



Water Resources Technical Stakeholder Meeting Demand management and resource options, 6 May 2016

Note of meeting

1. Welcome and Introductions

Chris Lambert welcomed everyone to the meeting and outlined the agenda. This included an introduction to the work underway to assess measures to manage demand and provided an update on work to examine resource options for Thames Water's next Water Resources Management Plan (WRMP19).

2. Demand management

Anwen Beaton provided an introduction to the current demand management programme and work to review the demand management options for WRMP19. A briefing paper was circulated in advance of the meeting.

Anwen outlined the focus on measures to manage demand, including leakage, water efficiency and the roll out of the progressive metering programme in London over the 5 year period from 2015 to 2020. Performance so far has been good, achieving annual targets for leakage and water efficiency, and installation of ~68k meters through the progressive and optant metering programmes.

Anwen then outlined the work underway to examine demand management options for WRMP19 and sought feedback on the approach and the options under consideration. To date the WRMP14 Rejection Register has been reviewed to determine whether previously rejected options were suitable for revisiting, new options identified and a constrained option list developed. A screening report will be published in June 2016 for consultation. Work is also progressing on the development of modelling tools to support the development of integrated demand management programmes.

There was wide discussion on demand management options. Key points raised were as follows:

TRT asked if there are opportunities to encourage the commercial building sector to integrate water efficient devices in new developments and if TW is active in this area. **TW** agreed that new build housing presented opportunities to promote the efficient use of water however the legal and regulatory framework does not provide the support needed to encourage developers to take action. That said TW is working with GLA and other partners to explore opportunities.

TRT asked what the current levels of meter penetration are within TW's area and what the target levels are. **TW** confirmed that current level of meter penetration is ~ 34% and the programme underway will achieve 70% meter penetration in London by 2025.

Windsor & Maidenhead asked TW how it proposes to promote rainwater harvesting, without a supportive legislative or regulatory framework, as the difficulty lies in the implementation. **TW** agreed that a supportive regulatory framework would be helpful but TW is currently undertaking work with GLA and other partners in designated Opportunity Areas in London to examine a range of options, including rainwater harvesting, as part of the Integrated Water Management Studies (IWM) and this will help set a pathway for these types of interventions.

GARD asked how TW will estimate savings linked to demand management measures. **TW** confirmed that it monitors activity to evaluate the costs and benefits of measures and is establishing trials to evaluate new approaches eg incentive scheme. This information will be used to inform WRMP19.

GARD asked if there will be a report to detail this information. **TW** confirmed that it provides an annual performance report in the Annual Review which is published on TW's website www.thameswater.co.uk/wrmp



in August each year. TW will also publish feasibility reports on new demand management options and a screening report to explain the pathway to the development of the constrained list of options.

CPRE asked about the target for water use in new homes. **TW** explained that the Housing Standards Review (2015) resulted in significant changes to the Building Regulations and introduced a new national approach under which all new homes should be of the same technical performance, whereas previously local authorities had been able to specify building standards relating to energy efficiency, water efficiency, materials use etc. relevant to their area. The Building Regulations (Part G) requires that the average water usage of a new home should be no more than 125 litres/person/day and an optional standard can be applied of 110 litres/person/day for water stressed areas.

TW explained that average household water use in the TW supply area is ~ 158 l/h/d and metering is an important measure which is expected to facilitate a reduction in household water use.

A question was asked about non-household water consumption. TW outlined the work currently underway to analyse industrial sectors, current consumption and future trends which will inform WRMP19 non-household demand forecasts.

North Wessex Downs AONB raised comments about the integration of demand measures and consideration of intangible benefits. **TW** confirmed that it considers the costs and benefits of individual measures and then develops integrated programmes and considers the benefits of the integrated approach.

North Wessex Downs AONB asked whether any reductions in demand that may be achieved could be used to reduce TW abstractions from sensitive rivers? **TW** explained that demand will continue to increase but demand management will help slow the rate of increase – Cascade will be looking at wider benefits of strategic water resource schemes to potentially address abstractions from sensitive rivers as part of the catchment management work.

