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14 Isles of Scilly: Technical Summary

Document purpose:

This chapter is a standalone technical chapter explaining the methodology used to develop the first ever dWRMP for the Isles of Scilly (IoS), since SWW took over operation in 2020. This chapter also sets out the recommended plan.

Note on navigating the rest of the dWRMP Technical Chapters: Chapter 1 of our Technical Document contains information on the purpose, methodology and timescales for developing and finalising a Water Resource Management Plan. It also sets out information on how to navigate all the documents that comprise our Technical Submission. Chapter 12 covers specific elements of our Assurance of this draft plan. All other aspects of the dWRMP relevant to the IoS are covered in this separate Chapter.

Summary:

Like much of the South West, the IoS is an area of outstanding natural beauty, with the local economy intrinsically linked to tourism. As part of putting the Isles of Scilly onto a sustainable footing, South West Water started running water and wastewater services on the islands in 2020, following detailed discussions with Defra. This involves investing to improve resilience and compliance, as well as building up an understanding of water sources and the environment.

Because of the level of data immaturity, and the specific needs of the islands, we have followed a simplified planning process which still adheres to the key planning principles and EA guidance. As we learn more and engage with the community, we will develop stronger strategies and plans to best-manage the issues facing the islands.

We have significant work planned for AMP7. Our current planning assumptions are that by 2025 we will:

- Have invested in our water treatment works, to address known water quality risks which will mean that we will have a **healthy supply-demand balance position** as the starting position for WRMP24.
- Our 2025 position relies on desalination (both seawater and brackish groundwater) which is contingent on SWW, DWI and EA reaching agreement on Reg31 approvals for the reverse osmosis water treatment technology that is required.
- We will have upgraded our existing customer meters with Advanced Metering Infrastructure (AMI) meters and achieved near universal metering.
- Undertaken further mains replacement and works to target and resolve leaks.
- Continued our work on water efficiency, engaging with the communities and business and seeking out opportunities for rainwater harvesting and rainshare opportunities (aligned with the Council of the Isles of Scilly Environmental Strategy)

Our recommended plans for WRMP24 are to:

- Continue with our existing metering, leakage, and water efficiency strategies throughout AMP8 and focus on establishing a robust baseline.
- Undertake environmental and social studies to improve our confidence in our medium to long-term forecasts. This will reduce uncertainty in future demand, climate change and population forecasts (including increases in the peak summer months due to tourism) at a cost of £0.475m totex for AMP8.

Between now and our final WRMP, we will continue to investigate and develop unconstrained supply-side options including new boreholes, new/upgraded desalination plants, some inter-island transfers and increased water storage. We will present this as an alternative pathway in our final plan to demonstrate how we will maintain supply if our groundwater licences are not renewed in 2030 and treatment options involving increased desalination cannot be delivered.

1 Setting the scene

The Isles of Scilly (IoS) are generally subject to the same statutory obligations as the mainland and must comply with the same WRMP guidelines and Environment Legislation. Refer to Chapter 1 for more information.

However, there are some significant differences in terms of available baseline information and environmental understanding, both for SWW and the regulators:

- **Environment:** There have been no environmental targets set by the regulators (either WINEP or environmental destination). However, the IoS has been classified as a seriously water stressed area.
- **Leakage and Metering:** The long-term targets are the same as the mainland but there is limited information on a current baseline on which to base any % improvement
- **Drought and PCC Targets:** We are still collecting data to develop drought and per-capita consumption targets, and there are choices to be made around when to achieve drought resilience.

2 The Isles of Scilly

As of 1st April 2020, South West Water (SWW) assumed responsibility for public water supply and waste treatment on the Isles of Scilly (IoS), taking on the established sources and small networks on the five inhabited islands. Prior to 1st April 2020, these were operated by the Council of the Isles of Scilly (St Mary's and Bryher), The Duchy of Cornwall (St Martins and St Agnes) and Tresco Estates (Tresco).



Figure 1: The Isles of Scilly and their water resources.

The Isles of Scilly is made up of five inhabited islands and 140 other islands and has a population of approximately 2,100. This population nearly doubles with tourists during the peak summer season.

Water on the islands comes predominantly from groundwater sources, mainly located within fractured granite and overlying 'head' deposits. Natural freshwater sources of supply are restricted because the geological formations underlying the islands have a relatively low capacity to store water.

On St Mary's, the water into supply comes from the desalination of seawater, abstracted from coastal boreholes and, in the summer months, from a seasonal sea-water intake. A large raw-water storage reservoir is not viable, primarily due to the size of the islands and the underlying geology. In addition, each island is vulnerable to varying degrees of water-quality issues. Risks include high nitrates from horticultural/agricultural sources, naturally occurring radon, and treated/untreated effluent contamination from private sources, as well as the risk of high salinity, either from wind-blown sea spray and/or saline intrusion.

3 Customer and stakeholder engagement

Since taking over responsibility for the provision of water supply and wastewater services on the IoS, SWW has undertaken a significant amount of stakeholder engagement with these island communities.

Pre-2020, SWW visited the islands in 2018, meeting with all the individuals responsible for operating the islands water utilities at that time, and this engagement continued throughout 2018 and 2019 prior to SWW taking over in April 2020. There was also extensive consultation with all key stakeholders (including regulators) in relation to a series of new licence applications and the approach for the new Isles of Scilly Drought Plan, which has now been agreed with EA and Defra.

SWW wants to better understand the interaction between its operations and the environment on the islands and has been working to develop appropriate assessment methodologies. In early 2022, in response to a condition placed on the abstraction licences, an Environmental Monitoring Plan for the islands has been developed in consultation with the EA, NE and IoS Wildlife Trust. Having received feedback from all three organisations, delivery of this plan is beginning in Winter 2022.

In addition, the SWW operations manager and programme manager for the islands is leading the development of a stakeholder engagement strategy in 2023 that will consolidate and formalise the excellent relationships with key island stakeholders that have already been established. These include strong engagement with household and non-household customers; the farming community; the Duchy of Cornwall; the Wildlife Trust; the Council of the Isles of Scilly; the Tresco Estate; and the Area of Outstanding Natural Beauty. We have also had ongoing engagement with the Council of the Isles of Scilly and Isles of Scilly Wildlife Trust.

