WRMP24 Upper Hampshire Avon Water Resources Strategy

Wessex Water

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Wessex Water
YTL GROUP

Document revisions

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Contents

1. Introduction

Following the development of our draft plan and public consultation period, we have had further engagement with the Environment Agency and Natural England through the WINEP process, and also following receipt of representations on the draft version of this plan. Specifically Natural England have raised concerns about the impact of our current abstraction on the integrity of the River Avon Special Area of Conservation and Sites of Special Scientific Interest (SSSI) in the catchment. Of key importance was the requirement from the EA and NE to ensure first that new growth in the catchment is not met through additional abstraction, so that abstraction would remain at recent actual levels, and second, that abstraction will be reduced as soon as practicable. A key cited driver is to keep abstraction at recent actual levels is to avoid the imposition of “Water Neutrality” which may inhibit planned development growth.

The purpose of this document is to set out our strategy to deliver sustainable abstraction for the Upper Hampshire Avon. The remainder of this introduction introduces the catchment area in relation to our supply system. Section 3 compares recent actual abstraction to the abstraction in our Water Resources Management Plan (WRMP); Section 4 summarises the WRMP preferred adaptive plan, and specifically how this will meet the needs of the catchment in the near term and from 2035; and Section 5 and 6 explain how our demand management strategy will be implemented and targeted in the catchment to ensure new growth can be met by existing abstraction. Section 7 then explains the next steps we will be taking to deliver this strategy.

1.1 Catchment Area and current water supply

For security reasons this section has been edited and source names redacted and not available in the version of this document published on our website.

Our forecast of available water to supply to customers is constrained by the availability of water in the environment, the licenced quantities Wessex Water is available to abstract, and the infrastructure to abstract, treat and distribute it to customers.

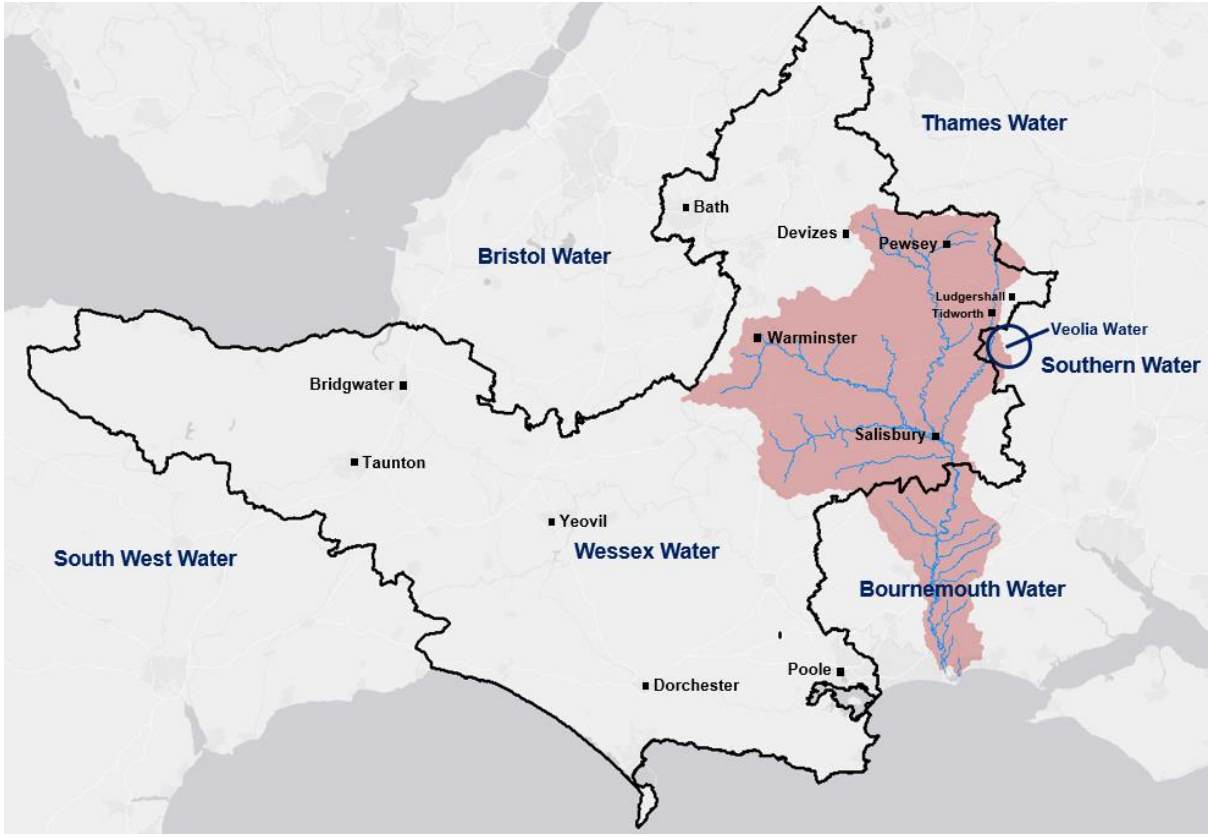
The Hampshire Avon is one of the main river catchments in the Wessex Water region (Figure 1-1) rising in the valley of Pewsey with the Wiltshire tributaries converging in Salisbury, and meeting the sea at Christchurch[1]. The main tributaries of the catchment, which converge in Salisbury, include the Wylye which flows South East from Warminster, the Nadder which flows East towards Salisbury and the Bourne which flows South through the Tidworth area parallel to the upper Abon itself towards Salisbury. The majority of the perennial (Hampshire) River Avon and part of one of the winterbournes (River Till) is designated as a Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI).

Eight of our thirty three Water into Supply (WIS) zones fall fully or partially within the Hampshire Avon River catchment (Figure 1-2) and water is both imported to and exported from the catchment to surrounding areas via our integrated grid network. Other notable

[1] Avon Hampshire Management Catchment | Catchment Data Explorer

abstractors in the catchment are Veolia Water and the Ministry of Defence (MoD). We currently receive imports from Veolia Water and imports from Southern Water Ludgershall (Figure 1-2).

Figure 1-1: Hampshire Avon River catchment (red) with its tributaries in proximity to the outlined Wessex Water supply region, neighbouring water companies*, and key towns.



* It should be noted that the Veolia Water region is not a true representation of its actual geographical border but has been circled to differentiate between itself and Southern Water. It has been included in the figure due to the importance of its bulk imports into the Hampshire Avon catchment.

Figure 1-2: Water into Supply Zones (green) within the Hampshire Avon catchment (red) with its tributaries and key towns indicated.

For security reasons this figure is redacted and not available in the version of this document published on our website.

1.2 Integrated Grid Investment in 2018

Over the past 20 years, we have worked in partnership with the Environment Agency and others to investigate sources where there are concerns that the volume of water we are licensed to take has unacceptable impacts on local water courses, groundwater levels and the wildlife that they support. Some investigations have led to the reductions in the licensed volumes or other mitigation measures being made to ensure precious habitats in our region are protected.

Following the 2004-2008 Review of Consents (RoC), 23.5 Ml/d of licence reductions for the River Wylye and River Bourne tributaries of the Hampshire Avon chalk stream catchment were identified as needed in our 2009 Water Resources Management Plan. The water

supply GRID project was proposed to accommodate these reductions (Figure 1-3). This was £230m investment project involving over 50 individual schemes in our water supply network to connect communities that were once stand-alone (i.e. could only be supplied by one source) to the wider distribution network, thereby increasing their security of supply and making the system more resilient to the potential impacts of climate change. The most notable new connections were from sources in the south of the supply system, in the Stour catchment near Poole, northwards past Blandford forum and Shaftesbury into Warminster and east towards Salisbury and the wider Hampshire Avon.

The project has not just included investment in traditional asset infrastructure, but also investment in innovative technology, referred to as 'The Optimiser', which models operation of the GRID and the demand placed upon it up to 72 hours in advance, repeating this modelling at least hourly to account for potential operational or customer demand changes. The optimiser automatically recalculates the best way to operate the network to mitigate outages and improves the resilient operation of our water supply system.