EA asked TW what assumptions are being applied for the transition to a meter. **TW** confirmed it had assumed a 12% reduction in average household demand for smart meters in WRMP14 and it will analyse actual data from the current programme to inform WRMP19. **EA** also asked whether there were assumptions regarding “bounce-back” from meter programme demand reduction or if TW was planning on a continued demand reduction following meter installation. **TW** confirmed that it had assumed any bounce back.

TRT asked if TW considers the impact of climate change on demand. **TW** confirmed that the impact of the changing climate is considered in developing the demand forecast. This was a relatively small impact in WRMP14.

GARD asked whether TW is reviewing what other water companies are doing, and have achieved, and learning from good practice. **TRT** also referenced international good practice. **TW** confirmed that it works with the wider industry and shares best practice on water efficiency, this is through an industry wide working group and also research projects via UKWIR. Collaborative working is also evidenced by the recent establishment of a south east regional water efficiency partnership. TW also takes account of international experience, and the recent droughts in California and Australia have provided some useful information and learnings.

TRT asked how much political pressure is applied to promote demand management. **TW** explained that its current programme exceeds the Economic Level of Demand Management and this reflects customers’ preferences and Government aspirations at WRMP14. However whilst demand management is widely supported it is not fully within the company’s control and there is a risk that it will not deliver the savings forecast which is an important factor in ensuring long term security of supply.



North Wessex Downs AONB asked how changes in the ecological status of rivers is factored into this work. **TW** explained that the IDM models are limited in scope to only take account of the costs and benefits of demand management measures to derive optimised demand management (DM) programmes and then these DM programmes are input into the programme appraisal models and at this stage environmental impacts are considered in the development of the overall preferred programme.

GARD asked if they will have an opportunity to comment on scenarios considered. **TW** confirmed that it will continue to share work on an on-going basis and it will consult on scenarios that will be used in the formulation of WRMP19.

WWF queried what work had been completed on tariffs and why TW had decided to progress an incentive scheme in preference to tariffs. **TW** outlined the work undertaken to explore tariffs which included work with RPS and NERA to explore tariffs used in the UK and internationally both within the water sector and more widely, and research undertaken with customers to understand their views on tariffs. Customer feedback indicated that tariffs were viewed as penalty measures and the focus should be on measures to help customers to use water efficiently. Furthermore customers clearly stated that meter penetration needed to be sufficiently high for the imposition of tariffs to be considered to be fair. Hence TW's current focus on the development of an incentive scheme.

Windsor and Maidenhead asked if TW procure specialist advice on Building Regulations. **TW** confirmed that the internal water efficiency and planning teams have knowledge of the regulations around buildings and water use requirements.

There was a discussion on the potential impact of retail competition on the efficient use of water and the promotion of demand management measures. This raised a number of points and is an area TW is continuing to explore.

Stakeholders confirmed that there were no further comments on the demand management options proposed on the constrained list and that the process to review and shortlist options was reasonable.

Non-potable reuse

Anwen then provided an introduction to non-potable reuse, setting out TW's past experience of operating non-potable systems, the programme of work underway to examine the potential for such systems focusing on commercial customers – hotels and managed flats, the risks and how these can be mitigated, and management and operational structures. Current work led by TW has examined 22 Opportunity Areas in London and identified potential benefit of 8.4 Ml/d but with substantial costs.

TRT queried whether work had been undertaken to examine opportunity to use borehole water in London. **TW** confirmed that there is a study looking at the possibility of using groundwater for non-potable purposes.

GARD and **North Wessex Downs AONB** questioned the benefit identified to date, surprised that it was so small (8.4Ml/d) and asked if reports will be prepared on this work which will provide further information on the derivation of this figure. **TW** confirmed that this work is on-going and it will present further information as it moves forward. Reports will also be provided to stakeholders for review.

Windsor and Maidenhead asked if TW will report on the full set of options considered, those that are rejected and the reasons for rejection. **TW** confirmed that it will report this information.



TRT stated that this is well established field in the US and that TW was previously involved with companies who are active in this area and queried whether TW is drawing on this experience. **TW** confirmed that it will follow this up with the technical lead.

STW stated that it had undertaken work to explore the use of aquifer recharge in Birmingham and it was not found to be very successful.

Ofwat asked if TW had ruled out household scale non-potable reuse. **TW** confirmed that it had at this stage due to the risks of misconnection and management of the systems hence the focus was on community and managed properties.

