WRMP24 Technical Document

Norfolk Happisburgh Water Resource Zone summary

April 2025

1. Introduction

1.1 About our company

Anglian Water is the largest water and wastewater company in England and Wales geographically, covering 20% of the land area. We operate in the East of England, the driest region in the UK, receiving two-thirds of the national average rainfall each year; that's approximately 600mm.
Our region has over 3,300km of rivers and is home to the UK's only wetland national park, the Norfolk Broads. Between 2011 and 2021, our region experienced the highest population increase in England. Despite this, we are still putting less water into our network than we did in 1989.

1.2 Planning for the long term

Our company Purpose is ***"to bring environmental and social prosperity to the region we serve through our commitment to Love Every Drop"***.
This purpose is at the heart of our business, having been enshrined in our Articles of Association in 2019. Central to delivering this purpose is planning for the long term; one of the strategic planning frameworks we use to achieve this is the Water Resources Management Plan (WRMP), which details how we will ensure resilient water supplies to our customers over the next 25 years. A WRMP looks for low regret investments for our region, giving flexibility to adapt to future challenges and opportunities such as technological advances, climate change, demand variations, and abstraction reductions.

1.3 What is a Water Resources Management Plan

We produce a WRMP every five years. It is a statutory document that sets out how a sustainable and secure supply of clean drinking water will be maintained for our customers. Crucially it takes a long-term view over 25 years, allowing us to plan an affordable, sustainable pathway that provides benefit to our customers, society and the environment.
Our previous WRMP, WRMP19, had an ambitious twin track strategy, combining an industry leading smart meter roll out and leakage ambition with a strategic pipeline across our region, bringing water from areas of surplus to areas of deficit.
This WRMP focusses on the period 2025 to 2050, and is known as WRMP24. We have developed it by following the Water Resources Planning Guideline (WRPG), as well as other relevant guidance, in order to meet statutory requirements.

1.4 Developing our WRMP

Our WRMP24 has been progressed following processes detailed in the WRPG. We start by determining the extent of the challenges we face between 2025 and 2050.
We achieve this by developing forecasts to establish the amount of water available to use (supply forecast) and the amount of water needed (demand forecast) in our region.
When these forecasts are combined, a baseline supply-demand balance is created. This tells us whether we have a surplus of water or a deficit, establishing our water needs for the planning period. An appraisal for both demand management options and supply-side options is undertaken.
We environmentally assess both demand management and supply-side options so we can understand their potential environmental impacts and what could be put in place to mitigate them.
The next step is for the water savings associated with the chosen demand management options to be added into our baseline supply-demand balance to determine if our region's water needs are met. If the demand management options savings do not solve the need, supply-side options are added into the modelling process and solution development.

1.5 Best value plan

To ensure we developed the right solution for our region's water needs, we have focussed on 'best value'. To us, best value is looking beyond cost and seeking to deliver a benefit to customers and society, as well as the environment, whilst listening and acting on the views of our customers and stakeholders.

1.6 Our revised draft WRMP24

Our best value plan, the revised draft WRMP24, has been produced following a public consultation on our draft WRMP24. This consultation ran from December 2022 to March 2023.

1.7 Strategic context of the revised draft WRMP24

Our revised draft WRMP24 aligns with our Purpose, as well as internal and external strategic plans and initiatives. We have worked collaboratively with internal and external stakeholders, regulators and other water abstractors to achieve this.

1.8 Guide to our draft WRMP24 submission

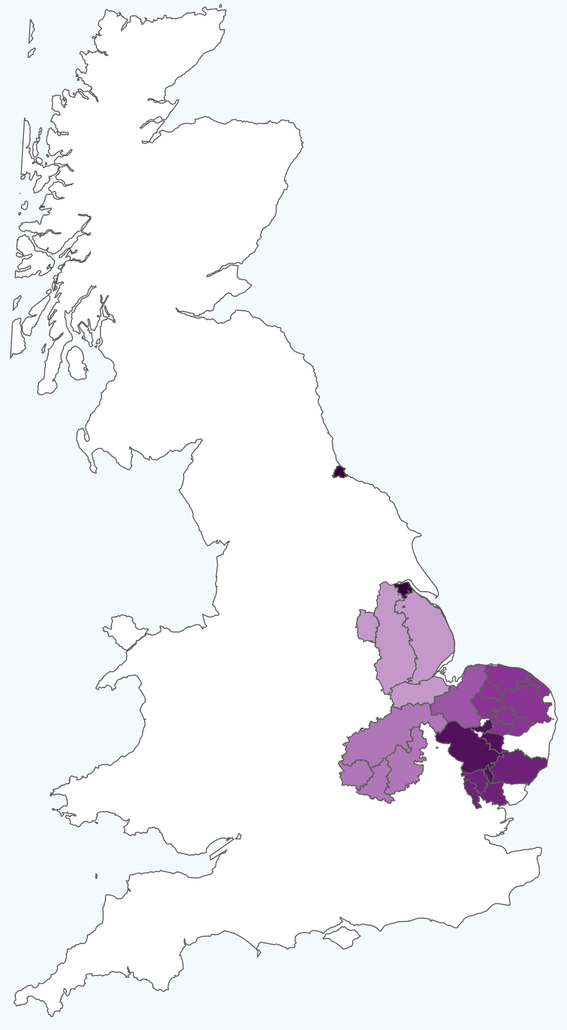
Our final submission comprises a non-technical customer and stakeholder summary, our main report and nine technical supporting documents and non-technical supporting documents.

Introduction

1.9 This report provides a non-technical summary of the WRMP24 Water Resource Zone (WRZ) data. It highlights key supply and demand information across the 27 WRZs included in WRMP24, grouped by region based on the outcomes of our problem characterisation analysis.

