean that we now intend to progress a different option to increase utilisation of the Derwent Valley reservoirs. The primary reason for this is that Yorkshire Water are unable to accommodate a variation of the Derwent Valley agreement within the timeframes that we had assumed without threatening their customers' level of service. Furthermore the size and timing of Anglian Water's needs since we published our draft WRMP have changed meaning that the transfer option included in their draft WRMP no longer forms part of their preferred plan. We have amended the scope of the option to provide a smaller increase in output of 7.5Ml/d from the Derwent Valley reservoirs into our Strategic Grid. Our water resources modelling shows that we can sustain this increased output without impacting on the current export arrangements to Yorkshire Water.	5th June 2018

How it's changed our plan:

The most significant change to the recommendations made in our draft WRMP relates to the scope and timing of our supply-side option to increase the use of the Derwent Valley reservoirs. In our draft WRMP we proposed an option that by 2028 would allow us to increase the output from the water treatment works that serves the Derwent Valley reservoirs. As already explained, it became clear after publishing our draft WRMP that this option could not be accommodated by Yorkshire Water's draft WRMP. Therefore, for the final WRMP we have reduced the scope of this option from 20Ml/d to 7.5Ml/d. The smaller scale option can be accommodated within the existing Derwent Valley agreement and will not impact on exports to Yorkshire Water.

Since we published our draft WRMP, we have continued to contribute to regional and multi-sector water resources planning. We continue to be active participants in all regional groups; Water Resources East, Water Resources South East, Water Resources North and most recently West Country Water Resources. We have initiated two multi-sector working groups on the primary river transfer routes that pass through our region; the River Severn Working Group and the River Trent Working Group. The purpose of these groups is to understand the potential in-combination impacts of transfer and new abstractors on the rivers. Environmental regulators (Natural Resources Wales, the Environment Agency and Natural England) are members as well as abstractors.

While we are disappointed that our active discussions have not generated a new trade within our final WRMP, we have a strong platform for developing future solutions. We remain committed to the concept of water trading and will continue to work hard to develop viable water transfers.

In addition to participating in these collaborative groups we set up and lead a multi-sector catchment based approach in the River Idle and River Torne catchment in Nottinghamshire (one of our most water stressed areas.) This group has successfully identified new local water trades, resource development opportunities and enhancements to our Severn Trent Environmental Protection Scheme (STEPS) catchment management programme to incentivise water efficiency. We are pursuing co-development of water resource schemes with the local agricultural community. We believe that this local approach to water resource planning is highly beneficial and we intend to adopt this approach in AMP7 on a targeted basis.

The Idle and Torne rivers catchment has now been selected as an Initial Priority Catchments (IPCs) within Defra's Abstraction Plan. We are in discussions with the Environment Agency on how to build on our work to further develop innovative solutions to abstraction issues.

We will continue to provide leadership in this area in AMP7.

More information on our water trading considerations can be found in Appendix A5.

3.6 Water supply options

Our draft WRMP described how our latest supply / demand balance challenge is larger than in any of our previous plans. Our draft WRMP also explained how our ability to respond has been further constrained by the statutory requirement to prevent future ecological deterioration, as required by the Water Framework Directive, which limits our options for developing new sources of supply.

To meet these future challenges, we need to improve our supply capability by investing in expanding our water treatment and strategic distribution capacity and prioritising solutions that make more use of existing water supply assets. Our draft WRMP described the supply-side and demand-side investment options that we have considered and gave more detail on our options appraisal and decision making process.

Chapter 6 of our draft WRMP described the options that we recommended, with further information provided in Appendix D of the draft WRMP. The accompanying Strategic Environmental Assessment report provided additional insight into the environmental impacts and considerations of these options.

What stakeholders told us:
We received comments on many different aspects of the supply-side options that we recommended in the preferred programme of options in our draft WRMP. Most comments were seeking more detailed explanation of the proposed options, asking for further supporting information on Water Framework Directive assessments, local environmental impacts and option delivery risks. Stakeholders also asked us to make sure that our recommendations took account of the changes made to WINEP3 and water trading.

The Canal and Rivers Trust as well as RWE and Uniper energy companies asked for reassurance that our proposals to develop abstraction on the River Trent along with any associated water trading would not impact on their existing operations.