We have recently begun to forge links with Guernsey Water, looking to compare approaches to island supply management. We are particularly looking to share our experiences on the Isles of Scilly and how this compares to their management of their smaller island supplies including those on Sark, Jethou and Herm.

Our engagement with our customers is now continuous, and our operations manager and programme manager are fully embedded into the community. We have also committed to, and started to use, local contractors and residents to deliver our services. We need to continue this and work closely with the local community and stakeholders to further develop the AMP7 plans; to deliver water treatment processes in line with Drinking Water Inspectorate (DWI) notices; fully implement the metering programme; and develop our future strategy and plan.

4 Enhancing and protecting the environment

The IoS uses a combination of sea water desalination and groundwater boreholes to provide water to the islands. The rainfall patterns are changing, and we expect the availability and reliability of groundwater during summer to be at greater risk in the future. This is a particular risk to all islands because only St Marys currently has seawater desalination provision.

We are proposing to invest in further studies to monitor and understand these interactions to inform improved long-term forecasting and decision-making. We are also looking at options associated with reducing our reliance on groundwater, which will have a benefit on groundwater levels. We are continuing to deliver studies to improve our understanding of the hydrogeology of the islands.

Our goals are aligned to the strategic goals of the Council of the IoS, who are promoting the need for greater rainwater harvesting and water efficiency through government grants alongside their ambitions to gradually reduce their carbon footprint and achieve net-zero.

5 Our 2020-25 (AMP7) Plans

This is the first Water Resource Management Plan for the Isles of Scilly: there is no previous WRMP against which to compare performance.

There are significant investment plans in place for delivery during AMP7. The areas of greatest uncertainty are the solutions that will be required to address the current DWI notices in place regarding high levels of radon and tritium across all five Islands. These plans, and our progress on leakage management, water efficiency and metering are discussed below.

5.1 Investing in water quality and supply resilience

Investment in the islands has increased in recent years and will see a further step up ahead of 2025 to meet the water-quality commitments agreed with the DWI. This investment will improve water quality as well as creating a stable resource position, meaning that we will not need to invest in further water-supply options in the short to medium term.

Our plan currently assumes that we will deliver marine desalination, thereby reducing our reliance on groundwater. However, we are still evaluating options with a final planning decision to be reached in early 2023.

DWI improvement notices have been agreed for each of the five islands: to have installed and commissioned all required 'control measures' and thus comply with our DWI quality regulations with a completion date between March 2024 and March 2025.

As we are on track with these obligations, our baseline assumptions from 2025 are that we will meet these deadlines, providing a stable resource position in the short to medium term.

5.2 Our AMP7 leakage & metering plan

By the end of 2025, we will have near universal smart-metering penetration across the islands, (AMI and AMR); water consumption is monitored by the metering team. We aim to be at 95% penetration.

The island currently operates a robust approach to leakage management. The pipelines are shallow and easy to repair, which significantly supports our ability to manage leakage. The water distribution systems are small, so leaks can be quickly and easily targeted, and our high level of metering will support our ability to identify and target leaks by the end of AMP7. We are not yet able to report leakage levels in MI/d; therefore, in the short to medium term, we have not recommended additional investment in leakage options for the IoS.

We are currently investing in additional monitoring in the network and telemetry and combining this with our distribution input information to better target leakage investment. We also have an ongoing programme of mains replacement and rehabilitation.

Our current plan, from 2025 onwards, is therefore to 'hold things steady'. We are currently going through a period of increased investment and will use this to establish our baseline position, which will be used to better inform our final and subsequent plans.

5.3 Water efficiency plans

As part of our water-efficiency planning, we have worked with the local team to develop our messaging and initiatives to meet the requirements of the Isles.

We have established that local residents have a good awareness of the value of water and the need to treat it as a precious resource; we have aimed to support them in this and have concentrated on asking visitors to be more mindful of the unique water resources of the Isles.

We are also mindful that, while we are investing, the Isles still have a fragile water resource position (until 2025) and the residents are familiar with historic water supply risks, so they are generally responsive to water-efficiency messages.

5.3.1 Water efficiency in 2021

We worked with the Island Council to adapt their existing messaging to introduce SWW branding to posters and flyers. Two employees from our affordability team spent time on the island engaging with key stakeholders, the council, visitors and residents. We handed out free water-saving devices (such as shower heads and tap inserts) and provided water butts to residents.

The team spent time with the Tourist Information Centre to promote the 5-litre challenge (or regional customer water efficiency challenge), and we provided stickers and flyers to local tourism businesses to pass on to their visitors.

Our Water Saving Community Fund awarded the Isles of Scilly Golf Club with £1,000 for the installation of new toilets and water saving taps, saving them over 150,000 litres a year.

5.3.2 Water efficiency in 2022

We have held two two-week community events: in early May and again in August.

For residents, the community events promoted virtual water efficiency audits for all households, and our team spent time in conversation, reinforced by light-touch social-media advertising, the distribution of posters and flyers, and water-saving adverts in the local press to raise awareness. We handed out water-saving products and provided an additional 90 water butts. We contacted 309 customers by text message.

To raise awareness for visitors, our team worked with the Tourist Information Centre and Councils to engage them directly and distributed flyers and posters. The 5-Litre challenge was highlighted with strategic messaging on St Marys and St Martins using stickers for display in public toilets and local services.

5.4 Water treatment work improvements

Many of our current supply-demand challenges on the IoS stem from water treatment works that have long-standing process issues; this means they are unable to produce adequate quality water at their design capacity. There are also known interconnectivity issues between treatment works and boreholes on some islands (e.g., St Martins). This has had a significant impact on the water available for use since before SWWs involvement on the islands.

The water-quality deficiencies will be resolved in this AMP (before 2025), in line with improvement notices served by the DWI and funding arrangements agreed with Ofwat.

Because the quality issues will be resolved and new design capacities can be achieved in the current period, this removes the need to resolve these issues as part of the WRMP24.

The assumptions that underpin the required improvements due by 2025 are provided in Table 1 (below).

