

## Thames Water: Water Resources Work Programme 2014 – 2018

Date: May 2017

### Introduction

The purpose of this report is to accompany the Water Resources Work Programme 2014 to 2018 and to provide a summary of the main work areas and projects. The report is based on the best available information and will be reviewed and updated quarterly. Updates since the February 2017 report are provided. A stakeholder statement of engagement has also been prepared to accompany the programme.

### Section 1: Regulatory Developments

There are 3 regulatory submissions with respect to water resources; these are 1) Annual Review (AR); 2) Drought Plan (DP); and 3) Water Resources Management Plan (WRMP19).

Since February 2017:

- **AR:** This will be provided to the EA at the end of June 2017. It will provide the baseline for WRMP19.
- **DP:** We have completed a public consultation on our draft DP (5 January – 17 February 2017). We received 11 responses to the consultation. We have prepared a Statement of Response to the responses received and submitted a revised draft DP to Defra in April 2017. We are waiting for feedback from Defra prior to publishing our final DP.
- **WRMP19:** Work is progressing on WRMP19. The work programme provides an update on the key workstreams. We have continued to engage with regulators and stakeholders as we undertake this work. The draft WRMP19 will be submitted to Defra on 1 December 2017.

### Section 2: External projects

A number of external technical projects have been completed to refine approaches to water resources planning and strategy formulation. These include projects led by UKWir, WaterUK and the EA. The work programme has been updated based on the best available information.

We continue to work with Water Resources in the South East (WRSE), a collaboration of water companies located predominantly in the South East of England and regulators. The objective of WRSE is to develop a flexible and robust water resources strategy for the region. WRSE has completed modelling to investigate the resilience of the region to a range of possible futures. The modelling has highlighted the vulnerable zones in the region, considered opportunities for transfers and greater connectivity to share resources across the region, and identified potential regional infrastructure investment. The output has been reviewed and commented on by WRSE members and it is intended that the output will be used to inform individual water company's plans. A number of companies are still working to define their future requirements; this is significant for the development of our plan. We will continue discussions with neighbouring water companies to confirm their existing and future requirements, and will address uncertainties through scenario analysis.

### Section 3: National Environment Programme (NEP) Investigations

The EA publish a National Environment Programme (NEP) which defines the sustainability reductions (SRs) that may be required to ensure protection of the environment. SRs are reductions in existing abstraction licences that are identified to provide environmental improvements, typically through increased flows in rivers. Water companies work closely with the EA to identify where abstraction may be having an adverse environmental impact and then put plans in place to address this impact, where necessary to do so.

The studies that are underway are set out in the programme. The main investigation is on the Lower Lee. The investigation started in February 2016 and we are working closely with stakeholders at it progresses.

Options appraisals are also underway at Pann Mill, Letcombe Brook, Sunridge, Waddon, Darent and Cray. These investigations are due to complete by the end of 2017.

Since February 2017:

- In March 2017 the EA provided information on sources likely to be subject to SRs and advised that this information should be used in the development of the baseline supply demand forecast for WRMP19. Broadly the reductions were as expected, with the exception of the large reduction proposed on the Lower Lee of 125 MI/d. We are engaging with the EA on this to confirm the SR. At this time we have included 25 MI/d in the baseline forecast.

#### **Section 4: Demand forecast**

Two UKWir projects on forecasting household demand and developing population and property forecasts have completed. We have used the output from these studies to inform our approach to develop the baseline demand forecasts. We have worked with Local Authorities to develop population and housing forecasts over the next 25 years and with the University of Leeds to develop the longer term population forecasts.

Since February 2017:

- In March we published method statements setting out the approach to develop household (to 2045) and non-household (to 2100) forecasts.
- In April we presented the draft baseline supply demand balances for each Water Resource Zone (WRZ) which set out the challenge that we need to plan for. In response to stakeholder interest we will cover these in more detail at the July Water Resources Forum.

#### **Section 5: Assessment of available resource**

We have an improved water resources management system model, WARMS2, the tool we use to assess deployable output (DO). The tool has been reviewed by recognised independent industry experts, HR Wallingford, and we have commissioned periodic audits to ensure the model remains fit for purpose, and provide assurance to this effect for external stakeholders.

The 2010-2012 drought exposed potential weaknesses in the existing processes for assessing the impact of climate change on resources and that perturbing the historic record of rainfall and evaporation may not adequately reflect how the system might respond to more intensive droughts likely to occur under climate change. Atkins completed work to investigate prolonged droughts, adopting a stochastic based forecasting approach, and developed stochastic drought libraries for both the River Thames and Severn catchments. This work was used in the draft DP to assess our resilience to more extreme drought events than occurred in the available historical record and has been used to assess the reliable yield of new surface water resource options in the WRMP.

Since February 2017:

- We have completed further work, using stochastic assessment of yield under future drought scenarios, to examine the resilience of the Upper Thames Reservoir (UTR). This work has concluded that there is relatively little variability in yield across the majority of the major

drought events that are expected to occur in the future and as such it is a very resilient resource option.

- We have undertaken modelling using a stochastically generated flow series for the River Severn to confirm the deployable output (DO) of an unsupported transfer and different supported transfer capacity options. This work was shared with stakeholders at Technical Stakeholder Meetings in February and April 2017.

## Section 6: Water Resource Options

In WRMP14 we set out that a new large resource scheme (>150 Ml/d), or combination of schemes, is highly likely to be required to maintain security of supply in the region from the mid-2020s. In autumn 2014 we started a programme of work to examine resource schemes. The programme comprises multiple phases and we are working with regulators and stakeholders as we progress this work.

