7.6 Interim Solutions

As outlined in in Section 8.3.7.6 of the Framework Plan, the NWRP provides for an “interim solution” approach, which allows shorter term interventions to be identified and prioritised, when needed. The Preferred Approach for each WRZ, Study Area and Region will be delivered on a phased basis subject to budget and regulatory constraints. It will take many investment cycles to deliver the Preferred Approach across all WRZs, therefore, Irish Water must have a means to continue delivering safe, secure and reliable water supplies (on a short to medium term basis) while we deliver our Preferred Approach.

On this basis, interim, short term capital maintenance solutions have been identified for all WTPs and will be utilised when needed. These solutions will allow Irish Water time to deliver the Preferred Approach, while at the same time, maintaining a sustainable water supply. These interim solutions are generally smaller in scale and rely on making best use of already existing infrastructure.

Examples of general interim measures for different water sources include the following:

- For groundwater sites, where the Preferred Approach requires that the existing WTP is to be maintained, the interim solution would typically provide for refurbishment of the existing boreholes or development of new boreholes and borehole pumps, and an upgrade of the treatment process in line with proposed growth predictions. This may require a staged upgrade of the WTP. For example, the interim solution would typically include an upgrade of the WTP to provide supply to existing customers with consideration given to a further required expansion of the WTP at a later date.
- For surface water sites, where the Preferred Approach requires that the existing WTP is to be maintained, the Interim Option would typically involve the upgrade of the existing WTP in line with proposed growth predictions. Similar to groundwater sites this may require a staged upgrade of the WTP where the interim solution would typically include an upgrade of the WTP to provide supply to existing customers with consideration given to a further required expansion of the WTP at a later date.
- For groundwater and surface water sites where the Preferred Approach involves the decommissioning of the WTP by providing supply to the customers from another WTP within the WRZ or from another WRZ/Study Area/Region, the interim solution would involve the advancement of the rationalisation of the WTP, by provision of part supply or full supply if possible. If rationalisation is not feasible at that point in time due to dependencies on Study Area or Regional Option, containerised WTP upgrade solutions would be considered for the WTP. This involves the provision of a package WTP within a containerised unit. These package plants can be modified for use on other sites in the future therefore are considered “no regrets” infrastructure investment.

A decision to progress any interim solution will be based on urgent or priority need to address water quality risk or supply reliability e.g., RAL, drought issues or critical need. The RWRP-EM does not confer funding availability for any project and any interim measures will be subject to budget availability, relevant environmental assessment and other required consents in the normal way.

These solutions, in most cases, will only be used to allow time to deliver the longer-term solution. The interim solutions are determined in line with the Preferred Approach and as such, they are considered “no regrets” infrastructure investment.

7.6.1 Study Area 1 to Study Area 8

The potential interim solutions for Study Areas 1 to 8 are summarised in Table 7.19 and described in the Technical Appendices 1 - 8.

Table 7.19 SA1 to SA8 Interim Solutions

Interim Solutions	Number of Option by Type							
	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8
Upgrade WTP to Irish Water standards	2	-	5	2	5	8	3	5
Upgrade WTP to Irish Water standards- Potential site for containerised solution	4	-	2	1	-	1	1	4
Refurb existing borehole and upgrade WTP to Irish Water standards	9	8	9	-	9	35	7	23
Refurb existing borehole and upgrade WTP to Irish Water standards- potential for a containerised solution	5	2	1	-	-	4	7	12
Upgrade the WTP to maximise output	-	-	1	-	-	-	-	-
Progress the PA	-	1	-	-	-	-	-	1
Progress the PA: Part-rationalise the supply	-	-	2	-	-	-	-	1
Develop new borehole and upgrade WTP to Irish Water standards	-	-	-	-	-	-	-	1
Develop new borehole or refurb existing borehole and upgrade WTP to Irish Water standards	-	-	-	6	2	-	-	-
Develop new borehole or refurb existing borehole and upgrade WTP to Irish Water standards - potential site for containerised solution	-	-	-	3	-	-	-	-
A new temporary package WTP supplied by GW to provide additional supply required before implementation of the PA	-	-	-	1	-	-	-	-
Total no. of Options	**20**	**11**	**20**	**13**	**16**	**48**	**18**	**47**

Irish Water's Investment Plan 2020-2024 includes a number of programmes and projects targeted at providing for growth. One such programme is the Small Towns and Villages Growth Programme (STVGP) which will provide funding for Water and Wastewater Treatment Plant growth capacity in smaller settlements which are not otherwise provided for in the Capital Investment Plan 2020 to 2024. The STVGP is focused on supporting growth in areas already served by Irish Water infrastructure but

where current or future capacity deficits have been identified. Irish Water have engaged with Local Authorities across the country to ensure that the investment is made appropriately in accordance with the relevant County Development Plan. The Interim Option that will be considered under this programme include those for the following WRZs: Rathdrum and Laragh (SA1); Ballivor (SA3); and Adare, Rathkeale, Kilfinane and Murrow WTP (SA8).

