8 Preferred Approach - Regional

8.1 Introduction

As outlined in Section 1.9.4 of the Framework Plan and Section 1.4 of this document, given the large number of WRZs per capita of population, the National Water Resources Plan (NWRP) has been subdivided into 22 Study Areas (SAs) across four (4) Regions.

These subdivisions are necessary and appropriate to make the Option development and assessment tasks manageable for both Irish Water and the public/stakeholders during the consultation phase. Notwithstanding the sub-division, solutions are not constrained by distance i.e., WRZ, Study Area or Regional boundaries, but instead by the criteria of Resilience, Sustainability, Flexibility and Deliverability.

One of the key benefits of having a Regional Plan is that it allows us to consider Options to address Need for each individual supply, and then to further assess whether the outcomes of the Plan can be improved by reviewing larger Study Area (SA) Options which serve multiple WRZs at Study Area Level; or even larger Regional Options that can be applied across the region.

SA and Regional Options in some cases perform better than local solutions, as they:

- Allow us to look at the resilient supplies across a wider area
- Provide opportunities to decommission problematic, unsustainable local sources
- Allow us to balance our overall regional abstraction in an improved way across multiple catchments, with improvements in sustainability
- Improve operational control by having fewer Water Treatment Plants (WTPs) to manage
- Provide more resilient WRZs that are less sensitive to peaks in demand during critical events.

As part of Section 7, we reviewed the Preferred Approach at WRZ and Study Area Level. During that process we assessed the Feasible Options to determine whether any Options were available to meet the Need across multiple WRZs (SA Options). This process identified 35 SA Options. Thirty (30) of the SA Options interconnect WRZs within the same Study Area. The remaining five (5) SA Options involve an interconnection with an external transfer i.e., from a supply in another Study Area (Cross Study Area Transfer), including three (3) connections to adjacent regions.

In this section we:

- Explain the limitations to the development of a large-scale regional interconnected supply for the South West Region; and
- Describe the Regional Preferred Approach, outlining the benefits of supply rationalisation and interconnectivity achieved through our proposed SA Options.

8.2 Limitations to the Development of a Regional Interconnected Supply for the South West Region

Unlike the Eastern and Midlands Regional Water Resources Plan (RWRP-EM), our Option Development Process for the South West Region did not identify any Feasible Options with the potential, in terms of quantity and distribution of supply, for a large-scale interconnection of multiple WRZs across the Study Area boundaries. The Preferred Approach for each Study Area does however comprise large, interconnected supplies within the Study Area boundaries and in this way provides the benefit of resilience and improved environmental outcomes, through the decommissioning of unsustainable sources. It also contains some small Cross Study Area Transfers, including connections to adjacent regions.

The potential for large Feasible Options with the capability to provide regional interconnectivity (across Study Area boundaries) is limited by the terrain of the South West Region and the volume of water we

can sustainably abstract from the water sources. These limitations are discussed further in the following sections.

8.2.1 Topography and Designated Sites

Opportunities to merge WRZs across Study Area boundaries are limited by both topography and the potential impact of construction through European designated sites. The Mullaghareirk Mountains in the north west of Study Area H (SAH) runs along much of the border with Study Area J (SAJ). The Mountains have the Blackwater valley to the south in SAJ, Castleisland to the west, and the Deel Valley to the east. They form part of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protection Area (SPA), which covers an area of 556 km^2. Figure 8.1 shows the designated sites across the South West Region and identifies the Mullaghareirk Mountains.

Similarly, the Macgillycuddy's Reeks, the highest mountain range in Ireland, runs along the border between SAH and Study Area I (SAI). It stretches approximately 19km from the Gap of Dunloe in the east to Glencar in the west. Some of the highest peaks in Ireland form part of the mountain range, including Carrauntoohil, Ireland's highest mountain. The range forms part of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment Special Area of Conservation (SAC).

Many of the surface waters of the region are within designated sites, including Lough Guitane, the largest surface water source in SAH.

