WRMP24 Technical Document

Norfolk East Dereham Water Resource Zone summary

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Utility Weel

2023

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WATER COMPANY OF THE YEAR

1. Introduction

1.1 About our company

Anglian Water is the largest water and wastewater company in England and Wales geographically, cover 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. De 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 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 framework 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 investmen 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 see 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 bene

our customers, society and the environment.

Our previous WRMP, WRMP19, had an ambitious twin track strategy, combining an industry leading smatrix meter roll out and leakage ambition with a strategic pipeline across our region, bringing water from areas surplus to areas of deficit.

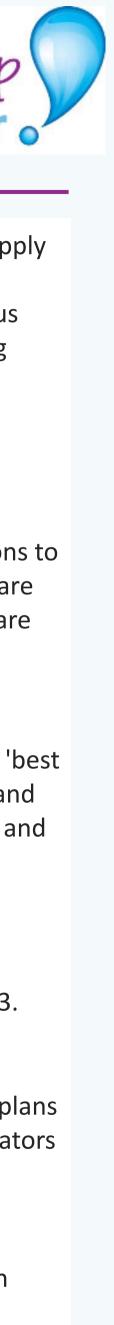
This WRMP focusses on the period 2025 to 2050, and is known as WRMP24. We have developed it by following the Water Resources Planning Guideline (WRPG), as well as other relevant guidance, in order meet statutory requirements.

1.4 Developing our WRMP

Our WRMP24 has been progressed following processes detailed in the WRPG. We start by determining extent of the challenges we face between 2025 and 2050.

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	We achieve this by developing forecasts to establish the amount of water available to use (supp
ring	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
espite	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.
our	The next step is for the water savings associated with the chosen demand management options
loui	be added into our baseline supply-demand balance to determine if our region's water needs are
9.	met. If the demand management options savings do not solve the need, supply-side options are
	added into the modelling process and solution development.
ks we	
e ents	1.5 Best value plan
111.5	To ensure we developed the right solution for our region's water needs, we have focussed on 'b
	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 ar
	stakeholders.
cure	1.6 Our revised draft WRMP24
ofit to	Our best value plan, the revised draft WRMP24, has been produced following a public
efit to	consultation on our draft WRMP24. This consultation ran from December 2022 to March 2023.
- *	consultation on our draft which 24. This consultation fail from December 2022 to March 2025.
art	1.7 Strategic context of the revised draft WRMP24
as of	Our revised draft WRMP24 aligns with our Purpose, as well as internal and external strategic pla
	and initiatives. We have worked collaboratively with internal and external stakeholders, regulate
t 0	and other water abstractors to achieve this.
to	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
+ba	report and nine technical supporting documents and non-technical supporting documents.
the	report and time technical supporting documents and non-technical supporting documents.



