

Need and Availability of Water: Affinity Water Pre-consultation dWRMP19

Introduction

Affinity Water supplies drinking water to approximately 3.5 million people and 1.4 million properties in the South East of England.

Our supply area comprises three distinct geographic regions, as shown in **Figure 1.0**:

- Central provides water to North London and extends into rural parts of Essex, Hertfordshire and Buckinghamshire, with a population of 3.2 million people;
- Southeast provides water to the towns of Folkestone and Dover, together with surrounding rural areas including Romney Marsh and Dungeness, with a population of 160,000 people;
- East provides water to north east Essex including the towns of Harwich and Clacton on Sea, with a population of 156,000 people.

We have a statutory responsibility to produce a Water Resources Management Plan (WRMP) every 5 years, and the next WRMP is currently being prepared. The new WRMP will come into effect in 2019 (referred to as WRMP19).

Affinity Water is preparing its WRMP in accordance with the Water Resources Planning Guideline: Interim Update (April 2017)¹ which requires that all water companies in England and Wales publish estimates of the need for water to meet the balance between future water supplies and future water demands - '*the supply demand balance*'. This notice sets out initial estimates of the supply demand balance (SDB) that the Company predicts as the baseline for the next WRMP, and the potential variance from that baseline, the draft submission of which is due in December, 2017 (dWRMP19).

This statement of need is intended to provide neighbouring companies, third parties and other interested stakeholders with initial estimates of SDB forecasts at pre-consultation stage, in order that interested parties can offer potential solutions to meet deficits, model deficits and surplus within their own dWRMPs, or simply understand the scale of potential supply demand issues within the Affinity Water area. This statement can help interested parties in the interim period, between our previous estimates of our SDB at WRMP14, and our new estimates due in December, 2017.

¹ Environment Agency (available from www.environment-agency.gov.uk)



Figure 1: Map showing Affinity Water Regions (Central, Southeast and East)

Status of Data and Limitations

Affinity Water will be reporting on 8 WRZs (six in the Central region and one each for East and South East).

The data presented on the following figures summarises our forecasts to 2040, based on our WRMP14. It is important to recognise that the data presented in this note are estimates and will be subject to improvement as we develop our own dWRMP19. For example, we are working with the Environment Agency (EA) to understand the impacts of licence reductions as part of the current Water Industry National Environment Programme (WINEP1), and the most recent list of licence reductions proposed by the EA will not have been taken into account within the WRSE work. We are also improving our understanding of the latest demand forecasts ahead of dWRMP19.

The data in **Table 1** has been taken from our Final WRMP14 modelling exercise, these are our baseline estimates, before solutions were modelled to meet the SDB, as set out in our Final WRMP14 Plan (available online). The estimates at WRMP14 covered the minimum 25 year period from 2014/15; the start year for WRMP19 will be 2019/20. Water Resource Zone 8 (WRZ East) is not included as a surplus has historically been forecast for this zone.

The water balance in **Table 1** represents the difference between Water Available for Use (WAFU) and Distribution Input (plus Headroom). WAFU includes an assessment of climate change impact on source deployable outputs and sustainability reductions are included in the baseline along with outage.

	Surplus/Deficit Forecast									
	2019/20		2024/25		2029/30		2034/35		2039/40	
WRZ	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP
WRZ1	-12.19	-9.01	-14.73	-13.70	-15.41	-16.59	-16.37	-19.86	-17.63	-23.53
WRZ2	-8.23	-9.02	-18.52	-11.19	-20.36	-13.92	-22.49	-17.08	-24.97	-20.73
WRZ3	4.59	-30.77	-15.18	-44.17	-19.12	-48.60	-23.81	-54.16	-29.15	-60.69
WRZ4	-1.56	-12.97	-2.38	-15.54	-5.01	-20.55	-8.98	-27.46	-13.92	-35.73
WRZ5	-5.44	-6.18	-6.05	-7.52	-7.05	-9.41	-8.38	-11.81	-10.01	-14.64
WRZ6	-2.36	1.94	-4.64	-1.28	-7.66	-5.55	-11.24	-10.68	-15.36	-16.62
Total (Central) 1-6	-25.19	-66.01	-61.5	-93.4	-74.61	-114.62	-91.27	-141.05	-111.04	-171.94
WRZ7 (SE)	1.27	1.22	-0.17	-1.11	-1.37	-3.11	-2.55	-5.11	-3.83	-7.23
Total 1-7	-23.92	-64.79	-61.67	-94.51	-75.98	-117.73	-93.82	-146.16	-114.87	-179.17

Table 1: Indicative supply demand balances for the Dry Year Annual Average condition (DYAA) and for the Dry Year Summer Critical Period condition (DYCP)

Estimate of variance from WRMP14: Interim for draft WRMP19

For the 2019 WRMP the Water Resources Planning Guideline: Interim Update (April 2017)¹ states that water companies should assess the risks that are unique to each company and set out the appropriate methodology for modelling the SDB (that should at minimum cover the statutory 25 year period).

We have applied the problem characterisation exercise (as set out in UKWIR, 2016²) and concluded that we should apply an extended modelling methodology which will include stress testing of our supply base to various droughts, beyond the worst historic event. The modelling will also extend beyond the 25 year planning horizon to 2079/80.

This modelling will test the resilience of our water resources to droughts that will include the worst historic and severe drought events. It is therefore important to note that should any future plan be based on or be referenced to a SDB from a severe drought (for example the 1:200 year event), then there is the potential for further variance from the WRMP14 SDB as set out in **Table 1.0**.