Island	Description	Delivery	Design life (yrs.)
St Mary's	Treat saline and groundwater separately then combine requiring: New marine intake / permanent infrastructure to take 100% seawater New groundwater / brackish water treatment works to improve WQ to acceptable standards	AMP7	20
Bryher	New groundwater / brackish water treatment works to improve WQ to acceptable standards	AMP7	20
Tresco	New groundwater / brackish water treatment works to improve WQ to acceptable standards	AMP7	20
St Martins	New 100% seawater desalination plant located by sea to improve WQ to acceptable standards	AMP7	20
St Agnes	New 100% seawater desalination plant located by sea to improve WQ to acceptable standards	AMP7	20

Table 1: The proposed AMP7 improvements to the existing water treatment on the IoS.

This position is still under review as part of our AMP7 options process with the balance between groundwater and desalination being considered across St Mary's, Bryher and Tresco. A confirmed position will be determined in early 2023, which will feed into our statement of response and the development of the final WRMP24.

6 Forecasting supply

Our approach to estimating our baseline supply forecast reflects the relatively simple water supply system on each island, the low volumes of water produced and the lack of historical data available.

Refer to the problem characterisation and water resource zone integrity check in Annex A and B of this chapter.

6.1 Deployable Output

We have estimated the peak deployable output (PDO) from the existing boreholes on each island from recent pump tests and operational understanding. We have assumed that our annual deployable output (ADO) is constrained by our annual licences.

6.2 Changes in Deployable Output

6.2.1 Operational Use and Process Losses

The DWI improvement works to our water treatment works will increase the process losses. This is one of the main drivers for reducing our reliance on groundwater and increasing our desalination capacity. We have included these process losses separately within our planning assumptions to determine our water available for use.

6.2.2 Outage

Outage is currently considered to be negligible due to reasonable asset resilience, good levels of treated water storage and the off-peak demand being substantially lower than peak demand, allowing a large degree of headroom outside of summer.

Our dry year annual average (DYAA) scenario is licenced constrained and therefore any outage could be recovered within the annual balance, and our dry year critical period (DYCP) scenario already has a large available headroom.

As we gain more operational data and experience, we will continue to review this assumption. Some operational use will occur and has been included based on operational experience.

6.2.3 Climate Change

We are aware that climate change will impact on the availability of fresh or brackish groundwater in the future. However, we do not yet have a sufficient data or understanding of the island sources to be able to quantify this climate-change risk.

We have not included an allowance for climate change in our plan at this time, partly because we anticipate a higher reliance from seawater desalination from 2025 onwards.

Based on the performance of the supply system in the dry weather of 2022, we do not anticipate any issues in the short-term considering the improved supply position we will have from 2025.

We are in the process of implementing our groundwater monitoring plan during AMP7, which will provide us with additional data to improve our understanding of vulnerability to drought and climate change.

We have taken a precautionary approach to target headroom to reflect this uncertainty too (see section 8.1).

6.2.4 Sustainability reductions and environmental destination

There are no river abstractions on the IoS, and we are unaware of any future abstraction reductions planned for the current operational groundwater boreholes. The current abstraction licensing period ends in 2030, and our plan assumes that the abstraction licences would be renewed based on the same conditions and assumptions (following the monitoring and study work implemented ahead of this date).

Abstraction Reform and the Abstraction Incentive Mechanism do not currently apply to the IoS.

There is no impact on supply availability due to the risk of invasive non-native species.

There are no water transfers currently between islands or with the mainland.

6.2.5 Baseline Water Available for Use

Based on the above methodology, we have calculated the baseline supply forecast shown below in Table 2. We have not included drought measures in our baseline supply forecast.

WAFU	St Mary's	Tresco	Bryher	St Martins	St Agnes	Total
DYAA MI/d	0.678	0.062	0.048	0.071	0.050	0.909
DYCP MI/d	1.120	0.219	0.112	0.071	0.050	1.572

Table 2: WAFU for 2025/26

7 Forecasting demand

7.1 Distribution Input

We adopted a simple approach to estimating demand, reflecting the limited available historical data currently available.

We have used historical data on distribution input (DI) on each island and made broad assumptions using data and information from our mainland WRZs to disaggregate this high-level DI figure to individual components of demand. This means that the IOS demand forecasting is a 'top down' calculation starting from DI rather than a 'bottom up' calculation, which is typically how a WRMP demand forecast is derived.

7.2 Population, Properties and Occupancy

Our approach to population forecasting¹ is to assume a relatively modest growth, both in population and in household numbers, of 0.5% per year. The base-year population in 2021/22 is 2,159, and this increases to 2,483 by 2050.

Demand on the Isles of Scilly varies significantly by season, driven by the tourism in the summer months which more than doubles the population across the islands. We have represented this peak in our DYCP planning scenario using historical DI data to derive a peaking factor of 1.49 which we then apply to our DYAA forecasts.

We have separated our household and non-household customers based on our billing position at the end of 2021/22 which has 66% of meters listed as household and 34% as non-household.

We have used the consumptive water volumes from the same dataset to separate household and non-household consumptive demand at 53% and 47% respectively.

Our PCC figures are determined by splitting the consumptive water component of DI based on the 53%/47% splits and then dividing the household consumption by the total number of measured and unmeasured population.

PCC is therefore derived through a top-down approach as opposed to bottom-up.

We have assumed that we will reach 100% property connectivity on St Marys, Tresco and Bryher and will reach around 60% connectivity on St Martins and St Agnes.

7.3 Leakage

Our baseline leakage estimate has been derived by RPS using assumptions based on expert industry knowledge on leakage performance. We have validated these assumptions with other small island operators for reference - the RPS methodology is provided in appendix 14.1.

We have used data from our mainland WRZs to assume that 18% of leakage originates as customer supply pipe leakage.

7.4 Metering

Our AMP7 metering programme means we will be able to improve our understanding of PCC and leakage to one of the highest standards in the country. However, it will take a full year of data collection to establish the revised baseline, which we do not have at this time. As a planning assumption, we have assumed a reduction in measured PCC of 15%² from our base-year derived PCC.

¹ Unlike our other WRZs, Office of National Statistics (ONS) data was not used for the planning period forecast. We have deviated from ONS data for future forecasts, because the ONS has told us it is hard to predict the IoS population and it was indicating a reasonable decline, which is contrary to recent housing growth noted on the island.