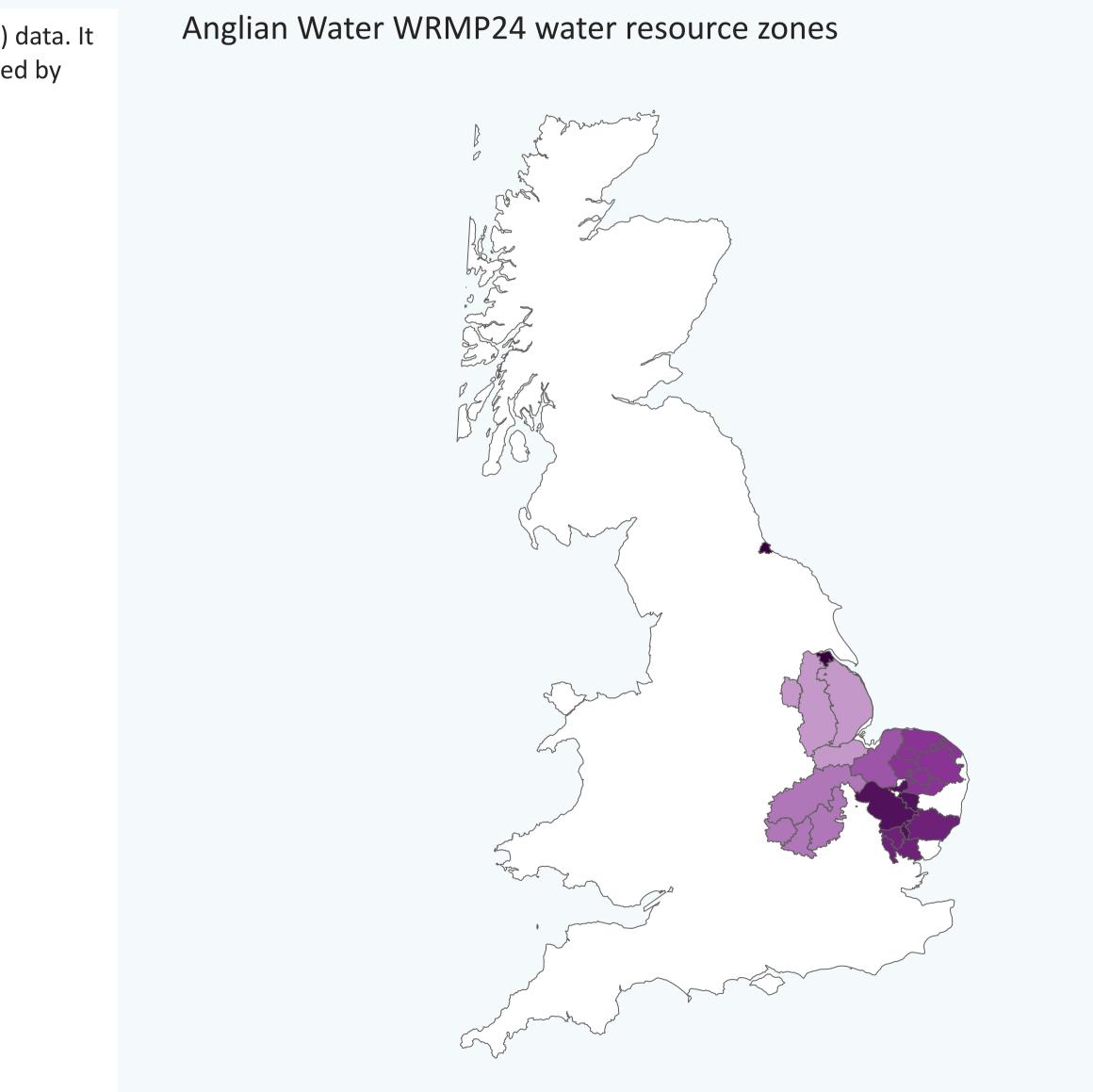
Revised draft WRMP24

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

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2. Strategic Overview

Norfolk

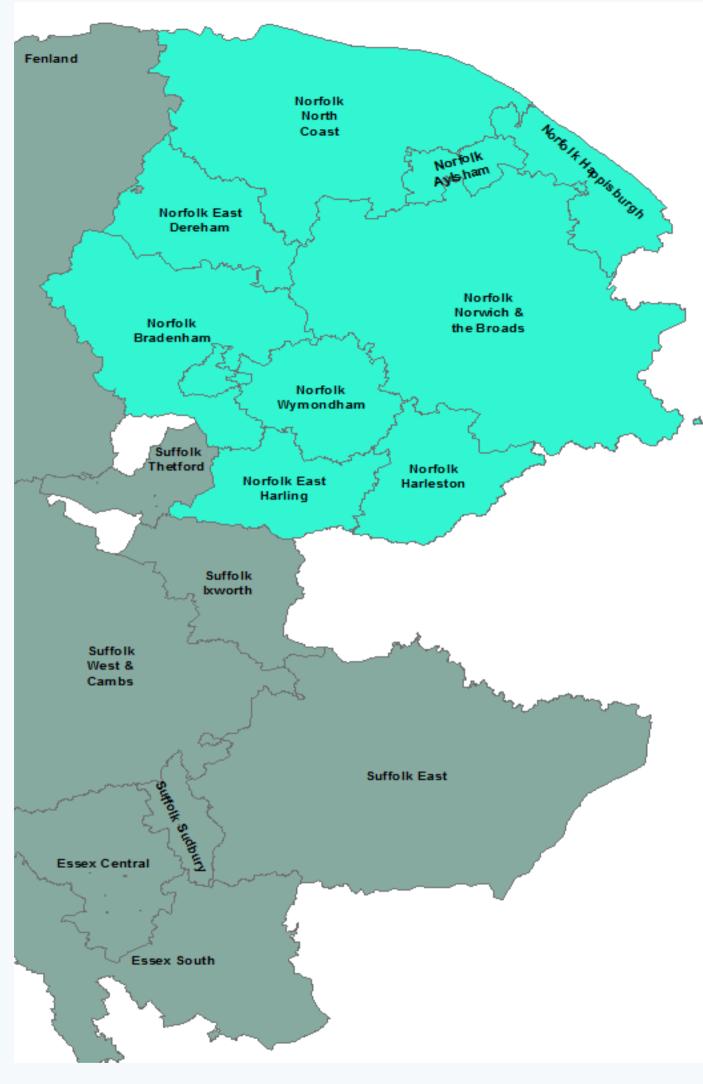
2.1Strategic risk and issues

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.





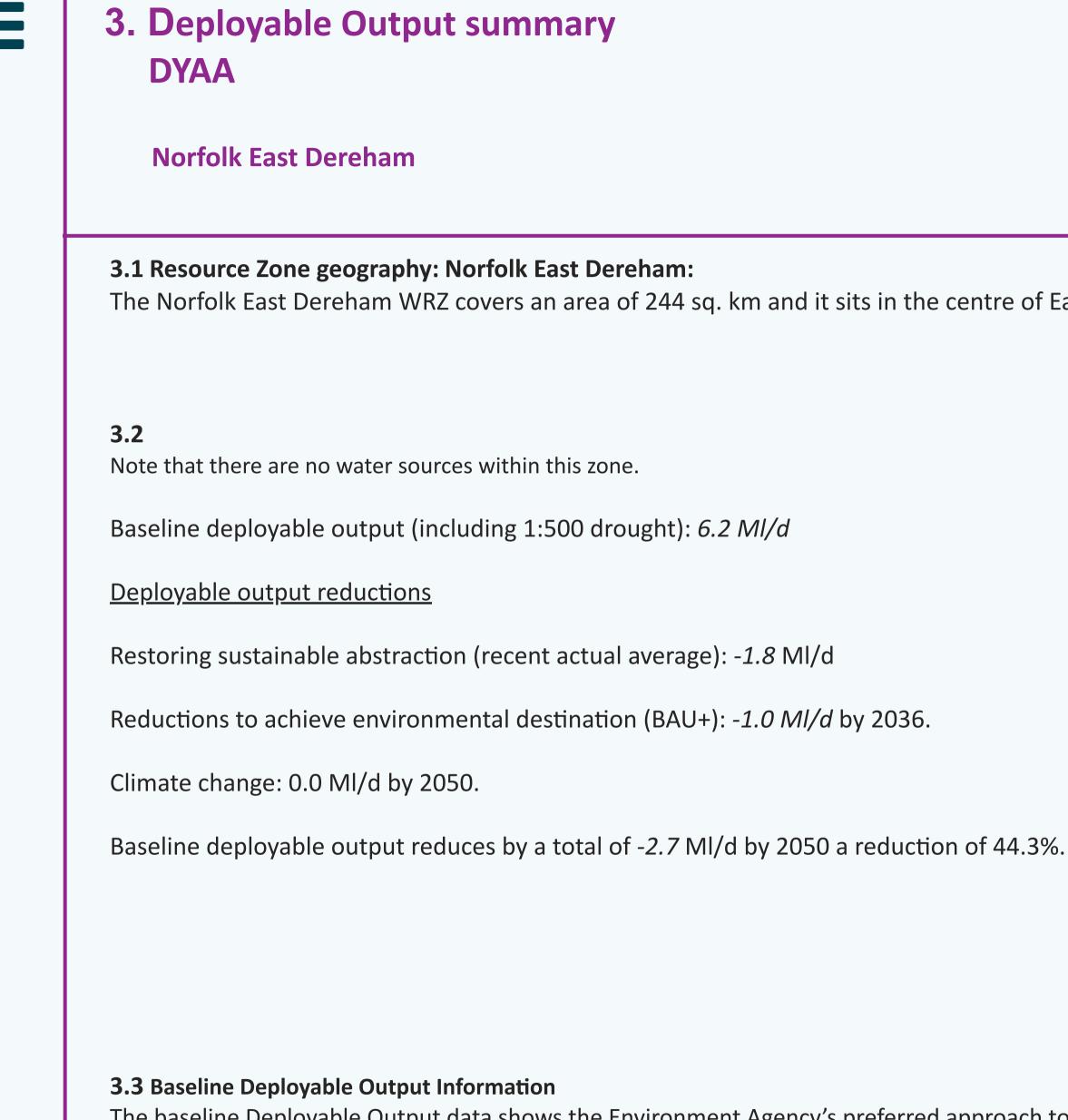
Choose area



Figure 1 Problem Characterisation Area

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





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.

Norfolk East Dereham



The Norfolk East Dereham WRZ covers an area of 244 sq. km and it sits in the centre of East Anglia. Water is supplied from groundwater abstractions from the Norfolk Chalk aquifer.