Since February 2017:

- **Feasibility studies and screening assessments:** We sought comments from stakeholders on work completed to examine feasible resource options (Feasibility Reports), and decisions to screen out options to produce a constrained list of options (Fine Screening Report) in autumn 2016. We responded to these comments in February 2017. Since then we have completed further work in response to the comments and also new information from the studies. In April 2017 we published a note to update stakeholders on progress with these studies. We also completed further work on the constrained list of options and published an updated fine screening report in April 2017. We discussed this work at a Technical Stakeholder Meeting held in April 2017 and provided an opportunity for further comment. We will take account of these further comments and expect to publish final reports at the end of June 2017.
- **Teddington transfer:** We are examining an option to increase abstraction upstream of Teddington Weir supported by transfer of tertiary treated effluent from Mogden sewage treatment works. Detailed modelling is underway to examine hydrodynamic, navigational and environmental impacts of this option. We are continuing to work with Port of London Authority, EA and NE on this work to ensure we understand and address issues.
- **Raw Water Transfer:** There are ongoing discussions on the various options to transfer water from the River Severn catchment into the Thames catchment. A summary of the status of raw water transfer is noted below:
  - We have screened out the unsupported transfer (UST) due to the low reliable yield and as such the option is not cost effective.
  - We have screened out conveyance via the Cotswold Canals due to cost, operational and construction complexity, and the higher risk of spread of non-native invasive species.
  - We have screened out supported transfers of capacity 100 and 600 Ml/d as they are less cost effective than capacities of 300, 400 and 500 Ml/d.
  - We have completed work to confirm the DO of supported 300, 400 and 500 Ml/d pipeline transfer with discharge at Culham based on the stochastic flow series.
  - Following discussions with the Canal and Rivers Trust we are developing options to transfer resource via the Oxford canal or the River Cherwell for abstraction further downstream and transfer into Farmoor reservoir.
- **Upper Thames Reservoir (UTR):** As reported in February, Abingdon has been identified as the preferred site for a reservoir. We have engaged with Parish Councils in the vicinity of the reservoir to update them.
- **Assessment of Cumulative Effects of Re-use, Desalination and Direct River Abstraction options:** We are considering a number of options in the Tideway area. The EA

raised concerns about the cumulative impact on the salinity of the estuary. The study has assessed potential cumulative tidal level and salinity effects of combinations of options in the mid-Tideway. This work was shared with stakeholders in April.

- **System perspective:** We are undertaking work to consider the development of new infrastructure capacity within the wider water treatment and network system and briefing stakeholders as this work is progressed.

## **Section 7: Demand Management Options**

We are implementing a large programme of demand management activity from 2015 to 2020, comprising leakage reduction, metering and the promotion of water efficiency. The programme is planned to deliver approximately 106 Ml/d of savings (equivalent to use of c.625,000 people).

Since February 2017:

- We published an updated demand management options screening report (March 2017) which addressed comments raised by stakeholders in February 2017 and confirmed the constrained list of options. We sought further final comment on this report.
- We presented an overview of the current programmes on water efficiency and metering to stakeholders at the Water Resources Forum in March 2017.
- We presented the work completed to explore opportunities for the use of non-potable water to help to manage demand in London, and specifically the Opportunity Areas in London identified by GLA.
- We are currently undertaking modelling of demand management options to develop optimised demand management portfolios to input to the programme appraisal decision support tools alongside the resource options. We will hold a Technical Stakeholder Meeting in June to share this work with stakeholders.

## **Section 8: Developing our preferred programme**

In the formulation of our preferred programme for WRMP14 we used the least cost planning tool (EBSO), complemented by a stepwise programme appraisal approach, and with sensitivity analysis to ensure future uncertainties were fully understood and considered. We recognise that there are shortcomings with this approach, not least future uncertainties, and have explored more sophisticated models and tools which will enable a wider set of considerations to be taken into account to inform strategic decision making. These include multi-criteria performance modelling, real options analysis and adaptive pathways. We have briefed stakeholders on this work as it has developed (September 2015 Water Resources Forum and technical stakeholder meetings in March 2016 and November 2016).

Since February 2017:

- We have developed new decision support tools to move from a least cost planning approach to a best value approach. We have engaged with stakeholders and customers on this and overall they have supported a best value planning approach.
- We have developed a new visualisation tool to improve the transparency of the programme appraisal process. We have engaged with our Expert Panel and the Environment Agency to present the tool and seek comments to ensure confidence in the tool and its application.
- The programme appraisal process started at the end of April and will conclude in September.

## **Section 9: Engaging with our customers**

Our plan must reflect the preferences and priorities of our customers. We are undertaking a programme of engagement with customers to seek their views on our services overall and specific topics in more detail, including water resources. The output from this will be taken into account in developing our preferred programme. We sought feedback from stakeholders on the

approach and materials at the July and October 2016 Water Resources Forums and are engaging with the Customer Challenge Group (CCG) as we progress this work.

Since February 2017:

- Research work has been completed to understand customer views on a range of topics including resilience, being a good neighbour, inter-generational fairness, water resources and leakage. The output has been used in the development of a customer preference metric to be used in programme appraisal, and will also be used to inform the Business Plan.
- We are hosting a series of events across the Thames Water region to engage with local communities on our future plans during May and June. The events will take place in Cirencester, Abingdon, Hungerford, Guildford, Marlow and some London Boroughs. We are also hosting stands at a number of public events, including the Cotswold Show and The Banbury and District Show, to engage with customers and gain insight into their views, priorities and concerns for water resources and wider business services.

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