Resource Zone	Area
Suffolk Ixworth	Cambridgshire & West Suffolk
Suffolk Sudbury	Cambridgshire & West Suffolk
Suffolk Thetford	Cambridgshire & West Suffolk
Suffolk West & Cambs	Cambridgshire & West Suffolk
Essex Central	East Suffolk & Essex
Essex South	East Suffolk & Essex
Suffolk East	East Suffolk & Essex
Fenland	Fenland
Hartlepool	Hartlepool
Lincolnshire Bourne	Lincolnshire & Nottinghamshire
Lincolnshire Central	Lincolnshire & Nottinghamshire
Lincolnshire East	Lincolnshire & Nottinghamshire
Lincolnshire Retford and Gainsborough	Lincolnshire & Nottinghamshire
Norfolk Aylsham	Norfolk
Norfolk Bradenham	Norfolk
Norfolk East Dereham	Norfolk
Norfolk East Harling	Norfolk
Norfolk Happisburgh	Norfolk
Norfolk Harleston	Norfolk
Norfolk North Coast	Norfolk
Norfolk Norwich & the Broads	Norfolk
Norfolk Wymondham	Norfolk
Ruthamford Central	Ruthamford
Ruthamford North	Ruthamford
Ruthamford South	Ruthamford
Ruthamford West	Ruthamford

Anglian Water WRMP24 water resource zones



2. Strategic Overview

Norfolk

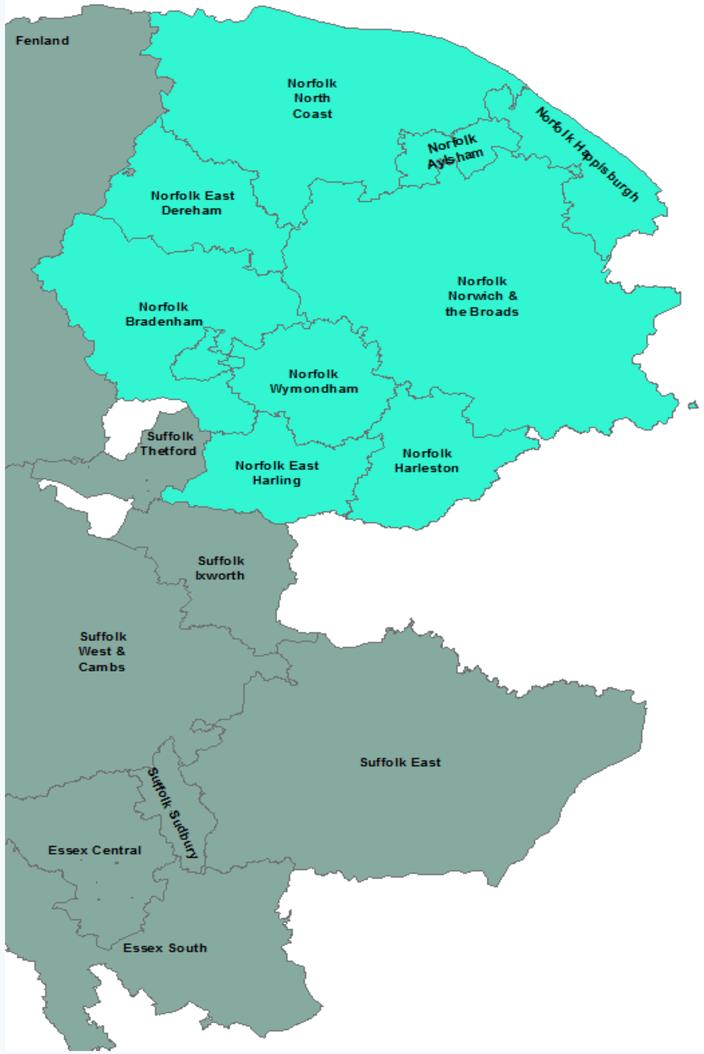
2.1Strategic risk and issues

Norfolk experiences deficits in the baseline scenario because of growth.
The area is vulnerable to extreme drought (particularly in Norwich and the Broads WRZ, because of Heigham surface water abstraction on the River Wensum). There is potential for sustainability reductions to increase baseline scenario deficits in Environmental Destination scenarios. Vulnerable catchments include:

- Broadland Rivers
- Can and Ely Ouse

Options in this area include connecting to the strategic grid, water reuse and desalination.

Figure 1 Problem Characterisation Area



Choose area

Cambridgshire & West Suffolk	Fenland	Lincolnshire & Nottinghamshire	Ruthamford
East Suffolk & Essex	Hartlepool	Norfolk	

3. Deployable Output summary
DYAA

Norfolk Happisburgh

3.1 Resource Zone geography: Norfolk Happisburgh:
The Norfolk Happisburgh WRZ covers an area of 190 sq. km and sits along the Norfolk coastline.

It should be noted that this WRZ has no actual supply sources of its own.

3.2
Note that there are no water sources within this zone.

Baseline deployable output (including 1:500 drought): *2.3 Ml/d*

Deployable output reductions

Restoring sustainable abstraction (recent actual average): *-0.1* Ml/d

Reductions to achieve environmental destination (BAU+): *-1.3 Ml/d* by 2040.

Climate change: 0.0 Ml/d by 2050.

Baseline deployable output reduces by a total of *-1.4* Ml/d by 2050 a reduction of 60.6%.

Table 3: supply characteristics (all values are Ml/d)

	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
DO pre forecast changes	2.3	2.3	2.3	2.3	2.3
Change in DO due to climate change	0.0	0.0	0.0	0.0	0.0
DO reductions to restore sustainable abstraction	0.0	-0.1	-0.1	-0.1	-0.1
DO reductions for Environmental Destination	0.0	0.0	0.0	-1.3	-1.3
Change in DO from drought measures	0.0	0.0	0.0	0.0	0.0
Final DO	2.3	2.2	2.2	0.9	0.9
Raw water losses (-ve)	0.1	0.1	0.1	0.1	0.1
Outage Allowance (-ve)	0.0	0.0	0.0	0.0	0.0
WAFU (own sources)	2.2	2.1	2.1	0.8	0.8
Net Transfers	2.0	2.3	2.4	4.0	4.4
Other benefits	0.0	0.1	0.0	0.0	0.0
Total Water Available for Use	6.1	4.0	4.0	4.1	4.4

3.3 Baseline Deployable Output Information
The baseline Deployable Output data shows the Environment Agency's preferred approach to reducing water use. It uses average licence limits from 2022–2024 for short-term licences and sets limits for permanent licences by 2030. A major drought impact (1 in 500 years) is included from 2025, not from 2039/2040 as preferred. These changes apply only to the baseline forecast.
In the final plan, we use a different approach. It includes licence limits chosen through a step-by-step process to bring in changes earlier. The 1 in 500 drought rule starts in 2039/2040 in that plan.
You can find more information in section 6 of the WRMP24 Decision Making technical document.