CCT gave a view that a strong regulatory framework would be needed to support non-potable reuse. Furthermore the retrofit of dual pipe systems would be vastly costly and operational infeasible.

Windsor and Maidenhead stated that with the drive by Government to facilitate housing growth that there is no appetite for the introduction of new, and more complex measures. Developers will only do what they are forced to do and therefore the opportunities are limited.

GARD asked what proportion of demand in the TW supply area is non-household demand and that they considered that the commercial sector was the right target market to promote this and suggested a target could be set. **TW** stated that ~ 500 MI/d of London's demand is for the non-household sector, however retrofit of non-potable systems would be extremely expensive, so the focus is on new development which presents a smaller opportunity.

CCG asked if TW is proposing to develop its own systems for rainwater and grey water recycling and cited personal experience of operating such a system which was proving to be expensive in terms of maintenance costs. **TW** explained that it was not intending to develop its own systems but was looking at existing systems on the market.

3. Resource options

Motts provided an update on the programme and introduced the work to examine the resource options from a system wide perspective. A briefing paper was circulated ahead of the meeting.

GARD asked if TW will publish reports on methodologies. **TW** confirmed that it will.

GARD asked about baseline data. TW confirmed that the baseline data used for WRMP19 will be based on 2016/17.

Albion Water asked what is the impact to south of river and connections with areas outside of TW supply area which are short of water. **TW** confirmed that an important aspect of WRSE's work is to consider the optimal combination of options. Related to this **TRT** asked if the work is considering wider network connectivity between TW/Affinity and SE Water and the need for upgrades.

Option screening

Motts then provided an update on the work to screen resource options. Since the publication of the fine screening report in May 2015 there has been a modification to the approach, with the development of Feasibility Reports for each option type. The purpose of these reports is to collate information on each option type in one document.

Taking information in the feasibility reports, an update to the fine screening report will be prepared and published in June/July 2016 for consultation. This report will include all options, both large and small, and will summarise the journey from generic options through to the constrained options. Options taken forward to the

constrained options list will then be assessed in further detail, for example a quantitative assessment of deployable output. This will be presented in the detailed design concept reports. In addition a longer term planning horizon will be considered extending the period from the minimum of 25 years to a 80 year time horizon.

GARD asked if the stochastic drought generated work will be included in the July fine screening report. **TW** stated that this is work in progress and if it has been completed in time it will be included.

GARD stated that resilience should be assessed for all options including the Unsupported Severn Thames Transfer and all new reservoir options. **TW** stated that it does not think an unsupported transfer is resilient and there are several supported transfer options being considered. The work on stochastic droughts will support this. **GARD** reiterated its point that it considered a consistent approach on the assessment of drought resilience should be applied across all option types including the unsupported transfer.

GARD queried why drought resilience was not a criterion for the reuse feasibility report screening as in drought conditions re-use may be constrained by low river flows for dilution. **TW** responded that this would not be a criterion that would differentiate between the various reuse options and that the design assumption is for the sewage effluent to be treated to a level that would not preclude discharge to the receiving water body even in drought flow conditions.

UU asked if TW will be using the stochastic flow series in determining the baseline supply-demand balance. **TW** confirmed that it will be using the stochastic flows to inform the supply-demand balance assessment.

GARD asked if the assessments that TW is undertaking to understand deployable output of schemes will be consistent with approaches completed by UU and STW. **TW** agreed that the approaches would be aligned.

Feasibility reports – Objective and methodology

Motts then provided an update on the objectives and methodological approach for the feasibility reports, followed by a high level update on each of the work streams.

North Wessex Downs AONB queried why drought resilience is not considered as a criterion for reservoirs. **Motts** explained that the feasibility reports involve comparison **within** an option type and not between option types. The drought resilience of the reservoir options is broadly the same for each option and therefore is not a differentiator. At the fine screening stage, comparison will be made between option types against six key assessment “dimensions”, one of which is resilience.