	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	6.2	6.2	6.2	6.2	6.2
Change in DO due to climate change	0.0	0.0	0.0	0.0	0.0
DO reductions to restore sustainable abstraction	-1.0	-1.8	-1.8	-1.8	-1.8
DO reductions for Environmental Destination	0.0	0.0	-1.0	-1.0	-1.0
Change in DO from drought measures	0.0	0.0	0.0	0.0	0.0
Final DO	5.1	4.4	3.4	3.4	3.4
Raw water losses (-ve)	0.3	0.3	0.3	0.3	0.3
Outage Allowance (-ve)	0.0	0.0	0.0	0.0	0.0
WAFU (own sources)	4.8	4.1	3.1	3.1	3.1
Net Transfers	-0.2	0.6	1.6	1.6	1.6
Other benefits	1.0	0.0	0.0	0.0	0.0
Total Water Available for Use	5.5	4.5	4.0	4.0	4.0

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



4. Population & Housing

Norfolk East Dereham

4.1 Over the WRMP period, population in Norfolk East Dereham is set to increase from 21704 in 2025 to 24513 in 2049-50 - this is an increase of **12.9 %** over the 25 years.

Table 4a: Population totals (cumulative) by AMP

Year	Total Populatio (000s)
2029-30 (end of AMP8)	22
2034-35 (end of AMP9)	22
2039-40 (end of AMP10)	23
2044-45 (end of AMP11)	23
2049-50 (end of AMP12)	24

4.2 Over the WRMP period, property numbers in Norfolk East Dereham are set to increase from **9323** in 2025 to **11102** in 2049-50 - this is an increase of **19.1 %** over the 25 years.

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Table 4b: Property totals (cumulative) by AMP

Year	Total Properties- excl voids (000s)
2029-30 (end of AMP8)	9.702
2034-35 (end of AMP9)	10.100
2039-40 (end of AMP10)	10.441
2044-45 (end of AMP11)	10.774
2049-50 (end of AMP12)	11.102

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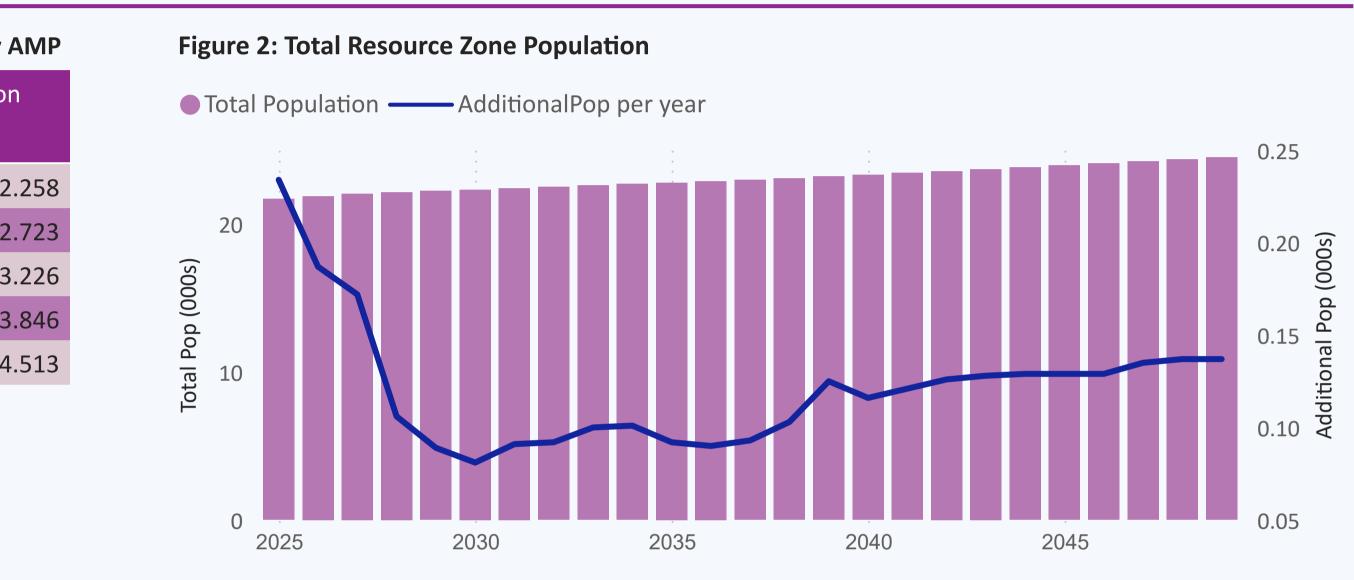
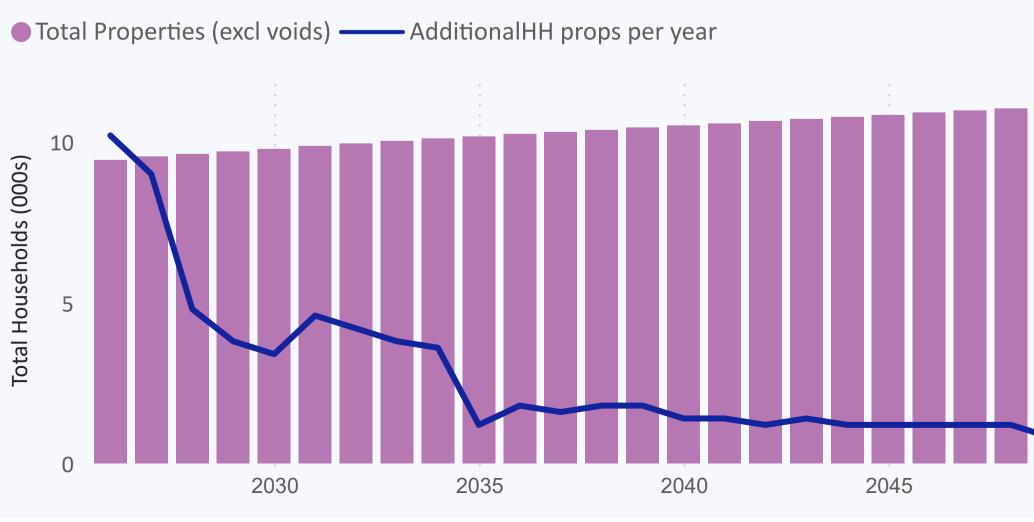
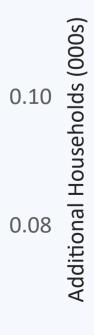


Figure 3: Total Resource Zone Properties (excl. voids)