Data source: revised draft WRMP24 Tables submitted to the EA Nov 2024

4. Population & Housing

Norfolk Happisburgh

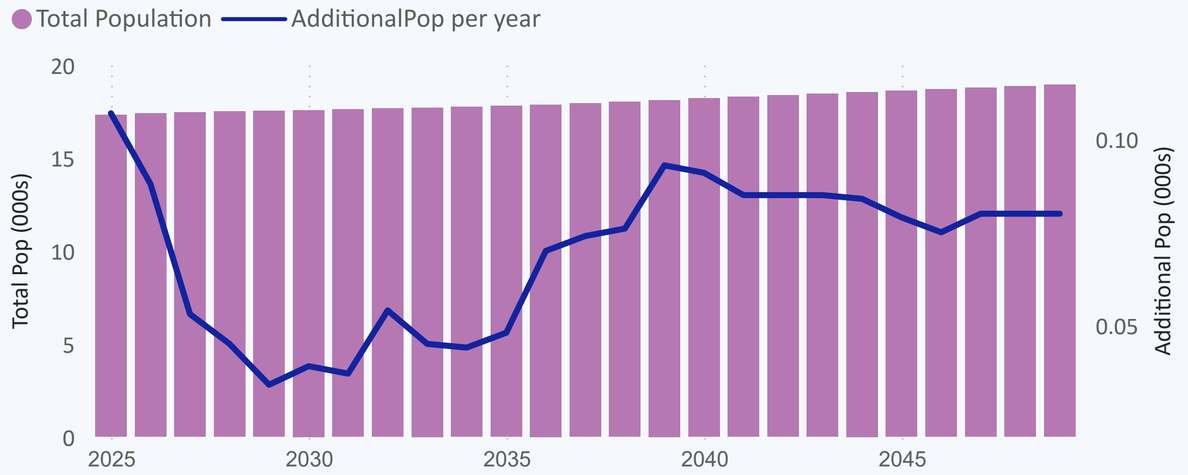
Norfolk Happisburgh

4.1 Over the WRMP period, population in **Norfolk Happisburgh** is set to increase from **17309** in 2025 to **18933** in 2049-50 - this is an increase of **9.4 %** over the 25 years.

Table 4a: Population totals (cumulative) by AMP

Year	Total Population (000s)
2029-30 (end of AMP8)	17.529
2034-35 (end of AMP9)	17.748
2039-40 (end of AMP10)	18.109
2044-45 (end of AMP11)	18.539
2049-50 (end of AMP12)	18.933

Figure 2: Total Resource Zone Population

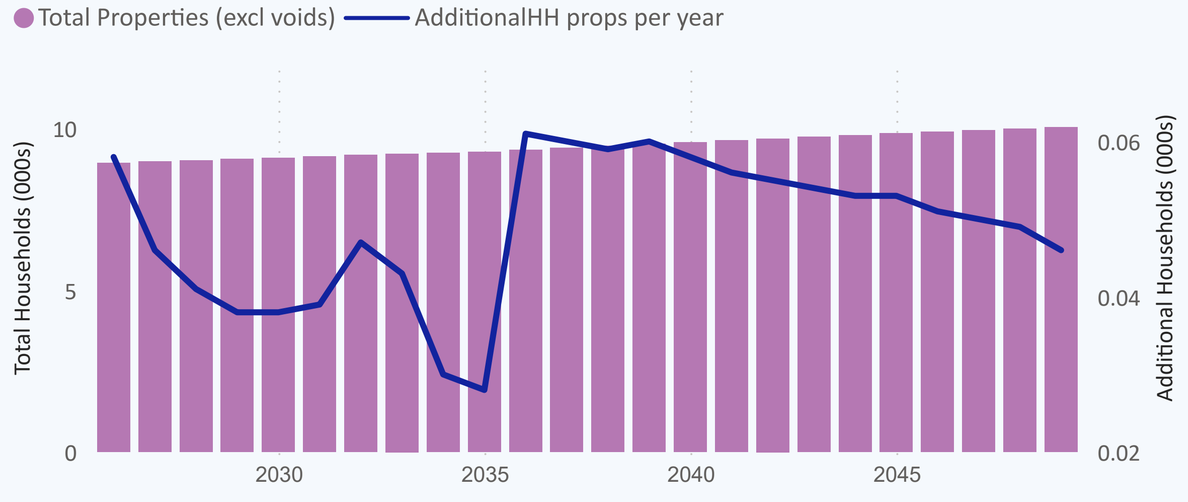


4.2 Over the WRMP period, property numbers in **Norfolk Happisburgh** are set to increase from **8873** in 2025 to **10046** in 2049-50 - this is an increase of **13.2 %** over the 25 years.

