

Regional Water Resources Plan South East

Strategic Environmental
Assessment Appendix H: Study
Area M – Environmental Review



Data disclaimer: This document uses best available data at time of writing. As data relating to population forecasts and trends are based on information gathered before the Covid-19 Pandemic, monitoring and feedback will be used to capture any updates. The National Water Resources Plan will also align to relevant updates in applicable policy. In December 2022, the Water Services (Amendment) (No. 2) Act, 2022 was signed into law. This act provides that, from the 31 December 2022, Irish Water will only be known as Uisce Éireann. It also provides that, from that date, all references in any enactment, legal proceedings or other document to Irish Water shall be construed as references to Uisce Éireann only. The SEA Environmental Report and Appendices, including this Environmental Review reflect this transition from Irish Water to Uisce Éireann.

Baseline data included in the RWRP-SE has been incorporated from numerous sources including but not limited to; National Planning Framework, Central Statistics Office, Regional Spatial and Economic Strategies, Local Authority data sets, Regional Assembly data sets and Uisce Éireann data sets. Data sources are detailed in the relevant sections of the RWRP-SE. The year 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

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1

Introduction and Background

1 Introduction and Background

This Study Area Environmental Review forms part of the SEA Environmental Report for the Regional Water Resources Plan (RWRP) for the South East Region (referred to as the Regional Plan). The Regional Plan includes three individual study area reviews (SAK, L, and M) as appendices.

This Study Area M Environmental Review includes:

- Context for the Study Area Environmental Review;
- Environmental baseline;
- Environmental assessment for the options screening process and feasible options;
- Assessment of the alternatives considered and the Preferred Approach;
- Cumulative effects assessment; and
- Recommendations for implementation, including mitigation and monitoring.

This Environmental Review summarises the environmental assessment undertaken for Study Area M within the South East Region for the options and approaches considered and as outlined in the Study Area M Technical Report (RWRP-SE Appendix 3). This Environmental Review applies the Strategic Environmental Assessment (SEA) objectives and environmental assessment methodology set out in the NWRP Framework Plan (Framework Plan).

Environmental Reviews have been undertaken for each study area and form appendices to the SEA Environmental Report for the Regional Plan as part of Phase 2 of the National Water Resources Plan (NWRP). Phase 1 in the development of the NWRP was the preparation of the Framework Plan, which was adopted in Spring 2021 following SEA, Appropriate Assessment (AA) and extensive public consultation.

Three regional plans, the RWRP for the Eastern and Midlands region, the RWRP for the South West region and the RWRP for the North West region have been taken through the assessment and consultation process and have been finalised and adopted. The RWRP for the South East region, which this SEA Environmental Report addresses, will be the final region for the Phase 2 NWRP and has been consulted on and is expected to be adopted in Winter 2023. The Framework Plan, Regional Plans and supporting documentation are available at <https://www.water.ie/projects/strategic-plans/national-water-resources/>.

1.1 Options Assessment Methodology

The Options Assessment Methodology as adopted in the Framework Plan and implemented as part of the RWRP-SE provides a framework to identify potential solutions to address identified need. The key stages of the process are illustrated in Figure 1.1 and summarised below:

- 1) Identifying need – based on SDB and/or Drinking Water Safety Plan Barrier Assessment;
- 2) Scoping of the study area (Water Resource Zones (WRZs)) – understanding the study area and the existing conditions of assets, supply and demand issues; as well as environmental constraints and opportunities;
- 3) Identifying potential options for consideration relevant to the study area;
- 4) Coarse screening – assessing the unconstrained options and eliminate any that will not be viable;
- 5) Further option definition, information collection and preliminary costing;

- 6) Fine screening – options assessment and scoring against the key criteria with further removal of options identified as unviable and development of feasible options for costing and scoring assessment update;
- 7) Approach appraisal – comparison and assessment of combinations of options identified to meet the predicted supply demand deficit to determine the Preferred Approach; and
- 8) Monitoring and Feedback – a process for monitoring the implementation of the plan and responding to changes to policy and guidelines and to information changes which will feed into the 5 year plan cycle and includes an annual review to identify actions required within the plan cycle.

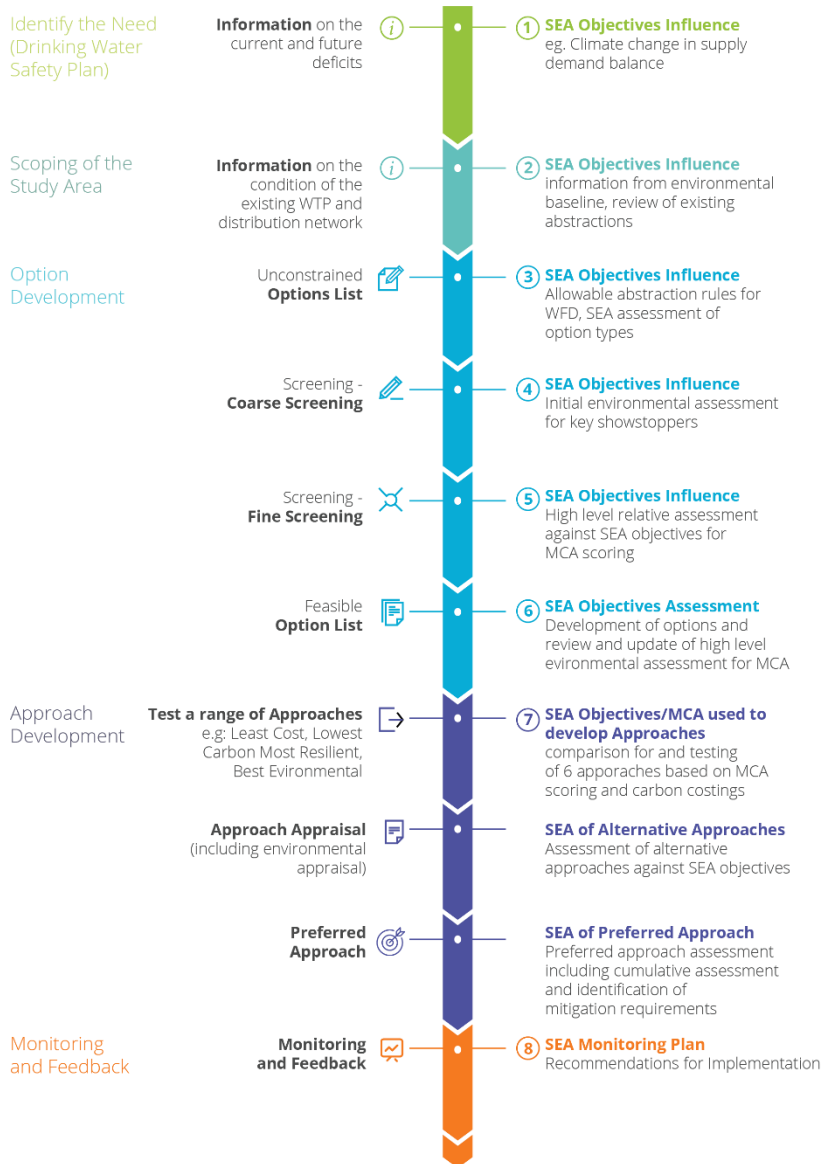


Figure 1.1 Option and Approach Development Process

1.2 Regional Plan Strategic Environmental Assessment

The four RWRPs, implementing Phase 2 of the NWRP, are each subject to a separate SEA process. The study area assessments follow the outline methodology established by the Framework Plan. The SEA Environmental Reports are published for consultation alongside the Regional Plans for each of the four regions. As indicated in section 1.1, this consultation process has been completed for four of the regions and the South East Region is the final region in Phase 2 of the NWRP that is to be adopted in Winter 2023.

Each of the Study Area Environmental Reviews, are presented as appendices to the SEA Environmental Reports, and include:

- Introduction for SEA, Water Framework Directive (Council Directive 2000/60/EC) (WFD) and AA applied at the study area level;
- Environmental baseline context;
- Environmental assessment for the options screening process and feasible options;
- Assessment of the alternatives considered and the Preferred Approach;
- Cumulative effects assessment between options within each study area and with proposed developments in the study area; and
- Recommendations for implementation, including mitigation and monitoring.

1.3 Study Area: Strategic Environmental Assessment

The set of SEA objectives developed at the Phase 1 scoping stage have been refined and finalised following consultation (see Table 1.1). These objectives have been influenced by the plans, policies and programmes review, the baseline trends and pressures identified, and the scope of the assessment as defined and consulted on in the Regional Plan SEA scoping report.

Table 1.1 SEA Objectives

SEA Topic	SEA Objective
Population, economy, tourism and recreation, and human health	Protect and, where possible, contribute to enhancement of human health and wellbeing and to prevent restrictions to recreation and amenity facilities in providing water services.
Water environment	<p><u>Water quality and resources</u></p> <p>Prevent deterioration of the WFD status of waterbodies with regard to both water quality and quantity due to Uisce Éireann’s activities. Contribute towards the “no deterioration” WFD condition and, where possible, to the improvement of waterbody status for rivers, lakes, transitional and coastal waters, and groundwater to at least ‘Good’ status.</p>
	<p><u>Flood risk</u></p> <p>Protect and, where possible, reduce risk from ground water and surface water flooding as a result of Uisce Éireann’s activities.</p>
Biodiversity	Protect and, where possible, enhance terrestrial, aquatic and soil biodiversity; particularly regarding European sites and protected species in providing water services.
Material assets	<p>Minimise resource use and waste generation from, new or upgraded, existing water services infrastructure and management of residuals from drinking water treatment - to protect human health and the ecological status of waterbodies.</p> <p>Minimise impacts on other material assets and existing water abstractions.</p>

SEA Topic	SEA Objective
Landscape and visual amenity	Protect and, where possible, enhance designated landscapes in providing water services.
Climate change	<u>Climate change mitigation</u> Minimise contributions to climate change emissions to air (including greenhouse gas emissions) as a result of Uisce Éireann’s activities.
	<u>Climate change adaptation</u> Promote the resilience of the environment, water supply and treatment infrastructure to the effects of climate change.
Cultural heritage	Protect and, where possible, enhance cultural heritage resources in providing water services.
Geology and soils	Protect soils and geological heritage sites and, where possible, contribute towards the appropriate management of soil quality and quantity.

The SEA informs the development of the approaches and is undertaken on the various alternative approaches considered and the Preferred Approaches identified, along with cumulative impact assessment and identification of ‘in-combination’ effects.

The Regional Plan SEA Environmental Report was completed only after all study area reports for the South East region were available. At that point, Uisce Éireann conducted an exercise as part of the development of the overall relevant Regional Plan to assess the cumulative and in-combination impacts of the Preferred Approaches identified for each study area within the South East region. The conclusions of that cumulative assessment are presented in the SEA Environmental Report for the South East region.

If appropriate, the Preferred Approach identified for SAM will have been modified prior to finalisation of the Regional Plan Technical Report and Environmental Review to take into account the conclusions of that cumulative assessment and identification of in-combination effects. The SEA for each of the Regional Plans in turn includes a cumulative assessment of the Preferred Approaches identified in the Regional Plan, in combination with the effects of the Preferred Approaches for each other region (to the extent that data was available and recognising that each Regional Plan is at a different stage of development).

1.4 Study Area: Water Framework Directive

Requirements under the WFD to avoid deterioration in waterbody status or objectives has been incorporated into the allowable abstraction constraints for new option abstractions. WFD requirements are also included in the SEA objectives for the assessment (see Table 1.1). Baseline data in relation to the WFD is presented in section 2.2.1 and a summary of the assessment for SAM is provided in chapter 8 of this review.

1.5 Study Area: Appropriate Assessment

An AA was required for the Framework Plan to comply with the EU Habitats Directive (92/43/EEC) and is relevant to development of the Regional Plans, including the component study areas.

AA issues will be addressed in a separate Natura Impact Statement (NIS) for the Regional Plan, which will support the overall AA process that Uisce Éireann is required to carry out. Habitats Directive requirements have been integrated into the options development process and conclusions from the NIS for SAM are provided in chapter 9 of this review.

1.6 Study Area M

The South East Region is subdivided into three study areas based on factors such as:

- Groundwater body boundaries;
- Surface water sub-catchments;
- Geographical features;
- WRZ boundaries;
- Local authority functional areas; and
- Appropriate size for an efficient reporting structure.

This appendix reports on SAM, the location of SAM in relation to the South East Region is shown in Figure 1.2.

Study Area M lies within the counties of Carlow, Wexford and Wicklow and its total area is approximately 2,420 km². There are two principal settlements (with a population of over 10,000) within SAM. The largest settlement is Wexford, with a population of 20,188 (CSO, 2016a), as shown in Figure 1.3.