² 15% reduction in PCC is assumed based on moving from unmeasured households to AMI metering as outlined by consultant research/review. Network Metering Strategy, 2022, Wood.

Distribution Input	2025/26	2030/31	2049/50
DYAA MI/d	0.71	0.70	0.74
DYCP MI/d	1.06	1.07	1.11

Table 3: Baseline distribution input

8 Baseline position and future challenge

8.1 Target headroom

We have used our target headroom analysis from the mainland as the basis for estimating target headroom.

Our mainland WRZs target head room range from 8% to 10% of DI. We have assumed a target headroom of 10% of DI for the Isles of Scilly.

8.2 Supply demand balance: baseline

This is our first WRMP for the IoS, and therefore we have no previous baseline against which to compare and understand changes.

Our planning assumption in developing our baseline and understanding our future water resource challenge assumes that we deliver the water quality improvements, as set out in our 2020-25 Business Plan, across the five islands by 2024/25.

With the high levels of investment in our current water treatment works planned for AMP7, our forecasts currently show that we have a healthy supply-demand position through AMP8 and the remaining 25-year planning period for both DYAA and DYCP planning scenarios.

8.3 Our future challenges and 2025 baseline.

We recognise that our dWRMP has a degree of uncertainty associated with the baseline position from 2025. We have assumed in our planning that we will meet our DWI commitments and that this will result in a supply-demand surplus position. We will confirm in early 2023 what our planning solution will be and update our final plan position to reflect these assumptions.

In our final plan, our possible pathways will be

1. a blended mix of groundwater and seawater desalination from 2025 with our groundwater licences being renewed “as is” in 2030 with no further options being implemented for the duration of the plan
2. a blended mix of groundwater and seawater desalination from 2025 with our groundwater licences being reduced in 2030 with supply options in place to increase seawater desalination capacity from 2030
3. a blended mix of groundwater and seawater desalination from 2025, with supply options in place to move to full seawater desalination from 2030 if our groundwater licences are not renewed
4. full seawater desalination from 2025 onwards with no further options being implemented for the duration of the plan

Our pathways that our dependent on future desalination (both seawater or brackish groundwater) are contingent on SWW, DWI and EA reaching agreement on Reg31 approvals for the reverse osmosis water treatment technology that is required. Depending on the 2025 position in our Final Plan we will include different pathways and options programme to meet these requirements.

In summary the future challenges for the Isles of Scilly are as follows:

- Our baseline assumes that our DWI Notices are resolved during AMP7, leaving our supply-demand balance in a healthy position during AMP8. The blend between groundwater and desalination is still to be finalised and will be confirmed in early 2023 to inform our statement of response and the development of our final WRMP24.
- As a result of these improvements, our supply-demand position is in surplus for AMP8 and beyond, acknowledging the medium to longer-term forecasts have a lower confidence because of the lack of data, particularly on the impacts of climate change on groundwater.

- In producing a WRMP, it is important to establish a baseline performance for the start of the planning period: 2025. This is particularly challenging because, historically, the IoS were not regulated to the standards applicable on the mainland, and historic data is in many cases either limited or missing. This has constrained our ability to establish a robust baseline and forecast, and we acknowledge our position is uncertain.
- We will continue to enhance our understanding of supply-demand uncertainty between draft and final WRMP. As agreed with our regulators we expect it to take until the end of AMP7 or early AMP8 to improve our longer-term forecasting capability for the Islands. We will therefore provide updates on this position via the WRMP annual-review process and improve our long-term forecasting capabilities to develop and inform our WRMP29 submission
- We have assumed that our groundwater licences will be renewed in 2030 in our baseline plan. Because of the risk associated with these licences not being renewed, we have undertaken an options-assessment process.

9 Option development

Our approach to option development, selection and shortlisting to identify a range of feasible options is similar to that defined in “Chapter 8: Supply Options” of our WRMP Technical Document, yet slightly simpler due to the limited number of options available.

We have included a list of supply-side options within this section as an indication of the likely options that are being considered. Some of these options have a water-quality or resilience driver and therefore do not directly impact water available for use but have been included to provide a clearer picture of the wider plans for the Islands. Many of the investments in boreholes and water treatment works will be significantly influenced by the agreed AMP7 supply-side improvements to address the known water-quality risks.

9.1 Demand-side options

For our dWRMP, we have assumed fixed levels of leakage and water efficiency given the uncertainty in leakage and PCC in our baseline position.

The National Framework targets of a 50% reduction in leakage and a PCC of 110 l/p/d are considered at a company level and not on a WRZ basis. The Isles of Scilly WRZ DI represents only 0.11% of SWW DYAA total DI in the base year, and the WRZ position does not materially affect cross-WRZ, company-level metrics.

Ahead of our statement of response, we are developing demand-side options for water efficiency and leakage to support our company-level approach to the National Framework targets. These will further benefit our supply-demand surplus.

9.2 Supply-side options

9.2.1 Unconstrained options

The following Table 4 summarises the full list of unconstrained options that were identified for the Isles of Scilly. As mentioned previously, these cover water available for use as well as resilience drivers.

Island	Option ID	Option description	What is the driver
			Water Quality, Resilience, or WAFU
St Mary's –	ISMY1	New Borehole (Location 1)	WAFU
	ISMY2	New Borehole (Location 2)	WAFU
	ISMY3	100% Seawater Desalination (Replace existing Boreholes and Desalination plant)	WAFU
	ISMY4	Increase Existing Desalination Plant Capacity	Resilience

Island	Option ID	Option description	What is the driver
			Water Quality, Resilience, or WAFU
	ISMY8	Increase Service Reservoir Capacity	Resilience
Bryher –	ISB1	New Borehole	WAFU
	ISB3	100% Seawater Desalination (Replace existing Boreholes and Desalination plant)	WAFU
	ISB4	Increase Existing Desalination Plant Capacity	WAFU
	ISB5#	Link Tresco and Bryher with Pipeline	Resilience
	ISB8	Increase Service Reservoir Capacity	Resilience
Tresco –	IST1	New Borehole	WAFU
	IST3	100% Seawater Desalination (Replace existing Boreholes and Desalination plant)	WAFU
	IST6	Increase Service Reservoir Capacity	Resilience
St Martins –	ISTM1	New Borehole	WAFU
	ISTM3**	100% Seawater Desalination (Replace existing Boreholes and Desalination plant)	WAFU
	ISTM6	Increase Service Reservoir Capacity	Resilience
St Agnes –	ISA1	New Borehole	WAFU
	ISA3**	100% Seawater Desalination (Replace existing Boreholes and Desalination plant)**	WAFU
	ISA6	Increase Service Reservoir Capacity	Resilience

Table 4: Unconstrained list of options (IoS)

#: Only ISB5 has been discounted due to being considered technically unfeasible, or excessively expensive. All other options listed above were considered feasible, and further work was completed to develop costs and benefits for each.