North Wessex Downs AONB queried the Stage 1 criteria and specifically the exclusion of international and national designated landscapes, stating that they should be afforded equal status as other designated sites (i.e. heritage and ecological/environmental designated sites). **Cascade** explained that Stage 1 was the first screening stage only and focused on those sensitive environmental features that could be completely or largely destroyed by the construction of a reservoir being built over a site. Landscape designations, such as National Parks and AONBs, cover a wider area and such sites would not be completely destroyed by a new reservoir. Landscape designation is a key consideration at Stage 2 and Stage 3 of the feasibility assessment and has regard to setting as well as designations. It was agreed that Cascade would follow up with North Wessex Downs AONB and other interested parties on this point and the methodologies being applied to landscape and visual amenity at Stage 2 and Stage 3 of the feasibility assessment.

TRT queried why “sites which could supply water to London WRZ” not identified as a criteria for desalination. **Motts** explained that the criteria “sites which would provide water for London” was introduced for reuse so as to screen out sewage catchments outside the London WRZ where the consumptive element of reuse schemes



would impact on downstream abstractors. Motts confirmed that the wording would be amended to make this clearer.

GARD requested further information on the WaterUK long term planning study. **TW** explained that this had been covered at the April WRF and that the aim of the study is to look at existing resilience of water supply across UK. The study is planned to report in July 2016 and the results disseminated to the industry, with wider communication after this date.

TRT asked if TW expect any surprises from this work. **TW** confirmed that it did not, as much of the work underway for the WaterUK project is already in train for TW.

CCT requested further information on the Black & Veatch study being undertaken on behalf of the CRT. **CRT** confirmed this is being led by CRT in collaboration with several large water companies and is completing a feasibility study focused on the CRT existing network.

GARD asked if the Mogden effluent transfer was the same as Mogden effluent reuse. **Motts** confirmed that the transfer is replacement rather than reuse and would involve provision of treated effluent downstream of Teddington Weir so can additional water can be abstracted upstream of Teddington. These options are mutually exclusive.

TRT asked if all desalination options being considered were in the Beckton area. **Motts** confirmed this was the case.

TRT asked whether the inter-zonal transfers were restricted to TW inter-zonal transfers or also included transfers between companies. **Motts** confirmed the latter is the case.

GARD requested further information on the STW transfer option. **TW** explained that this had been covered at the April WRF, presentation and minutes have been circulated. STW are completing some work to unbundle the lower and mid Severn options to determine the most economical way of supporting flow in Severn.

GARD asked for a clearer outline of the feasibility reports. **Motts** explained that these would provide a breadth of detail for the options considered. A greater level of detail will be provided compared to the detail in the WRMP14 summary scheme dossiers.

TRT asked if TW is making assumptions about future water quality requirements given the planning horizon. **Motts** confirmed that the current work is founded on current water quality standards but is aware of future risks. **TRT** emphasised that this is a huge opportunity to ensure investment is planned appropriately for future need. **TW** agreed and stated that this aspect should be picked up when considering the adaptability of programmes. **TRT** suggested that space should be reserved for additional treatment stages as a precautionary measure against the risks of more stringent future drinking water quality standards.

TRT asked if the London Ring Main had a maximum demand assumption included in its original design. **TW** responded that that various sections of the Ring Main had been expanded already and there was scope for some further expansion.

North Wessex Downs AONB queried how much work had been undertaken to examine how changes to land management can bring changes to water quality and therefore treatment requirements. **Cascade** confirmed that current water treatment design work assumes current water quality but the role of catchment management in addressing risks to drinking water quality was being explored as part of the catchment management work for WRMP19 (progress on this aspect was presented by Cascade later in the meeting). **North Wessex Downs AONB** cited work underway by Southern Water and South Downs AONB to consider the improvements that land management practices can bring to water quality.



Ofwat explained that they have been reviewing company Climate Change Adaptation Reports and the majority of companies have reported that raw water quality as a risk under climate change.

TRT raised the point that reduced flows in the river under climate change and subsequent reduction on dilution could bring non-compliance and subsequent concerns regarding effluent disposal.

Cotswold Canals

Andrew Kirby (Motts) then presented an update on work to review the use of the Cotswold Canals as a conveyance option for a Severn-Thames transfer. A more detailed discussion was held on this option post meeting.

CCT asked how frequently pollution incidents occur on the navigable reaches of the River Thames near to Thames Water's abstraction intakes. **TW** stated it did not have data to hand and agreed that it was not a frequent occurrence.