0.06

0.12



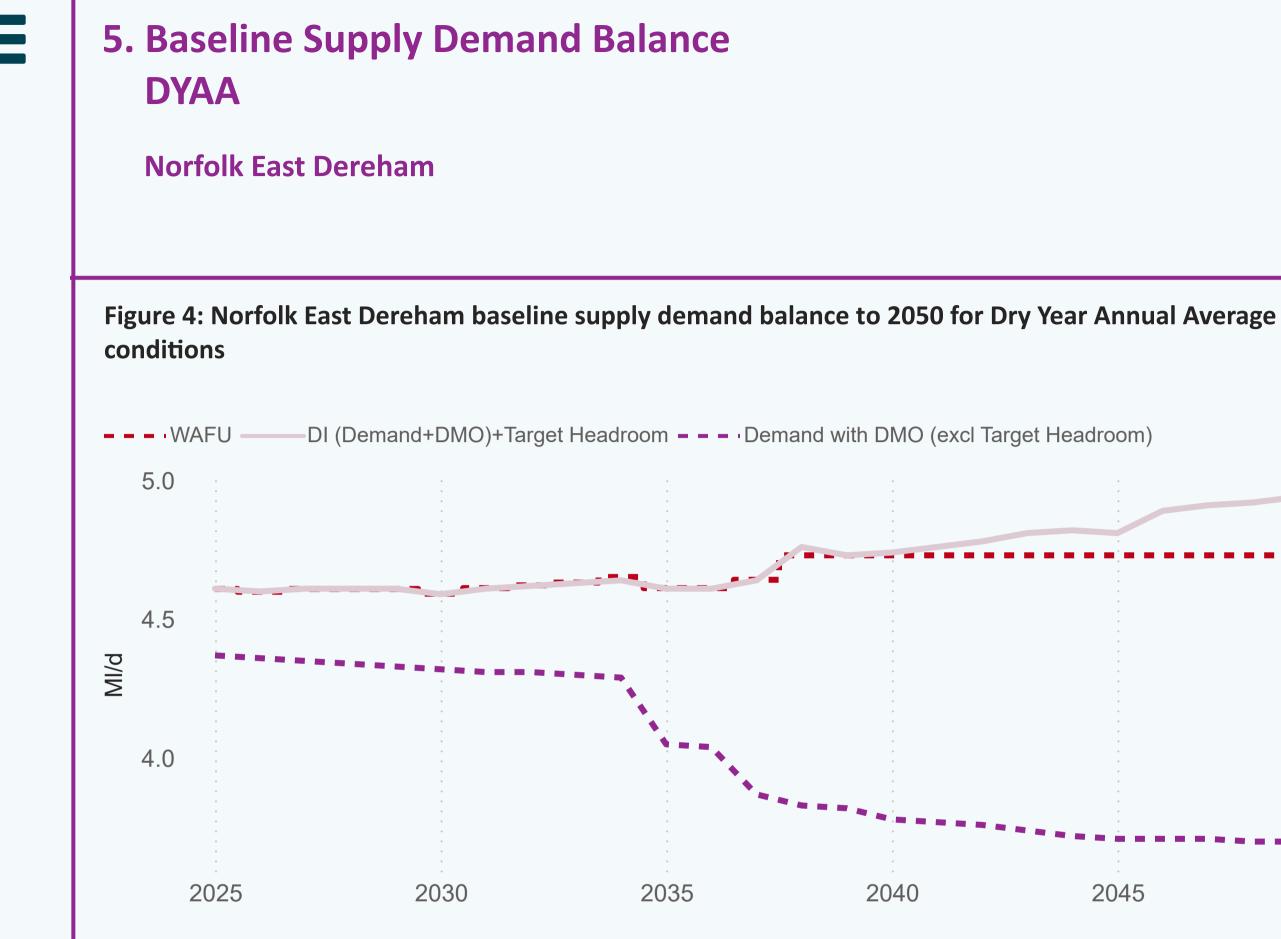


Table 5a: Baseline supply demand balance 2025 - 2050 for DYAA conditions

	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	4.8	4.8	4.1	3.1	3.1	3.1
Net Transfers	0.2	0.2	0.6	1.6	1.6	1.6
Total Water Available For Use	4.6	4.6	4.7	4.7	4.7	4.7
Distribution Input	4.4	4.4	4.4	4.5	4.6	4.7
Target Headroom	0.2	0.2	0.2	0.2	0.3	0.3
Supply Demand Balance	0.0	0.0	0.0	0.0	-0.1	-0.2





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

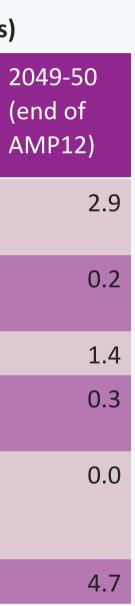
	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)
Water delivered measured household	2.3	2.4	2.5	2.7	2.8
Water delivered unmeasured household	0.6	0.5	0.4	0.3	0.2
Total Leakage	1.4	1.4	1.4	1.4	1.4
Water delivered measured non-household	0.2	0.3	0.3	0.3	0.3
Water delivered unmeasured non- household	0.0	0.0	0.0	0.0	0.0
Distribution Input	4.4	4.4	4.4	4.5	4.6

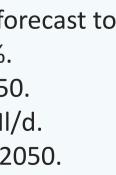
5.1 DYAA BL supply demand summary: Norfolk East Dereham

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 2.9 MI/d in 2025 to 3.1 MI/d in 2050, a percentage change of 8.0 %.
- Baseline Leakage: is forecast to change from 1.4 Ml/d in 2025 to 1.4 Ml/d by 2050.
- Baseline Non-Household demand: is expected to change from 0.2 Ml/d to 0.3 Ml/d.
- Baseline Distribution Input: is expected to change from 4.4 MI/d to 4.7 MI/d by 2050.