Table 4b: Property totals (cumulative) by AMP

Year	Total Properties-excl voids (000s)
2029-30 (end of AMP8)	9.056
2034-35 (end of AMP9)	9.253
2039-40 (end of AMP10)	9.521
2044-45 (end of AMP11)	9.797
2049-50 (end of AMP12)	10.046

Figure 3: Total Resource Zone Properties (excl. voids)



5. Baseline Supply Demand Balance
DYAA

Norfolk Happisburgh

Norfolk Happisburgh

Figure 4: Norfolk Happisburgh baseline supply demand balance to 2050 for Dry Year Annual Average conditions

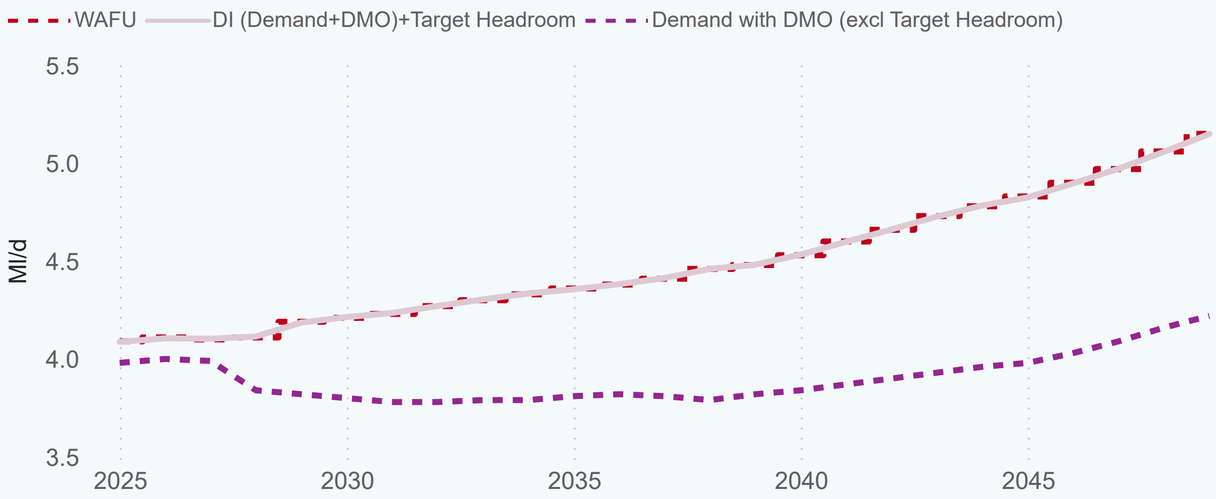


Table 5a: Baseline supply demand balance 2025 - 2050 for DYAA conditions

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water Available For Use	2.2	2.2	2.1	2.1	0.8	0.8
Net Transfers	2.5	2.6	2.9	3.0	4.6	5.0
Total Water Available For Use	4.1	4.2	4.3	4.5	4.8	5.2
Distribution Input	4.0	4.0	4.1	4.3	4.6	5.0
Target Headroom	0.1	0.2	0.2	0.1	0.2	0.1
Supply Demand Balance	0.0	0.0	0.0	0.0	0.0	0.0

Table 5b: Baseline demand forecast (without preferred demand management options)

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water delivered measured household	2.0	2.1	2.2	2.3	2.5	2.5
Water delivered unmeasured household	0.6	0.5	0.4	0.3	0.2	0.2
Total Leakage	0.6	0.6	0.6	0.6	0.6	0.6
Water delivered measured non-household	0.9	0.9	1.0	1.2	1.4	1.7
Water delivered unmeasured non-household	0.0	0.0	0.0	0.0	0.0	0.0
Distribution Input	4.0	4.0	4.1	4.3	4.6	5.0

5.1 DYAA BL supply demand summary: Norfolk Happisburgh

Baseline Supply Demand Balance: This zone is not expected to go into deficit (under the preferred baseline scenario - as described in section 3.3).

- Demand Forecast: Baseline household demand (measured and unmeasured) is forecast to change from 2.6 Ml/d in 2025 to 2.8 Ml/d in 2050, a percentage change of 6.2 %.
- Baseline Leakage: is forecast to change from 0.6 Ml/d in 2025 to 0.6 Ml/d by 2050.
- Baseline Non-Household demand: is expected to change from 0.9 Ml/d to 1.7 Ml/d.
- Baseline Distribution Input: is expected to change from 4.0 Ml/d to 5.0 Ml/d by 2050.

Nb. 'Deficit' is one outcome of the calculation WAFU minus Distribution Input (including Target Headroom).

6. Baseline Supply Demand Balance DYCP

Norfolk Happisburgh

Norfolk Happisburgh

Figure 5: Norfolk Happisburgh baseline supply demand balance to 2050 for Dry Year Critical Period conditions

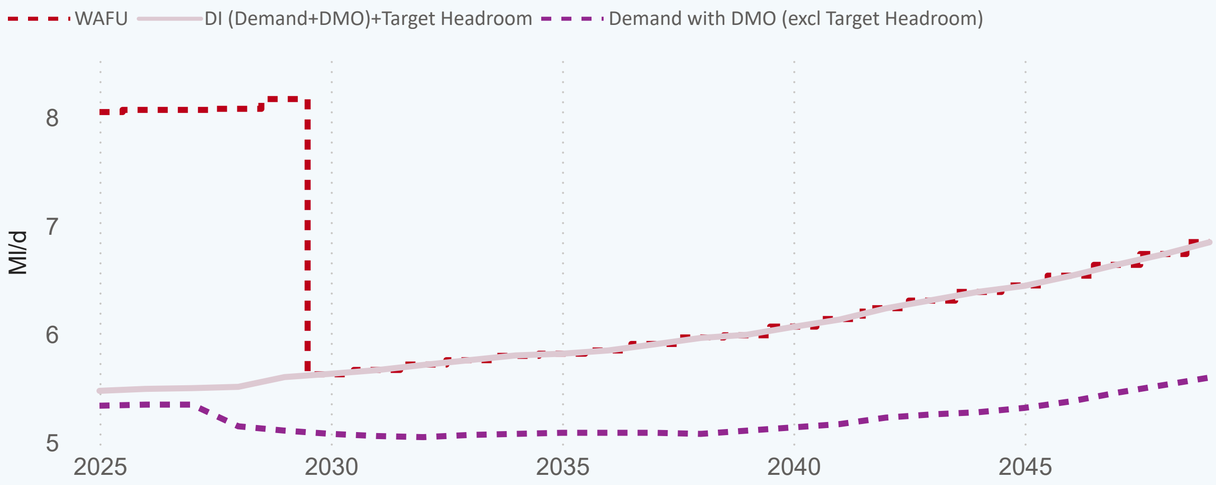


Table 6a: Baseline supply demand balance 2025 - 2050 for DYCP conditions

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water Available For Use	2.6	2.6	2.6	2.6	2.6	2.6
Net Transfers	6.1	6.2	3.8	4.0	4.4	4.9
Total Water Available For Use	8.1	8.2	5.8	6.0	6.4	6.9
Distribution Input	5.4	5.4	5.6	5.8	6.2	6.7
Target Headroom	0.1	0.2	0.3	0.2	0.2	0.2
Supply Demand Balance	2.6	2.6	0.0	0.0	0.0	0.0