** ISTM3 and ISA3: 100% Seawater desalination options on St Martins and St Agnes, are now being delivered in AMP7 as part of the DWI notices and are no longer part of the options for WRMP24.

More detail on the IOS feasible options (excluding Resilience schemes) are included in Appendix 8.1.

9.3 Drought options

We have included the benefits that are realised from our supply and demand side drought management actions. The island communities have a good understanding of their water supply and associated risks from previous droughts. Residents respond well to messaging around water efficiency. We have assumed demand savings as outlined in Table 5.

Drought Action	% saving of distribution input
Publicity, appeals for restraint and water conservation measures	5%
Temporary Use Bans	10%
Demand-side Drought Orders	5%

Table 5 Overview of demand side drought interventions and their savings.

We have a limited number of options on our supply side with the current infrastructure. There is small benefit that could be realised through further optimisation of the desalination (0.01 Ml/d) and a drought permit at Carrs Well on St Mary (0.02 Ml/d).

10 Plan development

10.1 Approach

At this time, we do not require any further options due to our healthy surplus in the supply-demand balance which is also reflected in our Problem Characterisation which reports 'low' complexity and 'small' strategic needs as outlined in Annex A. This is subject to the assumption that our licences would be renewed in 2030.

Once we have confirmed our baseline AMP8 supply position in early 2023, we will produce an alternative pathway in our final plan to demonstrate what would be required if these licences are not renewed.

11 Recommended plan

11.1 Our long-term strategy

11.1.1 Overview of the need

The baseline supply-demand forecast show that we have a healthy surplus in AMP8 onwards for the remaining planning period.

In line with EA guidance, we have assumed that our licences would be renewed in 2030 to allow continued abstraction from existing groundwater sources. However, we have undertaken an options-appraisal process to ensure we can mitigate the potential risk that the licences are not renewed.

11.1.2 Strategic focus

Our IoS WRMP strategy is aligned to our SWW strategic priorities as follows:

- Protecting the marine environment: protecting the wildlife that depends on the health of waterways collectively in catchments
- Providing security of water supply to homes and businesses, protecting them from changing weather through:
 - Reducing leakage and the future demand for water
 - Providing sustainable water sources and building resilience to climate change
- Promoting re-use and recycling, maximising the value of this precious resource
- Ensuring a resilient infrastructure that can support tourism and the longer-term economic growth of the region.

Chapter 11 of our WRMP Technical Document, "Our Best Value Plan", gives more detail on our strategic priorities.

11.1.3 Alignment across our Business Plans

The following summarises our alignment with our various strategic plans and regulatory submissions:

- **Business Plan and long-term delivery strategy:** We are confident we are aligned with Ofwat's PR24 guidance and our PR24 plan that is under development. As set out in Chapter 11, our WRMP strategy aligns with our overall Strategic Direction and priorities. In our final plan, we will be doing further work on the long-term adaptive plan for IoS and how the common reference scenarios could impact our final plan.
- **Drought Plan:** We have used consistent tools and methodology for assessing both our Drought Plan and our WRMP. For the IoS, we are aligning our levels of service with our other WRZs from 2025.
- **River Basins Plan:** Not applicable, there are no river basin plans on the IoS.
- **Drainage and Wastewater Management Plans:** We have carried out checks between our WRMP and recently published Drainage Water Management Plan (DWMP). We are, however, limited by the availability

of robust long term rainfall data for the IoS. We are also working closely with the Council to ensure our plans are aligned.

- **Drinking Water Safety Plans:** Through our routine raw-water sampling programme, we understand our catchment risks and focus on minimizing the risk of contamination entering our groundwater. In following up our current DWI notices, we are building a fuller understanding of water-quality risk and designing appropriate control measures and interventions for AMP7.

11.1.4 Alignment with regional and other companies' plans

We are confident that our WRMP aligns with relevant regional and other companies' plans as follows:

- **Regional plan:** The West Country Regional Plan does not influence the Isles of Scilly WRMP.
- **National Environment Plan:** The National Environment Plan does not cover the IoS for water resources. We have, however, looked at how groundwater abstractions may impact on sensitive habitats and environmental resilience. We have assessed natural capital as part of our supply-options development.
- **Other National, Regional and Local Plans:** We are in regular dialogue with the Council of the IoS, and our WRMP plans are aligned with their published Environmental Strategy and their projected growth and predicted tourist numbers. Our population aligns with the Office for National Statistics (ONS) data for our base year. We have used Local Authority data (that from the Council for the Isles of Scilly) to make our population projections. This reflects plans for relatively material new housing projects (in contrast to the ONS position which forecast a declining all year-round population).

11.2 Our plan

11.2.1 Water resources for all: Reduce leakage and the future demand for water & Promoting re-use and recycling of water.

Our current plans for AMP8 (2025-30) are to continue similar base levels of investment across water efficiency, leakage management and metering as per our AMP7 plan, to maintain current levels.

We will continue to manage the demand for water through water-efficiency engagement, maintaining our leakage management, through proactive 'find and fix' and mains replacement, while continuing to enforce compulsory metering and replacing existing meters with AMI meters at the end of their asset-life.

The Isles of Scilly are classed as 'water stressed'. Due to their historic dependency on groundwater, the islanders are well accustomed to implementing their own measures to reduce water use. We will look at ways to improve communication at times of water stress to maximise opportunities to manage demand. This will support the identification of customer supply-side leaks and other water-saving opportunities and improve overall management of water resources across the islands.