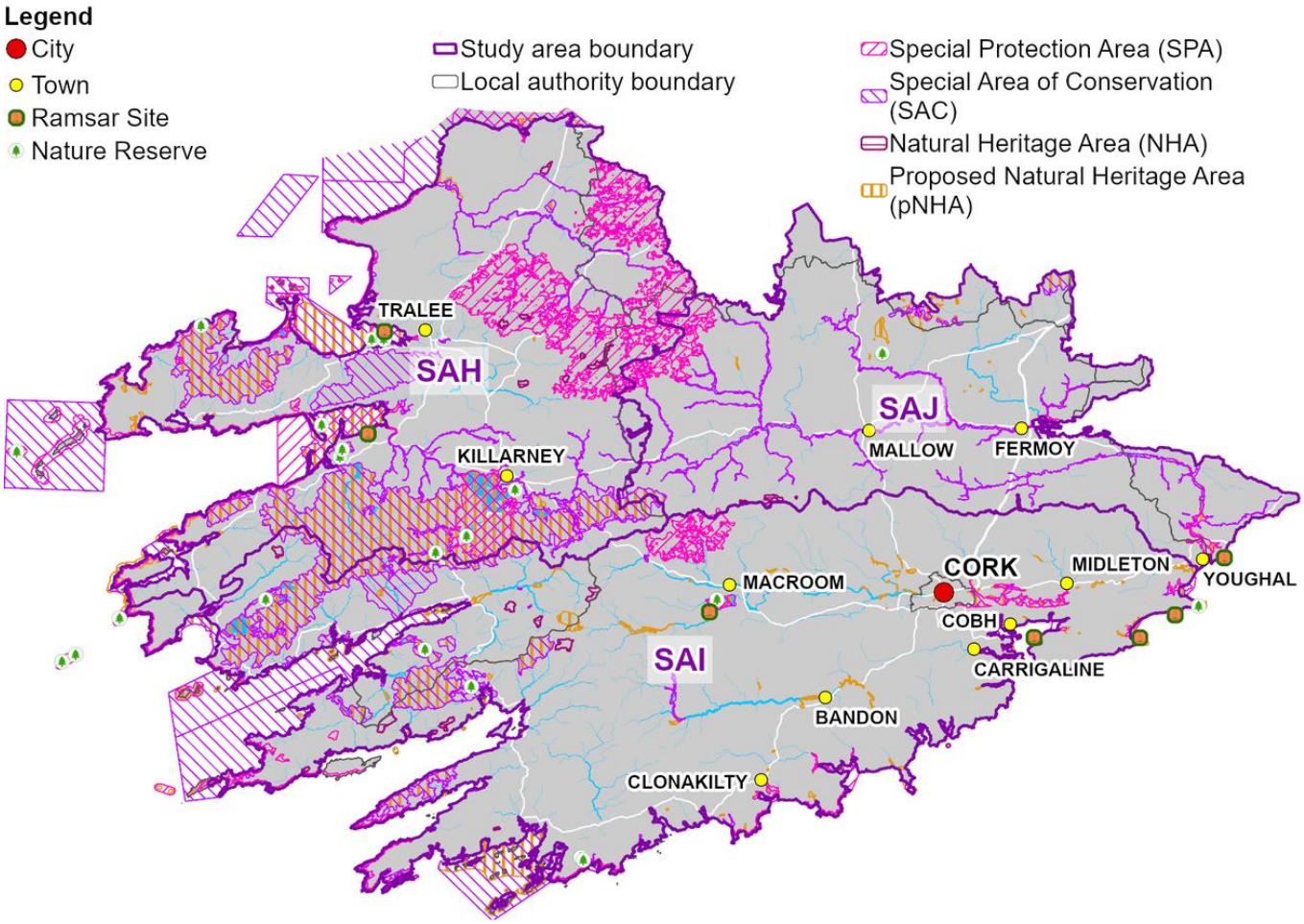

Figure 8.1 Designated sites in the South West Region

8.2.2 Sustainable Abstractions

Under the Water Framework Directive (WFD), Ireland must ensure that all waterbodies achieve 'Good' status by 2027. In addition, any modification to a WFD waterbody should not lead to a deterioration in either the overall status or any of the WFD water quality parameters[1].

As discussed in Section 2.3.7, in developing our Preferred Approach we have considered the potential impact of the pending Abstraction Legislation[2] on our Supply Demand Balance (SDB). We have used this information to identify opportunities to improve environmental outcomes through our Plan solutions, and to ensure new or increased abstractions remain below the theoretical sustainable abstraction limits.

The water abstraction standards used to assess the impact of new Options are based on UKTAG[3] guidance for achieving 'Good' or 'High' status, depending on current waterbody status. Therefore, when considering abstractions from 'Poor' status waterbodies, the proposed abstraction is limited to the volume that will support the achievement of 'Good' status. The volume of water we can abstract from 'High' status water bodies is more limited than the volume of water we can abstract from 'Good' status water bodies.

The riverine ecology of just over 80% of the main river water bodies in the South West Region is considered highly sensitive to changes in flow and water level (see Section 2.3.3). Furthermore, over 24% of the surface water bodies in the region are classified at below 'Good' ecological status. Six percent (6%) are at 'Poor' or 'Bad' status (below 'Moderate') (see Section 2.3.5). This includes reaches of the Maine and Feale in SAH, the Blackwater in SAJ and the Lower Lee and Upper Bandon in SAI. Given the current ecological status of surface water bodies across the region, there are very few surface water abstractions that can be sustainably developed. Those with potential to support large scale sustainable abstractions include the Inniscarra reservoir source that currently supplies Cork City, the lower Leane catchment source in SAH, and the Lough Currane source in SAI. The development of these sources is proposed under the SA Preferred Approach.