Table 6b: Baseline demand forecast with DYCP conditions (without preferred demand management options)

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water delivered measured household	2.9	3.0	3.2	3.4	3.6	3.7
Water delivered unmeasured household	0.9	0.7	0.6	0.5	0.4	0.3
Total Leakage	0.6	0.6	0.6	0.6	0.6	0.6
Water delivered measured non-household	1.1	1.2	1.3	1.4	1.7	2.1
Water delivered unmeasured non-household	0.0	0.0	0.0	0.0	0.0	0.0
Distribution Input	5.4	5.4	5.6	5.8	6.2	6.7

6.1 DYCP BL supply demand summary: Norfolk Happisburgh

Baseline Supply Demand balance: This zone is not expected to go into deficit

- Demand Forecast: Baseline household demand (measured and unmeasured) is forecast to change from 3.8 Ml/d in 2025 to 4.0 Ml/d in 2050, a percentage change of 6.9 %.
- Baseline Leakage: is forecast to change from 0.6 Ml/d in 2025 to 0.6 Ml/d by 2050.
- Baseline Non-Household demand: is expected to change from 1.1 Ml/d to 2.1 Ml/d.
- Baseline Distribution Input: is expected to change from 5.4 Ml/d to 6.7 Ml/d by 2050.

Nb. 'Deficit' is one outcome of the calculation WAFU minus Distribution Input (including Target Headroom).

7. Demand forecast and PCC

Norfolk Happisburgh

Norfolk Happisburgh

Figure 6: Norfolk Happisburgh DYAA DI with and without demand management strategy

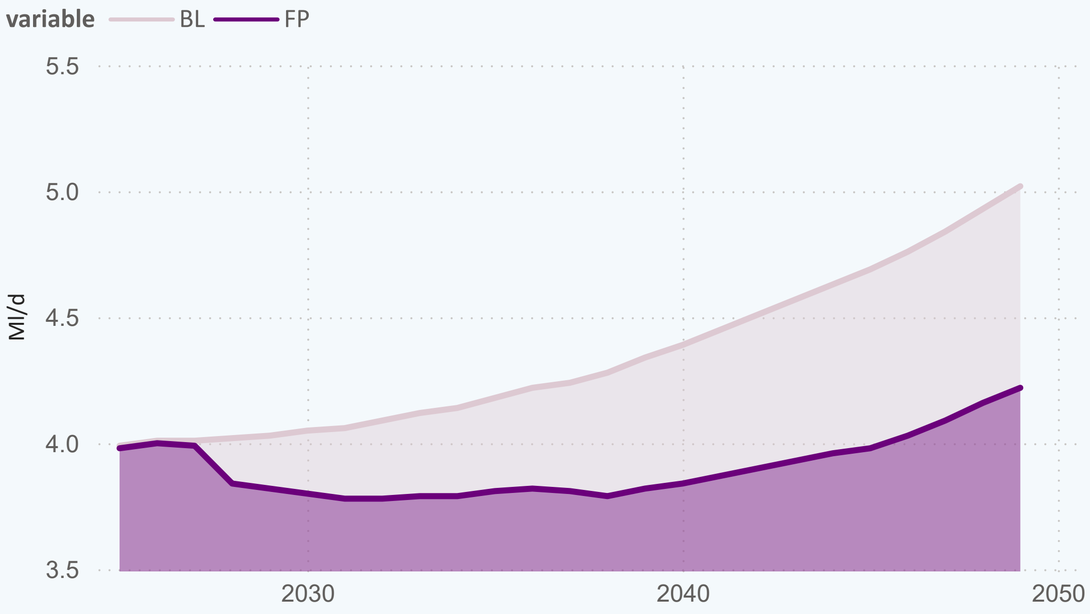


Table 7a: Demand - baseline and final plan

variable	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
BL	4.0	4.1	4.3	4.6	5.0
FP	3.8	3.8	3.8	4.0	4.2

7.2 Demand Norfolk Happisburgh (see Table 7a)

Baseline demand is expected to increase from 4.0 (Ml/d) in 2025 to 5.0 (Ml/d) in 2050. With demand management options in place, demand is expected to be 4.2 (Ml/d).

7.1 PCC Norfolk Happisburgh (see Table 7b)

Per Capita Consumption (PCC) in the base year 2025/26 is 127.7 (l/h/d) measured and 215.1 (l/h/d) unmeasured.

The weighted average PCC (l/h/d) comes in at 140.4 (l/h/d) in 2025/26. This is forecast to fall to 113.0 (l/h/d) in the Final Plan forecast as demand management option savings are realised and customers switch from unmeasured to measured status

Table 7b: DMO strategy Final Plan

	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
BL demand forecast(DYAA)	138.6	136.9	137.5	137.0	137.3
FP demand forecast(DYAA)	130.1	124.5	119.8	115.4	113.0
% change BL to FP	-6.2%	-9.1%	-12.9%	-15.7%	-17.7%

8. Demand management options

Norfolk Happisburgh

Norfolk Happisburgh

8.1 Regional overview:
Across the entirety of the Anglian Water region our demand management strategy will comprise three strongly interlinked programs:

Water metering program:

- We plan to complete our smart meter rollout, replacing all existing meters over 10 years (two AMPs). By 2025, 1.1 million smart meters will be installed across Anglian Water. These meters will give customers better insight into their water use and help us guide behaviour change. They will also improve our ability to detect leaks, cutting down plumbing losses and supply pipe leaks.