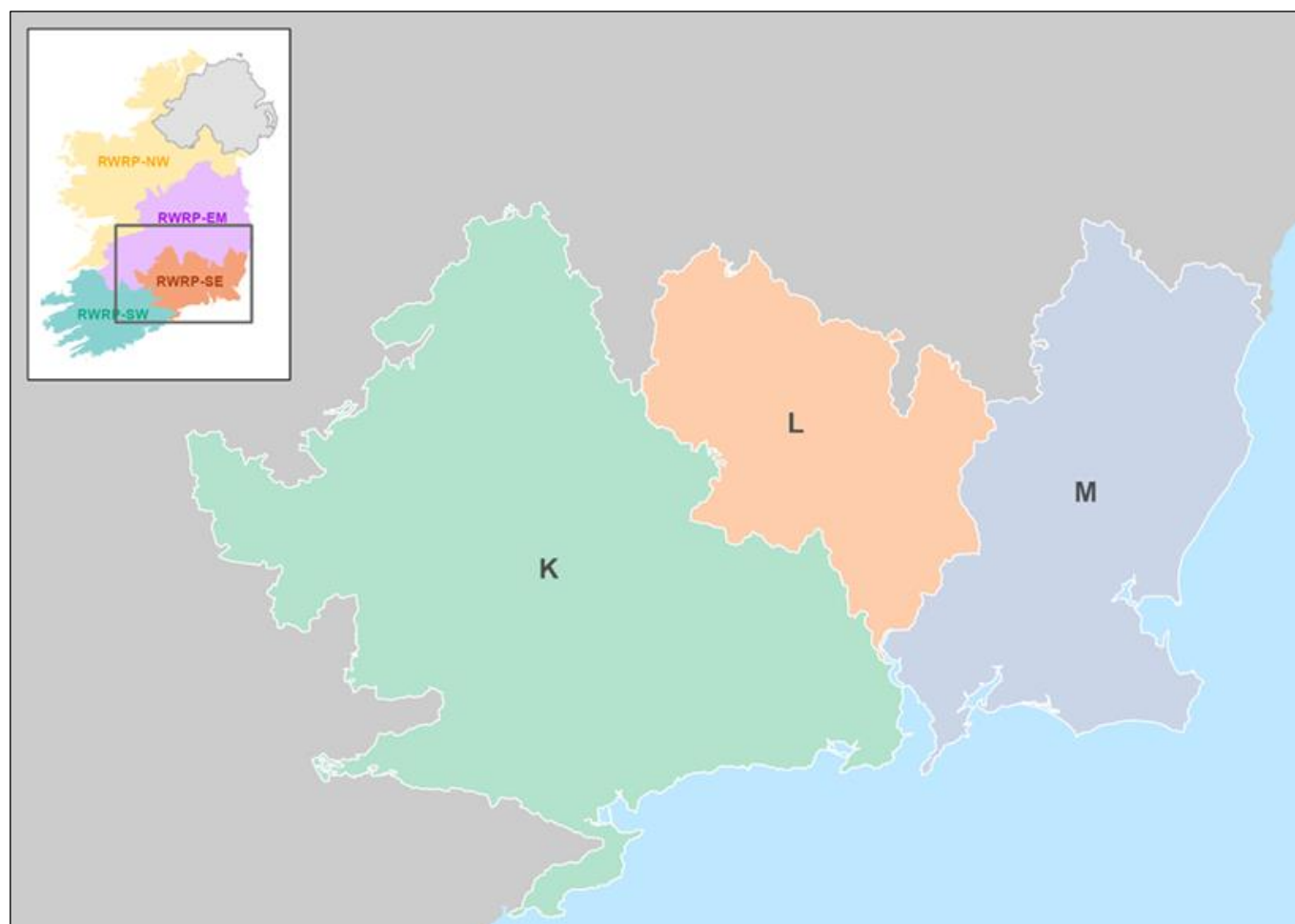


Figure 1.2 South East Region Study Areas

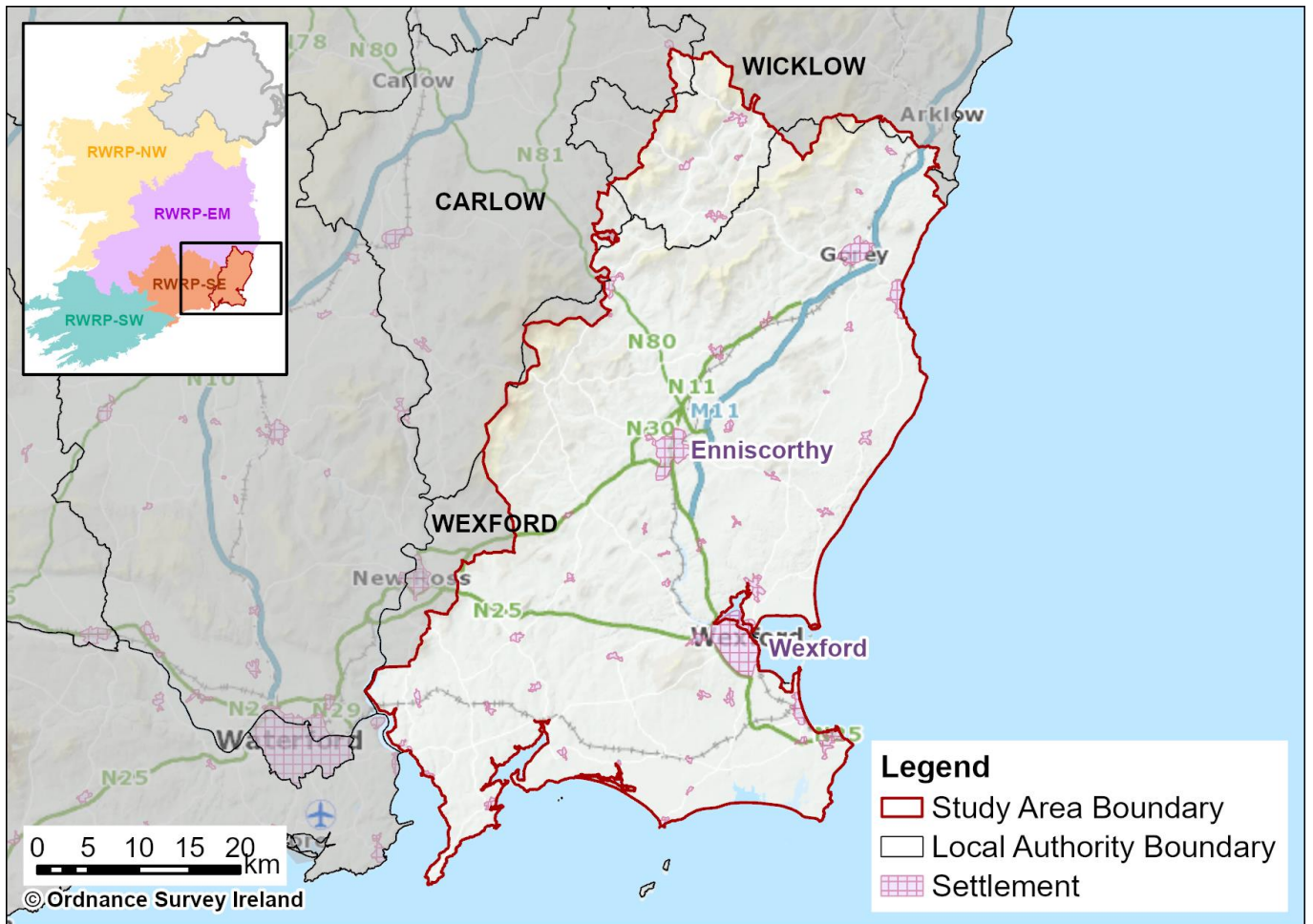


Figure 1.3 Study Area M

2

Study Area M Environmental Baseline Context

2 Study Area M Environmental Baseline Context

This chapter provides environmental baseline information for SAM regarding the following key environmental topics in the SEA:

- Population, Economy, Tourism and Recreation, and Human Health;
- Water Environment;
- Biodiversity, Flora and Fauna;
- Material Assets;
- Landscape and Visual Amenity;
- Air Quality and Noise;
- Climate Change;
- Cultural Heritage;
- Geology and Soils; and
- Summary of key issues and trends over the plan period within the study area.

The baseline environment considers key indicators characterising the current situation in the study area and how these aspects are likely to develop over the Framework Plan's implementation period. This includes issues relating to pressures on the environment or the sensitivity of the environment to change. This chapter is intended to support and add to the baseline environmental information for the Regional Plan SEA Environmental Report, as context for the option appraisal and programme selection.

The baseline assessment also addresses the environmental aspects of Stages 1 and 2 of the options assessment methodology:

- Stage 1 Identifying need – based on SDB and/or Drinking Water Safety Plan Barrier Assessment; and
- Stage 2 Scoping of the study area (WRZs) – understanding WRZ's within the study area and the existing conditions of assets, supply and demand issues as well as environmental constraints and opportunities.

2.1 Population, Economy, Tourism and Recreation, and Human Health

2.1.1 Population

Table 2.1 provides a general overview of the WRZ's population and the projected percentage change in population between 2019 and 2044. The estimated population currently living in each WRZ has been based on the 2016 Census data. The 2016 population was assigned to District Metering Areas (DMAs) by mapping the Central Statistics Office (CSO) data to DMA boundaries. Uisce Éireann have projected the 2016 population forward to 2019 using the growth projections in the National Planning Framework, updated information from the Regional Spatial and Economic Strategies, and Local Authority Planning sections (where available). Uisce Éireann is working closely with CSO on the update of 2022 Census population data as per Uisce Éireann's District Meter Areas boundaries. The Supply Demand Balance will be updated with the 2022 Census population data once the population update of Uisce Éireann's District Meter Areas boundaries is completed. Updated data and information will be incorporated via the monitoring and feedback process as set out in section 8.3.8 of the Framework Plan.

Table 2.1 Overview of the Population within the WRZs of SAM

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
3300SC0011 - Ballindaggin	201	13
3400SC0053 - Ballingate Public Supply	8	13
3300SC0032 - Ballyhogue	359	13
3400SC0045 - Ballynavortha Public Supply	8	13
3300SC0077 - Bree	363	13
3300SC0004 - Bunclody	1,976	4
3300SC0004 - Bunclody	150	13
3300SC0002 - Camolin	326	13
3300SC0022 - Carrigbyrne	927	13
3300SC0013 - Clonroche	532	13
3400SC0010 - Coolboy Coolafancy Public Supply	492	13
3300SC0020 - Coolgreany	1,052	13
3300SC0015 - Davidstown	97	13
3300SC0023 - Enniscorthy	11,758	21
3300SC0078 - Fardystown	15,604	18
3300SC0003 - Ferns Regional	1,700	13
3300SC0017 - Glynn	191	13
3300SC0001 - Gorey	20,208	19
3300SC0012 - Killealy	232	13
3300SC0010 - Marshalstown	89	13
3300SC0014 - Monageer	194	13
3300SC0066 - Raheen	15	13
3400SC0013 - Raheengrany Pubc Supply	8	13
3300SC0079 - South Regional	10,492	16
3300SC0080 - Sow Regional	11,774	19
3300SC0081 - Wexford Town	21,790	36
3300SC0027 - Woodview Drive Adamstown	98	13

*The estimated population has been based on the 2016 Census data. Uisce Éireann have projected the 2016 population forward to 2019 using the growth projections in the National Planning Framework, Regional Spatial and Economic Strategies, and Local Authority Planning sections

2.1.2 Economy and Employment

SAM had a below average household disposable income per person in 2019 (CSO, 2023a). The unemployment rate was 6.0% in the South East and 3.3% in the Mid East regions of the country in Q2 of 2023 (CSO, 2023b).

Population increase and expected economic growth has meant that housing and sustainable urban development have been made a priority for the National Development Programme; therefore, to supply the demand there is an aim to increase housing stock. The number of new dwellings completed in Q2 2023 was 556 for the South East and 1,708 in the Mid East regions (NUTS3) of Ireland (CSO, 2023c).

2.1.3 Tourism and Recreation

Tourism in SAM has an important role, particularly in rural areas, with the National Planning Framework (NPF) stating that tourism is a key aspect of rural job creation now and in the future (Government of Ireland, 2018). While only a small portion of the county is included in the RWRP-SE, within SAM, the county of Wexford contains the famous Curracloe beach, Johnstown Castle, and Tintern Abbey, as well as the iconic Hook Lighthouse. Additionally, Wexford is known as ‘The Sunny Southeast’. Alongside being a Viking town, it offers coasts and beaches, and is said to be one of the best places to see puffins in the wild (Visit Wexford, 2022). The county of Wicklow (SAM) has been described as “the garden of Ireland”, containing Ireland’s largest national park (Wicklow National Park) and emphasising outdoor recreation as a key asset for the area (Visit Wicklow, 2020).

SAM is located within Ireland’s Ancient East, which is part of a tourism development strategy that covers the South, East and part of the Midlands. This strategy places emphasis on the importance of historic sites in the area (National Tourism Development Authority, 2016).

Ireland’s natural heritage is also recognised as an important tourism asset by the Department of Transport, Tourism and Sport (2019). Furthermore, for SAM, rivers, loughs, and coastal areas all make an important contribution to tourism and recreational opportunities and support important fisheries.

2.1.4 Human Health

Table 2.2 provides well-being indicators for the South-East region within Ireland. Improvements in air quality, access to good quality drinking water and participation in recreational activities can all have a positive influence on human health and well-being.

Table 2.2 Well-Being Indicators for the South-East Region within Ireland

Region	Life Expectancy (CSO, 2020a)	Participation in Sports, Fitness or Recreational Physical Activities (% of Persons Aged 15+) (CSO, 2020b)	Air Quality (EPA, 2023c)
South East	Male: 79.3 Female: 83.1	44%	Good
Mid East	Male: 80.3 Female: 84.0	49%	Good

A key issue for public health is reliable access to good quality drinking water. Regulated water service providers have to ensure appropriate standards of supply and be able to cope with drought conditions,

peak events, and maintenance of assets. This requires adequate reserve capacity in Uisce Éireann's supplies to provide a 1 in 50 Level of Service. At present, not all supplies within this study area provide the required levels of reserve capacity. Due to the limited historical monitoring of these supplies, particularly in relation to groundwater, this will need to be studied further. Table 2.3 lists the areas supplied by the Water Treatment Plants (WTPs) in SAM.