About 19% of the water supply for the South West Region is currently abstracted from underground sources, predominantly from the higher yielding aquifers located in the SAJ. The main aquifer type (representing 51% of aquifers in the region) is made up of poorly productive bedrock (see Section 2.3.2). The potential for interconnected groundwater supplies is therefore limited to settlements within SAJ. There are four (4) large SA Options in SAJ that will interconnect WRZs and serve a combined population greater than 5,000. All of these Options are supported by new or increased groundwater sources.

8.2.3 Small and Isolated Settlements

Besides the topographical constraints and the potential impacts on designated sites and WFD status, the feasibility of interconnecting supplies across long distances depends on the volume of water that is transferred. Transferring water to small demand centres across long distances is not economically feasible nor efficient, due to the associated friction and loss of pressure head. Small, local water supply sources therefore remain the Preferred Approach for isolated, rural settlements.

Transferring small quantities of water over long distances can also result in water quality issues. Minimum main size requirements means that treated water may be stored in the network for extended periods of time and hence there can be a significant time lag between when the water was treated and when the customer receives the water. Additional chlorine dosing may be required along the network to ensure water received by our customers meets the required water standards. Such arrangements can be complicated and costly for small supplies.

8.3 The Regional Preferred Approach

Due to the limitations described in Section 8.2, our Option Development Process for the South West Region did not identify any Feasible Options with the potential, in terms of quantity and distribution of supply, for a large-scale interconnection of multiple WRZs across the Study Area boundaries. Therefore, there is no large Regional Option that can be applied across the region. For this reason, the SA Preferred Approach that is presented in Section 7 is identified as the 'Best Value' solution to address the regional water supply Need. The Regional Preferred Approach is therefore defined as the combination of the three (3) Study Area Preferred Approaches for the South West Region.

Although the Preferred Approach for the South West Region does not involve a large-scale regional interconnected supply, the SA Preferred Approach does comprise large, interconnected supplies within the Study Area boundaries and in this way provides the benefit of resilience and improved environmental outcomes, through the decommissioning of unsustainable sources.

The interconnection of WRZs is achieved through 35 SA Options that collectively benefit 112 existing WRZs and reduce the number of WRZs in the region from 174 to 92. These SA Options merge two or more WRZs. The largest of these connects 21 WRZs to the existing Cork City WRZ. Table 8.1 shows the number of SA Options that merge a specific number of WRZs. For example, it shows that 24 of the 35 SA Options merge two WRZs, and four (4) of the 35 SA Options merge three (3) WRZs to form a new single WRZ.

The Preferred Approach also comprises 63 local WRZ Options. The WRZ Options generally supply rural settlements that are challenging to supply via a transfer due to the difficulties in transporting small volumes of water over long distances.

Table 8.1 Number of SA Options that Merge a specified number of WRZs

No. of Merged WRZs	Number of SA Options
Two	24
Three	4
Four	1
Five	2
Six	2
Nine	1
Twenty-two	1

8.3.1 Benefits of Interconnecting Supplies

In most cases, where WRZs are interconnected, one or more existing water supply system is rationalised. The rationalisation of supply systems enables smaller and/or unsustainable sources to be decommissioned, delivering improved environmental outcomes and wider associated community benefits. The decommissioning of WTPs through rationalisation also delivers efficiencies through the reduced number of assets to operate and maintain. The Regional Preferred Approach proposes to decommission 91 sources and 90 WTPs. Supplies will only be decommissioned once a new source is

connected and operational and abstraction licenses for the new or alternative supply have been obtained.

Larger interconnected water supply systems usually comprise multiple raw and/or treated water storages and WTPs. This provides operational flexibility and increased resilience by enabling supply to be delivered from other connected WTPs or storages during drought periods and at times of supply outage. Larger supply systems are therefore less sensitive to peaks in demand during critical events. For this reason, peaking factors (used to estimate design capacity) are lower for larger WRZs. Similarly, for larger WRZs, the uncertainty in the supply demand calculation reduces as any potential changes in demand estimates will have a relatively lower impact for a large WRZ compared with smaller WRZs. As a result, the headroom allowance we need to plan for is lower. The combination of reduced peaking effects and reduced headroom allowance means that the estimated supply volume that we need to provide a 1 in 50 Level of Service (LoS) to customers is lower. One of the key benefits of merging WRZs is this reduction in the design capacity resulting from the increased resilience of larger water supply systems.

Headroom is the term given to a buffer in the Supply Demand Balance (SDB). It accounts for the uncertainty with data and the assumptions used in the supply and demand estimates and forecasts.

The **Level of Service (LoS)** refers to the Reliability of the supply that our customers can expect to receive and is expressed as a frequency or return period of supply failure. A 1 in 50 LoS means that customers would only expect to experience a supply failure, on average, once every 50 years, or there would be a 2% chance of experiencing a supply failure in any given year.