The problem characterisation also identified a number of other key risks to our existing supply demand forecast, which are represented by the following sources of information that have been made available to our teams since WRMP14:

- **Demand Projections:**

The updated 'plan based' demand forecasts (Experian)

- The household forecasts for WRMP19 are generally higher than those used at WRMP14. The average annual growth ranges from 0.87 to 1.14 per cent per annum compared with 0.72 per cent for the WRMP14 forecast. The biggest differences are seen for WRZ3, WRZ5, WRZ6 and WRZ7. Equally, the population forecasts for WRMP19 are generally higher than those used at WRMP14, noticeably in WRZ3, WRZ5, WRZ7 and WRZ8. The average annual growth ranges from 0.65 to 0.83 per cent per annum compared with 0.37 per cent for the WRMP14 forecast. These differences will undoubtedly add pressure to the supply-demand balance, although no major changes can be foreseen at this stage

- **Sustainability Reductions:**

Without agreement with the EA on the exact reductions it is difficult to forecast the impacts on our supply base over the planning period from WINEP1, though this will be modelled. At this time however we can say that the WINEP1 tables were issued with PR14 sources as 'amber' i.e. **medium** certainty

- AMP6 – 42.1MI/d agreed (on target to deliver)
- AMP7 – 27.71MI/d included as 'likely'

Future uncertain reductions

- A further 48MI/d as 'red' low certainty (currently AMP6 NEP studies) were identified, at this time it is assumed that should these reductions materialise then they would be planned for by the end of AMP7 (or 2024/25) though this is not confirmed (it is assumed that the Water Framework Directive is implemented by 2026);

Dates for WINEP2 – 29/09/2017 and WINEP3 – 30/03/2018 were also provided;

- **No Deterioration:** Affinity Water's assessment of the no-deterioration risk (Sustainable catchments) is currently calculating a total residual risk to DO of c.12 MI/d.

The work to represent these potential additional impacts on our existing supply demand balance forecasts is ongoing, however **Table 2.0** sets out our initial assessment to 2045, whilst the modelled data projected to 2079/80 remains in progress:

WRZ	2044/45 MI/d		(post 2024/25) MI/d
	DYAA	DYCP	WINEP1
1	-18.89	-27.2	-15
2	-27.45	-24.38	0
3	-34.49	-67.22	-8
4	-18.86	-44.00	0
5	-11.64	-17.47	-26
6	-19.48	-22.56	0
7 (VWS)	-5.11	-9.35	0
Total 1-7	-135.92	-212.18	-48

Table 2: Affinity Water estimates of supply demand balance at 2044/45 based on our problem characterisation and our initial understanding of the potential impacts on our baseline from the various changes to our data used at WRMP14.

The following key points are provided, as additional information to help with the understanding when using **Table 2.0**:

- Demand forecast: The Experian data is not a direct impact on our distribution input forecast (DI). The forecasts will be used to derive DI and consumption through our demand forecast modelling, that work is ongoing. The use of the plan based estimates is in line with the Water Resources Planning Guideline: Interim Update (April 2017)1;
- WINEP1: WINEP2 will be too late for this Statement of Need, though the dialogue will continue with the EA and should further reductions need to be modelled these will be agreed with the EA; and
- No-deterioration: Agreed a joint position statement with Thames Water and South East Water on the LTOA. River Thames abstractions not at risk from no-deterioration.

	Surplus/Deficit Forecast											
	2019/20		2024/25		2029/30		2034/35		2039/40		2044/45	
WRZ	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP	DYAA	DYCP
WRZ1	-12.19	-9.01	-14.73	-13.7	-30.41	-31.59	-35.26	-34.86	-32.63	-38.53	-33.89	-42.2
WRZ2	-8.23	-9.02	-18.52	-11.19	-20.36	-13.92	-22.49	-17.08	-24.97	-20.73	-27.45	-24.38
WRZ3	4.59	-30.77	-15.18	-44.17	-27.12	-56.6	-31.81	-62.16	-37.15	-68.69	-42.49	-75.22
WRZ4	-1.56	-12.97	-2.38	-15.54	-5.01	-20.55	-8.98	-27.46	-13.92	-35.73	-18.86	-44.00
WRZ5	-5.44	-6.18	-6.05	-7.52	-33.05	-35.41	-34.38	-37.81	-36.01	-40.64	-37.64	-43.47
WRZ6	-2.36	1.94	-4.64	-1.28	-7.66	-5.55	-11.24	-10.68	-15.36	-16.62	-19.48	-22.56
Total (Central) 1 - 6	-25.19	-66.01	-61.5	-93.4	-74.61	-114.62	-91.27	-141.05	-111.04	-171.94	-179.81	-251.83
WRZ7 (SE)	1.27	1.22	-0.17	-1.11	-1.37	-3.11	-2.55	-5.11	-3.83	-7.23	-5.11	-9.35
Total 1 - 7	-23.92	-64.79	-61.67	-94.51	-75.98	-117.73	-93.82	-146.16	-114.87	-179.17	-184.92	-261.18

Table 3: Provides an indication of the potential impacts on the WRMP14 deficits from applying the uncertain WINEP1 sustainability reductions, at 2024/25 onwards (to 2004/45). Figures in red represent WINEP1 impacted projections.



Our modelling work to determine our zonal SDB forecasts will begin to output draft results between now and the autumn 2017. We will endeavour to update this statement of need with new results ahead of the draft plan submission, if it is possible to do so.

Responses

There is a statutory consultation on the development of the dWRMP19 and further information will be placed on the Affinity Water website in due course.

In the meantime any questions on this document or other aspects of the WRMP should be emailed to **Nick Honeyball or Mumin Islam at WRMPconsultation@affinitywater.co.uk**

2 UKWIR, Risk Based Planning Methodology 2016