Table 2.3 Areas Supplied by the WTPs in SAM

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Adamstown WTP	3300SC0027 - Woodview Drive Adamstown	Wexford
Ballinavortha WTP	3400SC0045 - Ballynavortha Public Supply	Wicklow
Ballindaggin WTP	3300SC0011 - Ballindaggin	Wexford
Ballinellard WTP and Killmallock Bridge WTP	3300SC0080 - Sow Regional	Wexford
Ballingate WTP	3400SC0053 - Ballingate Public Supply	Wicklow
Ballycrystal WTP	3300SC0012 - Kiltaly	Wexford
Ballygarron WTP, Ballyminaunhill WTP and Creagh WTP	3300SC0001 - Gorey	Wexford
Ballyhogue WTP	3300SC0032 - Ballyhogue	Wexford
Bree WTP	3300SC0077 - Bree	Wexford
Camolin WTP	3300SC0002 - Camolin	Wexford
Carrickbyrne WTP	3300SC0022 - Carrickbyrne	Wexford
Carrickduff WTP	3300SC0004 - Bunclody	Wexford
Clonroche WTP	3300SC0013 - Clonroche	Wexford
Davidstown WTP	3300SC0015 - Davidstown	Wexford
Enniscorthy (Edermin) WTP, Kilagoley WTP and Vinegar Hill WTP	3300SC0023 - Enniscorthy	Wexford
Ferns WTP	3300SC0003 - Ferns Regional	Wexford
Glynn WTP	3300SC0017 - Glynn	Wexford
Knockgreany WTP	3300SC0020 - Coolgreany	Wexford
Logan WTP	3400SC0010 - Coolboy Coolafancy Public Supply	Wicklow
Marshalstown WTP	3300SC0010 - Marshalstown	Wexford
Mayglass WTP	3300SC0078 - Fardystown	Wexford
Mongear (Moin Rua) WTP	3300SC0014 - Monageer	Wexford
Raheen (Adamstown) WTP	3300SC0066 - Raheen	Wexford

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Raheengraney WTP	3400SC0013 - Clonroche	Wicklow
Taylorstown WTP	3300SC0079 - South Regional	Wexford
Wexford Town (Newtown) WTP	3300SC0081 - Wexford Town	Wexford

Currently for day-to-day operations, nineteen out of twenty six of the WRZs in the area have a current and projected SDB deficit for 2044 (based on a ‘Do Minimum’ approach – see section 4.4 for further clarification). However, under normal weather and demand conditions, the current deficit does not manifest as an interruption to supply for all WRZs.

Poor water quality can be linked to risks to health. The Uisce Éireann Barrier Assessment identified twenty-four of the thirty-one WTPs within the study area as being at high risk of failing to achieve the Uisce Éireann’s conservative Barrier Assessment standards in relation to Barrier 1 (Bacteria and Virus) and the effectiveness of Uisce Éireann’s protozoa removal processes (Barrier 3) (see Table 2.1 in the SAM Technical Report).

The “quality need” identified through the Barrier Assessment is not an indicator of compliance with the Drinking Water Regulations. It is an internal Uisce Éireann assessment of the need to invest in areas of the Uisce Éireann asset base through resource planning, to ensure that potential risks or emerging risks to supplies are addressed. Currently, there are three WRZs on the EPA Remedial Action List within SAM, namely, Wexford Town, Enniscorthy and Clonroche. Uisce Éireann is currently progressing immediate corrective action in relation to a number of supplies within SAM in advance of the NWRP. Details of these are included in the SAM Technical Report.

2.2 Water Environment

This topic covers geomorphology, WFD, flood risk, surface water quality and groundwater receptors. Figure 2.1 shows the water environment, including the WRZs, the WFD water catchment boundaries, the WTPs and the waterbodies in SAM.

Figure 2.1 provides a summary of the WFD catchments within SAM.

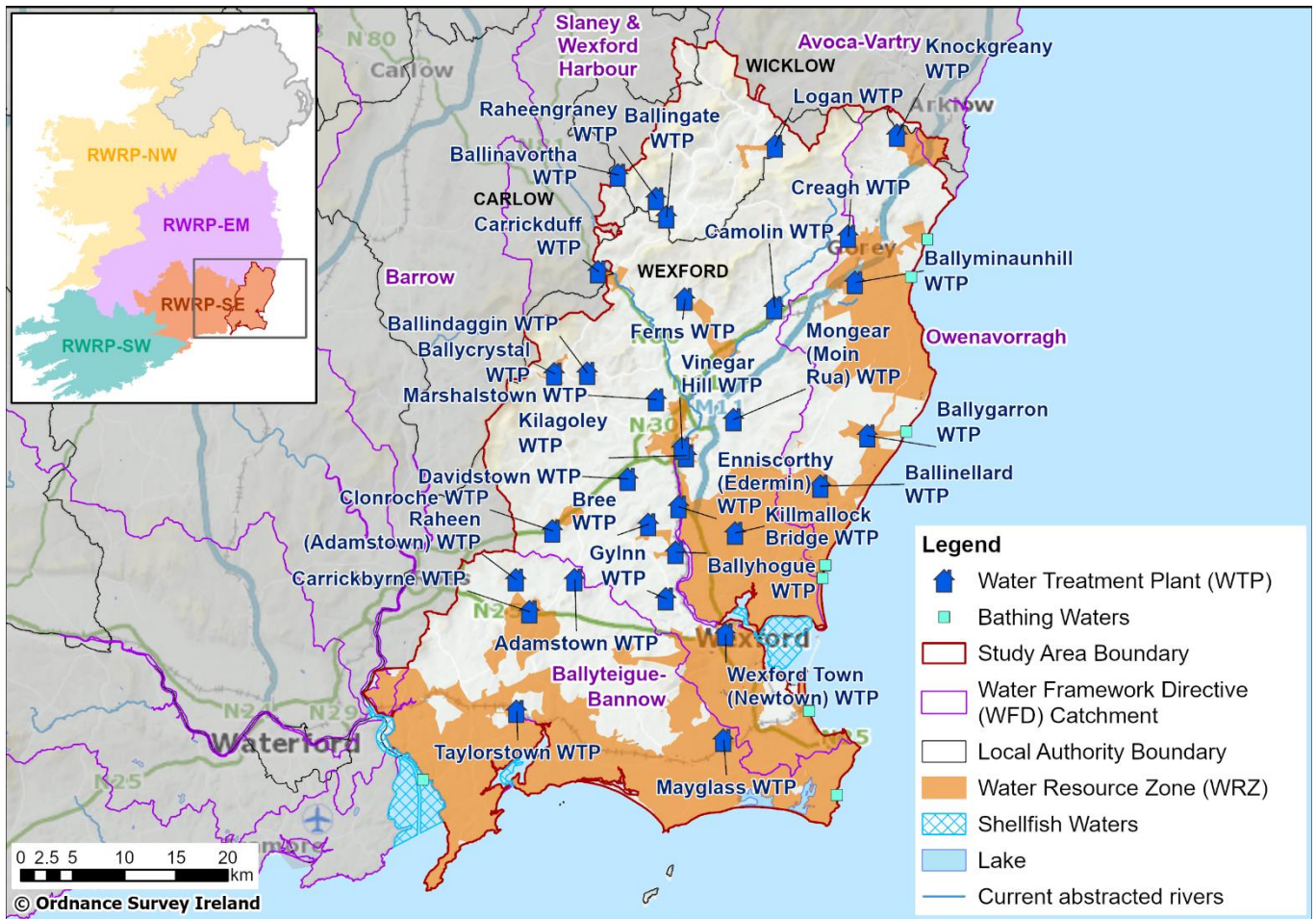


Figure 2.1 Water Environment of SAM

Table 2.4 Catchments within SAM (EPA, 2020)

WFD Catchments	Total Catchment Area (km ²)	Catchment Area within SAM (km ²)
Avoca-Vartry	1,234	6
Ballyteigue-Bannow	660	659
Barrow	3,016	10
Owenavorragh	395	394
Slaney & Wexford Harbour	1,980	1,344

2.2.1 Water Framework Directive

Under the WFD, Ireland must ensure that all waterbodies achieve ‘Good’ status by 2027. In addition, under the legislation, any modification to a WFD waterbody should not lead to deterioration in either the overall status or any of the WFD water quality parameters.

At the end of 2022, the government passed the Water Environment (Abstractions and Impoundments) Act, 2022 (the Abstractions Act) which will ensure that national abstractions align with the requirements of the Water Framework Directive. The Abstractions Act has not yet commenced and the associated regulations and guidelines which will further detail the types of assessment and national methodology to be used have not yet been published and are not yet in place.

Whilst the regulations and guidelines for the new abstraction regime are being developed, Uisce Éireann are assessing existing abstractions to identify surface water sites that may exceed future abstraction thresholds (see Appendix C of the Framework Plan for assessment methodology). Uisce Éireann have taken a precautionary approach based on their current understanding of how proposed abstraction legislation might be applied. This assessment suggests that certain schemes may be subject to reductions in abstraction under the new legislation; however, this will ultimately be determined by the EPA based on the project level information before them.

As there are very few long duration flow records for Uisce Éireann’s abstractions and for waterbodies within Ireland, Uisce Éireann lacks comprehensive data to fully understand the impact of the new legislation on these sources. Information is not currently stored centrally as it was historically collected and collated by Local Authorities. Uisce Éireann is building a telemetry system which will aid bringing all this data together, but this will take time. Therefore, improved monitoring and gathering better data is a priority.

On an interim basis, Uisce Éireann has developed an initial desktop assessment based on available information (see SAM Technical Report). Over the coming years, Uisce Éireann will work with the EPA and the Geological Survey of Ireland, to develop desktop and site investigation systems to better understand the sustainability of its groundwater sources.

To understand the potential impact of the Abstraction Legislation on the SAM supplies, Uisce Éireann has assessed its ten surface water abstractions for SAM, namely, Barkers Stream (Bunclody), Craan Intake (Bunclody), Clonhasten (River Slaney) (Enniscorthy), River Curralane (Ferns Regional), Bann River (Pallis Bridge) (Gorey), Bann River (Kilmichael Pumping Station) (Gorey), Owenduff (South Regional), River Sow- Sow Regional (Sow Regional), River Sow- Wexford Town (Wexford Town), and Coolree Intake (Wexford Town). Based on this initial assessment, only the volume abstracted at Clonhasten (River Slaney) would appear to comply with sustainability guidelines. However, under the proposed regulatory regime, this will be adjudicated on by the EPA.

Uisce Éireann has taken a conservative approach in identifying sustainable abstractions for new options (described in section 3.2) and has applied a sensitivity assessment that considers proposals against potential for future sustainability related reductions in volume (section 5.4).

The Department of Housing, Planning and Local Government’s (2019a) public consultation document, regarding the significant water management issues, has been considered by Uisce Éireann. Therefore, the pressures, and the relevant priority ‘Areas for Action’ are provided below and in Table 2.7.

There are five WFD catchments in SAM and the total number of surface and groundwater waterbodies within SAM are provided in Table 2.5 below.

Table 2.5 WFD Waterbodies within SAM (EPA, 2023a)

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
Rivers	Avoca-Vartry	3	0
	Ballyteigue-Bannow	30	6
	Barrow	1	0
	Owenvorragh	25	5
	Slaney & Wexford Harbour	72	4

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
Lakes	Avoca-Vartry	0	0
	Ballyteigue-Bannow	0	0
	Barrow	0	0
	Owenavorrigh	1	0
	Slaney & Wexford Harbour	1	0
Transitional and Coastal	N/A	18	3
Groundwater	N/A	19	3

The predominant pressures, and the percentage of 'at risk' waterbodies impacted by them, in the latest catchment summaries (catchments.ie, 2021a, 2021b, 2021c, 2021d and 2021e) are:

- Avoca-Vartry: Other (historically polluted sites, aquaculture, waste, atmospheric and anthropogenic factors) (54%), agriculture (31%), and urban runoff (23%);
- Ballyteigue-Bannow: Agriculture (90%);
- Barrow: Agriculture (75%);
- Owenavorrigh: Agriculture (83%); and
- Slaney & Wexford Harbour: Agriculture (73%).

Table 2.6 includes a summary of the 'at risk' waterbodies within SAM.

Table 2.6 Summary of 'At Risk' Waterbodies in SAM (EPA, 2023b)

Waterbody Type	Water Catchments	Number of Waterbodies Identified as 'At Risk'	Surface Waterbodies Status 'At Risk' Due to Abstraction Pressure*
Rivers	Avoca-Vartry	2	8
	Ballyteigue-Bannow	13	
	Barrow	0	
	Owenavorrigh	17	
	Slaney & Wexford Harbour	32	
Lakes	Avoca-Vartry	0	1
	Ballyteigue-Bannow	0	
	Barrow	0	
	Owenavorrigh	0	
	Slaney & Wexford Harbour	0	
Transitional and Coastal	N/A	12	0
Groundwater	N/A	7	N/A

Waterbody Type	Water Catchments	Number of Waterbodies Identified as 'At Risk'	Surface Waterbodies Status 'At Risk' Due to Abstraction Pressure*
Total		83	9

* Based on Uisce Éireann assessment of their current abstractions

To meet WFD objectives, it has been recognised that there is a need to prioritise and focus efforts to address issues through identifying 'Areas for Action'. The reasons for selection of the 'Areas for Action' within the sub-catchments of SAM are listed in Table 2.7. Note that the 'Areas for Action' included in Table 2.7 are from the WFD cycle 3 River Basin Management Plan (RBMP).