7.6.2 Study Area 9 (Greater Dublin Area)

The Preferred Approach for SA9, which includes a transfer of drinking water from the River Shannon, is a significant project. Irish Water recognises it will take time to progress a project of this scale and complexity through the necessary consent, procurement and construction phases to make it fully operational.

At present the GDA has a critical supply demand balance issue, with planning deficits in normal conditions in the order of 48 Ml/d in 2019. Even when accounting for heavy investment in leakage reduction, this Deficit will increase further based on expected growth and economic development (aligned with the National Planning Framework).

As outlined in Section 4 we have a number of ongoing supply intervention projects including the new WTP at Vartry and the Srowland network extension project which alongside leakage and water conservation measures will allow us to maintain the existing Level of Service (LoS) to our customers while facilitating growth to 2025. Therefore, we will need further supply interventions, beyond the ongoing supply interventions, prior to the delivery of the Preferred Approach.

Without such interventions Irish Water will potentially need to implement measures to protect the LoS provided to existing water users, which may include potential restrictions on new connections to the network. Such measures, if required to be implemented, would severely impact growth and economic development in the region.

The recommended Interim Option for the GDA involves a temporary increase in abstraction from the River Liffey and increase in production at Leixlip and Ballymore Eustace WTPs, subject to the appropriate statutory consents. The proposed interim solution aligns with recommendations in the Department of Housing Planning and Local Governments Water and Wastewater Quality Sectoral Adaptation Plan[4]. Further information regarding the selection of the Interim Option for the GDA is given in the SA9 Technical Report (Appendices 1 - 9).

The NWRP does not confer funding availability and any interim measures will be subject to budget availability, AA screening and other relevant consents in the normal way. Irish Water will work with the EPA, ESB and OPW to further investigate this Interim Option. We acknowledge that this proposal is not sustainable in the long term. However, with optimisation of the existing inlet and storage in the system, any potential impacts could be mitigated, and the proposal would be temporary in nature until the Preferred Approach is delivered.

The potential interim solutions for the SA9 supplies are summarised in Table 7.20. These solutions alongside leakage and water conservation measures will allow us to maintain the existing Level of Service (LoS) to our customers while facilitating growth prior to the delivery of the Preferred Approach. In long term these solutions will improve resilience in the network and improve the security and reliability of the supply to the GDA.

Table 7.20 Interim Option

Interim Option Description	Implementation Year	Option Capacity (Ml/d)
Leixlip WTP Upgrade - +50 Ml/d – Winter Critical Period and Normal Year Annual Average only	2028 earliest	50
Increase abstraction at Ballymore Eustace (BME) by optimising storage at Poulaphouca Reservoir and provision of 24 km main from BME to the Saggart Area	2025 earliest	62

7.7 Sensitivity Analysis

Our supply demand forecast has been developed using the best available information and application of best practice methods where we have data to do so. The uncertainty associated with our data is captured within our estimate of Headroom. The Headroom component is added to our consumption forecasts to calculate our Total Demand. We have identified areas where we will focus improvements in data to reduce the certainty of our forecasts. These are outlined in Section 9 of this Plan.

Future events that could alter the Supply Demand Balance and impact on Need, such as climate change and new abstraction legislation, introduce uncertainty to our long-term forecasts. For this reason, we undertake a sensitivity analysis that allows us to stress test our Preferred Approaches against a range of possible futures. This ensures that our decision making is robust and that the Preferred Approaches are adaptable.

We test our Preferred Approaches against future scenarios defined by five uncertainty factors:

- Sustainability: New abstraction legislation introducing sustainability limits on quantities to be abstracted, increasing the SDB Deficit.
- Climate change: Climate change reduction in water availability at certain times of the year is greater than anticipated, increasing the SDB Deficit.
- Growth forecast: Growth in demand is lower than forecast, reducing the SDB Deficit.
- Leakage targets exceeded: We achieve better than expected levels of effectiveness and efficiency in reducing leakage, reducing the SDB Deficit.
- Leakage targets not met: Leakage does not reduce to target levels within the planning period, increasing the SDB Deficit.