11.2.2 Water resources for all: providing sustainable water sources and building resilience to climate change

As part of our groundwater monitoring plan, we will continue to work on improving our understanding of the resilience of groundwater sources to drought and climate change. This will directly feed into the process of reviewing our groundwater licences in 2030. In parallel, we will continue to develop supply-side options with investigative works to make sure there is an alternative pathway in our plan to mitigate the risk that our licences would not be renewed or if, as our understanding increases, it becomes clear that sources will be impacted by climate change.

11.2.3 Nurturing the environment and working collectively in catchments

A critical part of our recommended plan for the Isles of Scilly will include investment in data collection and further modelling to improve our understanding of the future risks and investment needs, supporting us to ensure that our abstractions are sustainable and protect the environment.

11.3 Levels of service across the planning period

Given the step change we are making to our Island sources and treatments works as part of the DWI improvement notices, we are establishing a healthy supply-demand position.

On the back of this investment, and with the expectation that we will build desalination facilities capable of producing potable drinking water on all of the islands, we propose to align our Levels of Service with those of our other SWW

WRZs from 2025 onwards as outlined in Table 6. We assume these apply to both household and non-household customers.

Our ability to meet these levels of service commitments from 2025 is contingent on SWW, DWI and EA reaching agreement on Reg31 approvals for the reverse osmosis water treatment technology that is required to meet the DWI improvement notices for the Isles of Scilly. In the interim, in accordance with our published draft drought plan, we are currently improving our understanding of our existing position through a comprehensive monitoring programme.

Drought Action	Minimum level of service from 2025
Publicity, appeals for restraint and water conservation measures	1 in 10 years
Temporary Use Bans	1 in 20 years
Supply-side Drought Orders or Drought Permits	1 in 20 years
Demand-side Drought Orders	1 in 40 years
Emergency Drought Orders – partial supply, rota cuts or standpipes ⁽³⁾	1 in 200 years

Table 6 Planned Levels of Service from 2025.

11.4 Plan costs

Table 7 shows our overall planned level of capital and operational expenditure for our Best Value Plan to 2030.

Scheme / Investment Area	Total Expenditure (2025-2030)
Modelling, data collection and studies: Opex	£0.475m
Total	£0.475m

Table 7: Planned Totex

Prices in 2021/22 cost base³

11.5 Monitoring plan

We are continuing to improve our baseline data and our ability to report basic supply-demand metrics, including PCC, distribution input, leakage, and outages, in line with Annual Performance Reporting requirements. Given these data limitations, we have therefore not provided a monitoring plan for our WRMP24. We will look to include a monitoring plan for our revised draft plan, once key planning decisions for AMP7 are completed, and the levels of future uncertainty are clearer. We fully expect that the monitoring plan defined in chapter 11, will become applicable once the performance data is available.

11.6 Plan benefits

The overall performance of our plan is shown Figure 2 for DYAA and Figure 3 for DYCP. The difference between our baseline plan and final plan are a result of the benefits that are realised from our drought management actions. We do not require any future supply side options and therefore do not have any costs or greenhouse emissions associated with an investment programme. Further work ahead of our final plan on leakage and water efficiency options, to meet company wide targets, will increase the surplus in our supply-demand balance.