Leakage reduction

- Our goal is to cut leakage by over 45 million litres per day between 2025 and 2050. This builds on our current programme, which will reduce leakage by 27 million litres per day (14%) by 2025 as part of AMP7

Water efficiency measures

- New tools and actions will support the careful use of water. Our updated plans include promoting smart devices, expanding our Multi-utility web portal, offering garden tips, and helping vulnerable customers with plumbing and supply pipe issues. We'll also run community reward schemes. For non-household customers, we've added water-saving visits and leak reduction actions to our revised draft WRMP24.

Figure 7: DMO strategy Final Plan for Norfolk Happisburgh

For full chart key see table below

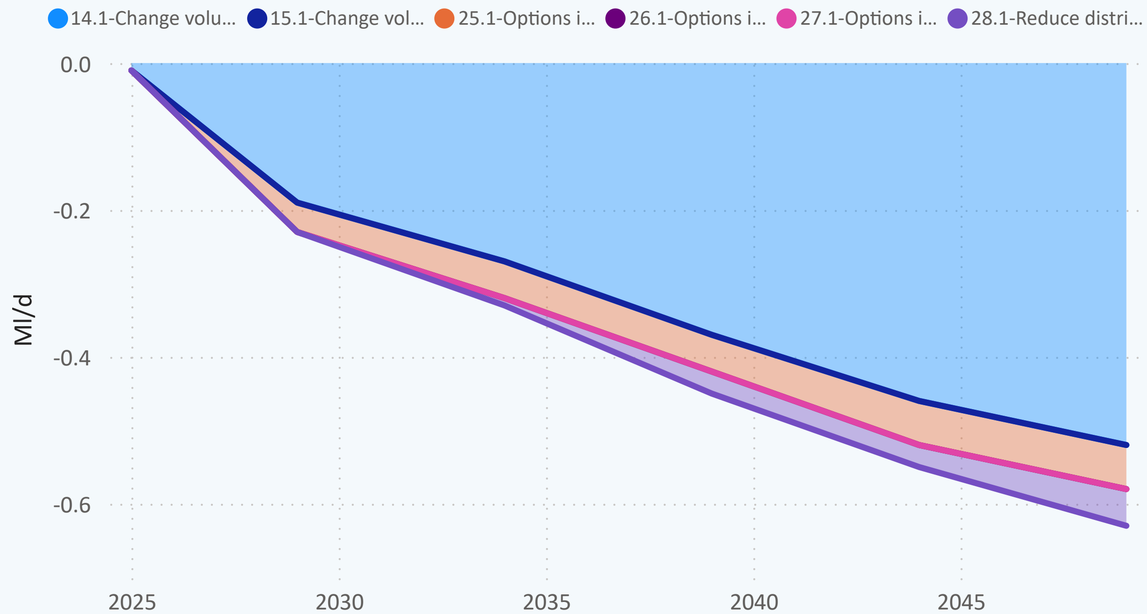


Table 8: DMO strategy Final Plan for Norfolk Happisburgh

	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
14.1-Change volume delivered to measured households(-ve)	-0.2	-0.3	-0.4	-0.5	-0.5
15.1-Change volume delivered to unmeasured households(-ve)	0.0	0.0	0.0	0.0	0.0
25.1-Options impacting on measured Household - USPL (-ve)	0.0	-0.1	-0.1	-0.1	-0.1
26.1-Options impacting on unmeasured Household - USPL (-ve)	0.0	0.0	0.0	0.0	0.0
27.1-Options impacting on Void properties - USPL (-ve)	0.0	0.0	0.0	0.0	0.0
28.1-Reduce distribution losses (-ve)	0.0	0.0	0.0	0.0	-0.1

9. Final Plan Supply Demand Balance
DYAA

Norfolk Happisburgh

Norfolk Happisburgh

Figure 8: Norfolk Happisburgh final plan SDB to 2050 for Dry Year Annual Average conditions

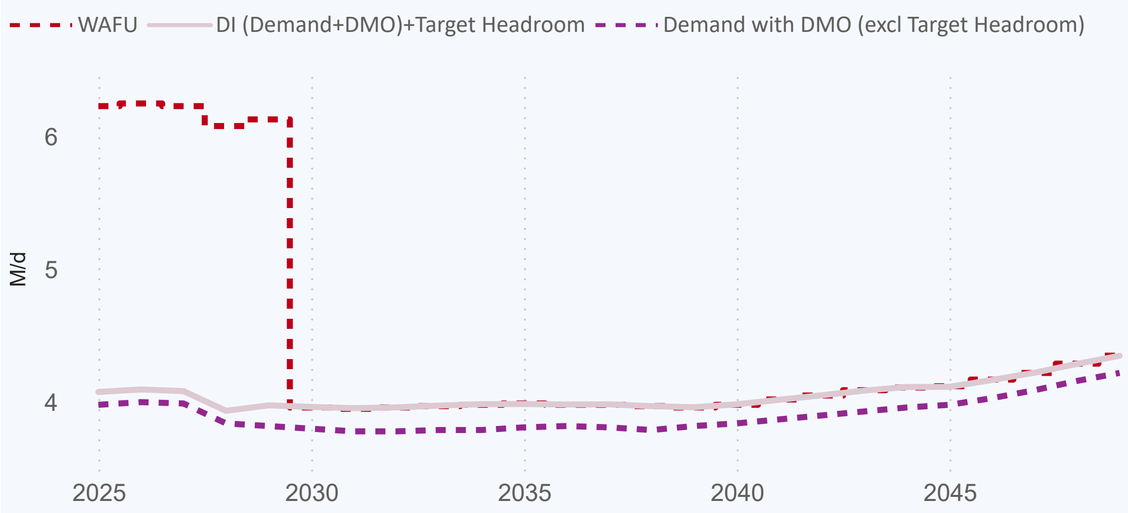


Table 9a: final plan SDB to 2050 for Dry Year conditions

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water Available For Use	2.2	2.2	2.2	2.1	0.8	0.8
Net Transfers	6.3	6.2	1.8	1.9	3.3	3.6
Total Water Available For Use	6.2	6.1	4.0	4.0	4.1	4.4
Distribution Input	4.0	3.8	3.8	3.8	4.0	4.2
Target Headroom	0.1	0.2	0.2	0.1	0.2	0.1
Supply Demand Balance	2.2	2.2	0.0	0.0	0.0	0.0