A number of respondents asked us to widen the range of environmental considerations used in the accompanying Strategic Environmental Assessment.

What we've done:
Since our draft WRMP was published, we have continued to explore the costs, deployable output benefits, delivery risks and environmental impacts of all of the options considered in our draft WRMP. We have continued to do this in order to improve our understanding of the preferred programme of options and to inform the accompanying PR19 Business Plan with the best available cost data. We have used this improved understanding of costs and benefits to update our supply / demand balance appraisal and programme optimisation reviews for the final WRMP.

As well as updating our understanding of the costs and benefits of our different supply-side options, we have also updated our assessment of long term supply / demand balance needs based on the outputs from WINEP3.

Finally, we have removed any options that have the potential to conflict with the water import / export plans set out in other companies' draft WRMPs.

Using these changes to option costs, benefits, dependencies and the latest understanding of the long term supply / demand balance need, we reviewed whether the preferred programme of options outlined in our draft WRMP is still appropriate. The outcome of our assessment was that there is no material change to the overall programme of options. However, we are proposing some changes to the scope and delivery timeline

for some of these options in order to meet WINEP3 objectives and to prevent conflicts with neighbouring companies' WRMPs.

We have also expanded our Strategic Environmental Assessment to include a number of recommendations made through the consultation responses.

How we've changed our plan:
We have made changes to the scope and timing of some of the options that were proposed in our draft WRMP. We have also introduced a mechanism to manage the risks and uncertainty around delivering a number of these options.

Figure 3.2 illustrates the changes to the programme of options between our draft and final WRMP. The figure shows all of the proposed supply side options that featured in our draft WRMP and compares them with the options which now feature in our final WRMP. The figure shows the option name, deployable output benefit and the delivery timing of each option in the preferred programme. The blue bars represent the preferred programme of options in our draft WRMP whilst the orange bars represent the revised preferred programme of options in our final WRMP.

Figure 3.2 demonstrates that while the majority of options remain unchanged, we have made revisions to the timing and sequencing of these options.

Figure 3.2 Comparison of our preferred programme of options between our draft and final WRMPs