We have not assessed against a scenario where growth is higher than forecast, as we consider the projections that we have used in our Supply Demand Balance calculation reflect an optimistic growth forecast. Furthermore, the scenario of higher than forecast growth would have the same impact as a scenario where Leakage targets are not met.

We describe the scenarios we have assessed in Chapter 8 of the Framework Plan. A summary of the outcomes of the analysis we have undertaken is given in Table 7.21. Further details can be found in the Study Area Technical Reports (Appendices 1-9).

Table 7.21 Sensitivity Analysis of the Preferred Approach

Sensitivity Criteria	Impact on the SA Preferred Approach								
	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8	SA9
Sustainability Impact*									
Status of abstraction potentially impacted by new legislations with PA in place	Decommission 3 Maintain 1	None in SA2	Decommission 2 Maintain 1	Decommission 2	Maintain 1	Decommission 1 Reduce 1	Maintain 1	Decommission 1 Reduce 2	Maintain 2 (PA will reduce pressure on sources)
Likelihood	Moderate/ High	Moderate/ High	Moderate/ High	Moderate/ High	Moderate/ High	Moderate/ High	Moderate/ High	Moderate/ High	Moderate/ High
Change in Deficit (m^3/day)	+2,108	+0	+5,800	+800	+700	+1056	+1035	+13,700	+90,000
Climate Change Impact									
Likelihood	High	High	High	High	High	High	High	High	High
Change in Deficit (m^3/day)	+100	+100	+400	+1000	+200	+1800	+100	+4000	+10,000
Demand Growth Impact									
Likelihood	Low/ Moderate	Low/ Moderate	Low/ Moderate	Low/ Moderate	Low/ Moderate	Low/ Moderate	Low/ Moderate	Low/ Moderate	Low/ Moderate
Change in Deficit (m^3/day)	-200	-283	-7700	-3942	-200	-200	-200	-200	-40,000
Leakage Targets not met									
Likelihood	Low	Low	Low	Low	Low	Low	Low	Low	Low

Sensitivity Criteria	Impact on the SA Preferred Approach								
	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8	SA9
Change in Deficit (m^3/day) ↑	-	-	+356	+251	+570	+823	-	+978	+92,400
Leakage Targets exceeded									
Likelihood	Moderate/ High	Moderate/ High	Moderate	Moderate/ High	Moderate/ High	Moderate	Moderate/ High	Moderate/ High	Low
Change in Deficit (m^3/day) ↓	-625	-32	-13,147	-9,008	-7,352	-8,311	-2,078	-21,330	-62,000

↓ = Reduced SDB Deficit

↑ = Increased SDB Deficit

* Number of abstractions potentially impacted by new legislation that are proposed to be decommissioned in the Preferred Approach. Abstractions which will be potentially impacted by the new legislation are set out in Table 3.19 in Section 3 of this Plan. These impacts are based on conservative estimates of what a future regulatory regime may require. The actual reductions that may be needed in future will depend on the specific requirements of that legislation.

In reality, a combination of these scenarios may occur together. For example, growth in demand might be lower if we achieve greater leakage reductions. However, if this coincided with a reduction in permitted abstraction volume under the new abstraction licensing regime, the reduction in demand may offset some or all of the loss in supply availability due to abstraction sustainability reductions.

Overall, our sensitivity assessment of the Interim and Preferred Approach indicates they are highly adaptable to a broad range of futures, and therefore represent 'no regrets' infrastructure.

The outcomes of the sensitivity analysis are discussed in more detail in the SA Technical Reports (Appendix 1 - 9).

7.8 Review of Preferred Approaches arising from Consultation

As set out in Section 9 of the RWRP-EM, the NWRP will be formally updated every five years at which point there will be further opportunities for public participation. Baseline forecasts and data feeding into the NWRP will be reviewed annually. Our data is continuously improving, and it is important that we review our Preferred Approach further to the receipt of updated data. During the consultation period for the RWRP-EM we received updated data for a number of WRZs through consultation workshops and subsequent further assessment. This resulted in a review of the Preferred Approach for those WRZs.

Following the review, Irish Water considered that the Preferred Approach for five (5) WRZs should be changed and the Preferred Approach for one (1) WRZ should be modified. A summary of the updated data and resulting change to the relevant Preferred Approaches is provided below. These changes are reflected throughout Section 7, Section 8 and Section 10 of this final Plan.