Another benefit of larger interconnected systems is the increased efficiency and economies of scale in delivering leakage reduction measures compared with fragmented systems. As explained in Section 5 of this Plan, we have committed to leakage targets that reduce leakage levels to 21% of average demand for large WRZs where the demand is greater than 1,500 cubic metres per day (m^3/day).

Prior to the development of solutions at project level, the SDB will be updated to account for the potential reduction in the demand component of the calculation that results from the reduced headroom and peaking factors and increased leakage target (see Section 6.4). The following section describes the approach to re-calculating the SDB.

8.3.1.1 Volume Benefit Calculation for Large Interconnected Supplies

The SA Preferred Approach for SAI, includes a SA Option which rationalises 18 WRZs and interconnects three (3) WRZs to the Cork City supply. As part of the approach the existing WTPs of the 18 rationalised WRZs will be decommissioned due to their age, condition and limited volume of supply. Therefore, water available for use (WAFU) from these supplies will reduce to zero when the Preferred Approach is in place. The WTPs for the interconnected supplies - Bandon Regional, Clonakility and Midleton WRZs – will be maintained, however the WAFU for these supplies will be reduced to allowable abstraction levels. The remaining Deficit will then be supplied from the increased abstraction from the Cork City Inniscarra source.

As the SA Grouped Option will result in the formation of one larger WRZ, rather than sum the demand from the 21 WRZs individually, a Cork City Regional WRZ will be considered and the SDB will be recalculated. The single larger merged WRZ will be associated with a lower headroom and peaking

factor (applied in SDB calculations for large WRZs) which will allow the benefit of a reduction in the design capacity required to provide the 1 in 50 Level of Service.

Table 8.2 lists the Dry Year Critical Period (DYCP) peaking and headroom factors that are applied in the SDB calculation for the existing discrete systems. This shows that the larger WRZs, such as Clonakility and Cork, have lower headroom factors compared with smaller WRZs. Additionally, Cork has a lower peaking factor of 8% compared to 20% for the other WRZs. For the proposed integrated multi-source system, the headroom and peaking factors will reduce to 13% and 8%, respectively across all WRZs.

If the WRZs are to remain isolated, the total demand required for the 22 WRZs would be 215 million litres per day (Ml/d) (Table 8.2). With Leakage Targets applied to the merged WRZs, this would reduce to 172 Ml/d, representing a 20% reduction in the required supply volume. The current estimated leakage across the WRZs equates to 64 Ml/d, which is 42% of the average 2044 demand. Leakage targets of 21% of average demand will reduce leakage to 28Ml/d.

The existing supplies in Bandon Regional, Clonakilty and Middleton will supply 15.5 Ml/d of the 172 Ml/d Demand for the merged WRZs. Additionally, approximately 56 Ml/d will be provided from the Lee Road WTP, Innishannon WTP, Glashaboy WTP, Watergrasshill WTP and Knockraha WTP within the Cork WRZ. The Inniscarra WTP will be required to provide approximately 100 Ml/d, which is approximately 18 Ml/d greater than the existing abstraction of 82.5 Ml/d. This is below the estimated sustainable abstraction of 153 Ml/d from Inniscarra Reservoir and in accordance with the 1975 supply agreement with Electricity Supply Board (ESB), which permits Irish Water to abstraction 227Ml/d from the Inniscarra Reservoir.

As set out in Section 3.5, the abstractions associated with the Clonakility, Middleton supplies and with the Innishannon WTP, Glashaboy WTP and Knockraha WTP may not meet sustainability guidelines and the Environmental Protection Authority (EPA) under the proposed regulatory regime will adjudicate sustainable abstraction quantities from these sources. Delivery of the Preferred Approach as an interconnected system, will allow flexibility across the supplies and enable us to reduce existing abstractions if required under the regulatory regime. This will be achieved through the extra capacity available from the Inniscarra source.

Table 8.2 Supply Required from Cork City Supply

Current WRZ	2044 DYCP* Demand	2044 DYCP* WAFU** from maintained supplies	Additional Supply required	Headroom (% of Average Demand)	DYCP* peaking factor (% of normal year average demand)
	(m^3/day)	(m^3/day)	(m^3/day)		
Aghabullogue	100	0	100	20%	20%
Ballincurrig-Lisgoold	90	0	90	20%	20%
Ballinagree	50	0	50	20%	20%
Ballyshoneen	40	0	40	20%	20%
Bandon Regional	6,400	4,510	1890	15%	20%
Bayview	70	0	70	20%	20%
Clash-Leamleara	30	0	30	20%	20%
Clashanamid	10	0	10	20%	20%
Clonakilty	10,850	5,950	4,900	15%	20%
Coolineagh	10	0	10	20%	20%
Corbally	90	0	90	20%	20%
Cork City	186,900	131,890	55,000	8%	13%
Cullen	10	0	10	20%	20%
Grenagh	440	0	440	20%	20%
Knockburden	20	0	20	20%	20%
Midleton	4,800	5,040	0	15%	20%
Rylan	240	0	240	20%	20%
Stoneview Blarney	50	0	50	20%	20%
Templemartin & Garranes	40	0	40	20%	20%
Tibbotstown	5,150	0	5,150	15%	20%