Table 2.7 'Areas for Action' within SAM (catchments.ie, 2021f)

Areas for Action	Key Reasons for Selection
Bannow	<ul style="list-style-type: none"> • Bannow bay is failing to meet its Protected Area objective for shellfish • Three deteriorated waterbodies • Building on ongoing work by Wexford County Council • Active community groups • Strong coast watch group • Potential to work with local CLAM (coordinated local aquaculture management) scheme • Most important sea trout fishery in the south of the county • Important sea angling • Important wild fowl in the bay. Preserving zoster grass, which geese feed on, and preventing it from being swamped by algae • Two potential 'quick wins'
Blackwater (Wexford)	<ul style="list-style-type: none"> • Building on work completed by Wexford County Council • One deteriorated waterbody • Discharging into bathing waters (Ballinesker and Curracloe)
Derreen and Douglas (Kiltegan)	<ul style="list-style-type: none"> • Protected area objectives not met for Freshwater Pearl Mussel (19 catchments of S.I. 296 2009) • Build on WwTP upgrades at Hacketstown • Active community group • Three of the five waterbodies are deteriorated waterbodies • One of the three deteriorated waterbodies is a High Ecological Status objective waterbody • Three potential 'quick wins'
Derry-Coolboy-Rosnastraw	<ul style="list-style-type: none"> • The most important tributaries on the Slaney for salmon spawning • Building on planned instream works by Inland Fisheries Ireland on Coolboy_010 at Coolattin estate

Areas for Action	Key Reasons for Selection
	<ul style="list-style-type: none"> • Three potential 'quick wins' • Eight deteriorated waterbodies • One At Risk High Ecological Status objective waterbody • Derry_010 is failing its protected area objectives for drinking water (pesticides)
Owenavorrhagh	<ul style="list-style-type: none"> • Longer term challenge. Ten waterbodies, four of which are consistently Poor status • Discharging into bathing water amenity (Courtown) • Teagasc Agriculture Catchments Programme catchment (Bracken_010) • Building on improvements completed in Gorey WwTP • NHA in Gorey • Very active community group in Ballycanew • Two deteriorated waterbodies • Three potential 'quick wins'
Sow	<ul style="list-style-type: none"> • Potential to utilise County Council involvement in local drainage schemes • Important water abstraction - Wexford town and area north of Wexford • Woodlands for water scheme is being developed in the area • Important amenity area • Opportunity to work with demonstration farm project • Important heritage areas, such as Edenvale, in the area • Active community groups in the area • One deteriorated waterbody • Drinking water protected area objective not met
Urrin	<ul style="list-style-type: none"> • Building on completed and planned improvements from Enniscorthy upgrade works • Three deteriorated waterbodies • Two of the three deteriorated waterbodies are At Risk High Ecological Status objective waterbodies • One potential 'quick win'
Waterford Harbour	<ul style="list-style-type: none"> • Waterford Harbour Shellfish area has recently downgraded. Locals have commented on die off of the local mussel population • Building on planned Uisce Éireann works at Duncannon, Arthurs town, Ballyhack) • Building on completed and ongoing work by Wexford County Council • Discharges into designated bathing area (Duncannon) • Important habitats, including the second largest Honeycomb coral habitat in Europe and wild shellfish fisheries
Wexford Coastal Lagoons	<ul style="list-style-type: none"> • Bad status (Lady's is land lake)

Areas for Action	Key Reasons for Selection
	<ul style="list-style-type: none"> • Building on ongoing research and work with Wexford County Council • Lady's is land lake is an important heritage site and is the start of the Norman way on the ancient east trail • Tacumshan Lake recently transferred to state ownership (NPWS) • Nature reserves, SAC, SPA, RAMSAR
Wexford Harbour	<ul style="list-style-type: none"> • Estuary project • Failing protected area objective: Shellfish area (Wexford harbour) • Building on work by Wexford County Council • SAC and SPA

2.2.2 Flood Risk

Flood risk is considered as part of the options appraisal; however, many options are at a conceptual stage and there is insufficient information to differentiate between options on the basis of flood risk when design details, siting and routing are still to be determined. Both surface water and ground water flood risk will need to be considered further as part of the development of option design and for assessment at project level.

The Office of Public Works (OPW) has been implementing the European Communities (Assessment and Management of Flood Risks) Regulations 2010 mainly through the Catchment Flood Risk Assessment and Management (CFRAM) Programme, through which draft Flood Risk Management Plans have been developed. Approximately 300 'Areas for Further Assessment' have been established along with a range of measures to reduce or manage the flood risk within each catchment. CRFAMS mapping for all Areas for Further Assessment is available to view on the CFRAMS website (OPW, 2018). Figure 5.4 in the SEA Environmental Report (Appendix A) provides a summary of surface water and groundwater flood risk from the OPW CFRAMS data for the region including SAM.

For existing water infrastructure assets such as WTPs, flood risk vulnerability is considered in decisions on need to rationalise and decommission assets.

Any options which are progressed and require planning permission will require a Flood Risk Assessment to be completed in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009).

2.3 Climate Change

Ireland's climate is heavily influenced by the Atlantic Ocean. Consequently, Ireland has a milder climate that has less extreme temperature variation compared with other countries at a similar latitude. The hills and mountains, many of which are near the coasts, provide shelter from strong winds and from the direct oceanic influence. Winters tend to be cool and windy, while summers are generally mild and less windy (Met Éireann, 2019).

In June 2019, the government agreed to support the adoption of a net zero target by 2050 at EU level, and to pursue a trajectory of emissions reduction nationally which is in line with reaching net zero in Ireland by 2050.

Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended in 2021) sets a new "national climate objective" for Ireland, which provides that:

"The State shall, so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy".

The amended Act requires public authorities, including Uisce Éireann, to, so far as practicable, perform their functions in a manner consistent with the furtherance of the national climate objective and the relevant national and sectoral plans and strategies to mitigate greenhouse gas emissions and adapt to the effects of climate change.

The Department of the Environment, Climate and Communications' Climate Action Plan (CAP) 2023 published December 2022, replacing CAP 2021, commits to achieving a 51% reduction in overall greenhouse gas emissions by 2030 and reaching net zero carbon emissions by 2050. The aim is for more sustainable growth and to create a resilient, vibrant and sustainable country. The CAP defines a roadmap to this goal and initiates a set of policy actions to achieve this. A detailed sectoral roadmap has also been set out, which is designed to deliver a cumulative reduction in emissions, over the period 2023 to 2030. CAP 2023 updates existing targets with renewable energy to provide 80% of electricity by 2030 and sets targets for sectors, including a target of 9 Gigawatts from onshore wind, 8 from solar, and at least 5 of offshore wind energy by 2030 (Department of the Environment, Climate and Communications, 2023).

In addition, Ireland has a sectoral climate adaptation plan for the 'Water Quality and Water Services Infrastructure' sector. A summary of the report's findings is included in Table 2.8.

Table 2.8 Summary of Key Points from the 'Water Quality and Water Services Infrastructure' Sectoral Climate Change Plan (Department of Housing, Planning and Local Government, 2019b)

Summary	
Key Points	<ul style="list-style-type: none"> • Protecting and improving water quality and improving water services infrastructure are major challenges in Ireland • Climate change-induced threats will increase the scale of these challenges • Risks to water quality and water infrastructure arise from changing rainfall patterns and different annual temperature profiles. The frequency and intensity of storms and sea level rise are also considered
The challenges: Water services infrastructure	<ul style="list-style-type: none"> • Increased surface and sewer flooding leading to pollution, water and wastewater service interruptions • Reduced availability of water resources • Hot weather increasing the demand for water • Increased drawdown from reservoirs in the autumn/winter for flood capacity, leading to resource issues • Business continuity impacts or interruptions for water services providers
Primary adaptive measures	<ul style="list-style-type: none"> • Fully adopt the 'integrated catchment management' approach

Summary

- Improve treatment capacity and network functions for water services infrastructure
- Water resource planning and conservation – on both supply and demand sides
- Include climate measures in monitoring programmes and research
- Many of these proposed adaptation actions are already underway through existing and scheduled water sector plans and programmes

There are four aims that local authorities are required to include in their climate adaptation strategies (Department of Communications, Climate Action and Environment, 2018):

- **Mainstream Adaptation:** That climate change adaptation is a core consideration and is mainstreamed in all functions and activities across the local authority. In addition, ensure that local authority is well placed to benefit from economic development opportunities that may emerge due to a commitment to climate change adaptation and community resilience;
- **Informed decision making:** That effective and informed decision making is based on a reliable and robust evidence base of the key impacts, risks and vulnerabilities of the area. This will support long term financial planning, effective management of risks and help to prioritise actions;
- **Building Resilience:** That the needs of vulnerable communities are prioritised and addressed, encourage awareness to reduce and adapt to anticipated impacts of climate change, and promote a sustainable and robust action response; and
- **Capitalising on Opportunities:** Projected changes in climate may result in additional benefits and opportunities for the local area and these should be explored and capitalised upon to maximise the use of resources and influence positive behavioural changes.

In addition to these high-level aims, each local authority is required to identify the key risks to their area; these are provided in Table 2.9.

Table 2.9 Climate Change Risks Identified by Local Authorities in SAM

County	Key Risk Areas
Carlow (Carlow County Council, 2019)	<ul style="list-style-type: none"> • Flooding • Extreme rainfall • Extreme cold/Heavy snowfall and ice • Extreme heat/Drought conditions
Wexford (Wexford County Council, 2019)	<ul style="list-style-type: none"> • Flooding • Extreme rainfall • Rising sea levels and Storm Surges • Storm frequency and intensity • Extreme cold/Heavy snowfall and ice • Extreme heat/Drought conditions • Bog, Sand, Dune, Gorse or Forest Fires

County	Key Risk Areas
Wicklow (Wicklow County Council, 2019)	<ul style="list-style-type: none"> • Flooding • Extreme rainfall • Rising sea levels and Storm Surges • Storm frequency and intensity • Wind speeds

Climate change is expected to influence weather conditions, such as frequency of droughts and extreme events such as storms, and is likely to affect habitats and species, water availability for supply and water demand and water quality. For SAM, not all supplies within the study area meet the required levels of reserve capacity. As evidenced in the 2018, 2020 and 2022 droughts, there is the potential for this deficit to affect access to water in the future. This situation could further deteriorate over time due to climate change driven reductions in water resources.

A key aspect of Uisce Éireann’s strategy is to ‘Supply Smarter’, by improving the quality, resilience and security of their supply through infrastructural improvements. One of the high-level goals taken from the national level is building resilience, with water services being a key factor.

Supporting environmental resilience to climate change will also be an important consideration for the future with additional benefits for supply resilience.

2.4 Biodiversity, Flora and Fauna

2.4.1 Designated Sites

Within SAM there are a number of European, national and locally designated sites, including Special Protected Areas (SPAs), Special Areas of Conservation (SACs), National Parks, Nature Reserves, and proposed Natural Heritage Areas (see Table 2.10 and Figure 2.2). The European sites (SPAs and SACs), and the potential impacts on them, are discussed in more detail in the NIS.

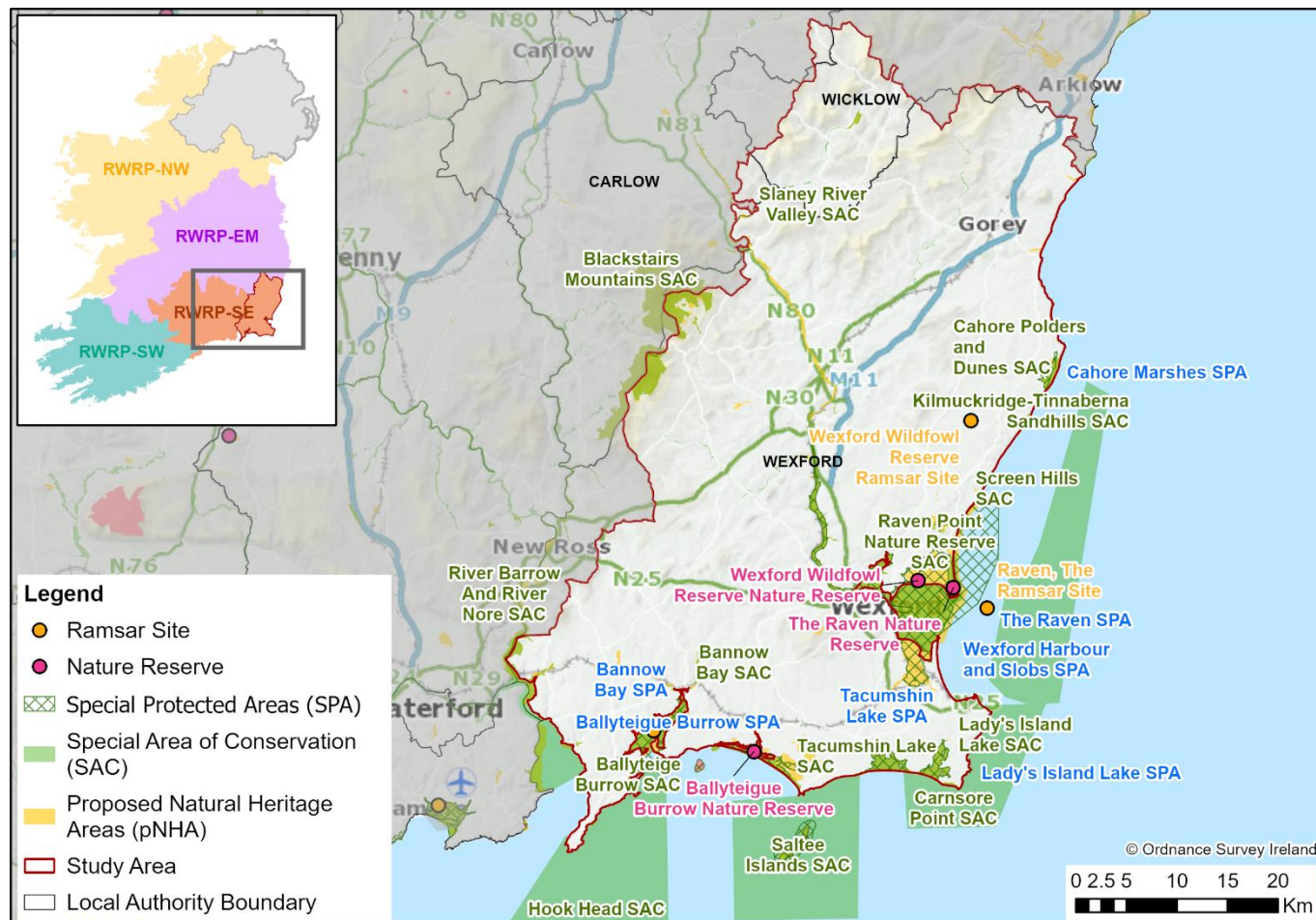


Figure 2.2 Designated Sites in SAM

Table 2.10 Designated Sites within SAM (NPWS, May 2023)