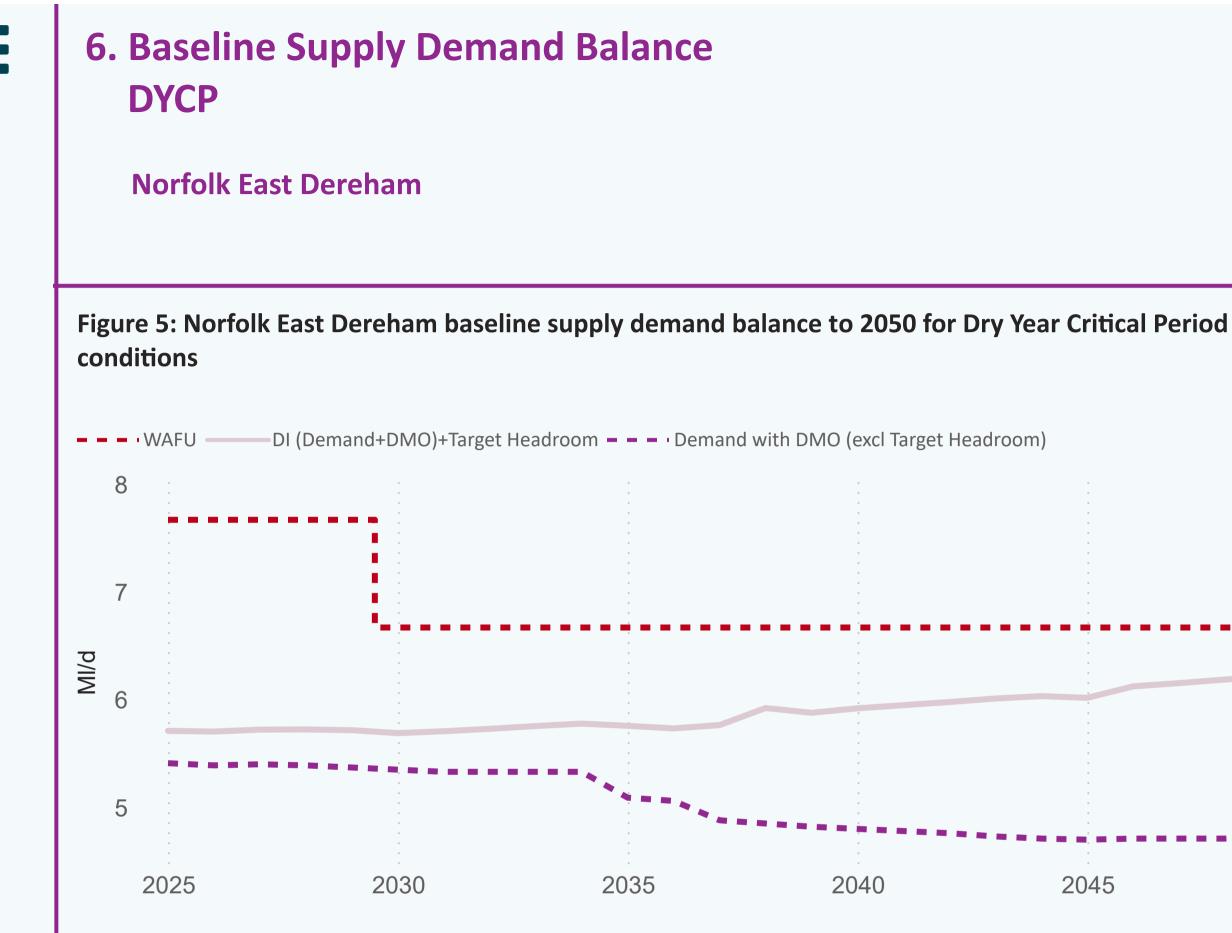


Table 6a: Baseline supply demand balance 2025 - 2050 for DYCP conditions

	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	7.7	7.7	7.7	7.7	7.7	7.7
Net Transfers	0.0	0.0	1.0	1.0	1.0	1.0
Total Water Available For Use	7.7	7.7	6.7	6.7	6.7	6.7
Distribution Input	5.4	5.5	5.5	5.6	5.7	5.9
Target Headroom	0.3	0.3	0.3	0.3	0.3	0.4
Supply Demand Balance	2.0	2.0	0.9	0.8	0.6	0.5







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

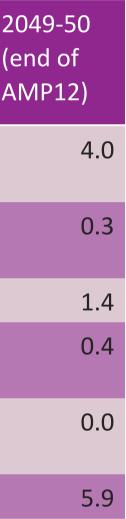
	2025-26 (start of AMP8)	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2 ((A
Water delivered measured household	3.1	3.2	3.4	3.6	3.8	
Water delivered unmeasured household	0.8	0.7	0.5	0.4	0.3	
Total Leakage	1.4	1.4	1.4	1.4	1.4	
Water delivered measured non-household	0.3	0.3	0.3	0.3	0.4	
Water delivered unmeasured non-household	0.0	0.0	0.0	0.0	0.0	
Distribution Input	5.4	5.5	5.5	5.6	5.7	

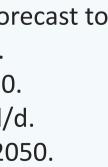
6.1 DYCP BL supply demand summary: Norfolk East Dereham

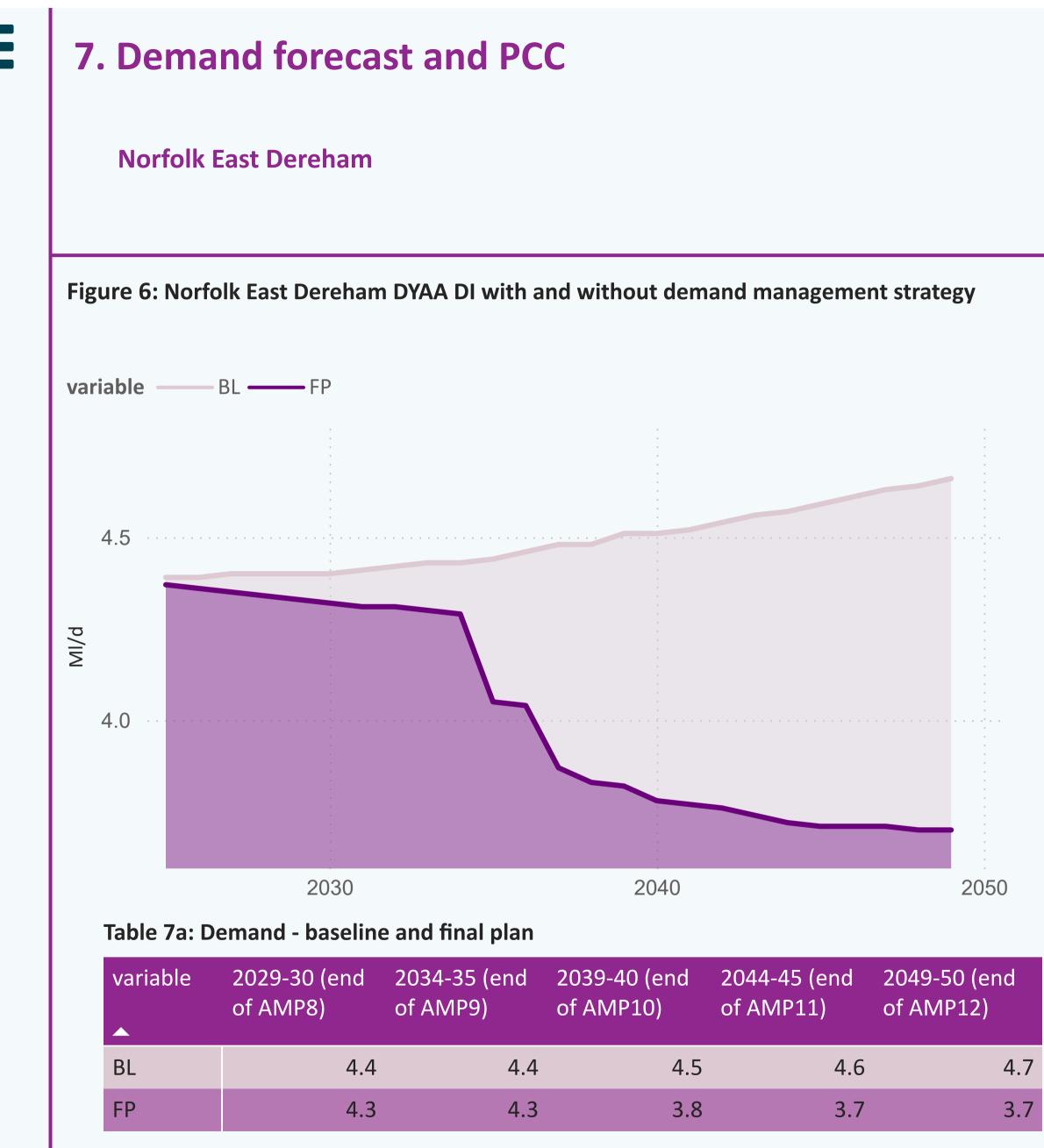
Baseline Supply Demand balance: This zone is not expected to go into deficit

- Demand Forecast: Baseline household demand (measured and unmeasured) is forecast to change from 3.9 MI/d in 2025 to 4.2 MI/d in 2050, a percentage change of 9.6 %.
- Baseline Leakage: is forecast to change from 1.4 Ml/d in 2025 to 1.4 Ml/d by 2050.
- Baseline Non-Household demand: is expected to change from 0.3 Ml/d to 0.4 Ml/d.
- Baseline Distribution Input: is expected to change from 5.4 MI/d to 5.9 MI/d by 2050.