Table 9b: Final Plan demand forecast for DYAA conditions (with preferred demand management options)

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water delivered measured household	2.0	1.9	1.9	2.0	2.0	2.0
Water delivered unmeasured household	0.6	0.5	0.4	0.3	0.2	0.2
Total Leakage	0.6	0.6	0.6	0.5	0.5	0.5
Water delivered measured non-household	0.9	0.9	1.0	1.0	1.2	1.5
Water delivered unmeasured non-household	0.0	0.0	0.0	0.0	0.0	0.0
Distribution Input	4.0	3.8	3.8	3.8	4.0	4.2

9.1 DYAA FP supply demand summary: Norfolk Happisburgh

The zone is in balance.

- Demand Forecast: Final Plan household demand (measured and unmeasured) is forecast to change from 2.6 Ml/d in 2025 to 2.2 Ml/d in 2050, a percentage change of -13.6 %.
- Final Plan Leakage is forecast to change from 0.6 Ml/d in 2025 to 0.5 Ml/d by 2050.
- Final Plan Non-Household demand is expected to change from 0.9 Ml/d to 1.5 Ml/d.
- Final Plan Distribution Input is expected to change from 4.0 Ml/d to 4.2 Ml/d by 2050.

10. Final Plan Supply Demand Balance DYCP

Norfolk Happisburgh

Norfolk Happisburgh

Figure 9: Norfolk Happisburgh baseline supply demand balance to 2050 for Dry Year Critical Period conditions

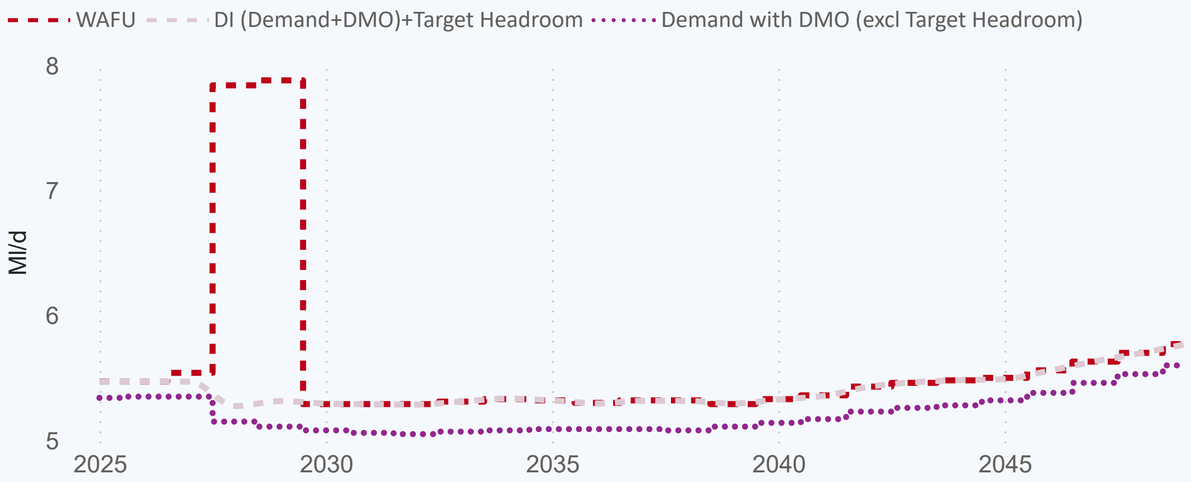


Table 10a: Final Plan supply demand balance 2025 - 2050 for DYCP conditions

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water Available For Use	2.6	2.6	2.6	2.6	2.6	2.6
Net Transfers	5.1	7.5	2.8	2.7	2.9	3.2
Total Water Available For Use	5.5	7.9	5.3	5.3	5.5	5.8
Distribution Input	5.3	5.1	5.1	5.1	5.3	5.6
Target Headroom	0.1	0.2	0.3	0.2	0.2	0.2
Supply Demand Balance	0.0	2.6	0.0	0.0	0.0	0.0

Table 10b: Final Plan demand forecast for DYCP conditions (with preferred demand management options)

	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
Water delivered measured household	2.9	2.7	2.8	2.8	2.9	2.9
Water delivered unmeasured household	0.9	0.7	0.6	0.5	0.4	0.3
Total Leakage	0.6	0.6	0.6	0.5	0.5	0.5
Water delivered measured non-household	1.1	1.1	1.2	1.3	1.5	1.8
Water delivered unmeasured non-household	0.0	0.0	0.0	0.0	0.0	0.0
Distribution Input	5.3	5.1	5.1	5.1	5.3	5.6

10.1 DYCP BL supply demand summary: Norfolk Happisburgh

The zone is in balance.

- Demand Forecast: Final Plan household demand (measured and unmeasured) is forecast to change from 3.7 Ml/d in 2025 to 3.3 Ml/d in 2050, a percentage change of -12.8 %.
- Final Plan Leakage: is forecast to change from 0.6 Ml/d in 2025 to 0.5 Ml/d by 2050
- Final Plan Non-Household demand: is expected to change from 1.1 Ml/d to 1.8 Ml/d.
- Final Plan Distribution Input: is expected to change from 5.3 Ml/d to 5.6 Ml/d by 2050.