GARD asked why the preliminary costs presented on the conveyance options assumed 365 days/year utilisation. **Motts** replied that this was an interim approach pending confirmation of likely utilisation rates from current water resource modelling activities, and that lower levels of utilisation would be expected to widen the difference in costs between the canal and pipeline due to the lower pumping heads associated with the canal.

CCT asked whether mitigation costs for zebra mussel build-up in the raw water pipeline had been included in the preliminary costs. **Motts** replied that no mitigation costs have been included to address environmental and operational issues. Mitigation measures are still being assessed and costs will be updated in due course for both the canal and pipeline conveyance options.

Motts confirmed opex assessment is currently based on 365 days / year, but this is expected to reduce once utilisation and operating philosophy has been finalised. **CCT** noted that removal of zebra mussels etc will need to be considered in the opex of the pipelines.

Reservoirs

Cascade then provided an update of work to review potential reservoir sites. The starting point for this work was the site selection work undertaken in 2006 and reviewed in 2012 which identified an initial 55 potential sites for a new reservoir in the Thames catchment upstream of Teddington. The feasibility assessments will lead to a shortlist of sites to be taken forward to fine screening. The reservoir feasibility report will be published in June 2016.

In summary, following assessment of the initial 55 sites through the Stage 1 assessment criteria, 34 sites were taken forward to the stage 2 assessment. Cascade highlighted that the assessments undertaken show changes to previous assessments, for example recent revisions to the designation of ancient woodland has resulted in amendments at a number of sites including the need to reduce the site boundaries at Chinnor and exclusion of additional sites including Longworth, West Hanney and Quainton. Cascade explained that 9 sites have been taken forward to stage 3 assessment defined in 3 reservoir site area bands and the provisional output of this assessment was presented. The best performing sites for each reservoir capacity are to be taken through to fine screening.

North Wessex Downs AONB queried the assessment criteria relating to visual viewpoints and, in particular, the distance from a recognised viewpoint used. **Cascade** acknowledged that distance has been used at Stage 2 to further screen sites, but at Stage 3 a more detailed assessment is being carried out regarding visual amenity and landscape sensitivity, which will not be based on a set distance and will consider the setting of a designated site.



As agreed earlier in the meeting, Cascade would follow up with North Wessex Downs AONB and other interested parties on the methodologies being applied to landscape and visual amenity at Stage 2 and Stage 3 of the feasibility assessment.

In response to **North Wessex Downs AONB** earlier query relating to Stage 1 consideration of landscape designations Cascade stated that there were 2/3 sites which included AONB designated land but that none of these sites were taken forward from Stage 2.

GARD questioned whether Wanborough is on chalk and similarly if Chinnor is on the chalk ridge. **Cascade** confirmed that the geology was a criterion in determining the feasible sites at Stage 1 and would subject to further consideration in Stage 3 so no sites will be located directly on chalk strata.

A question arose as to whether the options on the constrained list will be subject to the Strategic Environmental Assessment (SEA). **Cascade** confirmed that this is the case.

GARD stated that a vast amount of work was completed on initial screening in the 1990s and he presumed that TW had looked at this. **Cascade** confirmed that the past work was the starting point and where required data has been updated.

Catchment management

Cascade then presented the work undertaken to date to consider opportunities for catchment management which could provide additional resource (Phase 1 of the work), and if new resources are developed the potential to offset more local abstraction issues which may be causing adverse environmental effects (Phase 2 of the work – to be carried out once the Constrained List of options has been determined)

TRT recommended that TW should work with catchment hosts from catchment management partnerships to understand what activities are underway. This was noted by TW.

A comment was also made that flood defence measures can potentially provide resource benefit. This was noted by TW.

Ofwat asked whether the catchment management activities encompass in-channel river restoration. **Cascade** confirmed that this was the case and this may particularly apply to partially addressing issues raised by sustainability reduction and “serious damage” abstraction assessments.

TRT asked whether with urban catchments are misconnections and SuDS are a priority. **Cascade** confirmed that TW is working with partners on a range of urban catchments to address misconnections and investigate SuDS solution opportunities.

CPRE raised the use of swales and the focus to date on managing pesticides. **TW** is carrying out a pilot project to assess the benefits of swales in the upper River Thames catchment.