Receptor	Name	Total Number
Special Protected Area (SPA)	Ballyteigue Burrow SPA	7
	Bannow Bay SPA	
	Cahore Marshes SPA	
	Lady's Island Lake SPA	
	Tacumshin Lake SPA	
	The Raven SPA	
	Wexford Harbour and Slobs SPA	
	Ballyteigue Burrow SAC	14

Receptor	Name	Total Number
Special Area of Conservation (SAC)	Bannow Bay SAC	
	Blackstairs Mountains SAC	
	Cahore Polders and Dunes SAC	
	Carnsore Point SAC	
	Hook Head SAC	
	Kilmuckridge-Tinnaberna Sandhills SAC	
	Lady's Island Lake SAC	
	Raven Point Nature Reserve SAC	
	River Barrow And River Nore SAC	
	Saltee Islands SAC	
	Screen Hills SAC	
	Slaney River Valley SAC	
	Tacumshin Lake SAC	
Ramsar Sites	Bannow Bay	3
	The Raven	
	Wexford Wildfowl Reserve	
Nature Reserves	Ballyteigue Burrow	3
	The Raven	
	Wexford Wildfowl Reserve	
National Parks	N/A	0
Natural Heritage Areas (NHAs)	N/A	0
Proposed Natural Heritage Areas (pNHAs)	See Figure 2.2	39

2.4.2 Habitats

Table 2.11 lists the percentage of the study area, and the number of hectares, covered by each habitat within SAM; as reported in the Corine land use dataset¹.

¹ Since the land cover analysis was undertaken for the NWRP, OSI has published the National Land Cover Map. The analysis will be updated as part of the data review process as outlined in section 9 of the RWRP-SE. The National Land Cover data is identified as a source of baseline information in the SEA monitoring plan to be used for project development and assessments going forward.

Table 2.11 Habitat Areas for SAM (EPA, 2018)

Habitat	Ha	% of Study Area
Agricultural Land		
Pastures	152,735	63.14%
Non-irrigated arable land	56,405	23.32%
Complex cultivation patterns	4,799	1.98%
Land principally occupied by agriculture, with significant areas of natural vegetation	2,476	1.02%
Natural Habitats		
Peat bogs	1,204	0.50%
Beaches, dunes, sands	899	0.37%
Water courses	527	0.22%
Moors and heathland	189	0.08%
Natural grasslands	189	0.08%
Forest		
Coniferous forest	8,225	3.40%
Transitional woodland-shrub	2,452	1.01%
Mixed forest	2,101	0.87%
Broad-leaved forest	1,174	0.49%

Particularly relevant habitats that depend on the water quality and/or quantity in SAM are:

- Oligotrophic waters containing very few minerals of sandy plains;
- Groundwater dependant terrestrial habitats, such as petrifying springs with tufa formation;
- Northern Atlantic wet heaths with *Erica tetralix*;
- Coastal lagoons; and
- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho–Batrachion* vegetation

2.4.3 Species

The key species (Nelson et al, 2019) of concern within SAM include:

- Otter (*Lutra lutra*);
- Fish species - Atlantic Salmon (*Salmo salar*), Twaité shad (*Alosa fallax fallax*), Lamprey species;
- Freshwater pearl mussel (*Margaritifera margaritifera*);
- White-clawed Crayfish (*Austropotamobius pallipes*);
- Nore pearl mussel (*Margaritifera durrovensis*);
- Killarney Fern (*Trichomanes speciosum*);
- ‘Qualifying interest’ bird species e.g. hen harrier (*Circus cyaneus*); and
- Waterbirds of ‘qualifying interest’ e.g. Brent goose (*Branta bernicla*), whooper swan (*Cygnus cygnus*), Bewick’s swan (*Cygnus columbianus bewickii*), Greenland white-fronted goose (*Anser*

albifrons flavirostris), curlew (*Numenius arquata*), tern species (*Sterna spp.*) and winter migratory waders.

The key invasive species to consider (European Communities (Birds and Natural Habitats) Regulations, 2011) for developing options within SAM include:

- Japanese knotweed (*Fallopia japonica*);
- Himalayan balsam (*Impatiens glandulifera*);
- Giant hogweed (*Heracleum mantegazzianum*); and
- Waterweed species (*Elodea spp.*)

2.5 Material Assets

Material assets are considered to be the natural and built assets (non-cultural assets) required to enable a society to function as a place to live and work, in giving them material value.

Some of the natural assets within SAM are listed in

Table 2.12, such as agricultural land and coniferous forest.

Built assets include transport and communications infrastructure, and other developed areas, including existing water supply infrastructure (see Figure 2.1 and Figure 2.3). These assets all need to be taken into account in new water resource developments.

In addition, water resources and water quality are influenced by urban, agricultural and forestry activity within river and groundwater catchments. This can affect the availability and quality of water for supply.

Uisce Éireann has thirty one WTPs in SAM, meeting the demand of 40 MI/d as of 2019.

There are no canals or ports of national or regional significance in SAM. There are no airports of local significance. Other significant transport infrastructure includes the main road network (particularly the N11, N25, N30, N80, and M11).

Any new infrastructure considered for SAM will need to take existing as well as planned land zoning and local development into consideration.

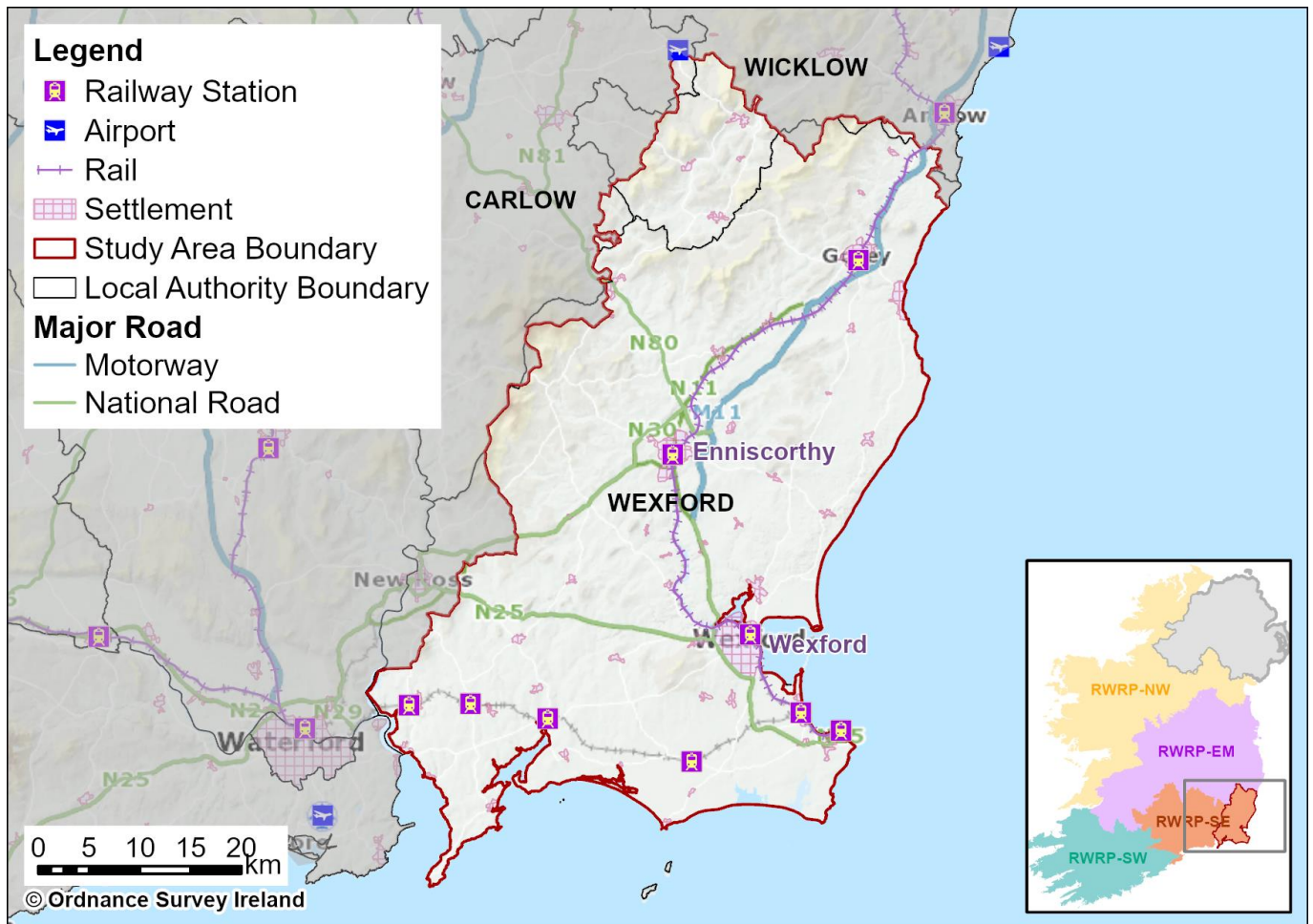


Figure 2.3 Transport Infrastructure in SAM

Table 2.12 Land Use within SAM (EPA, 2018)²

Land use	Ha	% of Study Area	Comparison to Overall South East Region %
Agriculture	216,415	89.46%	84.50%
Urban	5,254	2.17%	1.81%
Forest	5,543	2.29%	4.92%
Natural habitats	13,952	5.77%	8.56%
Industry	555	0.23%	0.18%
Other	197	0.08%	0.03%

Proposals for other strategic developments within SAM are considered for the assessment. These are primarily identified from the National Planning Framework and from myProjectIreland, where any relevant projects for the study area are included (other local developments may also be included that are not listed in myProjectIreland if they are considered to be of an appropriate scale). Small scale housing and business development are not considered for this plan level assessment.

² Since the land cover analysis was undertaken for the NWRP, OSI has published the National Land Cover Map. The analysis will be updated as part of the data review process as outlined in section 9 of the RWRP-SE. The National Land Cover data is identified as a source of baseline information in the SEA monitoring plan to be used for project development and assessments going forward.

Table 2.13 gives an overview of the project developments which are available from myProjectIreland (2022) for SAM³. The myProjectIreland map focuses mainly on major projects with costs over €20 million. The map also includes all projects supported to date under the Government’s Urban and Rural Regeneration Funds and reflects the full portfolio of projects in the pipeline at present.

Table 2.13 Proposed New Developments

Development	
Clonhasten, Enniscorthy, Wexford	Roxborough, Mulgannon, Wexford
Enniscorthy Flood Relief Scheme	Trinity Wharf
Enterprise Hub New Ross	Trinity Wharf 2
Ferrycarraig and the Hook Peninsula	Wexford General Hospital Ward Block
Kerlogue Manor, Roxborough, Drinagh, Wexford	Whiterock Hill, Wexford, Phase 1
Ramstown, Gorey, County Wexford	Whiterock Hill, Wexford, Phase 2

2.6 Landscape and Visual Amenity

The National Landscape Strategy 2015-2025 is in the process of being implemented and will be Ireland’s vehicle for complying with the EU Landscape Convention. Landscape assessment guidance is also available from the local authorities. This will be taken into account when identifying landscape character areas and protected areas at the project level in the future. Table 2.14 shows the sensitivity and value of the Landscape Character Areas (LCAs) within each of the counties listed within the study area. No data is available for the values of the LCAs within Carlow County and no value or sensitivity information is available for the LCAs within Wexford County⁴.

The value of the landscape in SAM is reflected in baseline data sections 2.1.3 (Tourism and Recreation), 2.4 (Biodiversity, Flora and Fauna) and 2.8 (Cultural Heritage).

Water supply infrastructure development will need to take account of sensitive landscapes and views. This will need to include culturally important areas, townscapes, natural areas and areas and views of importance for tourism and recreation.