The scheme was completed in 2018 and now delivers environmental improvements and enhances resilience for our customers across the supply system, but notably in the Hampshire Avon catchment, without the need to develop new sources.

Figure 1-3 Wessex Water integrated grid (new pipelines in red) to solve areas of supply and demand deficit and meeting licence reductions in the Hampshire Avon catchment

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2. Current investigations, needs and drivers

Since the development of the integrated grid, an AMP7 environmental investigation assessed the impact of our abstraction on achievement of Common Standards Monitoring Guidance (rCSMG) flow targets for the Hampshire Avon and River Till. This study concluded in March 2022 and found areas of non-compliance with flow targets, achievement of which requires further reductions in abstraction, but implementing these reductions would put customer supplies at risk unless adequate replacement water resources can be found.

We have engaged with the Environment Agency and Natural England during the development of the water resources management plan to understand the licence change requirements for the catchment, as driven primarily by the designated status of the catchment as a Special Area of Conservation and Special Site of Scientific Interest (SSSI). Much uncertainty remains to be resolved before a comprehensive plan can be developed and implemented to address flow non-compliance. There is a requirement to assess our other sources in the parts of the catchment not investigated in the AMP7, which may identify the need for further abstraction changes, whilst we also need to assess the likely effects of climate change on resource availability.

The wider water resources management plan deployable output assessment – the amount of water we can supply to customers during drought periods - includes abstraction from 17 sources across the catchment and supporting tributaries, as listed in Table 2-1 and shown spatially in Figure 2-1. Some of the sources shown in Figure 2-1 are not currently used, and therefore not included in our WRMP supply-demand balance. For the list Sources currently in use please see Table 3 1. Table 2-1 shows lists for each source in the catchment the AMP period and type of investigation that is to be conducted in the catchment, and for our Dry Year Annual Average (DYAA) and Dry Year Critical Period (DYCP) scenarios, forecast low, central and high deployable output reduction changes needed. The alternative scenarios reflect the uncertainty in changes required until investigations have concluded, and in total have an approximate range of 3 to 30Ml/d of further licence reductions required in the catchment, with a central estimate of 18Ml/d. These compare to our historical abstraction in recent years from the catchment of on average 61Ml/d (See Section 3).

Table 2-1 Hampshire Avon sources and scenarios of licence changes included in WRMP29

For security reasons source/site names in this table have been redacted and are not available in the version of this document published on our website. Catchment names have been included instead.

Catchment	Investigation type			Reductions in DO - DYAA			Reductions in DO - DYCP		
	Environmental Destination	No Deterioration	Regular Investigation	Low	Central	High	Low	Central	High
Wylye	AMP8		AMP8	0.00	0.00	0.00	0.00	0.00	0.00
Upper Hampshire Avon	AMP8		AMP7	1.02	1.02	1.02	1.06	1.06	1.06
Upper Hampshire Avon	AMP8		AMP7	0.95	0.95	0.95	0.78	0.78	0.78
Wylye	AMP8		AMP8	0.00	1.81	3.81	0.00	3.42	3.42
Upper Hampshire Avon	AMP8		AMP7	0.00	0.00	0.00	0.00	0.00	0.00
Wylye	AMP8		AMP8	0.00	5.68	5.68	0.00	4.03	6.03
River Bourne	AMP8		AMP8	0.00	0.00	0.00	0.00	0.00	0.00
Wylye	AMP8		AMP8	0.00	0.97	3.97	0.00	0.00	0.00
Upper Hampshire Avon	AMP8		AMP7	0.00	0.00	0.00	0.00	0.00	0.00
River Bourne	AMP8		AMP7	0.00	0.00	0.00	0.00	0.00	0.00
Upper Hampshire Avon	AMP8		AMP7	0.00	0.52	1.02	0.00	2.01	4.01
River Nadder	AMP8	AMP8	AMP9	0.00	0.00	0.99	0.00	0.00	1.53
River Nadder	NA			0.00	0.00	0.00	0.00	0.00	0.00
Wylye	AMP8		AMP8	0.00	4.52	6.78	0.00	5.00	7.50
River Bourne	AMP8		AMP8	0.00	1.53	4.03	0.00	0.00	4.16
Wylye	AMP8		AMP7	1.23	1.23	1.23	1.30	1.30	1.30
Wylye	AMP8		AMP8	0.00	0.00	0.00	0.00	0.00	0.00
Total				**3.2**	**18.23**	**29.48**	**3.14**	**17.6**	**29.79**

Our AMP8 WINEP programme will help to resolve the uncertainty in the amount of licence changes required in the catchment through the following investigation work:

- The Wylye, Bourne and Nine Mile River Investigation will extend the work of the AMP7 CSMG investigation to these parts of the Hampshire Avon SAC system.
- Catchment-level assessment of the effects of climate change on the yield of our sources (environmental destination);

- Quantifying abstraction in terms of available recharge (rainfall) in addition to river flow;
- Investigating the potential for abstraction from four disused sources and one active source to cause deterioration in WFD status of waterbodies.

Figure 2-1 Location of Wessex Water abstractions in the Upper Hampshire Avon catchment

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Water neutrality

Following the development of our draft plan and public consultation period, we have had further engagement with the Environment Agency and Natural England through the WINEP process, and also following receipt of representations on the draft version of this plan. Specifically Natural England have raised concerns about the impact of our current abstraction on the integrity of the River Avon Special Area of Conservation and Sites of Special Scientific Interest (SSSI) in the catchment. Of key importance was the requirement from the EA and NE to ensure first that new growth in the catchment is not met through additional abstraction, so that abstraction would remain at recent actual levels, and second, that abstraction will be reduced as soon as practicable. A key cited driver is to keep abstraction at recent actual levels is to avoid the imposition of “Water Neutrality” which may inhibit planned development growth.

Additional needs from MoD and Veolia Water

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Veolia Water and the Ministry of Defence (MoD) sites situated within the Hampshire Avon catchment are also facing sustainable abstraction licence reductions. The MoD have had their crown exemption removed from their abstraction, and have gone through a licencing process with the MoD which has identified concerns on the sustainability of their abstraction. We currently receive two bulk imports from Veolia. Through ongoing engagement between abstractors and regulators in the Hampshire Avon, our baseline supply-demand balance has accounted for additional need at the MoD sites of 2.27Ml/d from 2035-36.

We have liaised with Veolia water through WINEP investigations that have completed between the draft and draft final plan development to understand the potential for changes to the import and explore alternative scenarios as part of the WRMP. The preferred solution to meet Veolia’s needs is a stream support option for the nine-mile river.

Based on scenario analysis by Veolia Water and from the MoD we have considered in the development of the water resources plan alternative scenarios where an additional 9.84Ml/d is needed in the Hampshire Avon by 2035.

Through the process of engagement over the last WINEP cycle, what is clear is that there needs to be a clear and coordinated strategy to ensure all parties' needs are met to protect the environment.

3. Wessex Water recent actual abstraction and WRMP Deployable Output

For security reasons this section has been edited, and source/licence names redacted and not available in the version of this document published on our website.

This section evaluates recent actual abstraction compared to abstraction proposed in our water resources management plan to determine whether the plan proposes to use headroom on existing licences to meet new growth in the catchment.

We have 17 sources currently abstracting within the Hampshire Avon catchment and 8 of our Water Into Supply (WIS) Zones sit either fully or partially in the catchment. Alongside the Environment Agency, we have reviewed the recent actual abstraction (2018-2023) at each of these sources in both average and peak scenarios.

3.1 Recent actual abstraction – Annual Average

Table 3-1 shows the annual average abstraction from the last 5 years – the time period since the implementation of the grid system and so the most appropriate window over which to assess recent actual abstraction. The table compares the average demand over the period as well as the highest demand in the period to the WRMP deployable output and the annual licence equivalent.

Table 3-1 Recent actual abstraction from sources in the Hampshire Avon catchment

For security reasons source/site names in this table have been redacted and are not available in the version of this document published on our website. Catchment names have been included instead.