Current WRZ	2044 DYCP* Demand	2044 DYCP* WAFU** from maintained supplies	Additional Supply required	Headroom (% of Average Demand)	DYCP* peaking factor (% of normal year average demand)
	(m^3/day)	(m^3/day)	(m^3/day)		
Vicarstown	10	0	10	20%	20%
Walshtown	20	0	20	20%	20%
Total	**215,420**	**147,390**	**68,000**		

*DYCP is the weather planning scenario that is used in our National Water Resources Plan (NWRP) to estimate the supply Deficit that the Plan must address. It represents the period within a dry year where demands can be significantly above average.

**WAFU (Water Available for Use) is the amount of water that can be supplied from a supply system, taking into account infrastructure capacity constraints, treatment losses and planned and unplanned events that can reduce supply

The SA Preferred Approach for SAH is also a large interconnected system that will benefit from the reduction in headroom allowance and peaking factors, as well as higher leakage targets. The Preferred Approach includes a SA Grouped Option which merges three (3) WRZs - Mid Kerry, Rathmore and the Central Regional – Lough Guitane WRZ. The Rathmore WTP will be decommissioned and a new source and WTP in the lower Leane catchment is proposed to secure supply for the area and provide the required Deficit. The interconnection of these systems will reduce the supply volume required from our sources from 74 Ml/day (if the WRZs are to remain fragmented) to 47 Ml/day (if the WRZs are merged). This includes an estimated leakage reduction of 20 Ml/day and 7 Ml/day attributed to a lower headroom and demand peaking factors. This represents a total reduction of 36% Demand.

The combined volume benefit resulting from rationalising supplies to form the new expanded Cork City and Central Regional water resources is estimated to be 70 Ml/day. This is mainly achieved through the proposed leakage reduction and represents 50% of the estimated 2044 Deficit for the region. These interconnected systems will serve 73% of customers in 2044.

8.3.2 Cross Study Area Transfers

The Regional Preferred Approach includes five (5) small SA Options that involve interconnections across Study Area boundaries (Cross Study Area Transfer), providing a supply to one (1) or two (2) WRZs. Three (3) of the transfers are from WRZs located in other Regions: two (2) are supplied from the South East Region, while the other is supplied from within the Eastern and Midlands Region.

For each Cross Study Area Transfer Table 8.3 lists the ‘Source’ and ‘Destination’ Study Area, the ‘parent’ WRZ (i.e., the WRZ which is to supply the other WRZ) and the rationalised WRZs (i.e., the WRZs which will be receiving a supply from the ‘parent’ WRZ). These transfers are shown in Figure 8.2 with the letter reference listed Table 8.3.

Table 8.3 Cross Study Area Transfers

Source SA (Source Region)	'Parent' WRZ	Destination SA	Rationalised WRZs	Figure 8.2 Reference
SAI (South West)	Waterville	SAH	Cahersiveen, Emlaghheasta/Portmage e/ Maulin	A
SAI (South West)	Donoughmore	SAJ	Bweeng	B
SAK (South East)	Ballylanders	SAJ	Labbamollogga	C
SAK (South East)	Inchinleamy	SAJ	Kilmurry (Mitchlestown)	D
SA8 (Eastern & Midlands)	South West Regional	SAJ	Monabricka	E

The largest transfer is approximately 2,900 m^3/day to the Cahersiveen and Emphalaghheasta/Portmagee/Maulin WRZs from the Lough Currane source, which currently supplies the Waterville WRZ in SAI. The remaining transfers range between 20 m^3/day and 230 m^3/day.

When assessing the Options at the Study Area Level, the impact of the abstraction volume that is required to supply both the WRZs in the 'Source' Study Area and the WRZs in the 'Destination' Study Area, is considered in combination. As with all new and upgraded abstractions, the volume is limited to the estimated dry year sustainable abstraction threshold.

8.3.3 Cumulative Effects at Regional Level

At the Regional Level, cumulative effects need to be considered in relation to the combined effects from proposals in the three component Study Areas of the South West Region and includes consideration of the transfers across Study Areas and inter-regional transfers.

For cumulative effects to occur, there needs to be an overlap of temporal periods in some way for the impacts and/or the effect. For example, two strategic-level schemes being constructed at the same time could result in cumulative traffic movements, while two schemes being operated together could result in a drawdown of groundwater levels. A precautionary approach has been taken for the cumulative effects assessment, which assumes that all Options could be constructed at the same time and then all Options would be operated at the same time.