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







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7.2 Demand Norfolk East Dereham (see Table 7a)

Baseline demand is expected to increase from 4.4 (MI/d) in 2025 to 4.7 (MI/d) in 2050. With demand management options in place, demand is expected to be 3.7 (MI/d).

7.1 PCC Norfolk East Dereham (see Table 7b)

Per Capita Consumption (PCC) in the base year 2025/26 is 114.8 (l/h/d) measured and 212.2 (l/h/d) unmeasured.

The weighted average PCC (I/h/d) comes in at 126.2 (I/h/d) in 2025/26. This is forecast to fall to 103.6 (I/h/d) in the Final Plan forecast as demand management option savings are realised and customers switch from unmeasured to measured status

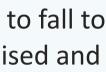
Table 7b: DMO strategy Final Plan

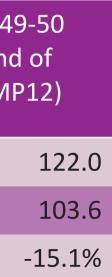
	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	204 (end AM
BL demand forecast(DYAA)	123.6	122.3	122.7	122.0	
FP demand forecast(DYAA)	121.3	117.5	112.4	106.5	
% change BL to FP	-1.8%	-4.0%	-8.4%	-12.7%	











8. Demand management options

Norfolk East Dereham

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

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• 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

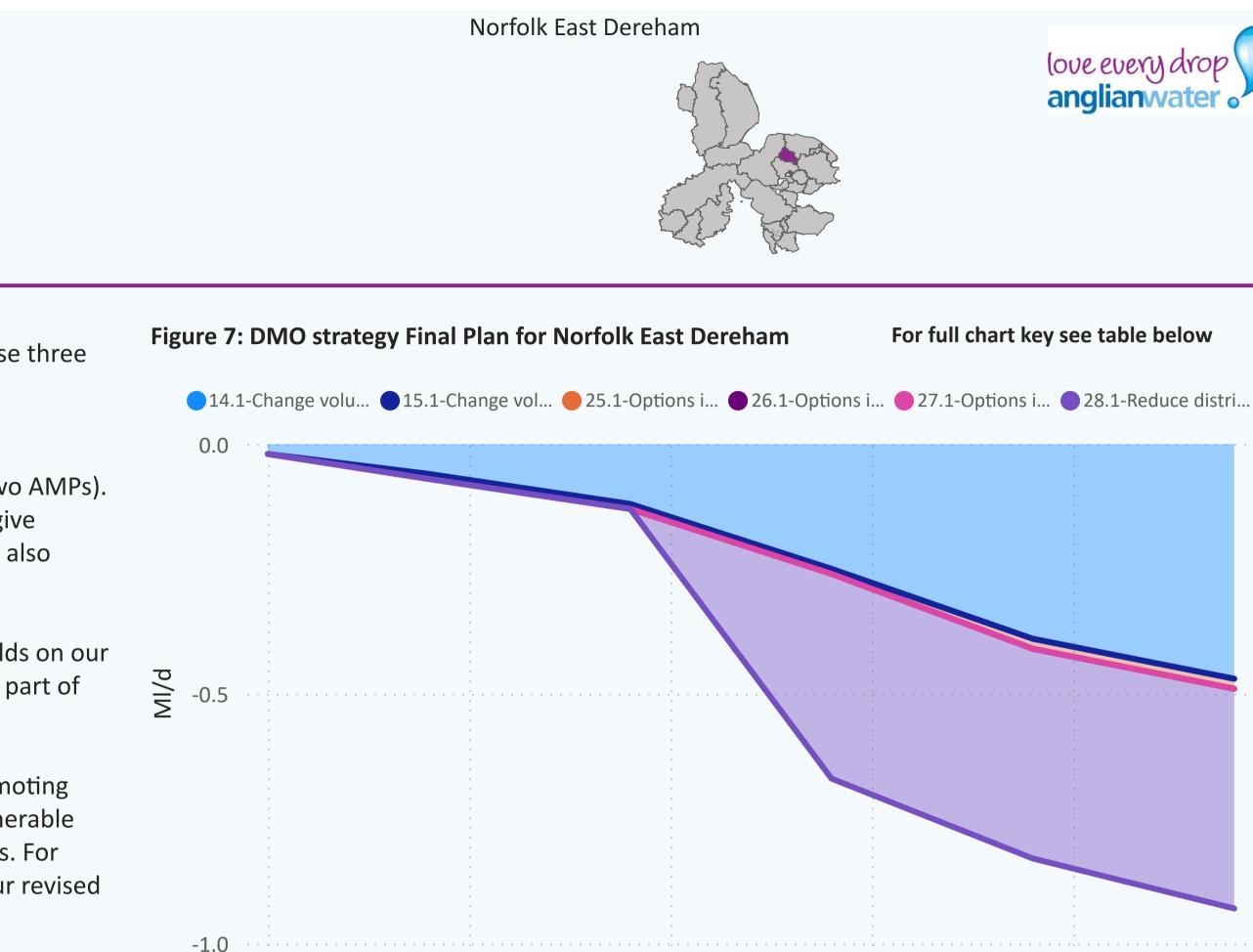
Water efficiency measures

• 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.