Source	Annual Licence eq	WRMP DO	Recent Actual						
			Average Year			Peak Year			
			Ml/d	% of licence	% of WRMP DO	Ml/d	Peak Year	% of licence	% of WRMP DO
Wylye	1.50	1.18	1.03	69%	88%	1.28	18-19	85%	109%
Upper Hampshire Avon	1.15	1.02	0.95	83%	93%	1.01	20-21	88%	99%
Upper Hampshire Avon	2.10	1.55	1.17	56%	76%	1.56	20-21	74%	101%
Wylye	4.04	3.85	3.71	92%	96%	3.98	22-23	99%	103%
Upper Hampshire Avon	1.50	1.36	1.37	91%	101%	1.49	19-20	99%	110%
Wylye	5.68	5.67	5.63	99%	99%	5.86	19-20	103%	103%
River Bourne	8.00	2.72	3.12	39%	115%	3.46	22-23	43%	127%
Wylye	16.44	6.41	8.31	51%	130%	10.20	21-22	62%	159%
Upper Hampshire Avon	2.73	2.24	2.25	83%	101%	2.58	22-23	94%	115%
River Bourne	11.78	10.00	9.11	77%	91%	9.33	18-19	79%	93%

Upper Hampshire Avon	4.93	4.93	4.55	92%	92%	4.85	22-23	98%	98%
River Nadder	6.99	5.48	4.09	58%	75%	4.93	18-19	71%	90%
River Nadder	1.50	0.99	0.97	65%	98%	1.15	19-20	77%	116%
Wylye	9.04	9.04	8.91	99%	99%	9.02	22-23	100%	100%
River Bourne	6.56	4.08	4.17	64%	102%	4.39	20-21	67%	108%
Wylye	2.28	1.23	0.86	38%	70%	0.98	22-23	43%	80%
Wylye	0.80	0.62	0.54	68%	88%	0.62	19-20	77%	99%
Bourne Group	16.82	16.79	16.39	97%	98%	16.70	22-23	99%	99%
Total	77.50	62.36	60.73	78%	97%	62.87	21-22	81%	101%

The amount of water that is needed to meet current demand in each year varies as a result of the weather, which explains the difference between the average over that last five years and the maximum abstraction during the peak year. Although it should be noted that the WRMP DO is calculated under the 1 in 500 drought year, whereas the recent actual years from 2018-19 to 2022-23 did not reach this level of drought severity. In well integrated supply systems like Wessex Water's during very dry conditions, some sources are used more to offset reduced water available from other sources because of the dry conditions. If a recent actual period does not include a very dry period, then a comparison between the WRMP DO and the recent actual abstraction may be quite different for some sources, where the headroom difference between an individual source output compared its WRMP DO will be needed to meet existing demand under dry conditions, not new growth. As a result, it is important to consider this considering comparison between recent actual and WRMP DO. In addition, it is important to consider the needs of supply resilience, where individual source works will need to be out of supply for certain periods to maintain and re-develop them when they naturally reach the end of their asset life, meaning additional abstraction will be needed for short periods of time from other sources to compensate.

Our annual average DO in our WRMP for the catchment sources totals 62.36 Ml/d compared to a recent peak year actual abstraction of 62.87 Ml/d (in 2021-22), and a total average over the period of 60.73Ml/d. As a result of licence changes already implemented in the catchment in 2018, that led to the construction of the grid project (Section 1.2), we already abstract to these new licences conditions. As a result, there is no proposed headroom on our licences in the WRMP that is available to meet new growth at the catchment level.

Blue highlighted cells in Table 2-1 show where recent actual abstraction in either the peak year or the average year is lower than the Deployable Output (DO) for the source in the WRMP – and therefore those sources where the WRMP is proposing to abstract more water than under recent actual abstraction to meet drought demand. The sources highlighted in green are group licence sources, where water taken from one source is totalled with the other sources to a maximum across them, as shown in the Bourne Group row. Even though individual source abstraction is lower than the total that in the WRMP, annual average and peak year abstraction is 98% and 99% of WRMP DO. For the peak year, two sources have significantly lower abstraction in recent actual than in the WRMP DO.

3.2 Recent actual abstraction – Critical Period

The percentage of the peak year abstraction compared to the WRMP DYAA deployable output for each critical period definition is outlined in Table 3-2 and Table 3-3. For both tables, values in blue cells denote sites where abstraction was greater than the WRMP DYCP deployable output.

The peak week, or critical period, for each year between April 2018 and March 2023 has been defined in two ways: firstly using the same companywide peak week for all sites, and secondly using the individual week at each site when the 7-day rolling average abstraction is at its highest each year. This is to account for some sites potentially being out of supply during the company-wide peak week and so this would not be a true reflection of the site's actual maximum abstraction in year. Or, some sites may be abstraction a greater volume at different points in the year, particularly in winter months, to compensate for outages that are taking place at other sites nearby in the network.

Table 3-2: Percentage of overall peak week abstraction compared to the WRMP DYCP DO (based on companywide peak week each year, i.e., same week for each site in year).

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	2018-19	2019-20	2020-21	2021-22	2022-23
Wylye	159%	71%	157%	104%	81%
Upper Hampshire Avon	107%	100%	118%	114%	110%
Upper Hampshire Avon	110%	120%	124%	85%	89%
Wylye	287%	139%	148%	145%	129%
Upper Hampshire Avon	162%	169%	165%	141%	126%
Wylye	136%	99%	111%	109%	115%
River Bourne	103%	24%	88%	70%	144%
Wylye	25%	71%	388%	381%	73%
Upper Hampshire Avon	105%	97%	102%	99%	109%
River Bourne	86%	100%	77%	82%	98%
Upper Hampshire Avon	76%	60%	77%	88%	88%
River Nadder	91%	97%	92%	47%	88%
River Nadder	96%	164%	114%	122%	93%
Wylye	99%	95%	99%	97%	98%
River Bourne	110%	124%	144%	130%	145%
Wylye	85%	67%	86%	80%	93%
Wylye	47%	84%	92%	79%	85%
Bourne Group	85%	95%	86%	86%	99%
Total	121%	99%	123%	116%	111%

Table 3-3: Percentage site peak week abstraction compared to the WRMP DYCP DO (based on individual site maximum 7-day rolling average each year, i.e., different week for each site).

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	2018-19	2019-20	2020-21	2021-22	2022-23
Wylye	194%	177%	171%	123%	123%
Upper Hampshire Avon	117%	116%	121%	116%	112%
Upper Hampshire Avon	133%	137%	135%	131%	130%
Wylye	321%	140%	157%	217%	240%
Upper Hampshire Avon	167%	171%	170%	156%	139%
Wylye	136%	129%	113%	109%	135%
River Bourne	175%	82%	160%	150%	179%
Wylye	445%	447%	418%	436%	443%
Upper Hampshire Avon	108%	97%	102%	99%	109%
River Bourne	101%	100%	101%	98%	100%
Upper Hampshire Avon	97%	97%	98%	96%	98%
River Nadder	104%	99%	102%	105%	113%
River Nadder	153%	166%	174%	158%	140%
Wylye	100%	101%	100%	100%	100%
River Bourne	116%	138%	144%	138%	148%
Wylye	90%	71%	88%	88%	98%
Wylye	93%	95%	95%	81%	87%
Bourne Group	NA	NA	NA	NA	NA

Over the last 5 years during the companywide peak week (Table 3-2), 12 of the 17 sources in the Hampshire Avon have achieved more source output than the dry year critical period demand in the draft WRMP. The total source output for Hampshire Avon sources across a peak demand week over the last 5 years average 79.4 Ml/d compared to a WRMP24 peak DO of 69.5 Ml/d. Of the 17 Hampshire Avon sources, 14 sources have achieved a higher peak week output at any given point during the year (Table 3-3) compared to the WRMP24 peak week DO.

3.3 Capping Summary

As analysed above, both annual average and peak abstraction from the Hampshire Avon catchment in total in recent actual years is greater than forecast in our WRMP deployable output, and therefore our WRMP does not have headroom to meet new growth.

On an individual source level, we have agreed to cap abstraction at one source at the recent actual level. The only other source in the Hampshire Avon where recent actual abstraction is notably below that proposed in the WRMP is in the Nadder catchment where recent actual abstraction is 90% of that proposed in the WRMP. As explained in Section 3.3.1, this is a result of winter nitrates, which we are currently implementing a blending solution. Therefore, increased abstraction from the 90% would occur in the wintertime, and as demonstrated below, would not increase any impact of flows in the SAC river above 10% at Q95.