The Strategic Environmental Assessment (SEA) of the RWRP-SW assessed the cumulative effects of proposals across the three (3) Study Areas related to:

- Biodiversity – for example, a cumulative loss or fragmentation of habitats or changes to a habitat quality through changes in water quality or groundwater levels;
- Water environment (surface water and ground water WFD status) – for example changes to water quality due to multiple construction projects;
- People and health – for example, nuisance or physical health impacts caused by multiple construction works taking place at the same time;
- Landscape and visual – for example if there are a number of Options located close together that could alter the landscape character or views;

- Cultural heritage – for example if the same cultural heritage features are affected by above ground infrastructure in close proximity or the combined effect of loss to undesignated archaeological assets or from combined impacts resulting in additional changes to water levels affecting archaeological resources; and
- Climate change – combined carbon emissions for the approach as a whole have been considered through the approach selection process. Combined effects on climate change adaptation are also considered biodiversity, the water environment (for example changes to water quality due to multiple construction works taking place at the same time).

Sustainability analysis for groundwater and surface water abstractions has already taken account of combined effects from other Irish Water abstractions within and across Study Area or region boundaries.

Therefore, the components of Preferred Approaches most likely to lead to within-plan cumulative effects are the construction of pipelines and associated works, such as new WTPs and pumping stations. The Cross Study Area transfers within South West Region are shorter in length than some of the within Study Area Options. Cumulative effect on landscape and visual amenity across Study Area Preferred Approaches and from pipeline construction of these cross transfers are therefore unlikely to be significant.

Further details of the cumulative assessment at regional level are provided in Section 9 of the SEA Environmental Report for the RWRP-SW, including the cumulative effects with other plans and programmes.

8.3.4 Option Types

The Regional Preferred Approach provides a solution to address an estimated total Deficit of 141 Ml/d. This is achieved through a combination of small Cross Study Area Transfers, interconnected SA Options within Study Areas and local groundwater and surface water sources. It also includes WTP upgrades to reduce water quality risks identified through our barrier assessment.

Table 8.4 summarises the Option Type and the Deficit that will be supplied for the South West Region.

Table 8.4 Preferred Approach Option Types

Option Type	No. of Existing Benefitting WRZs	Deficit Supplied (m^3/day)	Percentage of Regional Deficit Supplied (%)
Local source (GW)	26	9,560	7
Local source (SW)	10	4,120	3
Within SA interconnection	106	123,780	88
Cross SA interconnection	6	3,060	2
WTP upgrade (WQ only)	26*	not applicable	not applicable

*This is the number of WTPs that will be upgraded for water Quality only. It does not include the existing WTPs that will be upgraded for both WQ and capacity, as these form part of the other Option Types.

When the Options within the Regional Preferred Approach are delivered, the number of WRZs across the South West Region will be reduced from 174 to 92 through the development of interconnected systems. Thirty-five (35) new WRZs will be formed via 644 kilometres of trunk mains (>300 mm diameter).

Table 8.5 and Figures 8.2 and 8.3 summarise changes to our WTPs and abstractions.

Table 8.5 WTP and Abstraction Summary

Option Component	No. of Water Treatment Plants	No. of Surface Water Abstractions	No. of Groundwater Abstractions
New	17	9	21
Upgraded/Increased capacity	47	8	29
Maintained	90	54	65
Decommissioned	90	13	78