11. Supply Side Strategy

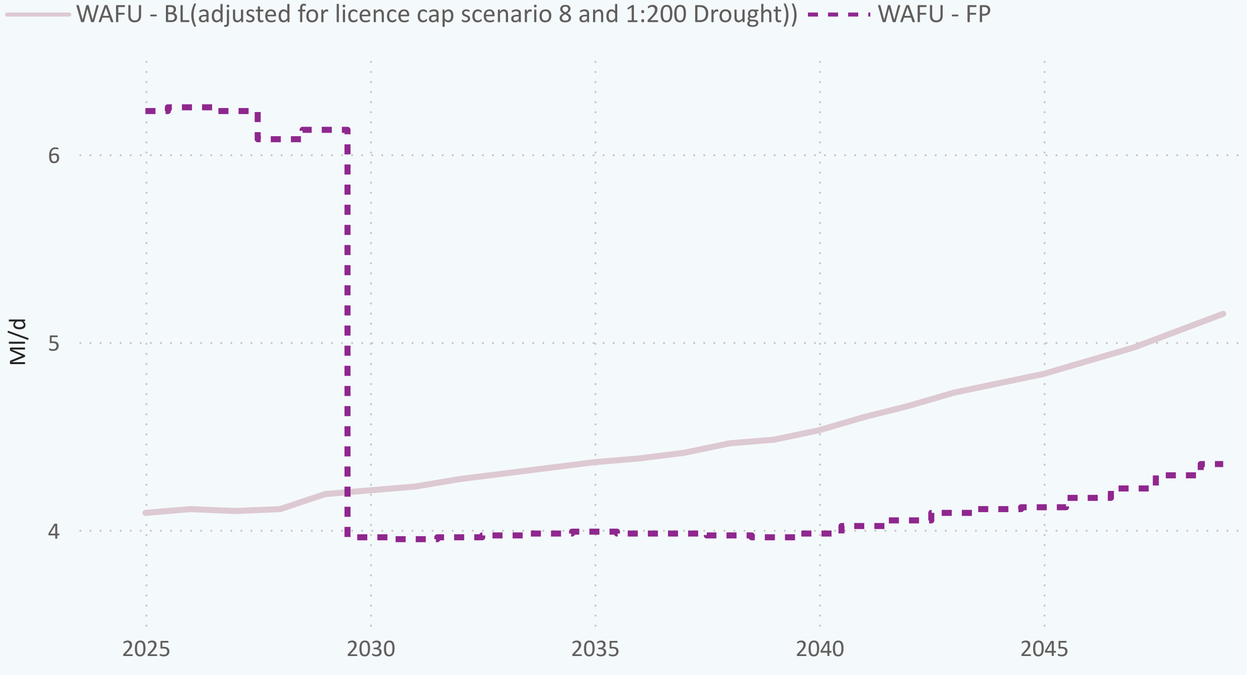
Norfolk Happisburgh

Norfolk Happisburgh

Table 11a: Total Water Available for use Baseline and Final Plan

	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 (end of AMP12)
WAFU - BL	4.2	4.3	4.5	4.8	5.2
WAFU - FP	6.1	4.0	4.0	4.1	4.4

Figure 10 Water Available for Use (WAFU) - baseline (BL) and final plan (FP)



11.1 Supply side strategy options.

For details on the feasible options list for Norfolk Happisburgh WRZ please refer to the Supply-Side Option Development technical supporting document.

Table11b: Preferred supply side options

Option ID	First Option Name
EE09	Adjustment to existing potable water export
EI09	Adjustment to existing potable water import

12. Non-Household consumption

Norfolk Happisburgh

Norfolk Happisburgh

12.1 Non-Household demand Norfolk Happisburgh

In 2025, 0.9 Ml/d of Non-Household demand (measured and unmeasured) is expected. In 2049 it is expected to be 1.5 Ml/d, which is a 69.32% change between the years.

Figure 11: Non-Household demand forecast 2025-2050

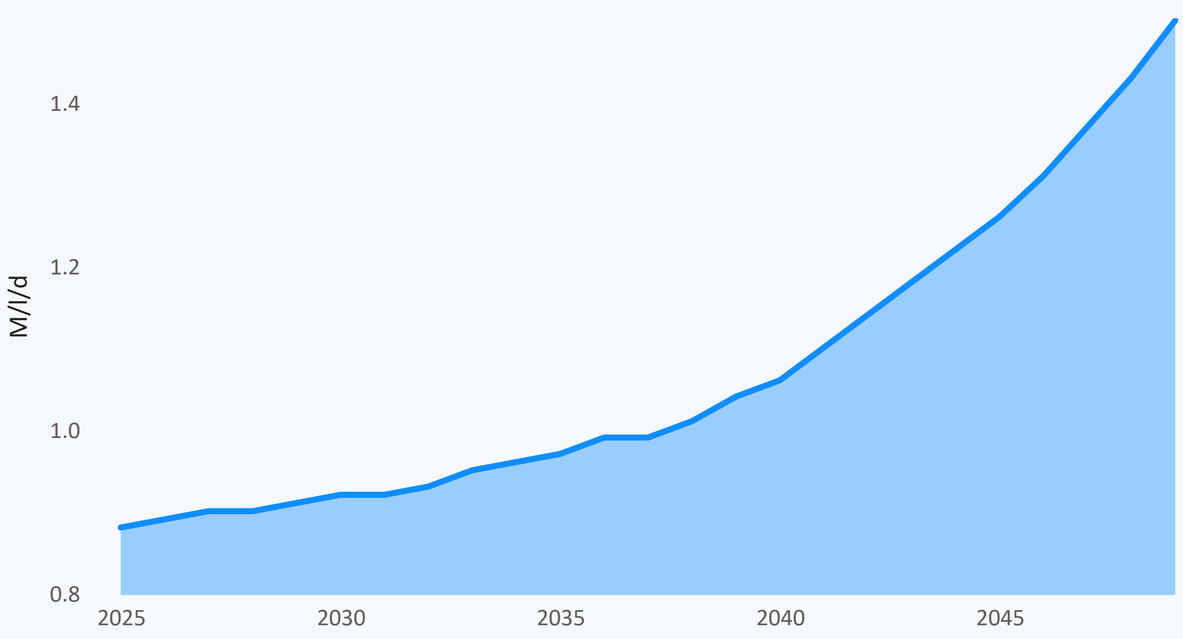


Figure 12: % Non-Household modelled sectors within resource zone