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

2025

Table 8: DMO strategy Final Plan for Norfolk East Dereham



2035

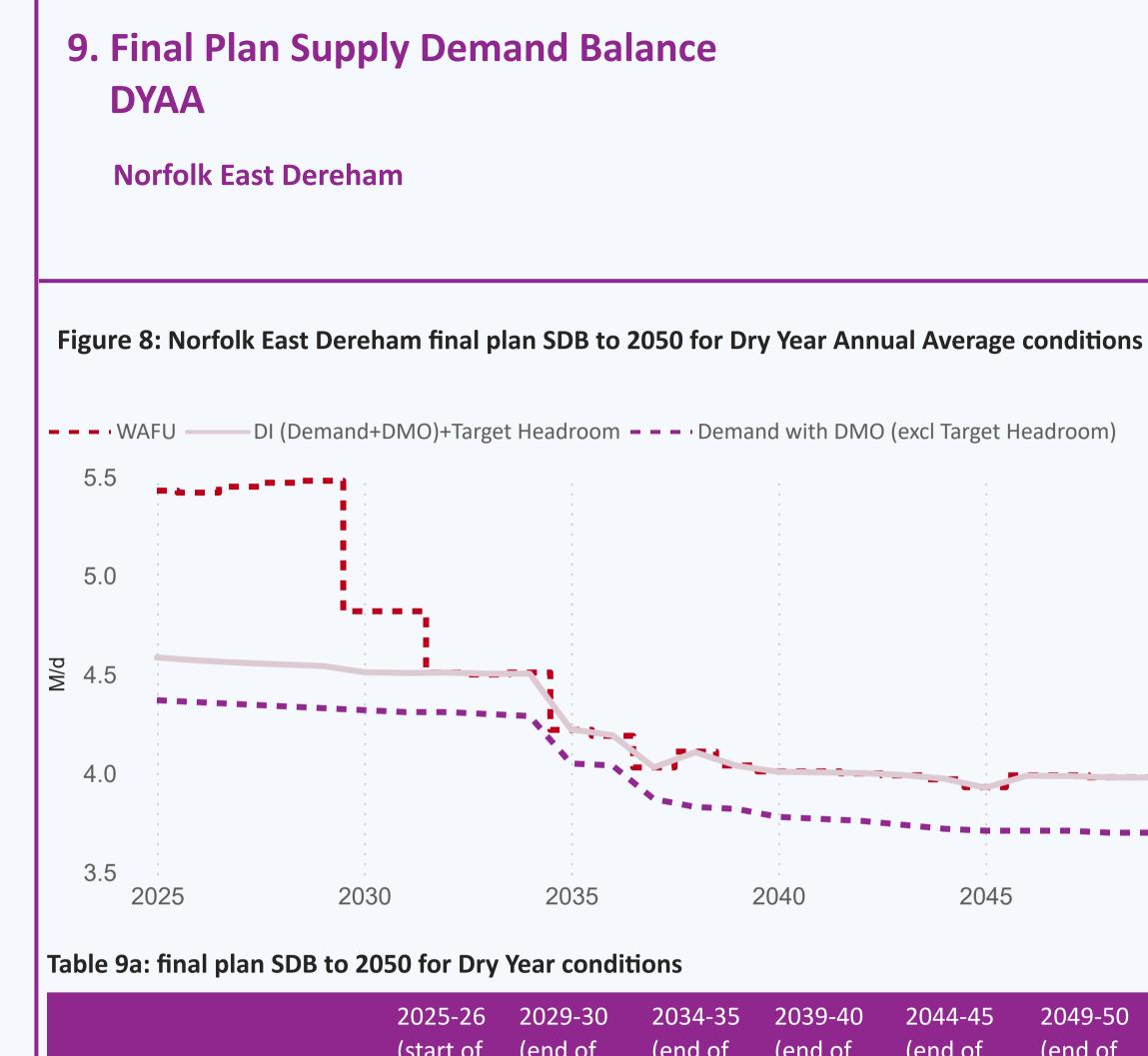
2030

2040



MP12) -0.5 0.0 0.0 0.0 0.0 -0.4

2045



	3.
Water Available For Use 5.9 5.9 4.1 3.1 3.1	
Net Transfers 1.6 0.4 15.2 13.8	12.
Total Water Available For Use5.45.54.54.04.0	4.
Distribution Input 4.4 4.3 4.3 3.8 3.7	3.
Target Headroom 0.2 0.2 0.2 0.3	0.
Supply Demand Balance0.80.90.00.0	0.

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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 (end AMF	
Water delivered measured household	2.3	2.4	2.4	2.4	2.4		
Water delivered unmeasured household	0.6	0.5	0.4	0.3	0.2		
Total Leakage	1.4	1.4	1.4	0.9	0.9		
Water delivered measured non- household	0.2	0.2	0.2	0.2	0.2		
Water delivered unmeasured non- household	0.0	0.0	0.0	0.0	0.0		
Distribution Input	4.4	4.3	4.3	3.8	3.7		

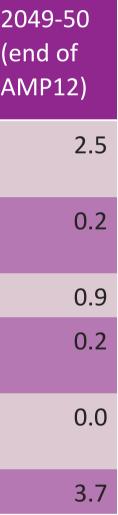
9.1 DYAA FP supply demand summary: Norfolk East Dereham

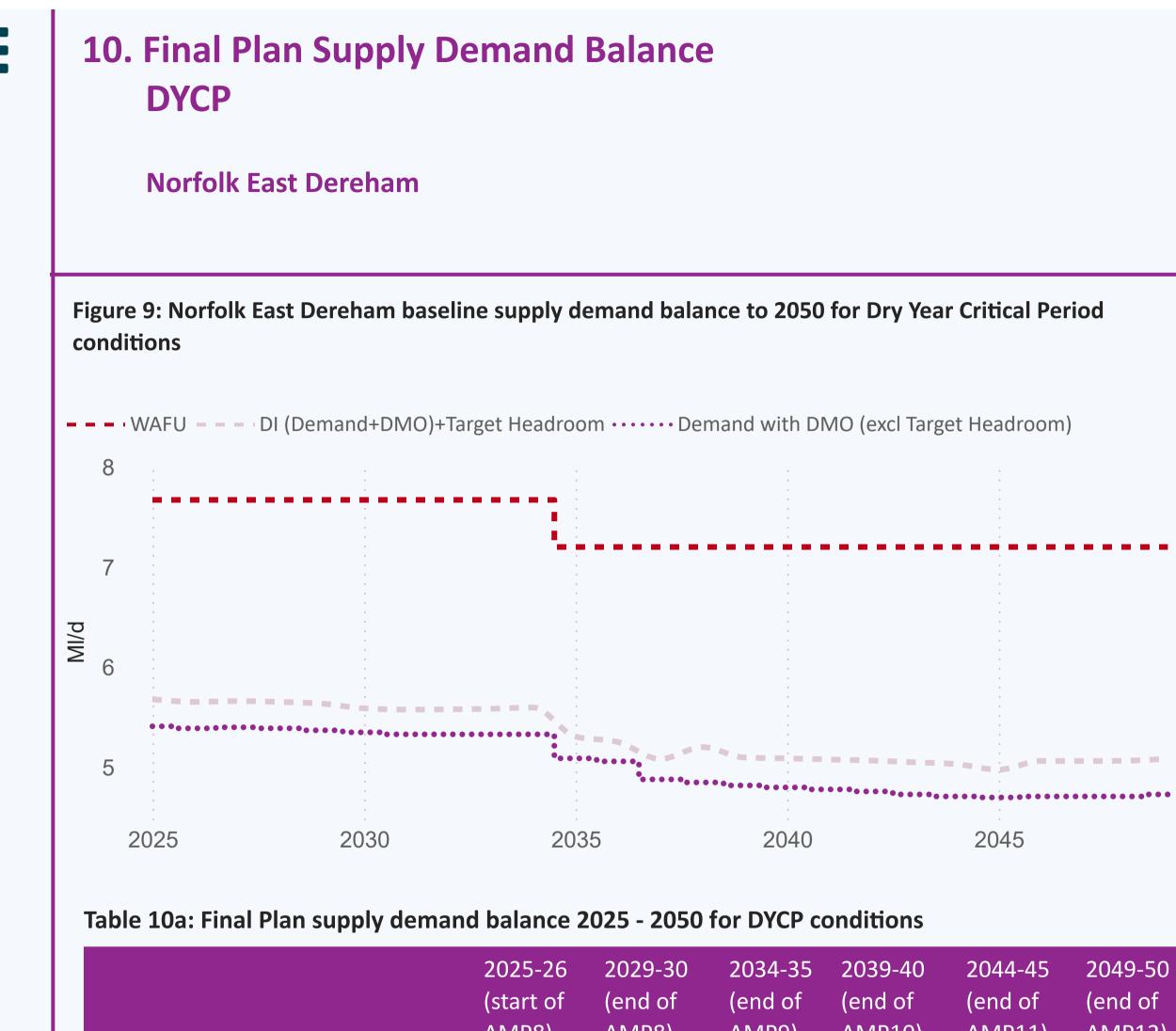
The zone is in balance.