3.3.1 River Nadder Source

The impact of full licence abstraction upon the Special Areas of Conservation (SAC) reach of the River Nadder has been undertaken using the Wessex Basin Model (WBM). The model has been jointly developed and funded by Wessex Water and Environment Agency, and where an acceptable calibration has been achieved it is the agreed tool to assess the spatial and temporal impacts of groundwater abstraction in the Hampshire Avon catchment. The WBM calibration of the Nadder is viewed as good and the model is fit for the purpose of assessing the impact of abstractions. The assessment has compared predicted river flows under full licence conditions to predicted natural flows. The assessment period is 1991 to 2016, as agreed with the Environment Agency and Natural England for other assessment work on the Hampshire Avon SAC. The assessment approach has been to generate flow duration curves (FDC) for the assessment period for points along the SAC reach. The SAC reach is shown in Figure 3-1 with the two PWS sources in the catchment.

Figure 3-1: SAC reach (purple line) with the two PWS sources in the Nadder catchment: Fonthill Bishop and Fovant.

For security reasons this figure has been redacted and is not available in the version of this document published on our website.

The flow duration curves for natural flows and flows under full licence abstraction at the start of the SAC is shown in Figure 3-2. A -10% bar is shown for each whole Q values from 0 to 100 for the natural flow curve. The CSMG flow compliance rules are variable dependent on the Q values, but if the impact is <10% from the natural for all Q values, i.e. the red full licence FDC plots within the natural -10% bars, then the impact flows are compliant with CSMG under all conditions. As seen below this is the case at the start of the SAC. The flow data has been assessed for the entire Nadder SAC reach and along the entire reach under all Q values the deviation under full licence conditions is <10% from the natural flow.

In addition, the source suffers from high nitrate concentrations which typically rise quickly due to the local geology and catchment, especially during periods of heavy rainfall. Therefore, the WTW has often been capped or taken fully out of supply during the winter months when nitrate concentrations have been high; Figure 3-3 shows the reduction in abstraction during these periods in black, and the logged outages in red.

We are currently implementing a blending scheme at this site to increase winter abstraction from the source. Assessment of the impact of the source at full abstraction at the top of the Hampshire Avon SAC in the Nadder (e.g. at the point of maximum potential impact) shows at full licence the abstraction is within 10% at Q95 and therefore compliant with CSMG (Common Standards Monitoring Guidance).

Figure 3-2: Flow duration curves for natural flows and flows under full licence abstraction at the start of the SAC

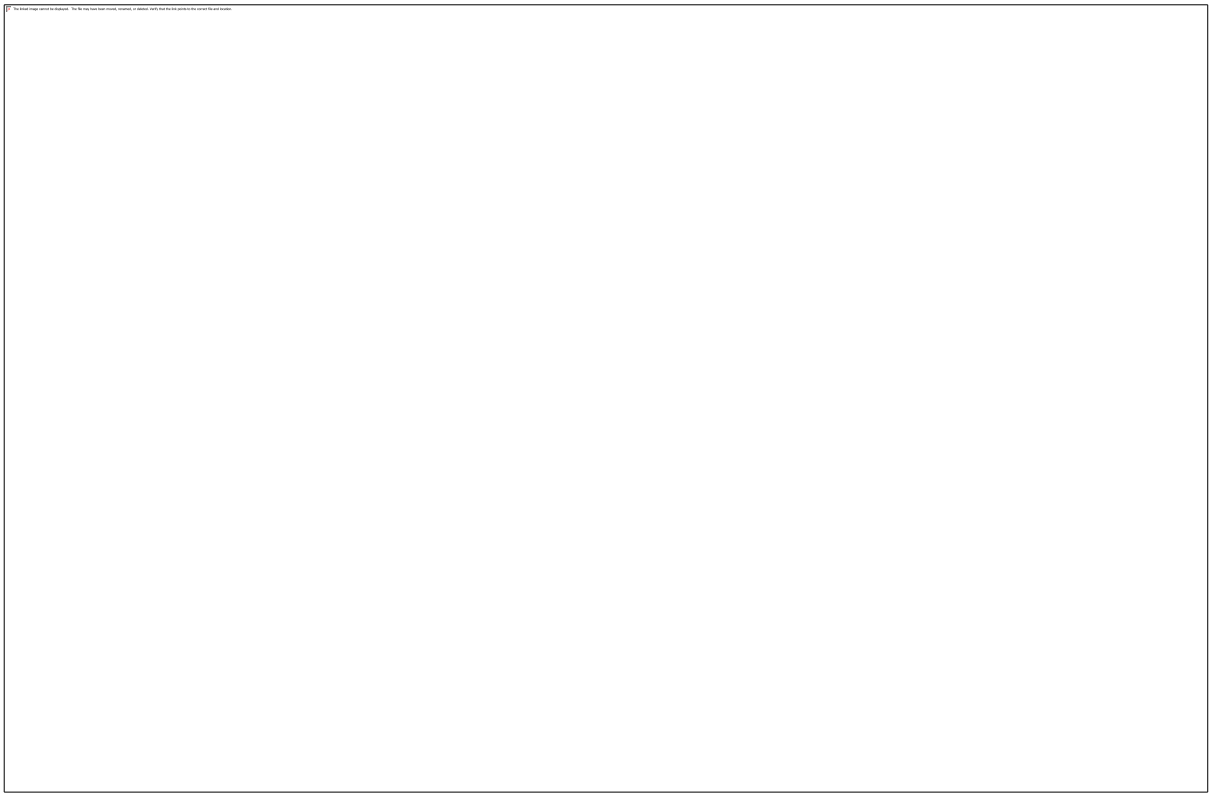
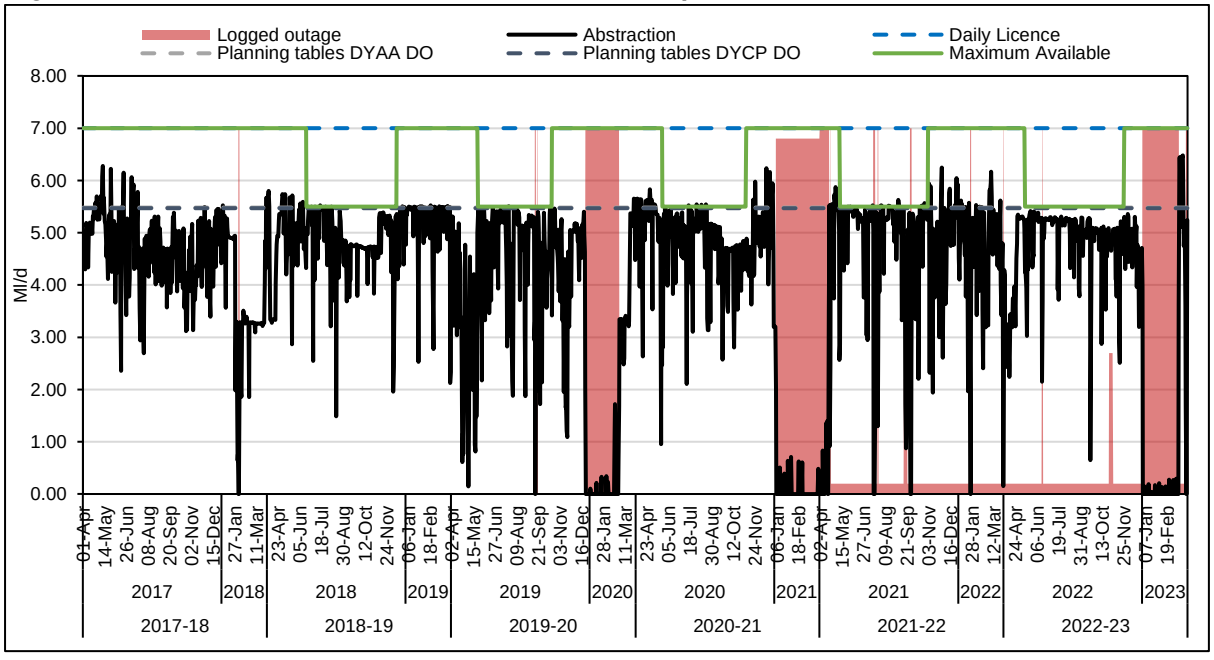


Figure 3-3: Recent actual abstraction at the source, April 2017 - March 2023



4. Options to solve the planning problem and time-scales

The WRMP Main Plan document and supporting Supply Demand Balance Decision-Making and uncertainty technical appendix explain how our preferred “most likely” plan, and adaptive plan have been selected, with key alternative pathways. This section explains how the adaptive plan will meet the needs of the Hampshire Avon catchment, and how the adaptive plan has accounted for future uncertainties.