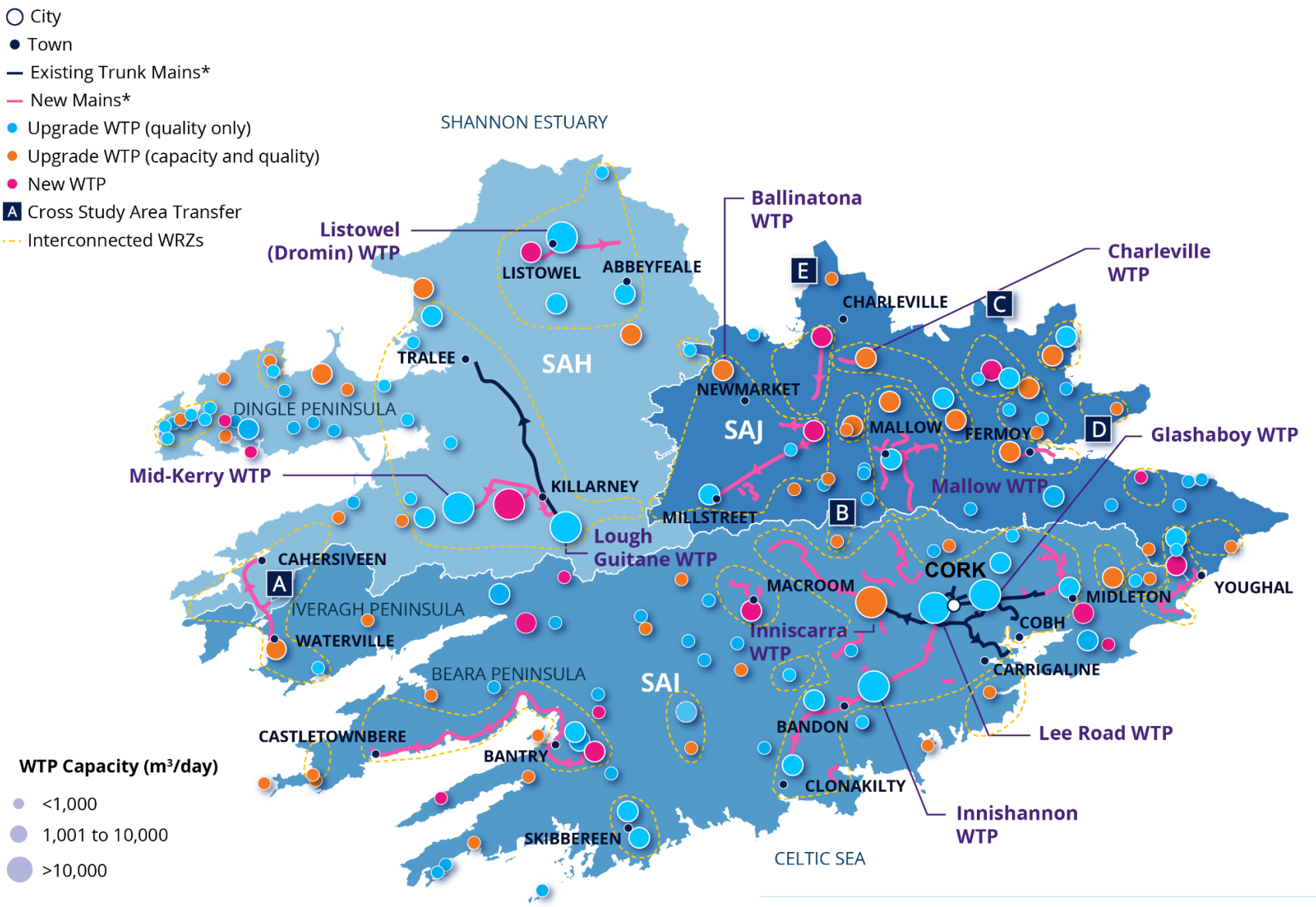

Figure 8.2 Regional Preferred Approach

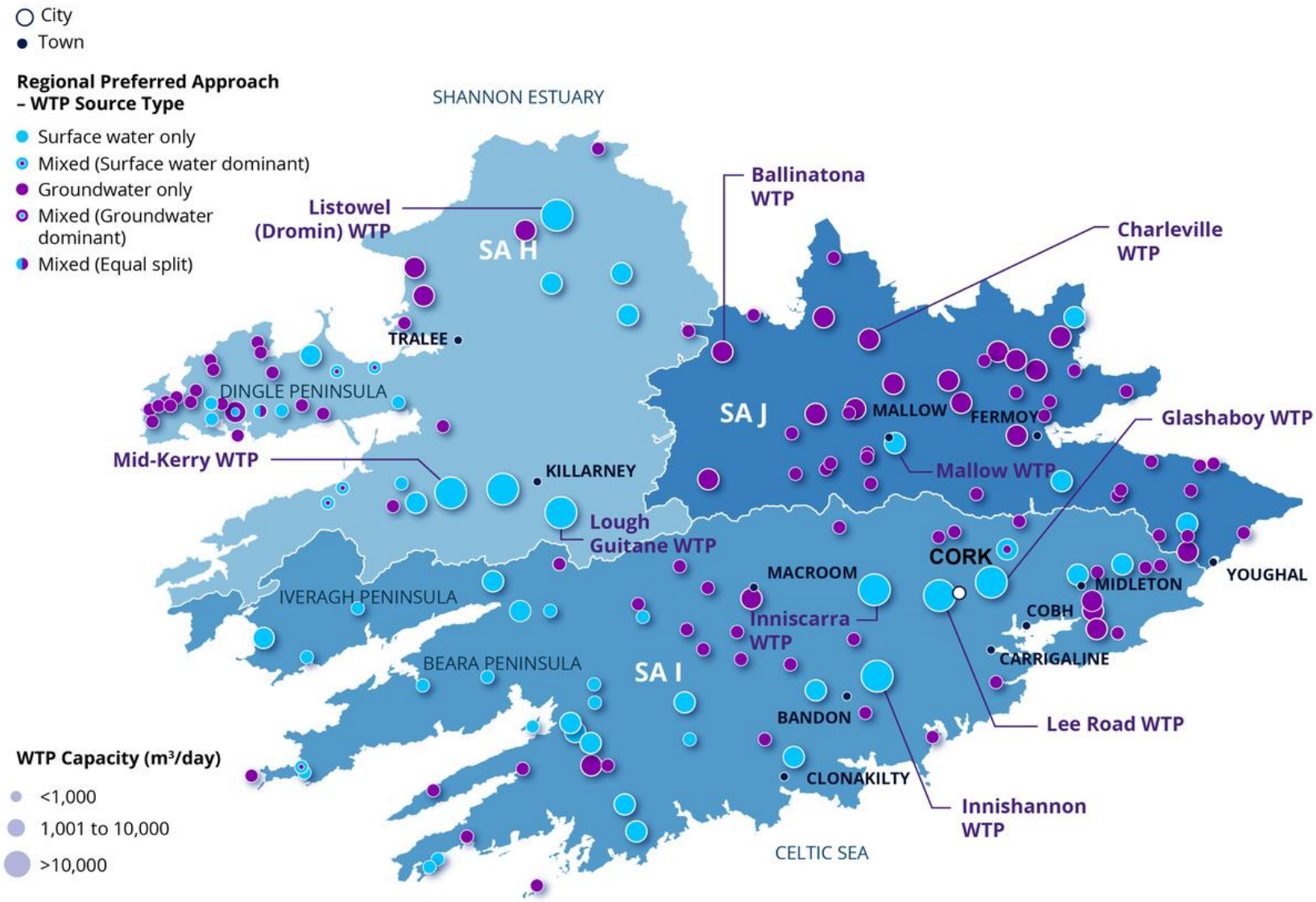

Figure 8.3 Regional Preferred Approach – Groundwater and Surface Water Supplies

8.4 Summary

The Regional Preferred Approach considers, at a plan level, what projects/solutions might work best to meet the overall Deficit in the South West Region. Taking a holistic view of the region presents opportunities to improve the sustainable management of our water resources and increase operational flexibility and resilience.

While some small Cross Study Area Transfers have been identified, including three inter-regional supplies, the potential for a large Feasible Option with the capability to provide regional interconnectivity (across Study Area boundaries) is limited by the terrain of the South West Region and the sustainability of the water sources. However, the Approach Development Process at Study Area Level, has identified large, interconnected supplies within the Study Area boundaries which will ultimately increase resilience and provide improved environmental outcomes. The interconnection of WRZs is achieved through 35 SA Options that collectively benefit 112 existing WRZs and will ultimately reduce the number of WRZs in the region from 174 to 92. The largest of these connects 21 WRZs to the existing Cork City WRZ.

The Regional Preferred Approach also comprises 63 local WRZ Options. The WRZ Options generally supply rural settlements that are challenging to supply via a transfer due to difficulties in transporting small volumes of water over long distances.

The benefits of delivering the Preferred Approach as proposed include:

- Improved environmental outcomes through the decommissioning of inefficient infrastructure and abstractions including from 91 surface water and groundwater abstractions. This includes nine (9) surface water sources assessed by Irish Water as not meeting sustainability guidelines during dry weather flows.