Table 2.14 Value and Sensitivity of Landscape Character Areas in the Counties of SAM (Ordnance Survey Ireland, 2021)

Landscape Character Area	Value	Sensitivity
County: Carlow (Carlow County Council, 2016)		
Killeshin Hills	-	Medium
Central Lowlands	-	Low
Blackstairs and Mount Leinster Uplands	-	High
River Slaney - East Rolling Farmland	-	Medium

³ Note that the myProjectIreland dataset was taken at a fixed point in time to allow for assessment of cumulative effects. The date for SAM being the 10/11/22.

⁴ As with all the baseline information, the LCA information will be updated as part of regular reviews

Landscape Character Area	Value	Sensitivity
County: Wexford (Wexford County Council, 2016)		
No values or sensitivity information available.		
County: Wicklow (Wicklow County Council, 2016)		
The Mountain Uplands	-	Very High
The Blessington Lakes Area	-	Very High
The Bray Mountains Group	-	Very High
The North Eastern Valley	-	Very High
Northern Coastal Area	-	Very High
Southern Coastal Area	-	Very High
North East Mountain Lowlands	Area of High Amenity	High
South East Mountain Lowlands	Area of High Amenity	High
Southern Hills	Area of High Amenity	High
Baltinglass Hills	-	High
Transitional Lands	-	High
The N11	-	Medium
The N81	-	Medium
Rolling Lowland Areas 1-6	-	Medium
All towns ranging from Levels 1-6 of the Wicklow Settlement Hierarchy	-	Low

2.6.1 Seascape

The Regional Seascape Character Assessment for Ireland (2020) presents the Regional Seascape Character Areas (SCAs) for the entire Republic of Ireland. An SCA is defined as “*an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors*”. The assessment identifies two SCAs in SAM; Celtic Sea Bays and Beaches, and South East Irish Sea.

2.7 Air Quality and Noise

2.7.1 Air Quality

Air quality is monitored and managed using Air Quality Zones and air monitoring sites. The majority of SAM falls within Air Zone D: Rural Ireland, with Wexford falling within Air Zone C: Other Cities and Large Towns. The air quality index rating of the core baseline area is rated as ‘good’ (EPA, 2023c).

In general, the water industry is not a major contributor to air quality issues, although there is potential for local pollution through Uisce Éireann vehicles, generator plants and drinking water residuals treatment facilities. There is a requirement to comply with air pollution regulations and also to identify

potential opportunities for reducing emissions. Air quality will be a consideration at the project level, for example, through scheme construction management and scheme design and operation.

2.7.2 Noise

The main areas that experience noise pollution are likely to be areas along the main roads, particularly around the N11, N25, N30, N80, and M11.

Water infrastructure development is not expected to add significantly to noise pollution. Construction noise will be considered through scheme construction management and design for local receptors and for sensitive receptors in close proximity. Noise pollution will also be managed through the planning process with conditions included in planning permissions.

2.8 Cultural Heritage

Within SAM, there are numerous designated and non-designated cultural heritage assets inventoried in the Record of Monuments and Places, the Sites and Monuments Record, the Record of Protected Structures, the Wreck Inventory of Ireland Database, and the National Inventory of Architectural Heritage (NIAH) (see Table 2.15).

Figure 2.4 shows the location of the individual cultural heritage records from the National Monuments Service and the NIAH. Given the number of small sites, these can be better viewed on the Department of Culture, Heritage and the Gaeltacht's (2020) 'Historic Environment Viewer' website and the National Monuments Service's 'Wreck Viewer' (2023).

The database of Irish excavation reports (<https://excavations.ie/>) contains summaries of archaeological excavations carried out on the island of Ireland since 1969. There are also potentially unknown, undesignated archaeological and architectural remains throughout Ireland. Water supply can affect cultural heritage through, direct loss or construction of infrastructure involving disturbance of soils, above ground structures close to existing heritage sites affecting setting or changes due abstraction changing drainage and affecting interests within wetland sites.

Section 3 of the National Monuments (Amendment) Act 1987 protects wrecks over 100 years old and archaeological objects underwater, irrespective of their age or location. The placement of an underwater heritage order may also protect the potential location of wrecks or archaeological objects and wrecks that are less than 100 years old if the wreck, area or object is considered to be of sufficient historical, archaeological or artistic importance to merit such protection. Previously unrecorded wreck sites may yet be discovered in the rivers and coastal waters under consideration in the Plan. Uisce Éireann note that the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was passed on the 13th October 2023 which, once enacted, will replace the existing National Monuments Act 1930 to 2014 and other related legislation to provide for the protection and conservation of Ireland's historic heritage.

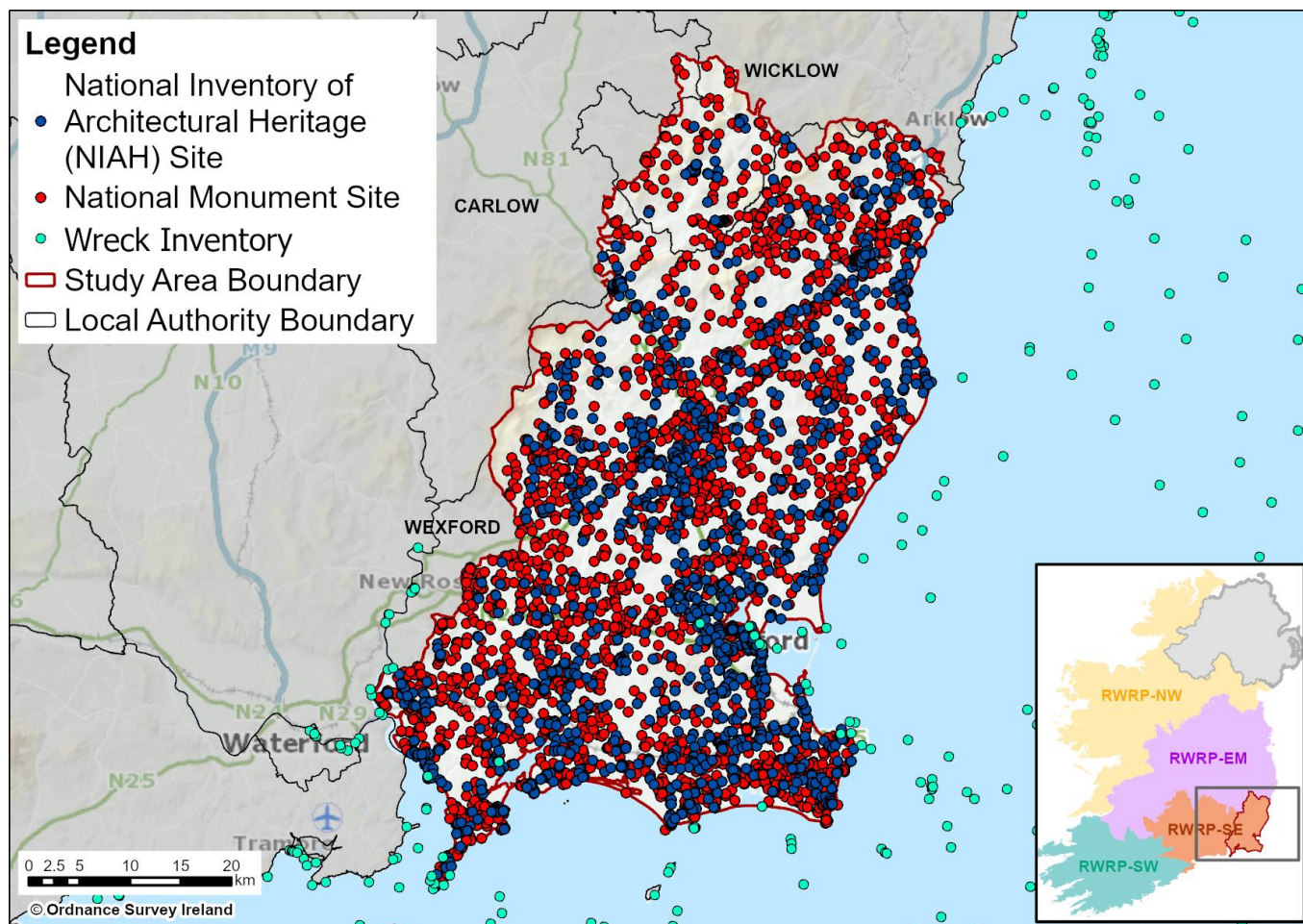


Figure 2.4 SAM Cultural Heritage Assets

Table 2.15 Cultural Heritage Assets within SAM

Assets	Total Number
National Monuments Service Sites	3,552
National Inventory of Architectural Heritage Sites	2,573
Sites and Monuments Record Zones	1,922

2.9 Geology and Soils

Table 2.12 lists the land uses within SAM. SAM predominantly has a coarse loamy soil type with areas of fine loamy drift to the east of the study area, and sandy drift to the west of the study area (EPA, 2019).

The geology and soils in the environment are fundamental for the quality and quantity of water in the area through differences in drainage, chemical composition, filtration and soil type, topography and resultant land use. Land use has significant impact on water quantity and quality. Groundwater supply depends on the type of aquifers in the area, as they determine the system’s ability to store and transmit groundwater. The regionally and locally important aquifers with resource potential for SAM are shown in Figure 2.5.

The predominant aquifer type of the area is made up of poorly productive bedrock (70%), followed by productive fissured (22%), gravel (5%) and karstic (3%). Surface water abstractions dominate the total water supply for the region, highlighting the vast areas underlain by poorly productive aquifers with lower

potential. There are extensive swathes of productive fissured bedrock stretching from Gorey in the north-east to Stradbally on the coast of Waterford.

The poorly productive rocks consist primarily of Ordovician and Cambrian Metasediments. The Precambrian Quartzites, which feature in the south-east of the county, are characterised by the absence of an intergranular permeability and the presence of low fissure permeability. Although fractured the Ordovician rocks generally have a low permeability and are mostly regarded as a poor aquifer. The Cambrian rocks, mostly seen in south-east of Wexford, generally show low aquifer potential.

An extensive body of productive fissured bedrock, made up primarily of volcanics, stretches from Gorey in the north-east to Stradbally on the coast of Waterford. The most productive yields are sourced from the well-developed fissures in the felsic Rhyolites and Andesites, which appear to decrease the further south-west one moves from Gorey in Wexford. Lower permeabilities and yields can be more common here, with intrusive rocks forming a barrier to groundwater flow.

There are extensive swathes of regionally important karst aquifer in some areas, particularly in south-east Wexford. The distribution of permeability and yield is more homogenous where the development of karst has resulted in a more diffuse network of flow pathways. The regionally important aquifers are generally smaller in extent in this part of the country and are banded by lesser productive bedrock aquifers.

Important geological and geomorphological sites could be identified for protection as NHAs, however, until designation is confirmed, these sites are classified as Irish Geological Heritage Sites (IGHS). There are over 900 IGHS identified around Ireland, 41 of which have the potential to constrain water resource options in SAM.

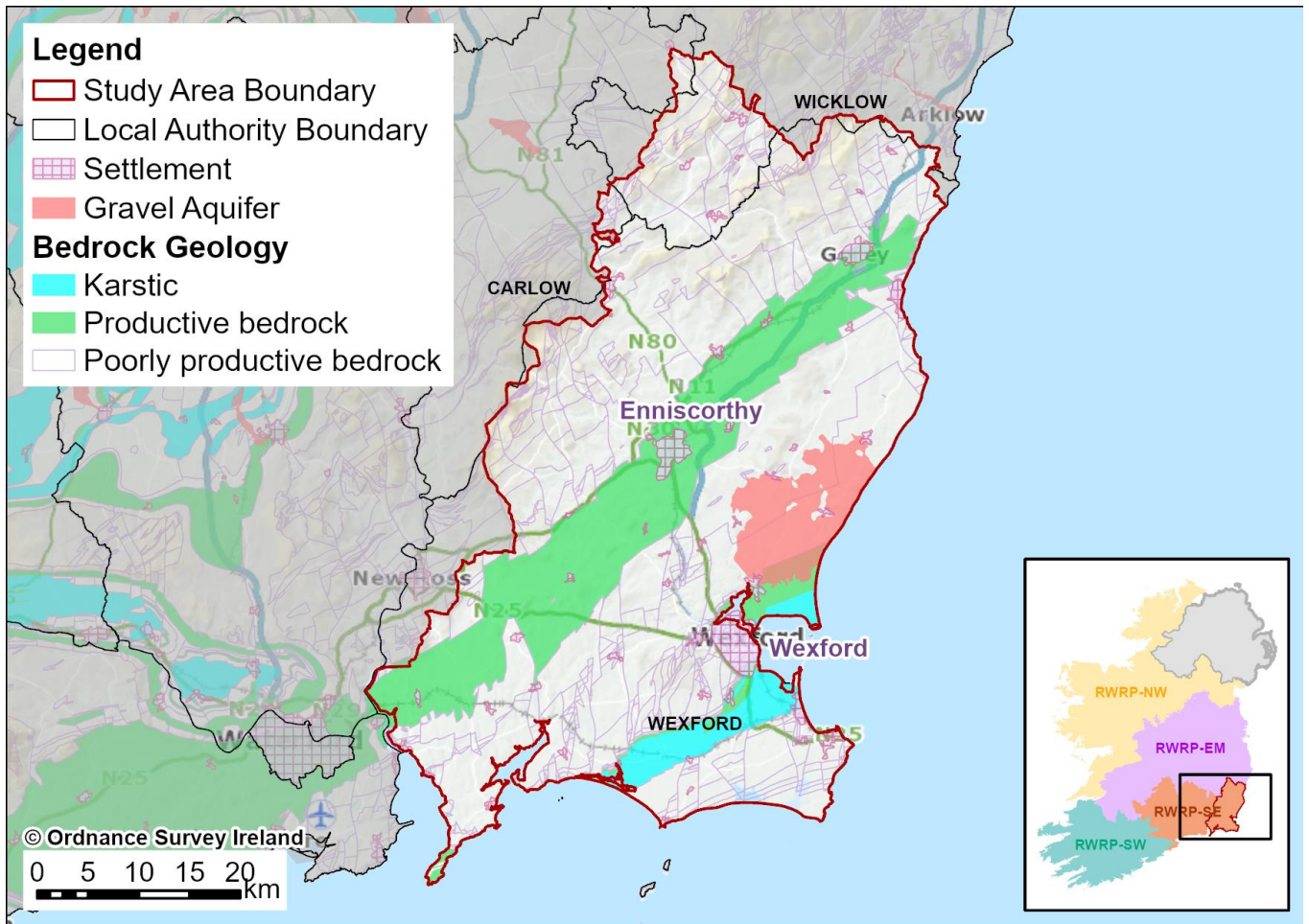


Figure 2.5 SAM Hydrogeology

2.10 Summary of Key Issues and Trends over the Plan Period

All aspects of the environment will need to be considered as individual schemes are taken forward for further design and implementation. However, the key issues relevant for strategic water planning identified within SAM are listed in Table 2.16.