4.1 Preferred “most likely” plan

As explained in Section & of the Supply demand balance, decision making and uncertainty technical appendix, the preferred “most likely” plan, which is derived to meet future needs under our central supply demand balance scenario, and therefore includes the deployable output losses under the central scenario in Table 2-1. In comparison to the least cost plan, our preferred best value plan has selected a more ambitious demand reduction strategy – Demand Strategy 7 – as part of the preferred plan. The reason for selecting this plan is that, in addition to meeting government and regulatory targets for distribution input reductions by 2037-38, and on a longer term glidepath to 2050 targets for per capita consumption and leakage reduction, the strategy is reducing abstraction from the environment whilst supply side schemes are put in place by 2035. This provides more of a benefit in the short term to chalk catchments such as the Hampshire Avon where the majority of sites targeted for licence reductions are located. In the Hampshire Avon, the need to offset future population growth through demand reductions to ensure no additional abstraction from the catchment is required is a key driver for selecting this plan.

In summary, the demand management strategy comprises demand reductions arising from programmes of activity relating to:

- The roll out of smart metering to households and non-households including 95% of properties with smart AMI meters by 2035.
- Water efficiency support for households and non-households, engaging with over 12,000 households and over 160 non-households a year from 2025-2030.
- Leakage reduction towards the target of 50% leakage reduction by 2050.
- The introduction of water labelling by government

Further details of the demand management strategy can be found in the Demand Management Strategy technical appendix.

Section 5 of this document explains how the demand management strategy, in particular through targeting of activities to demand centres that receive water from the Hampshire Avon catchment, will:

- help to ensure we meet future demand growth without additional abstraction
- reduce abstraction from sources, and therefore benefit the environment in the near-term whilst the supply solutions are being implemented
- mitigate the uncertainty in demand reduction measures if they prove less effective than forecast.

Under the preferred most likely plan no additional options within the Hampshire Avon catchment are selected.

4.2 Preferred adaptive plan in relation to the Hampshire Avon

As explained in Section 8 of the supply demand balance, decision-making and uncertainty technical appendix, we have explored sensitivity to key factors when deriving the adaptive plan, and appropriate alternative programmes. These include to:

- the effectiveness of the demand strategy, and how our plan would change if demand management measures were not as effective as forecast
- higher supply demand balance need in the future reflecting different factors including higher environmental need, which for the Hampshire Avon would mean the high need deployable output losses shown in Table 2-1.

In addition to these, we have also looked at factors specifically in relation to the Hampshire Avon:

- **Additional need from Ministry of Defence Sites and Veolia Water Services** – Alongside licence reductions in the catchment to achieve sustainable abstraction for Wessex Water, both the Ministry of Defence and Veolia Water Services may require additional volumes of water to meet their future needs that those already accounted for in our central supply-demand balance, which in part depends on the outcome of subsequent environmental investigations in the 2025-2030 period. To help ensure our plan can meet these needs, we have modelled scenarios where an additional 9.84Ml/d is required. These additional demands would be in the eastern part of our supply system in the Hampshire Avon.
- **Hampshire Avon options** – one solution to meet the needs of licence changes in the Hampshire Avon catchment for both Wessex Water and other users' needs is to combine existing abstractions and move them further downstream to different locations that have more water in the river where abstraction is compliant with the CSMG flow targets and then supply this water back upstream to existing demand centres. A number of our feasible supply options (34.08, 34.11, 56.01 and 70.07) fall under this category. Whilst these options may be preferential to other options by meeting demand more locally, and therefore have a lower environmental carbon impact than options that import the water from further afield, there is significant uncertainty about the impact they may have in the Hampshire Avon locally. Investigations are being taken forwards under the WINEP programme in the 2025-2030 period to assess option feasibility. Whilst these options have not been selected under our preferred "most likely" plan, it is important our plan adapts to uncertainty in availability under other plausible future scenarios.

Whilst these factors can be considered in isolation, it is important to consider them together, as combinations of these factors evolving in the future are plausible - e.g. additional need in the Hampshire Avon catchment but no additional options in the catchment available. Therefore, in addition the preferred "most likely" plan, and also based on some of the option selection under some scenarios, we have developed several alternative scenarios; the key features of these alternative scenarios are summarised in Table 4-1.

Under these alternative programmes, new supply options are required if the future evolves differently to that forecast under the preferred "most likely" programme. Under several of these scenarios, the movement of current abstractions downstream in the Hampshire Avon

are selected. Given the uncertainty in whether this is feasible, we have identified other solutions if this is not possible, including Poole water recycling scheme, and larger imports from Bristol Water, which through additional transfers as part of those schemes, as appropriate, will move the water into the Hampshire Avon catchment to offset current licence reductions, and additional water from MoD and Veolia.

Table 4-1 Key features of alternative programmes to the preferred "most likely" plan

For security reasons this table has been edited in the version of this document published on our website. Catchment names have been included instead of option names.

Alternative Programme	Key features in relation to the Hampshire Avon catchment, and how this differs to the preferred "most likely" plan
Alternative Programme 2 - Higher Need	Additional supply options selected to meet future needs, including those in the Hampshire Avon, including 52.02 - Poole water recycling, increased import from Bristol Water (70.03), new strategic schemes in the longer term, and moving current abstraction in the Hampshire Avon downstream to new boreholes (34.1).
Alternative Programme 3 - Higher Need, and no Hampshire Avon options available	Under the same need as AP2, but without Hampshire Avon options available, additional import from Bristol Water, and larger scale strategic schemes to meet need in the long-term including transfer from Mendip quarries (54.06).
Alternative Programme 4 - Central need, demand management strategy less effective	If the demand management strategy is less effective under the central need scenario, then Poole Water recycling (52.02) an increased transfer from Bristol Water (70.02) is selected in the near term, as well as a local boreholes option (34.1) in the longer term.
Alternative Programme 5 - Central need, demand management strategy less effective + Hampshire Avon options not available	If the Hampshire Avon options are not available as under AP4, then an alternative source is used to balance supply and demand (38.01)
Alternative Programme 6 - Additional need from MoD and Veolia	If additional water is required from the MoD and Veolia under the central planning scenario, then the development of new boreholes in the Hampshire Avon is selected (70.07)
Alternative Programme 7 - Additional need from Mod and Veolia and non-Hampshire Avon Options	if there is additional need and no Hampshire Avon options, then a larger increase in the import from Bristol Water (70.05) is selected with onwards transfer into the Hampshire Avon catchment.