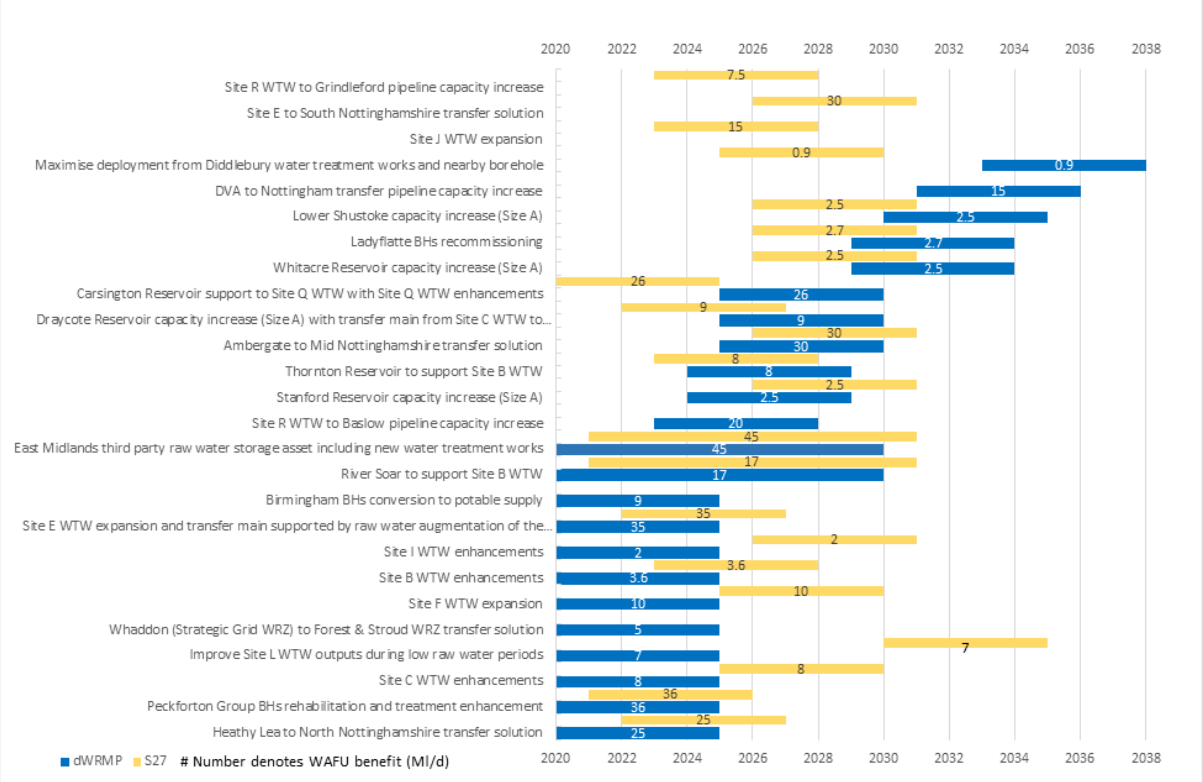


Figure 3.2 also illustrates that there are three options that were not within the preferred programme of options in our draft WRMP, but have been brought into our preferred programme of options for our final WRMP. However, we describe below why these revisions and new options are not material changes from our draft WRMP as they are variations to the scale and scope of the schemes that featured in our draft WRMP.

Revision 1: Option – Site E to South Nottingham transfer solution replaces DVA to Nottingham transfer
Our draft WRMP included consideration of four feasible options to increase the capability to transfer treated water from our Strategic Grid WRZ to our Nottinghamshire WRZ. These were:

- GRD19: DVA to Nottingham transfer pipeline capacity increase
- NOT01: Ambergate to Mid Nottinghamshire transfer solution
- NOT04: Heathy Lea to North Nottinghamshire transfer solution
- NOT05: Site E to South Nottinghamshire transfer solution

All four options were variations of a similar theme with the aim of increasing the strategic link capacity between the surface water treatment capacity on the Strategic Grid and the groundwater supplied areas of the Nottinghamshire WRZ. This is to support the reductions in WFD led groundwater deployable output in the Nottinghamshire WRZ. In our draft WRMP we recommended proceeding with a preferred programme containing options NOT01, NOT04 and GRD19 over AMP7, AMP8 and AMP9.

For our final WRMP, the revisions to WINEP3 and its implications for our groundwater sources in Nottinghamshire, alongside the updated option costs and benefits appraisal has led to a revision to the recommended strategic transfer options. We are recommending replacing option GRD19 with option NOT05. This is not a material change from our draft WRMP and is simply a revision to the recommended route and size of upgraded capacity for transferring treated water.

Revision 2: Option – Site R WTW to Grindleford pipeline capacity increase replaces Site R WTW to Baslow pipeline capacity increase
As described in section 3.5, since our draft WRMP was published we have worked with our neighbouring water supply companies to better align our future water trading plans. Three of our options involved variations to the way we operate the Derwent Valley reservoirs:

- BAM03: Site R WTW to Grindleford pipeline capacity increase
- BAM04: Site R WTW to Baslow pipeline capacity increase
- BAM05: Site R WTW to Ambergate transfer solution

In our draft WRMP we included option BAM04 for implementation by 2028. This option would provide an increase of up to 20Ml/d output from our Derwent Valley reservoirs into our Strategic Grid WRZ, and would likely require a reduction in the current export arrangements to our neighbour, Yorkshire Water.

Since we published our draft WRMP we have worked with Yorkshire Water to better understand the impacts this would have on their WRMP and to better align our assumptions around future changes to way the Derwent Valley reservoirs are utilised. As a result, we have amended the preferred programme of options in our final WRMP to reflect the needs of both Companies. In the preferred programme of options in our final WRMP we have now included the smaller scale option BAM03 to replace BAM04. Option BAM03 is expected to achieve an additional deployable output benefit of 7.5Ml/d from the Derwent Valley reservoirs into our Strategic Grid WRZ. Our water resources modelling shows that we can sustain this increased output without impacting on our current arrangements with Yorkshire Water. This is a change in scope to the option recommended in our draft WRMP.