7.8.1 Barndarrig WRZ (Study Area 1)

The initial Preferred Approach for the Barndarrig WRZ was to increase the existing groundwater abstraction and upgrade the existing WTP (Option reference SA1-037 in Appendix 1). However, further to a review of existing WTP infrastructure, the raw water quality, and feedback received at consultation workshops it was determined the level of upgrade required at the WTP was greater than initially assumed. The groundwater exhibits high nitrate levels, requiring additional treatment processing capability. On reviewing the feasible options to consider the additional costs associated with the required WTP upgrade, the Preferred Approach for the Barndarrig WRZ has been amended to rationalise the Barndarrig WRZ to the GDA WRZ and decommission the existing WTP in Barndarrig (Option reference SA1-503 in Appendix 1). Barndarrig will obtain supply from the Vartry WTP and the additional demand in the GDA will be offset by the proposed New Shannon Source. Therefore, this PA will form part of the Regional Preferred Approach (as described in Section 8), which can resolve Need in multiple WRZs across Study Areas.

The details of the updated PA for the Barndarrig WRZ are reported in the Study Area 1 Technical Report (Appendix 1), which includes analysis of this updated PA through the option assessment process.

7.8.2 Rahan WRZ (Study Area 5)

The initial Preferred Approach for the Rahan WRZ was to upgrade the existing Tully and Holmshill WTPs (Option reference SA5-085 in Appendix 5) for water quality purposes only, as the source yield data that was available at the time indicated a surplus rather than deficit for the Rahan WRZ. However, further to a review of existing WTPs, and feedback received at consultation workshops, it was determined that the available yield from the existing sources was lower than previously understood. Therefore, a deficit has

been identified and additional supply is required to support the current and future needs of the WRZ. On reviewing potential feasible options to provide additional supply to the Rahan WRZ, the Preferred Approach for the Rahan WRZ has been amended to provide a new GW source and provide upgrades to the existing WTPs (Option reference SA5-086 in Appendix 5).

The details of the updated PA for the Rahan WRZ are reported in the Study Area 5 Technical Report (Appendix 5), which includes analysis of this updated PA through the option assessment process.

7.8.3 Mountbolus WRZ (Study Area 6)

The initial Preferred Approach for the Mountbolus WRZ was to upgrade the existing WTP (Option reference SA6-198 in Appendix 6) as the source yield data that was available at the time indicated a surplus rather than deficit for the Mountbolus WRZ. However, further to a review of existing WTP infrastructure and feedback received at consultation workshops it was determined that the available yield from the sources was lower than previously understood. Therefore, a deficit has been identified and additional supply is required to support the current and future needs of the WRZ. On reviewing potential feasible options to provide additional supply to the Mountbolus WRZ, the Preferred Approach for the Mountbolus WRZ has been amended to rationalise Mountbolus WRZ to the Tullamore WRZ and decommission the WTPs in the Mountbolus WRZ (Option reference SA6-552 in Appendix 6). The Mountbolus WRZ will obtain supply from a connection to the pipeline transferring water from the proposed New Shannon Source to the GDA. Therefore, this PA will form part of the Regional Preferred Approach (as described in Section 8), which can resolve Need in multiple WRZs across Study Areas.

The details of the updated PA for the Mountbolus WRZ are reported in the Study Area 6 Technical Report (Appendix 6), which includes analysis of this updated PA through the options assessment process.

7.8.4 Upperchurch WRZ and Killaloe WRZ (Study Area 8)

The initial Preferred Approach for Upperchurch WRZ was to increase the existing groundwater abstraction and upgrade the WTP (Option reference SA8-165 in Appendix 8). However, further to a review of existing WTP infrastructure, the raw water quality and feedback received at consultation workshops it was determined the level of upgrade required at the WTP was greater than initially assumed as the existing UV treatment would need to be replaced. On reviewing the feasible options to consider the additional costs associated with the required WTP upgrade, the Preferred Approach for the WRZ has been amended to rationalise Upperchurch WRZ to the Kilcommon WRZ and decommission the existing WTP in Upperchurch (Option reference SA8-523 in Appendix 8).

The initial Preferred Approach for Killaloe WRZ was to upgrade the existing WTP (Option reference SA8-180 in Technical Appendix 8). However, further to a review of existing WTP infrastructure, raw water quality and feedback received at consultation workshops it was determined the level of upgrade required at the WTP was greater than initially assumed. The water exhibits high pH levels, and the hardness of the water is eroding services and resulting in failures of service connections. On reviewing the feasible options to consider the additional costs associated with the required WTP upgrade, the Preferred Approach for the Killaloe WRZ has been amended to rationalise Killaloe WRZ to the Newport WRZ and decommission the existing WTP in Killaloe (Option reference SA8-512 in Appendix 8). Killaloe will obtain supply from the proposed new WTP at Birdhill and form part of the Regional (as described in Section 8), which can resolve Need in multiple WRZs across Study Areas.