Table 2.16 Summary of Key Issues and Trends Over the Plan Period

SEA Topic	Issues and Opportunities	Interrelated Topics
Population, Economy, Tourism and Recreation, and Human Health	<p>Issues: Increasing population and the increased stress of climate change on water quality and water resources could affect health and well-being. Tourism can add to peak demand for water.</p> <p>Opportunities: Uisce Éireann will put in place plans to assess water quality and measures to address risks as part of the NWRP.</p> <p>Uisce Éireann has ongoing activities to improve the Supply Demand Balance in SAM, including, leakage management and water conservation measures.</p> <p>Raising awareness of the importance of water conservation and efficiency measures, and the value of the environment for health and wellbeing, can play an</p>	Climate change, biodiversity, water environment, material assets and landscape and visual amenity

SEA Topic	Issues and Opportunities	Interrelated Topics
	important part in water planning along with valuing water as part of access to environment for recreation.	
Water Environment	<p>Issues: The proposed abstraction licensing, aligned to WFD requirements, will require many current abstractions to be licensed and may limit future abstraction or involve significant conditions being imposed at associated sites. For SAM, some of the existing abstractions may not meet sustainability guidelines in the medium term; specifically, during drought periods. On an interim basis, Uisce Éireann has developed an initial conservative assessment based on available information (see SAM Technical Report). This has been used to inform options identification and appraisal.</p> <p>Uisce Éireann will update its sustainability analysis and impact on their baseline Supply Demand Balance (SDB) calculations when regulatory assessment for the new legislation is undertaken. Groundwater and flood risks and vulnerability are potential issues for water supply and environment. The plan assessment aims to identify strategic level risk but detailed siting and design through the project development stages is expected to take account.</p> <p>Opportunities: To take account of identified pressure on the water environment in the selection of solutions for SAM and opportunities for reducing pressure on resources and improving water quality.</p>	Biodiversity and climate change
Biodiversity, Flora and Fauna	<p>Issues: For SAM, the Slaney is designated as the Slaney River Valley SAC. It is considered especially important to avoid the loss of irreplaceable or rare habitats and increasing pressure on vulnerable species; potentially through direct land take or indirect such as through increased abstraction pressure. Tourism can bring issues of marine litter and water transport can add to spread of invasive non-native species.</p> <p>Opportunities: Potential to reduce pressure on habitats affected by abstraction pressure, for example through rationalisation. Potential for enhancement through reducing pressure on sensitive sites or building in requirements such as habitat enhancement in to schemes and identifying potential for nature-based solutions and catchment management.</p>	Water resources, water quality and climate change
Material Assets	Issues: WTP assets and network infrastructure requiring improvement or replacement	Health and wellbeing

SEA Topic	Issues and Opportunities	Interrelated Topics
	Opportunities: Improvements to support reliability of access to good quality water.	
Landscape and Visual Amenity	<p>Issues: Potential for climate change to affect land use and habitats and influencing landscape quality and amenity and potential for construction and infrastructure development to result in landscape and visual amenity change and loss of features.</p> <p>Opportunities: Potential to include enhancements in reinstatement through appropriate planting schemes and screening.</p>	Biodiversity and geology and soils, climate change, health and wellbeing
Air Quality and Noise	No specific issues identified for the baseline for SAM.	Health and wellbeing
Climate Change	<p>Issues: Climate change issues regarding sea level rise, flooding, extreme weather events and changes in seasonal weather patterns. Climate change has been taken into account in supply forecasts and additional risks to infrastructure and operations will need to be taken into account in planning for drought and freeze/thaw events; and in detailed scheme design and network operation.</p> <p>Opportunities: Additional management to minimise impact on supply and the environment, vulnerability to climate change and drought is required.</p>	Biodiversity and water environment
Cultural Heritage	Issues: Known cultural heritage and archaeological assets (underwater and terrestrial) and potential unknown archaeological assets could be affected by construction works or change to setting or access. Potential for hydrological changes to affect heritage and archaeological assets.	Health and wellbeing
Geology and Soils	<p>Issues: Potential loss of soils or pollution from runoff. General need for good soil conservation and retention of nutrients and carbon in soil resources</p> <p>Opportunities: Improve soil carbon and retention of nutrients contributing to improving water quality.</p>	Biodiversity, water quality, landscape and climate change
Additional interrelated aspects	<p>Issues: Poor water quality requiring additional water treatment and affecting aquatic biodiversity.</p> <p>Opportunities: Potential for catchment management initiatives leading to habitat, water retention, water quality enhancement and soil quality have the potential to provide wider benefits for environmental resilience and water supply; although this has not been specifically studied in this study area.</p>	

3

Environmental Assessment – Options Appraisal

3 Environmental Assessment – Options Appraisal

This chapter provides a summary of the environmental assessment of options considered in the study area, including the option identification and screening process, and assessment of options used in approach development.

3.1 Overview

Uisce Éireann applied its Options Assessment Methodology from the Framework Plan to identify potential solutions to meet the needs identified in the SAM WRZs.

The general methodology, and how environmental assessment is included, is outlined in the SEA Environmental Report prepared in relation to the Framework Plan. That report identifies SEA objectives and assessment criteria and provides a framework for integrating the environmental assessment of options and combinations of options into a phased appraisal process which also takes account of other criteria such as feasibility, deliverability, resilience and cost.

The Options Assessment Methodology covers eight stages. Stages 1 and 2 are covered through the needs and baseline assessments addressed in chapter 2 of this review. The key stages considered in this chapter for SAM are Stages 3-6:

- Stage 3 Unconstrained options – to identify all the potential options to be considered to resolve water quality or quantity requirements;
- Stage 4 Coarse screening – to assess the unconstrained options and eliminate any that will not be viable and collect information to inform the next stage;
- Stage 5 Fine screening – options assessment and scoring against the key criteria to verify option feasibility and understand key risks and constraints; and
- Stage 6 Feasible option list – further option development encompassing costing and SEA assessment of options.

3.2 Stage 3: Unconstrained Options

Environmental and social assessment criteria are included at the earliest stages of the screening process. At the outset of the process, some fundamental rules are applied as part of option identification. For example, inter-catchment raw water transfers are excluded due to the high risk of transferring invasive non-native species (INNS) between catchments and potential conflict with WFD objectives.

WFD objectives have also been a key consideration at this stage through an internal sustainable abstraction risk review. This was a specialist review of groundwater bodies and surface water catchments that was undertaken as part of the option identification stage. UK Technical Advisory Group on the Water Framework Directive (UKTAG) guidance (UKTAG, 2013) on baseflows have been used for the purposes of this plan until Ireland specific standards come into place.

The application of these conservative abstraction standards to new options ensures that any new or increased abstractions from rivers are likely to support conservation objectives for the most sensitive environmental sites. For surface waterbodies, the allowable abstraction standard of 10% of Q95 has been applied, with the exception of waterbodies requiring 'High' status where a higher threshold of 5% of Q95 has been applied. Allowable abstraction standards for lakes are set at 5 or 10% of Q50 in line with this guidance (the NIS prepared in relation to the Framework Plan, sets out the approach in relation to Appropriate Assessment).

As mentioned previously, these are estimates applied for the purpose of strategic planning and are based on a conservative approach to what the new regulatory regime might require. The EPA will be the authority adjudicating the sustainability or otherwise of abstractions, once the regulations and guidelines for the new abstraction regime have been developed there will be more detailed site-specific information.

For groundwater sources, the assessment includes a high-level assessment taking account of a range of information available for existing site and in many cases limited information for new abstraction options. This desktop assessment undertaken aimed to identify potential yield and the impact of the yield, including the steps described below.

3.2.1 Existing Groundwater Abstractions

Site specific data is taken into account where possible in assessing potential sustainable yield for increasing abstraction at existing sources. In some cases, however location, abstraction rate(s) and site configuration are often the minimum information available. The operational data provides useful information on the yield, and assumptions can be made around the average production from each site. It can be assumed the average abstraction value is an initial estimate of the yield. Most local authorities in the case of development of groundwater sources, would likely have drilled and sought the maximum yield possible through 72 hours pumping tests. This provides an initial yield. Additional information on performance in prolonged dry weather periods provides supporting information on yields. Data collected on site is used to improve the yield and impact estimates.

3.2.2 New Groundwater Abstractions

The Zone of Contribution (ZOC), the land area that contributes water to the well or spring, is defined and used to calculate a preliminary water balance for the source using the average abstraction rate and the annual average recharge rate as estimated from the Geological Survey Ireland (GSI) recharge maps. The water balance estimates the area needed to supply the yield and is then compared to the delineated ZOC. A WFD >30% recharge is applied as a guide for assessment in the fine screening assessment but is recognised to apply more to catchment scale abstraction impact assessments so at a very local abstraction scale it can overestimate the impacts for some sources.

Additional assessment is undertaken on potential preferred groundwater options to inform the SEA, taking into account site specific information and consideration of likely impacts on WFD and cumulative effects with existing groundwater abstractions.

Further work will need to be undertaken for groundwater options taken forward as part of abstraction licensing and the development of Drinking Water Safety Plans. This will include establishing detailed geoscientifically robust zones of contribution in line with GSI's Groundwater Protection Schemes (Department of Environment, Community and Local Government, GSI and EPA, 1999) and the EPA Advice Note Number 7, Source Protection and Catchment Management (EPA, 2013). This work will provide in-depth hydrogeological information on the source that will establish reliable and sustainable yields.

3.2.3 Sustainable Abstraction in Options Assessment

At the end of 2022, the government passed the Water Environment (Abstractions and Impoundments) Act, 2022 (the Abstractions Act) which will ensure that national abstractions align with the requirements of the Water Framework Directive. The Abstractions Act has not yet commenced and the associated regulations and guidelines which will further detail the types of assessment and national methodology to be used have not yet been published and are not yet in place. Therefore, Uisce Éireann does not have full visibility of the future regulatory regime. As the objective of the plan is to achieve safe, secure,

reliable and sustainable supplies, any new abstractions proposed to be developed by Uisce Éireann as part of this plan will be based on conservative assessments of sustainable abstraction. This will ensure that water supplies continually improve in terms of environmental sustainability.

Based on initial desk-based assessments outlined above, Uisce Éireann developed an initial list of unconstrained options for new supplies, increases and upgrades to existing supplies. An unconstrained options review workshop was held with Uisce Éireann’s Local Authority Water Services Partners to identify any additional unconstrained options that might be available based on local knowledge.

3.3 Stage 4: Coarse Screening

A total of 273 unconstrained options were identified for SAM and subjected to coarse screening. The coarse screening process assessed the options against the criteria outlined in Table 3.1. This process is summarised in chapter 6 of the SEA Environmental Report for the RWRP-SE. The process allows the assessment of the unconstrained options to eliminate any that will not be viable. The focus at this stage is on options that would be difficult to mitigate, those with likely significant effects on European or nationally important sites, or options likely to lead to deterioration of waterbody WFD status.

Table 3.1 Coarse Screening Assessment Criteria

Criteria	Unconstrained Option Assessment Questions	
Resilience	Q1	Does the option address the supply-demand problem?
Deliverability and Flexibility	Q2	Is the option technically feasible?
	Q3	Can the risks and uncertainties associated with the option be mitigated to avoid failure of the option?
Sustainability (Environmental and Social Impacts)	Q4	Can significant impacts on known high level environmental constraints for example European/ international or nationally designated biodiversity, landscape, cultural heritage sites, WFD objectives or community assets, be avoided or minimised? If not, is mitigation likely to be possible?

Of the 273 unconstrained options, 91 were rejected after being analysed against the coarse screening criteria of resilience, deliverability and environment.

Sustainability reasons for rejecting options were identified for twenty nine options. Table 3.2 provides the options that were rejected on a sustainability basis and not considered suitable to address the deficit for the WRZs located in SAM. The full rejection register, including those options rejected for other reasons, in both the coarse and fine screening (where applicable) is provided in Annex B of the SAM Technical Report.