Revision 3: Option – Site J WTW expansion

In the description for Revision 2, above, we outlined that due to the impacts on Yorkshire Water, we have needed to reduce the scope and deployable output benefit achieved from the Derwent Valley reservoirs related options. To ensure that we can balance our supply/demand needs, we have substituted an alternative option into the preferred programme to make up for the resulting capacity shortfall. The driver for requiring additional treatment capacity is the need to provide sufficient supply into the Strategic Grid WRZ to support the Nottinghamshire WRZ via the new strategic transfer links proposed within the preferred programme of options.

For this additional supply and transfer mechanism to be most effective, the treatment capability needs to be located upstream of the new transfer links, thereby utilising our capability to abstract from the River Derwent. In the light of constraints at the Derwent Valley reservoirs our preferred way of generating this additional capability is to expand our existing water treatment works at Site J. This option is in keeping with our other preferred options to increase treatment capacity at Site F and Site E treatment works.

Revision 4: Option - Birmingham boreholes conversion to potable supply

The preferred programme of options in our draft WRMP included an option to convert a number of existing flow augmentation boreholes into public water supply assets. Our intention was to improve deployable output capability in the Birmingham area and our Strategic Grid WRZ. Since publishing our draft WRMP we have updated our supply / demand assessment to reflect WINEP3, updated the costs and benefits of our supply options and revised our long term leakage ambition. Upon re-optimising our long term investment plan as a result of these changes, the Birmingham borehole conversion option is no longer in our preferred programme of options and our final WRMP has been adjusted accordingly.

However, this option remains feasible and whilst we do not have any plans for it to be progressed, it forms part of our contingency planning as a well formed and viable alternative in the event that our other preferred options benefiting the Strategic Grid WRZ are found to be unsuitable during subsequent design development stages.

Revision 5: Option - Whaddon to Forest and Stroud transfer

Our draft WRMP included this option to increase the transfer of treated water from our Strategic Grid WRZ to our Forest & Stroud WRZ to offset an expected reduction in deployable output at our Buckshaft groundwater site. Since we published our draft WRMP the Environment Agency have issued WINEP3 information which confirmed the scale of the required environment programme in that area.

WINEP3 confirmed the conclusions we arrived at in 2018 during our ongoing environmental investigations into the impact of our Buckshaft source on the neighbouring Cinderford Brook. Those conclusions were:

- We should focus on in-river and habitat improvement measures to help improve the status of the Cinderford Brook rather than make long term reductions in abstraction form Buckshaft.
- We should reduce the Buckshaft abstraction licence to limit future abstraction growth and prevent future deterioration of WFD status.

Therefore we no longer require options to offset a reduction in output at our Buckshaft site meaning that the Whaddon to Forest and Stroud transfer is not included in our preferred programme of options in our final WRMP.

Managing uncertainty around our water supply options

We recognise that the scale of our supply / demand balance challenge and our resultant investment plan is significantly greater than any proposed in our previous WRMPs. We also recognise that one of the key drivers for this investment is the uncertainty around the long term impacts of climate change on our water resources capability. Therefore, we have put in place additional customer protection measures through our PR19 business planning process.

During AMP7 we will use an uncertainty mechanism as the means to deliver the additional supply options as our understanding of the need improves when updated climate change projections (UKCP18) become available. We will use Ofwat's in-period Outcome Delivery Incentive (ODI) process to access funding through AMP7.

4 Next steps

This Statement of Response describes how we have taken account of stakeholder feedback on our draft WRMP. We have described in Section 3 how we have changed our draft WRMP in response to the feedback we received. Appendix A provides further detail of our approach and decision making that led us to make these changes.

We also received stakeholder responses asking us to provide more explanation of our methods, assumptions and decisions. These responses have not led us to change the recommendations made in our draft WRMP. We have provided detailed responses to these stakeholder requests in Appendix B.

We now await confirmation from the Secretary of State that we have approval to publish our final WRMP. Once we receive this confirmation we will publish the full WRMP document along with accompanying data tables, incorporating the changes and additional points of detail described in this Statement of Response. We will also update the water resources Market Information data tables.

We expect to publish the final WRMP and accompanying information in early 2019.

Appendices

Appendix A: Further detail on areas of change
Appendix B: Additional information
Appendix C: Consultation comments and our response.