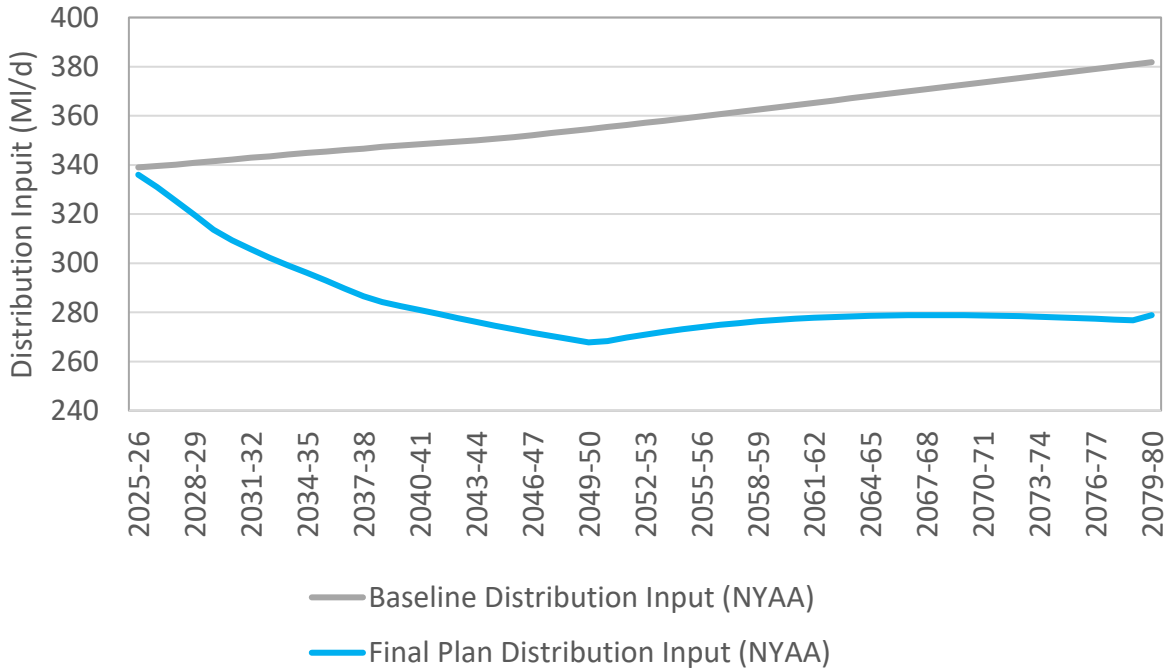
As explained in Section 8.2 of the supply-demand balance decision making and uncertainty technical appendix, under our Ofwat core programme in AMP8, 2025-2030 we will be taking forward alternative schemes through enabling works and design and development. This work will occur alongside the implementation of our demand management strategy, and WINEP investigation work into the licence reductions required in the Hampshire Avon catchment, and on the potential to develop new sources further downstream in the catchment to move existing abstraction. These activities will narrow down our uncertainties in future need, allowing us to make a decision in 2030 as to the most appropriate pathway to follow to deliver a solution for the upper Hampshire Avon catchment. To facilitate this, we are

leading up and Upper Hampshire Avon Water Resources steering group as explained in Section 7.

5. Hampshire Avon Demand Growth

Our baseline and final plan demand forecast to 2080 as a water resource zone is shown in (Figure 5-1). The forecast shows and increase in baseline demand over the planning period, associated with new demand growth. Our final plan distribution input - which includes the benefits of demand management Strategy 7 - will counteract the increase in demand, and lead to a decrease in demand and meet the Defra DI target by 2037-38. Therefore, at a WRZ level, the proposed demand management measures will be able to meet the future growth without leading to an increase in abstraction.

Figure 5-1 Baseline and Final Plan Distribution Input

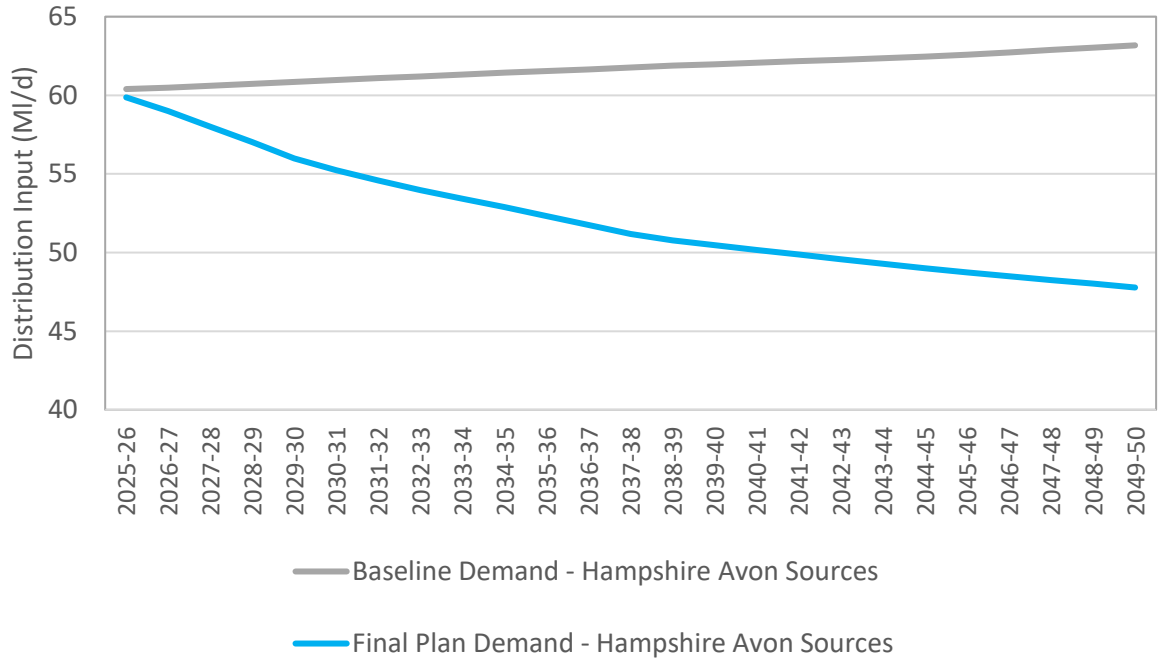


Based on recent actual abstraction, the proportion of the total Distribution Input that is met through abstractions from the Hampshire Avon is ~18% (Table 5-1). By implementing the proposed demand management strategy proportionally across our supply system, the baseline and final plan supply demand balance for the area supplied by Hampshire Avon sources is as shown in Figure 5-2 – the demand management measures are sufficient to reduce demand and not increase abstraction in the catchment.

Table 5-1 Abstraction from the Hampshire Avon as a proportion of total Distribution Input

	2018-19	2019-20	2020-21	2021-22	2022-23	Average
Daily equiv. abstraction Ml/d	57.84	59.57	61.74	62.87	61.62	**60.73**
Total Distribution Input (Ml/d) - outturn	347.75	335.68	342.69	336.96	341.24	**340.86**
Percent of Demand met from HA sources	16.63%	17.74%	18.02%	18.66%	18.06%	**17.82%**

Figure 5-2 Hampshire Avon supply-demand balance



The final plan scenario (blue line) assumes that:

- Growth within areas currently supplied by the Hampshire Avon is proportional to the supply area as a whole – e.g. there will not be a disproportionate amount of demand that must be met from Hampshire Avon Sources.
- Demand management activities are implemented equally across the supply area.

The next section evaluates this assumption by comparing future growth from the catchment to the company area as a whole.

5.1 New property growth in areas supplied by Hampshire Avon sources

For confidentiality reasons, some of the figures in this section in relation to property growth forecasts by Wiltshire County Council have been redacted.

Within our supply area, new demand arising from property growth that would be supplied by Hampshire Avon sources is within the Wiltshire County Council (WCC) area. We have liaised with WCC since the development of our draft plan to understand the latest property development forecast associated with the development of their next Local Plan. The latest data provided on property growth for WCC is to build 36,740 properties between 2020 and 2038 at a rate of ~2,000 properties per year.

The growth is forecast to occur in the Housing Market Areas (HMA) of Chippenham, Salisbury, Swindon and Trowbridge. Hampshire Avon sources supply water to Salisbury HMA, which includes the demand centres of Amesbury, Salisbury, Tidworth and Ludgershall, part of the Chippenham HMA in Devizes and part of the Trowbridge HMA, including Trowbridge itself, Warminster and Westbury.

Of the total growth forecast by WCC, we conservatively calculate ~17,000 properties are located in areas supplied by the Hampshire Avon sources. Based on properties already delivered, we conservatively calculate ~14,000 properties remain to be built in areas supplied by Hampshire Avon sources[2] from March 2023 until 2038, at a rate of ~935 properties per year.