- Increased resilience through large, interconnected supplies that include the expanded Cork City WRZ and Central Regional – Lough Guitane WRZ
- An estimated reduction in required abstraction volume of 70 ML compared with the alternative of maintaining fragmented supply systems. This reduction is met mostly through increased leakage targets (which represents approximately 80% of the reduction in Demand). Lower headroom allowance and demand peaking factors represent an estimated 20% of the reduced Demand in the SDB calculations for large supply systems.
- Delivery of efficient leakage reduction measures in more systems across the region that will aim to reduce leakage to 23% of average demand across South West Region.
- Improved minimum Level of Service of 1 in 50 in drought and winter conditions across all WRZs in the South West Region, as well as increased resilience during normal and dry conditions.

The projects and Options identified in the Regional Preferred Approach will be subject to their own planning and regulatory processes. As mentioned, the solutions identified in the NWRP will be delivered on a phased basis and will progress based on a risk-based prioritisation of capital investment, allowing Irish Water to address Need accordingly. It will take a number of investment cycles to progress these projects and they may change in later iterations of the NWRP. Over time, the intention is to ensure the delivery of a more Sustainable, Resilient and cost-effective water supply service.

8.5 References

1. European Commission. 2000. *WFD Directive 2000/60/EC on establishing a framework for community action in the field of water policy*.
2. Water Environment (Abstraction and Associated Impoundments) Bill 2022 (as initiated). [Online]. Available from: https://wwwoireachtas.ie/en/bills/bill/2022/87/.
3. UK Technical Advisory Group (UKTAG). 2008.UK Environmental Standards and Condition (PHASE 1). Water Framework Directive.