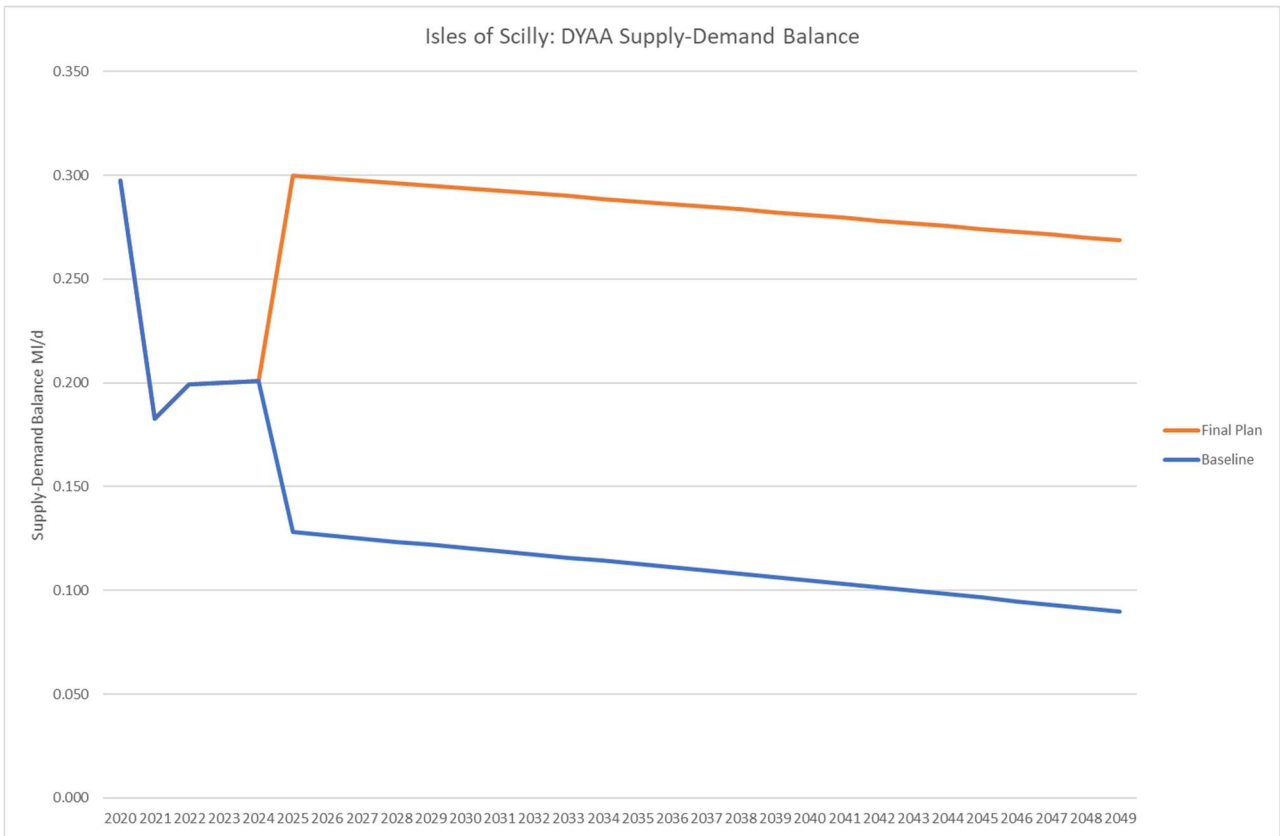


Figure 2 DYAA supply-demand balance for Isles of Scilly

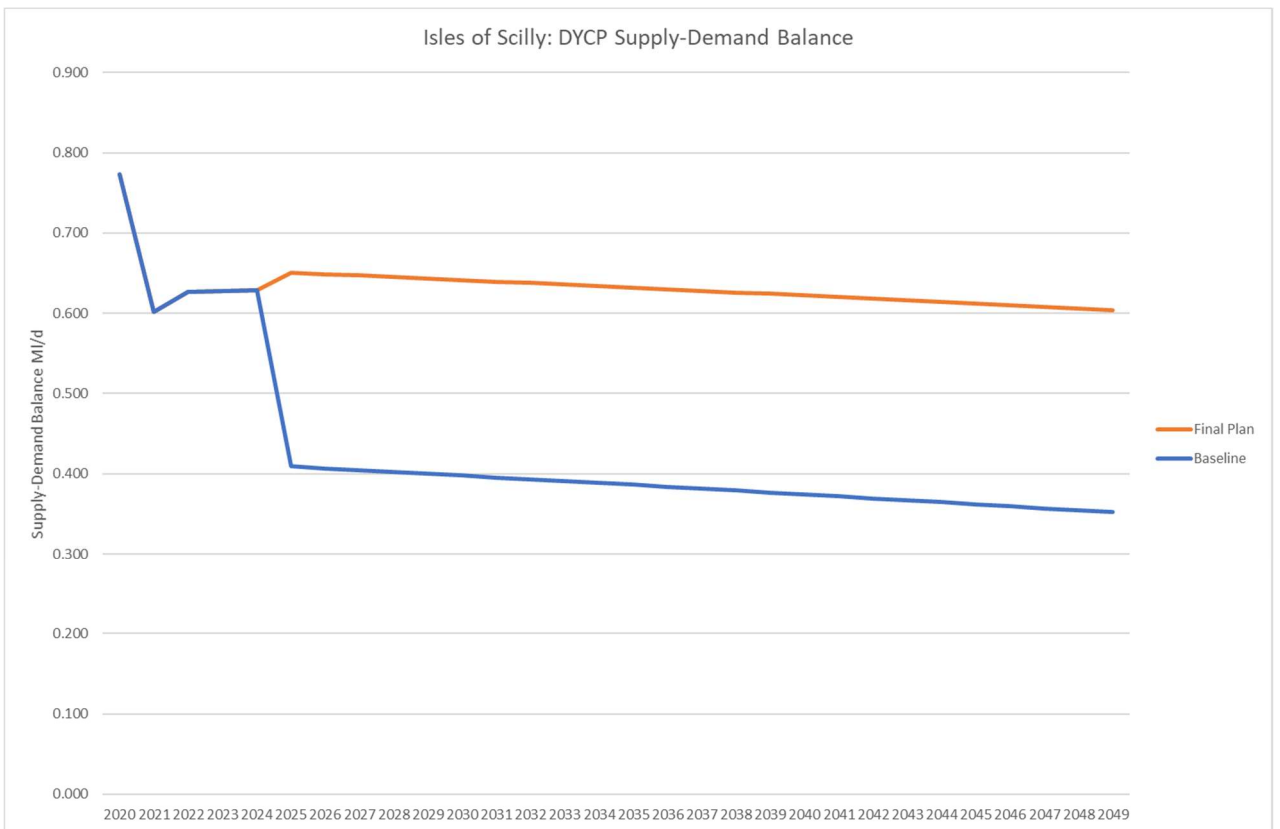


Figure 3 DYCP supply-demand balance for Isles of Scilly

11.7 Plan uncertainties and assumptions

The following summarises the largest uncertainties in our dWRMP for the IoS:

- Our 2025 position with **healthy supply-demand balance relies on desalination** (both seawater and brackish groundwater) which is contingent on SWW, DWI and EA reaching agreement on Reg31 approvals for the reverse osmosis water treatment technology that is required.
- Our ability to **establish a robust baseline performance** and accurately forecast the future demand and supply, factoring in climate change and population uncertainty.
- Our **use of a simple approach** to supply-demand forecasting with a top-down approach to our supply-demand balance and establishing our baseline position.
- We are currently **unable to fully understand the areas of greatest uncertainty**, and we plan to work on collating more data across all performance measures including PCC, leakage, source performance during drought and outage. We will incorporate this information into our final WRMP24 and set out the changes made as a result in our Statement of Response.

12 Next steps

- We will continue to improve our understanding of baseline performance and our preferred DWI improvement programme which will feed updates into our statement or response and final WRMP24.
- We will be beginning a significant hydrogeological investigation on the islands in Winter 2022/3 to improve confidence in our baseline groundwater source data. This information will help inform both the review of our existing licences and feed into our WRMP29. The data will also be shared with local stakeholders to improve our collective understanding of these unique environments.
- We continue to develop our future supply-demand options and once we have confirmed our AMP8 starting position we will provide an alternative pathway which demonstrates how we will plan to future uncertainties, particularly on the non-renewal of our groundwater source licences.
- Our WRMP24 is a “top down” view on the overall supply-demand balance. We have a surplus in our supply-demand balance, but we will update our assumptions and supply-demand position as we gather our additional data and information. We will keep stakeholders informed of progress through the Annual WRMP Reporting process
- We continue to grow relationships with organisations supplying water to island communities to learn from their collective knowledge.

13 Board Assurance

Refer to Chapter 12 for information on our Board Assurance.

Annex A: Problem Characterisation

Summary of IOS problem characterisation

We have assessed the size and complexity of the planning problem, a process known as ‘problem characterisation’, using the method presented in UKWIR’s Decision Making Process guidance. This approach shows the complexity of the planning problem to be solved by scoring the system based on assessing the complexity and strategic risk presented by the needs identified in each WRZ.