• Demand Forecast: Final Plan household demand (measured and unmeasured) is forecast to change from 2.9 MI/d in 2025 to 2.6 MI/d in 2050, a percentage change of -7.7 %.

- Final Plan Leakage is forecast to change from 1.4 Ml/d in 2025 to 0.9 Ml/d by 2050.
- Final Plan Non-Household demand is expected to change from 0.2 Ml/d to 0.2 Ml/d.
- Final Plan Distribution Input is expected to change from 4.4 Ml/d to 3.7 Ml/d by 2050.







	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	7.7	7.7	7.7	7.7	7.7	7.7
Net Transfers	0.0	0.0	0.0	0.8	0.8	0.8
Total Water Available For Use	7.7	7.7	7.7	7.2	7.2	7.2
Distribution Input	5.4	5.4	5.3	4.8	4.7	4.7
Target Headroom	0.3	0.3	0.3	0.3	0.3	0.4
Supply Demand Balance	2.0	2.0	2.1	2.1	2.2	2.1







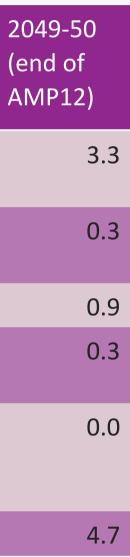
Table 10b: Final Plan demand forecast for DYCP conditions (with preferred demand management options) 2029-30 2039-40 2044-45 2025-26 2034-35 (start of (end of (end of (end of (end of

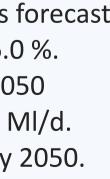
		AMP8)	AMP8)	AMP9)	AMP10)	AMP11)	AN
	Water delivered measured household	3.0	3.1	3.2	3.3	3.3	
	Water delivered unmeasured household	0.8	0.7	0.5	0.4	0.3	
	Total Leakage	1.4	1.4	1.4	0.9	0.9	
	Water delivered measured non-household	0.3	0.3	0.3	0.3	0.3	
	Water delivered unmeasured non- household	0.0	0.0	0.0	0.0	0.0	
	Distribution Input	5.4	5.4	5.3	4.8	4.7	

10.1 DYCP BL supply demand summary: Norfolk East Dereham

The zone is in balance.

- Demand Forecast: Final Plan household demand (measured and unmeasured) is forecast to change from 3.8 MI/d in 2025 to 3.6 MI/d in 2050, a percentage change of -6.0 %.
- Final Plan Leakage: is forecast to change from 1.4 Ml/d in 2025 to 0.9 Ml/d by 2050
- Final Plan Non-Household demand: is expected to change from 0.3 Ml/d to 0.3 Ml/d.
- Final Plan Distribution Input: is expected to change from 5.4 Ml/d to 4.7 Ml/d by 2050.





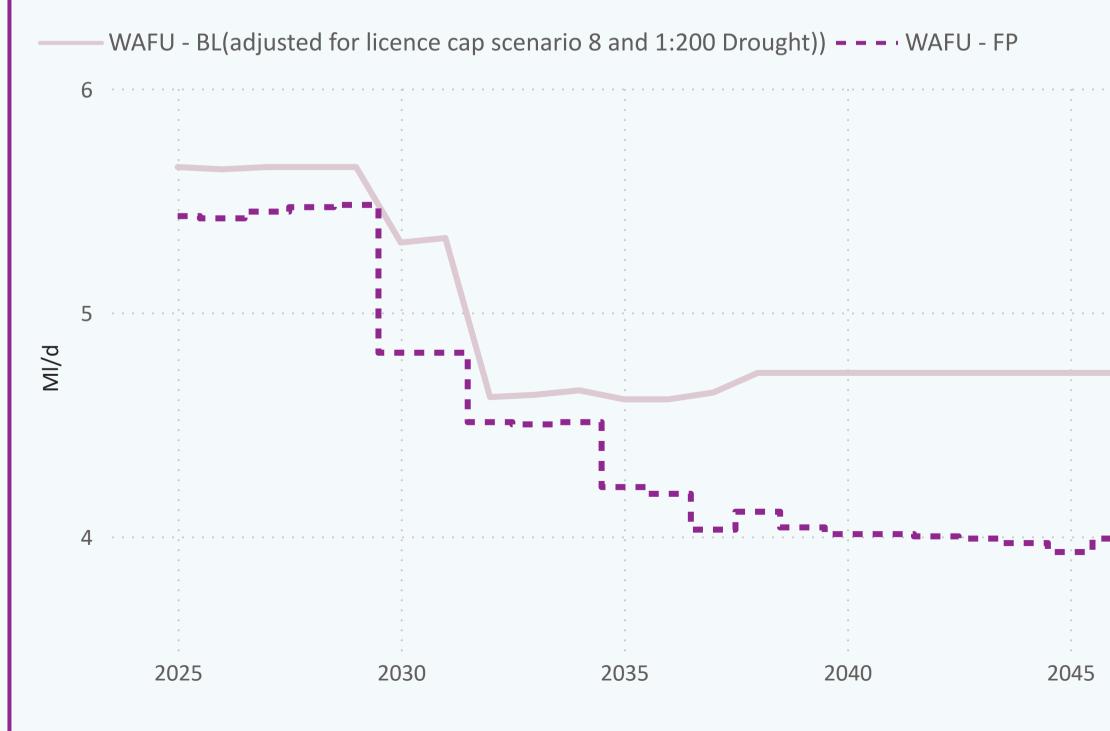
11. Supply Side Strategy

Norfolk East Dereham

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

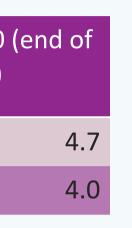
	2029-30 (end of AMP8)	2034-35 (end of AMP9)	2039-40 (end of AMP10)	2044-45 (end of AMP11)	2049-50 AMP12)
WAFU - BL	5.6	4.7	4.7	4.7	
WAFU - FP	5.5	4.5	4.0	4.0	

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 East Dereham WRZ please refer to the Supply-Side Option Development technical supporting document.

Table11b: Preferred supply side options **Option ID** First Option Name **EE07** Adjustment to existing potable water export Adjustment to existing potable water import E108 Adjustment for Licence cap scenario 8 LC09 Norfolk Bradenham to Norfolk East Dereham potable transfer (10 Ml/d) NED2 Norfolk East Dereham WTW backwash water recovery NED3