Based on the overall supply area total new Local Authority property forecast[3], this growth represents approximately 16% of total new growth forecast in the overall supply area. Hampshire Avon sources currently meet ~18% of total demand. Given these areas supplied by Hampshire Avon sources also include supplies by other sources, the growth in new demand in these areas is proportional to the supply area as a whole. We do not therefore expect a disproportional amount of growth in the Hampshire Avon compared to the supply areas as a whole**.**

In addition to the growth estimate above, if as a conservative estimate we take the number of new properties as a proportion of our central properties forecast, which is based on the ONS principle forecast and is lower overall than the local authority forecasts, this figure equates to 22% of new growth in the supply area.

5.2 Additional demand in the Hampshire Avon resulting from growth

Taking the two percentages of total new properties as a function of total new household properties in the supply area and converting this into demand growth based on our supply demand balance model and a new property PCC of 125l/p/d, this could equate to between 2.8Ml/d and 3.9Ml/d of new growth by 2037-38[4] under a baseline do nothing scenario. A more conservative estimate of new properties demand would assume new properties instead follow our baseline average PCC of 145.9l/p/d – which could lead to new growth of up to 5.09l/p/d.

5.3 Demand management targeting

The new growth of between 2.8Ml/d and a conservative estimate of 5.09Ml/d, which represents between 16% and 22% of new growth, compares to a total demand reduction proposed for the whole supply area of 59Ml/d by 2037-38, or 9% of that demand reduction. Therefore, with demand management measures being implemented evenly across demand centres in our supply area, the proposed demand reductions as shown in Figure 5-2, are

[2] Whilst these areas are supplied by the Hampshire Avon, they are not uniquely supplied by the Hampshire Avon given other sources outside the catchment and grid connections built to move water through the supply area.

[3] The High property forecast – see the Demand Forecast Technical Appendix. This figure is used for comparison as opposed to the central planning forecast which is based on ONS data, so that the comparison of new growth inside and outside the Hampshire Avon catchment in the supply areas is done so on like-for-like Local Authority Data.

[4] This forecast is a conservative calculation of new demand based on the assumption that a PCC of 125l/h/d can be achieved for all new properties, which may be a conservative calculation if a lower 110 l/h/d standard can be achieved for all new properties. Also, it assumes that all new properties lead to new population and demand in the areas of new growth, as opposed to spreading out of existing population over a broader housing stock and lower occupancy.

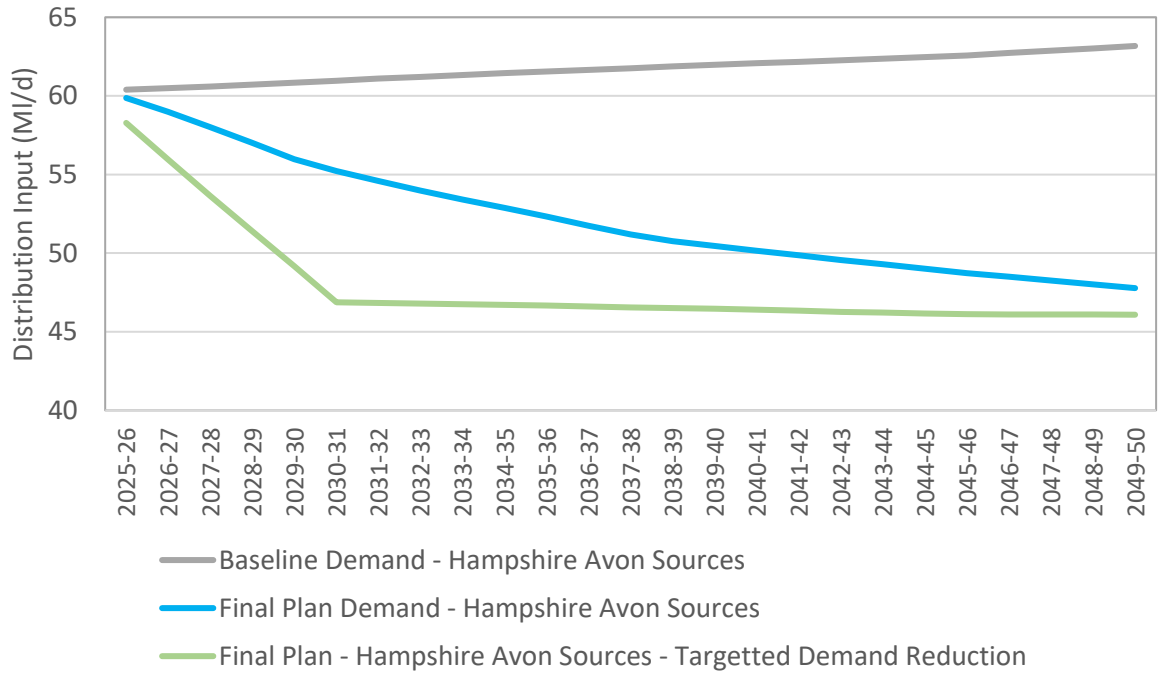
sufficient to ensure additional growth does not mean additional abstraction from the catchment.

The areas currently supplied by the Hampshire Avon sources contain 21% of current households, or 122,000 properties. Our demand management strategy proposes the roll out of smart metering to 450,000 domestic and non-domestic properties by 2030 with a further 136,000 meters by 2035. The most efficient way to roll out smart metering will be on a DMA by DMA or area by area basis.

Furthermore, our demand management strategy also proposes engaging with 12,000 households and 164 non-households per year with water efficiency advice, free devices and internal leak fixes. Between 2025 and 2030 we'll have engaged with over 60,000 properties and from 2030 to 2030 this will rise by a further 70,000.

We will prioritise the roll out of smart metering and water efficiency visits within the demand centres that receive water from Hampshire Avon sources, and the 122,000 properties that receive water from Hampshire Avon sources, to maximise the protection of the catchment through demand intervention, prior to the implementation of supply-side investments and licence changes in 2035[5]. The targeting will result in a steeper demand reduction in the area than a proportional approach to demand reduction applied across the supply system to help ensure demand growth can be met without increasing overall abstraction, and mitigate further risk associated with demand management savings not being as high as forecast (Figure 5-3).

Figure 5-3 Hampshire Avon demand growth with potential for more targeted demand reduction in the catchment



[5] This is based on the assumption that 50% of customers in the area of the 122,000 properties receive water from Hampshire Avon sources take up the offer of a home check service.

This will focus on the main demand centres within the catchment initially, including Salisbury Amesbury, Warminster, Devizes and Pewsey. Because of the grid investments made to the supply system that resulted from licence changes in 2018 (Section 1.2), we are able to supply water from across the supply system into the Hampshire Avon catchment, most notably from the south of the supply system and sources in the Stour catchment that mainly supply the Poole demand centre. Therefore, demand reductions made across the Stour and Hampshire Avon catchments, from Poole, Blandford Forum and Shaftesbury, as well as areas to the north of the catchment that receive water from Hampshire Avon sources, including the Trowbridge area, will benefit the Hampshire Avon catchment sources.

As per our main plan, there is a risk that despite the delivery and intervention of these activities, that they do not deliver the forecast demand savings. As shown in Figure 5-3, a proportional distribution of demand saving activity across the supply area will lead to a reduction in demand in the catchment, and so the targeting approach proposed will further act to mitigate the risk that demand savings associated with the activities may not be fully realised.

Throughout AMP8 we will regularly monitor the performance of our demand management strategies, as relating to the company performance commitments for leakage, per capita consumption and non-household demand. We will also maintain liaison with Wiltshire County Council through our developer services team to understand the location of growth within the catchments, and the rate of new properties development and its variation due to market forces, and how this will impact on delivery against Wiltshire local plan.

Whilst the integrated supply grid built in 2018 allows water from demand savings made in a wider area of our supply system beyond the Hampshire Avon to benefit the catchment, there are two specific demand areas within the catchment that are more constrained.

5.3.1 Devizes

For security reasons this section has been edited in the version of this document published on our website.

The Devizes area contains nearly 10,000 domestic properties and has an average demand of 4.5Ml/d. The area receives water from two sources in the Hampshire Avon catchment as well as water from another nearby source and an import from abstractions near Chippenham in the Bristol Avon catchment (Figure 5-4). In recent years, the area receives about 46% of its water supply from the Hampshire Avon. In order to protect the upper Hampshire Avon catchment, and in particular the Western Arm of the Hampshire Avon, licence changes are required to reduce abstraction from sources in the catchment to return the river to favourable condition.