North Wessex Downs AONB stated that if encourage catchment sensitive farming a key issue is silt which has a huge impact on ecological status. **TW** referenced the Evenlode pilot project which is being led by TW in collaboration with partners. **North Wessex Downs AONB** also referenced the Earth Trust and work that they are leading in this area.

WWF observed that the approach seemed to be designed from a water quality perspective and then a filter applied to consider water resources, whereas if it was approached from a resource perspective as a priority there may be wider opportunities. **North Wessex Downs AONB** also raised concerns about the approach, suggesting a number of components appear to have been compiled rather than an integrated catchment approach being properly considered. These points were noted and **Cascade** explained that work to date had



initially focused on assessing mutual benefits from existing and planned catchment management activities. The initial work was also taking a water resource perspective by assessing opportunities for catchment management to address poor water quality where this acts as a constraint to water resources. TW's overall catchment strategy has focused on water quality and flooding to date but is being broadened to consider water resources as a further objective.

EA asked if TW was considering an Ecosystem Services Assessment (ESA) or Natural Capital approach to understand wider benefits. **TW** stated that it has given some consideration to this but is concerned that these approaches are still emerging with limited practical application. **TRT** supported this suggesting that an ESA would be difficult.

Next steps

Motts outlined the focus over the next 3 months which, in summary, is as follows:

- Completion and publication of the methodology work
- Completion of the water treatment and network reinforcement cross-option studies
- Completion and publication of the option feasibility reports with the exception of the raw water transfers report.
- Update and publication of the fine screening report for comment
- Commence work on conceptual design for options on the constrained list.

A further technical stakeholder meeting will be held in November 2016 to provide an update on progress with resource and demand management options.

Discussion

TW stated that Ofwat had confirmed the timeline for the WRMP and the Business Plan. The key dates are companies to submit draft WRMPs to Defra by 1 December 2017 and start the public consultation in January 2018.

TRT asked how Ofwat participate in the process. **TW** confirmed that the Water Resources Planning Guideline is produced jointly by Ofwat, EA, Defra and Welsh Assembly and as such Ofwat is a key participant in the WRMP process. **Ofwat** confirmed its engagement in the WRMP process, actively participating in WRSE and WREA work and promoting the importance of cross boundary solutions. Ofwat is continuing to develop methodologies for the next round of Business Plans.

TRT asked how Ofwat will approach long term projects which span multiple AMP periods. **Ofwat** confirmed that this is an area of active discussion and there is a focus on long term outcomes. Ofwat also referenced the other work underway which will shape long term planning in the sector including Defra's roadmap, National Infrastructure Commission and the WaterUK long term planning study.

CCG raised a question around how the compatibility of the objectives of greater collaboration and competition. **Ofwat** stated that it did not view these objectives to be incompatible. Bulk transfers are commercially negotiated agreements to allow water trading and as such these are not incompatible with a competitive market.

4. Dates of forthcoming meetings

5 July 2016: Water Resources Forum: The forum will be held at the Penta Hotel, Reading. Invites will be sent for this meeting at the end of May.



6 October 2016: Technical Stakeholder Meeting on programme appraisal and specifically refined metrics and scenario definition

27 October 2016: Water Resources Forum (London) – Details to be confirmed

8 November 2016: Technical meeting on demand management and resource options



Attendees:

Name	Organisation
Dominic Gogol	WWF
Gwyn Rees	CEH
Harry Hodgson	CCG
Helen Tidridge	NRW
Henry Oliver	North Wessex Downs AONB
John Lawson	GARD
Karen Gibbs	CCWater
Kay Lacey	Pang Valley Flood Forum
Ken Burgin	Cotswold Canal Trust (CCT)
Malcolm Jeffery	Albion Water
Mark Smith	United Utilities
Martin Pilbin	RWE Generation UK plc
Mat Wells	Canal and Rivers Trust (CRT)
Pat Spain	Severn Trent Water (STW)
Peter Spillett	Thames Rivers Trust (TRT)
Richard Harding	CPRE Oxfordshire
Rob Cunningham	Ofwat
Robert Paddison	Royal Borough of Windsor & Maidenhead
Sarah Goode	Environment Agency (EA)
Sarah Wardell	Environment Agency (EA)