The details of the updated PA for the Upperchurch WRZ and the Killaloe WRZ are reported in the Study Area 8 Technical Report (Appendix 8), which includes analysis of this updated PA through the options assessment process.

7.8.5 GDA WRZ (Study Area 9)

Further to a review of leakage targets carried out by the leakage reduction team the leakage targets for the GDA were revised from 84 Ml/d to 92 Ml/d and these revised targets were built into the SDB. This reduced the deficit in the SDB the GDA and all feasible solutions were reconsidered for this reduced deficit. On reviewing the revised feasible options to consider the reduced deficit it was determined that the solution to provide supply to the GDA from the New Shannon Source remained the Preferred Approach. The magnitude of the supply required however, was reduced.

The details of the revised SDB deficit, and revised feasible options for the GDA are reported in the Study Area 9 Technical Report. The updated version of the Supply Demand Balance is provided in Appendix 10 of the RWRP-EM.

7.8.6 Updated Leakage Targets

As noted in Section 5.2.1.2, for WRZs outside the GDA, Irish Water has set additional leakage targets with the objective of reducing leakage levels to 21% of total demand for larger WRZs (WRZs where demand is greater than 1,500 m^3/day). Further to feedback received at consultation workshops, it was noted that these leakage targets had been applied to WRZs where 'accounted for demand' (that is, demand excluding current leakage) is greater than 1,500 m^3/day rather than the 'total average demand' (which includes leakage volumes). It was decided to apply these targets to WRZs where the 'total average demand' is greater than 1,500 m^3/d. This results in a higher number of WRZs being selected and increases our total leakage targets for WRZs outside the GDA from 58 Ml/d to 64.5 Ml/d. The details of the revised leakage targets are reported in Section 5.2.1.

7.9 Summary

Our SA Preferred Approaches consist of a combination WRZ Options and SA Options that perform best against our criteria of Resilience, Deliverability and Flexibility and Sustainability. These solutions have been developed with input from technical and local experts through workshops involving the assessment of 594 Feasible Options.

Following the consultation period on the draft RWRP-EM, the Preferred Approach for five (5) WRZs (Barndarrig WRZ, Rahan WRZ, Mountbolus WRZ, Upperchurch WRZ and Killaloe WRZ) were revised to take account of new data that became available through the consultation workshops. Furthermore, the Preferred Approach for the GDA was modified to account for increased leakage targets determined through a review of leakage undertaken by the Irish Water leakage reduction team.

Our SA Preferred Approaches:

- Consist of 98 Option comprising 85 WRZ Options and 13 Study Area (SA) Grouped Options. Study Area Options supply more than one WRZ and generally rationalise supplies, with associated environmental benefits.
- Comprise 58 increased or new local groundwater supplies, and five (5) increased or new local surface water supplies that contribute to meeting an estimated 10% and 3% of the Deficit across the Eastern and Midlands Region.
- Supply 81% of the Deficit through Cross Study Area Interconnections. This involves eleven (11) Options benefitting 37 WRZs.
- Supply 6% of the regional Deficit through Within SA Interconnections. These include: four (4) interconnections to the Limerick City supply system, utilising the spare capacity at Clareville WTP; and four (4) rationalisations to groundwater sources with associated upgraded existing supplies.

- Upgrade WTPs to reduce Water Quality risks identified through our Barrier Assessments (including 16 WRZs that are not in Deficit).
- Reduce investment costs by approximately 6% across the Region when compared with alternative independent and smaller scale WRZ Options.
- Increase resilience by delivering solutions through interconnections and rationalisation.
- Improve sustainability outcomes by decommissioning 70 WTPs and abandoning 73 associated abstractions. This includes nine (9) surface water abstraction sites that have been assessed to be potentially impacted by future abstraction legislation. The assessment was based on a conservative estimate of what a future regulatory regime may require.
- Include 196 Interim Options to ensure shorter term Deficits are addressed to account for lead times in delivery of Options that will ultimately meet the Deficit across the 25-year planning period.
- Are adaptable to change across a range of future scenarios including climate change, growth projections, sustainability outcomes and changes in leakage targets.

The development of our SA Preferred Approaches at the Regional Level is presented in Section 8.

7.10 References

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