Given the nature of the supply network in the area, losing water from these sources means new infrastructure is required to move replacement water into the area, through a new pipeline from the wider supply system, as it cannot be met through current abstraction from other sources in the area. The preferred “most likely” pathway option is to connect water into the area from the Chippenham area Figure 5-4. This pipeline will take 9 years to deliver,

alongside the supporting import from Bristol water, and therefore the licence reductions cannot take place until the end of AMP9 2034-35. Under an alternative higher need pathway, a transfer from the Trowbridge area may be needed. Both of these options are being taken forwards in AMP8 through enabling works and design and development as part of the adaptive plan.

Figure 5-4 Map showing the supply area around the Devizes area and new connections to be built to provide additional supplies by 2035 (red dashed lines)

For security reasons this figure has been redacted in the version of this document published on our website.

Between now and 2038, Wiltshire CC new properties growth forecast would equate to an additional 0.25Ml/d to 0.3Ml/d of demand. Targeting water efficiency household visits and smart metering in the area to the 10,000 properties prior to the new transfers in 2034-35 would results in savings sufficient to offset the growth in demand.

Demand management measures can also be targeted in the Chippenham area to reduce demand of the local sources that can also supply the Devizes area (22,000 properties) to help maximise the use of the existing transfer into the Devizes catchment.

5.3.2 Ludgershall

For security reasons this section has been edited in the version of this document published on our website.

The Ludgershall area of our supply system receives water from our wider supply system and also an import from Veolia Water Services which averages 1.93Ml/d from 2018 to 2023 (Figure 5-5). New growth in the Ludgershall area is calculated to mean a new demand growth of 0.52Ml/d by 2037-38. There are ~9,000 properties in the Pewsey and Ludgershall area, so similar to the growth forecast made for Devizes, there are sufficient properties in the area such that targeting of the demand management strategy in this area would result in savings sufficient to offset the growth in demand. This is noting that a significant proportion of the development in the area will occur after 2034-35, at which point an integrated solution for all needs in the catchment will be delivered.

Figure 5-5 Supply network in the area of Pewsey and Ludgershall in the Hampshire Avon including the current import from Veolia Water (red dashed line)

For security reasons this figure has been redacted in the version of this document published on our website.

6. Water Efficiency and Customer Engagement

As summarised in section 6.3 of this document, we will prioritise the roll out of smart metering within the demand centres that receive water from Hampshire Avon sources to maximise the protection of the catchment through demand intervention, prior to the implementation of supply-side investments and licence changes in 2035. The targeting will result in a steeper demand reduction in the area than a proportional approach to demand reduction applied across the supply system to help ensure demand growth can be met without increasing overall abstraction.

This will focus on the main demand centres within the catchment initially, including Salisbury Amesbury, Warminster, Devizes and Pewsey. Our integrated supply Grid enables us to supply water from across the supply system into the Hampshire Avon catchment, most notably from the south of the region and sources in the Stour catchment that mainly supply the Poole demand centre. Therefore, demand reductions made across the Stour and Hampshire Avon catchments, from Poole, Blandford Forum and Shaftesbury, as well as areas to the north of the catchment that receive water from Hampshire Avon sources, including the Trowbridge area, will benefit the Hampshire Avon catchment sources.

A focus on smart meter roll-out in this area will enable associated demand reduction benefits to be realised as soon as possible. These benefits include:

- Customer supply pipe leakage reduction - leak run times significantly reduced compared to current detection methods.
- Consumption reduction associated with changing from non-metred to smart metered (15% reduction when changing to measured billing, 2% reduction when remaining on unmeasured billing) and basic metered to smart metered (10% reduction).
- Enhanced targeting of household and non-household water efficiency visits resulting in better outcomes

As smart meters are rolled-out in the Hampshire Avon and surrounding areas from 2025, we will use this process to engage with customers on the environmental impacts of water abstraction, promoting water efficiency and linking this back to the potential for positive environmental outcomes in their local area, in particular the conservation of chalk streams. We will look to enhance this messaging locally through our team of Education Advisors who will visit schools to engage with children about the environment and water resources, providing education about how to save water at home and encourage pupils to spread the message to their families.

We plan to significantly increase our Home Check visits programme for household customers for 2025-2030, targeting 12’000 visits and 4,800 plumbing leak fix visits a year. The initial focus of this uplift will be in the Hampshire Avon area. The availability of hourly data from smart meters will allow even more effective targeting of these visits and the rapid identification of continuous flows to reduce the run time of plumbing losses from leaking toilets and taps. Our Home Check service offers free plumbing leak fixes for customers that need it. Our experience of delivering in-home support to customers in programmes like these since 2016 will make the expansion of this Home Check programme feasible when paired

with the smart metering programme to provide data and insight to target and drive the focus areas.

For 2025-2030 we will also facilitate an increase in non-household water efficiency visits to 160 per year, focusing on fixing internal leaks and reducing wastage. These will build on our current work engaging with schools and extend to other not-for-profit community focused organisations. For the Hampshire Avon Area we may look to tie these in with educational visits to local schools and community groups where possible to compound the water efficiency messaging in the area.

Learning from our innovative water efficiency approaches such as the community 'Rainsavers' project in Chippenham, a trial involving over 200 households taking part in an expanded Home Check including the installation of free water butts and 'soaker hoses', will help shape and optimise targeted water efficiency strategies for the Hampshire Avon.

7. Next steps – Upper Hampshire Avon Water Resources Steering Group

Resolving the planning problem in the upper Hampshire Avon requires a coordinated approach, with the main stakeholders working in partnership to ensure there is a coherent understanding of the flow requirements in the catchment under future climate change, so we can most effectively and efficiently invest to meet these requirements in the long-term. To achieve this, we have agreed with the Environment Agency to jointly lead an Upper Hampshire Avon Water Resources Steering group. The membership of this group will include the Environment Agency, Natural England, and the other main abstractors in the catchment - the MoD and Veolia Water - and will have two key objectives:

1. **Need** - Align the outcomes of environmental investigations under the WINEP programme to develop a coherent and shared understanding of flow requirements across the catchment to meet environmental needs now and in the future under climate change.
2. **Solution** - Develop joint best-value solutions to meet these needs, including demand reduction measures, investigation under WINEP of moving abstractions downstream, and new transfers to bring in additional supplies to the catchment.

The working group will align with our adaptive planning process, narrowing down uncertainty in environmental need in the catchment, and refining the solutions proposed in this plan over the next five years, to feed into the decision-making process for our next WRMP and Regional Plan. For the two components above, the group will therefore work towards producing outputs on the following time-scales[6] to feed into our adaptive planning process:

January-April 2027 – outputs to feed into the development of Wessex Water's draft WRMP 2029

- First co-ordinated assessment of licence change requirements across the catchment under climate change and understanding of new source potential. Key outputs – coordinated scenarios of licence reductions to feed into supply demand balance scenarios for the WRMP. Scenarios to account for uncertainty in need given WINEP AMP8 investigations not completed yet.
- Unconstrained and feasible options assessment to feed into WRMP decision-making.

January 2028 – outputs to feed into the development of Wessex Water's draft final WRMP 2029 and business plan and development of adaptive pathways towards the final decision on scheme progression in 2030, following conclusion of AMP8 WINEP investigations.

- Second co-ordinated assessment of licence change requirements, updated to reflect latest understanding of licence changes required. Scenarios to account for uncertainty in need given WINEP investigations not yet completed.
- Refinement to feasible options assessment, including Hampshire Avon options following further update of scheme feasibility resulting from WINEP investigations into new potential options in the catchment.

[6] based on WRMP24 timescales + 5 years, notwithstanding changes to WRMP and business planning timescales in next five years.

We should have a better understanding of need by the next plan, but new source investigations will likely take the full amp period to complete.

March 2030 – final outcome of WINEP investigations on need, which as part of WRMP29 adaptive pathway, will determine which solution to solve needs in the catchment, to commence to delivery in AMP9 to 2035.