We have used a problem-characterisation process which allows us to develop a proportional response for our long-term planning. As summarised in Table 8 below, the results of the Problem Characterisation process show a small strategic needs score and low complexity. This suggests relatively simple methods are acceptable for the Isles of Scilly plan, which are also necessitated by the lack of data currently available.

		Strategic Needs Score (“How big is the problem”)			
		0 (None)	2 (Small)	4 (Medium)	6 (Large)
Complexity Factors Score (“How difficult is it to solve”)	Low (<7)		✓		
	Medium (7-11)				
	High (11+)				

Table 8: Modelling complexity factors

Detailed assessment for IOS

The tables below use the following colour coding (as per the UKWIR guidance):

Low level of concern	
Moderate level of concern	
High level of concern	

Strategic WRMP risks	No significant concerns (Score = 0)	Moderately significant concerns (Score = 1)	Very significant concerns (Score = 2)
S. Level of concern that customer service could be significantly affected by current or future supply side risks, without investment		1	
D. Level of concern that customer service could be significantly affected by current or future demand side risks, without investment		1	
I. Level of concern over the acceptability of the cost of the likely investment programme, or that the likely investment programme contains contentious options (including environmental/planning risks)	0		

Table 9: Strategic WRMP risks

S: DWI interventions required over AMP7 will deliver a supply demand headroom, increasing resilience to supply-side risks, although climate change and sea-level rise remain a concern.

D: Industry leakage and customer consumption targets are ambitious and represent a large step-change from the current position. This makes the economic deliverability of these targets very uncertain. However, the healthy surplus that is forecast to be delivered by DWI required investment reduces concern.

I: For IoS, DWI interventions required over AMP7 will deliver a supply-demand headroom greatly reducing the likelihood of contentious options being required.

S	Supply side complexity factors	No significant concerns (Score = 0)	Moderately significant concerns (Score = 1)	Very significant concerns (Score = 2)
S (a)	Are there concerns about near-term supply system performance, either because of recent Level of Service failures or because of poor understanding of system reliability/resilience under different or more severe droughts than those contained in the historic record? Is this exacerbated by uncertainties about the benefits of operational interventions contained in the Drought Plan?		1	
S (b)	Are there concerns about future supply system performance, primarily due to uncertain impacts of climate change on vulnerable supply systems, including associated source deterioration (water quality, catchments etc.), or poor understanding?		1	
S (c)	Are there concerns about the potential for 'stepped' changes in supply (e.g., sustainability reductions, bulk imports etc.) in the near or medium term that are currently very uncertain?		1	
S (d)	Are there concerns that the 'DO' metric might fail to reflect resilience aspects that influence the choice of investment options (e.g., duration of failure), or are there conjunctive dependencies between new options (i.e., the amount of benefit from one option depends on the construction of another option)? These can both be considered as non-linear problems.	0		

Table 10: Supply side complexity factors

S(a): The limited data available to us raises some concerns over our understanding of supply system performance on the IoS, but experience through 2022 has provided useful information.

S(b): We do have some concerns given the lack of historic data on supply system performance, but the increased future reliance on desalination provides a supply system that is more resilient to climate change than more traditional sources.

S(c): While we are not currently aware of potential stepped changes in supply, increased understanding of the systems on the Islands could highlight the need for future changes.

S(d): No significant concerns.

D	Demand side complexity factors	No significant concerns (Score = 0)	Moderately significant concerns (Score = 1)	Very significant concerns (Score = 2)
D (a)	Are there concerns about changes in current or near-term demand, e.g., in terms of demand profile, total demand, or changes in		1	

D	Demand side complexity factors	No significant concerns (Score = 0)	Moderately significant concerns (Score = 1)	Very significant concerns (Score = 2)
	economics/demographics or customer characteristics?			
D (b)	Does uncertainty associated with forecasts of demographic/economic/behavioural changes over the planning period cause concerns over the level of investment that may be required?	0		
D (c)	Are there concerns that a simple 'dry year/normal year' assessment of demand is not adequate, e.g., because of high sensitivity of demand to drought (so demand under severe events needs to be understood), or because demand versus drought timing is critical?		1	

Table 11: Demand side complexity factors

D(a): We do not currently have concerns, but our current understanding is limited due to lack of data, so some concern remains.

D(b): The surplus delivered by the required DWI improvements makes future investment level insensitive to demand forecast uncertainty.

D(c): We do not believe this to be the case, but data to give us full confidence is not available, so some concern remains.

I	Investment programme complexity factors	No significant concerns (Score = 0)	Moderately significant concerns (Score = 1)	Very significant concerns (Score = 2)
I (a)	Are there concerns that capex uncertainty (particularly in relation to new or untested technologies) could compromise the company's ability to select a 'best value' portfolio over the planning period?	0		
I (b)	Does the nature of feasible options mean that construction lead time or scheme promotability are a major driver of the choice of investment portfolio?	0		
I (c)	Are there concerns that trade-offs between costs and non-monetised 'best value' considerations (social, environment) are so complex that they require quantified analysis (beyond SEA) to justify final investment decisions.	0		
I (d)	Is the investment programme sensitive to assumptions about the utilisation of new resources, mainly because of large differences in variable Opex between investment options?	0		

Table 12: Investment programme complexity factors

I(a): The surplus delivered by the required DWI improvements makes future investment needs very limited, so there are no concerns over selection of a 'best-value' portfolio.

I(b): The surplus delivered by the required DWI improvements makes future investment needs very limited, so we have no concerns.

I(c): The surplus delivered by the required DWI improvements makes future investment needs very limited, so we have no concerns.

I(d): The surplus delivered by the required DWI improvements makes future investment needs very limited, so we have no concerns.

Annex B: Water Resource Zone Integrity

The Isles of Scilly water supply network consists of 5 isolated supply systems covering the 5 inhabited islands. There is not currently any water connection between any of the islands, but the 'Water resources planning guideline supplementary guidance – Water resource zone integrity' document published in March 2021 only applies to:

“all WRZs where the population is greater than 5,000 and/or where over 1 Ml/d of Total Water Available for Use (WAFU) is supplied from your own sources”

The Isles of Scilly fall below both of these thresholds, so we have grouped them into a single WRZ.



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