Table 3.2 Coarse Screening Rejection Register

Option Reference	Option Description	Rejection Reasoning
SAM-028	Increase SW abstraction from Ballingale Stream and upgrade Ferns WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible. Therefore, this option did not meet the requirements of the Deliverability and Flexibility criteria.

Option Reference	Option Description	Rejection Reasoning
SAM-010	Increase SW abstraction from River Bann (Pallis Upper) and upgrade Creagh WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAM-011	Increase SW abstraction from River Bann (Kilmichael) and upgrade Creagh WTP to supply deficit.	
SAM-012	New SW abstraction from River Owenavorrhagh and new WTP to supply deficit.	
SAM-037	Increase SW abstraction from Bakers Stream and Clody River and upgrade Carrickduff WTP to supply deficit.	
SAM-039	Increase GW abstraction and upgrade Kilmyshall WTP to partly supply deficit.	
SAM-054	Interconnect Ballindaggin and Bola Beg WTP and supply deficit.	
SAM-082	Interconnect Bree with Sow Regional WRZ for increased resilience and supply deficit.	
SAM-083	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	
SAM-091	Interconnect Ballyhogue with Sow Regional WRZ (Kilmallock Bridge WTP) and supply deficit.	
SAM-092	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	
SAM-095	Rationalise Ballyhogue to Sow Regional WRZ (Kilmallock Bridge WTP).	
SAM-096	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	
SAM-170	New GW abstraction and new WTP to supply Sow Regional deficit.	
SAM-181	Develop Ballyfarnoge well and new WTP to partly supply deficit.	
SAM-208	New GW and new WTP in Castlebridge village.	
SAM-209	Interconnect Sow Regional and Gorey and supply deficit.	
SAM-210	Increase abstraction in Gorey and interconnect with Sow regional.	

Option Reference	Option Description	Rejection Reasoning
SAM-069	Rationalise Enniscorthy to Sow Regional WRZ.	Abstracting the volume of water required is considered unfeasible. This option also requires a significant length of pipeline. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAM-070	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	
SAM-049	Interconnect Killealy with neighbouring Rathnure/Blackstairs GWS and supply deficit.	
SAM-051	Interconnect Ballindaggin with neighbouring Rathnure/Blackstairs GWS and supply deficit.	
SAM-103	Interconnect Clonroche with neighbouring Rathnure/Blackstairs GWS and supply deficit.	
SAM-126	Increase GW abstraction and new no. 3 well at Ballinellard WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAM-128	Increase SW abstraction from River Owenduff and upgrade Taylorstown WTP to partly supply deficit.	
SAM-130	Increase SW abstraction from River Sow and upgrade Killmallock Bridge WTP to partly supply deficit.	
SAM-131	Increase SW abstraction from Coolree impoundment and upgrade Newtown WTP to partly supply deficit.	
SAM-071	Interconnect Enniscorthy with Sow Regional WRZ for increased resilience and supply deficit.	
SAM-072	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	The desktop assessments undertaken indicate that increase of surface water abstraction is not feasible. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
		The plan required a significant length of the pipeline. Therefore, it was considered not feasible at coarse screening stage, due to age of water and sedimentation. Rationalisation of the WRZs individually or in smaller groups was considered in other options. This option also has yield issues. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.

3.4 Stage 5: Fine Screening

A total of 182 options passed the coarse screening stage; these options were subjected to further consideration as part of a multi-criteria assessment (MCA) at the fine screening stage.

The objective of the MCA and the fine screening process is to determine the potential benefits and impacts of the options across a range of key criteria. The MCA process allows a combination of issues to be considered together. This process can help indicate if one option will be overall more cost effective, environmentally sustainable, progressible, resilient or feasible when compared with other options. This

process requires a desk-based analysis of the options and their potential benefits and impacts against the key criteria.

The environmental criteria are based on the SEA objectives in the form of screening questions. These questions have been developed to allow the performance of each option to be assessed against the SEA objectives. The list of questions developed to assess the environmental and social effects of the options and guidance on the MCA scoring for the fine screening is provided in the SEA Environmental Report Appendix B.

Summaries of the environmental assessment for options that passed the fine screening stage are grouped by option type and are included in Appendix A. These summaries combine the assessments against individual criteria to give an overall environmental topic score; this overall score is based on the worst score across each of the topic's criteria.

This is a high-level risk based assessment intended to support a comparison of options. Likely beneficial effects are represented by positive scores and likely adverse effects are represented by negative scores based on a seven-point scale.

No further options were rejected at fine screening in SAM.

3.5 Stage 6: Feasible Options List

A total of 182 options were included as feasible options and were taken forward for Approach Development. The next step was to use the information collected for the fine screening assessment to inform the development of approaches to resolve the SDB deficit within each WRZ and across the study area.

Details of the feasible options identified for this study area, and the Preferred Approach selected, are provided in the SAM Technical Report.

4

Environmental Assessment – Approach Development

4 Environmental Assessment – Approach Development

This chapter describes how the SEA was integrated into the development of potential approaches/combinations for meeting the SDB deficit at the WRZ level, then at the study area level, and how alternative approaches were considered and assessed.

4.1 Introduction to Approach Development

After the feasible options for the study area were identified the next step was to assess a range of possible SA combinations to resolve the supply deficit within each WRZ and across the study area as a whole. This chapter addresses Stage 7 in the assessment methodology.

An SA combination is a way of configuring an option, or options, to meet either an SDB deficit or water quality requirements. As set out in the Framework Plan, Uisce Éireann considers six SA approaches, which are the combinations rated as the best within the six categories summarised in Table 4.1. This process contributes to assessment of alternatives to meet plan objectives. Consideration of reasonable alternatives is an important part of meeting SEA regulatory requirements.

Table 4.1 The Six SA Approaches

SA Approaches Tested	Description	Policy Driver
Least Cost (LCo)	Lowest Net Present Value (NPV) cost in terms of Capital, Operational, Environmental and Social, and Carbon Costs	Public Spending Code
Best Appropriate Assessment (Best AA) (BA)	Lowest score against the European Sites (Biodiversity) sub criteria question based on assessing the option as having either no LSEs, LSEs that can be addressed with general/standard mitigation measures or LSEs that may be more difficult to mitigate. For options scoring -3, potential alternative higher scoring options are sought where possible.	Habitats Directive
Quickest Delivery (QD)	Based on an estimate of the time taken to bring an option into operation (including typical feasibility, consent, construction and commissioning durations) as identified at Fine Screening. This is particularly relevant where an option might be required to address an urgent Public Health issue (potential benefit for SEA Objective on population and public health).	Statutory Obligations under the Water Supply Act and Drinking Water Regulations
Best Environmental (BE)	This is the option or combination of options with the highest total score across the SEA objective criteria MCA questions. In addition, high risk -3 issues are considered against individual criteria focusing on long term operational effects.	SEA Directive and WFD
Most Resilient (MR)	This is the option or combination of options with the highest total score against the resilience criteria. (Link	National Adaptation Plan

SA Approaches Tested	Description	Policy Driver
	to SEA Objective for climate change adaptation for environment)	
Lowest Carbon (LC)	This is the option or combination of options with the lowest embodied and operational carbon cost	Climate Change Strategy

These six SA approaches focus on different plan or environmental objectives. Three of the six SA approaches address environmental objectives;

- Best AA;
- Best Environmental; and
- Lowest Carbon approaches.

These are all focused on environmental criteria and are based on the environmental information and scoring undertaken for the MCA.

4.2 Stage 7: Approach Development Process

There are three stages in the Approach Development Process, these are summarised below and provided in more detail in section 7 of the RWRP-SE:

The **First Stage** is the Approach Appraisal at WRZ level. This stage assesses the feasible options for each WRZ and identifies the best performing option within each of the six Approach Types for the relevant WRZ. For example, the option or combination of options that would be classified as the Lowest Carbon Approach, would be that with the lowest carbon cost, based on comparative outline design. The best performing options within each Approach Category are then compared against one another using the 7-step process outlined in Figure 4.1. This process develops an initial Preferred Approach at WRZ level for all of the individual WRZs in the study area (the "WRZ Level Preferred Approach").

For the Best AA Approach, the scoring on the European Sites (Biodiversity) sub-criteria question refers to the possibility for Likely Significant Effects (LSEs). A Score of 0 equates to no LSEs. If an option is identified that meets the "Objectives of the Plan" and is assessed as having no potential impact on a European Site (zero or neutral score based on desktop assessment), it is automatically adopted as the Preferred Approach at WRZ level. Furthermore, because it is possible that all of the potential impacts identified at Plan level can be entirely ruled out through project level investigation and analysis or avoided through project level mitigation, options with potential for LSEs (score of -1 to -3 for biodiversity) may be progressed as the Preferred Approach. If potential impacts cannot be ruled out or avoided, then mitigation in the form of avoidance is provided for within the NWRP to protect European site(s). Should potential adverse effects on European sites be identified at the project level from a given option/Preferred Approach the NWRP will have identified other options⁵ that could be progressed at the project level if required. Therefore, no project arising from the NWRP, with Adverse Effects on Site Integrity (AESI) identified at the project stage would be implemented. Scores of -1 to -3 equates to LSEs being identified. Scores of -1 to -2 are LSEs that will not result in AESI with standard best practice project specific mitigation applied as these can be addressed with general/standard mitigation measures.

⁵ These options may not have progressed as the Preferred Approach initially as they may have scored significantly worse against other environmental, resilience or feasibility criteria (e.g. the best AA approach may identify an option that results in four times more carbon being produced or is twice as expensive).

Scores of -3 equates to LSEs that may be difficult to mitigate, but it is understood at plan level that mitigation would be achievable, noting that further project level assessments are required to confirm this.

The NIS provides more detail in the LSE and the AESI Tables: Appendices C-D. Any option with a score of -1 to -3 is taken forward to AA (Stage 2 of the AA process) and assessed within the NIS for the Regional Plan.

The **Second Stage** assesses whether there are any larger options (SA options also referred to as ‘group’ options) that might resolve deficits across multiple WRZs within a study area. Combinations are then developed using these SA options and WRZ Preferred options to create “SA Combinations”.

The **Third Stage** compiles the SA Combinations that rank highest for each of the Six Approach Types to generate SA Approaches. The WRZ Level Approach and SA Approaches are then compared against each other using the 7-Step process in Figure 4.1 to generate the SA Preferred Approach.

STEP 0 Best AA	If there is an option that meets the Objectives of the Plan, and is assessed as having no potential impact on a European Site (based on desktop assessment), it is automatically adopted as the Preferred Approach
STEP 1 Least Cost	Compare Least Cost against best AA Approach, and consider again at Step 6
STEP 2 Quickest Delivery	Compare Least Cost against Quickest Delivery Approach and develop Modified Approach if appropriate
STEP 3 Best Environmental	Compare Least Cost or Modified Approach against Best Environmental, and modify approach if appropriate
STEP 4 Most Resilient	Compare Least Cost or Modified Approach against Most Resilient
STEP 5 Least Carbon	Compare Least Cost or Modified Approach against Lowest Carbon
STEP 6 Approach Comparison	Compare output from Steps 1 to 5 against: <ul style="list-style-type: none"> • SEA required outcomes • Sectoral Adaptation Outcomes • Best AA outcomes • Public Expenditure Code Outcomes
STEP 7 Preferred Approach	Select Preferred Approach based on steps 0 to 6

Figure 4.1 The 7 Step Process

4.2.1 Environmental Assessment in the Approach Development process

Combinations of feasible options are identified to balance the water demand and predicted baseline supply and address the remaining deficit over the plan period. The Approach Development process allows Uisce Éireann to compare and optimise the options against different elements to create a range of approaches capable of meeting the deficit.

There are two strands of environmental information and assessment used in the Approach Development process. These are:

Environmental and social costs: these were based on a natural capital/ecosystems services framework and scoped to be relevant and achievable with the information available and to add to, rather than duplicate, the qualitative environmental assessment of the options. This included:

- i. Climate regulation – woodland;
- ii. Traffic impacts – opportunity cost of time due to road congestion from roadworks;
- iii. Food – crops and livestock; and
- iv. Carbon equivalent emissions tonnes (note total greenhouse gas emissions are expressed in terms of carbon equivalent emissions) including embodied and operational carbon were also calculated and costed.

The approach for calculating the elements i, ii, iii and iv are explained in the SEA Environmental Report Appendix E.

Carbon emissions (tCO₂e) and carbon costs are calculated alongside construction and operational costs. As part of the environmental assessment carbon efficiency has also been calculated to identify carbon emissions per ML of water supply.

Environmental assessment: this is qualitative assessment against the SEA objective for each option as part of the MCA scoring for the fine screening. These scores are based on assessing options in terms of potential adverse or beneficial effects and a seven-point scale is used from Major, Moderate or Minor Adverse, Neutral, to Minor, Moderate or Major Beneficial. These are reflected in numeric scores -3 to 0 to +3 and are used to assess option performance against the MCA scores. The scoring applied at fine screening is reviewed and updated based on the developed option descriptions and additional environmental analysis.

Carbon emissions (tCO₂e) were initially assessed through qualitative assessment for fine screening as this preceded option costing, however in the approach development process the carbon emissions as total Net Present Value (NPV) costs have been used to inform the Approach Development Process. Total life- time carbon emissions and carbon efficiency per ML have been used to inform the SEA assessment.

The general process is illustrated in Figure 4.2 below.

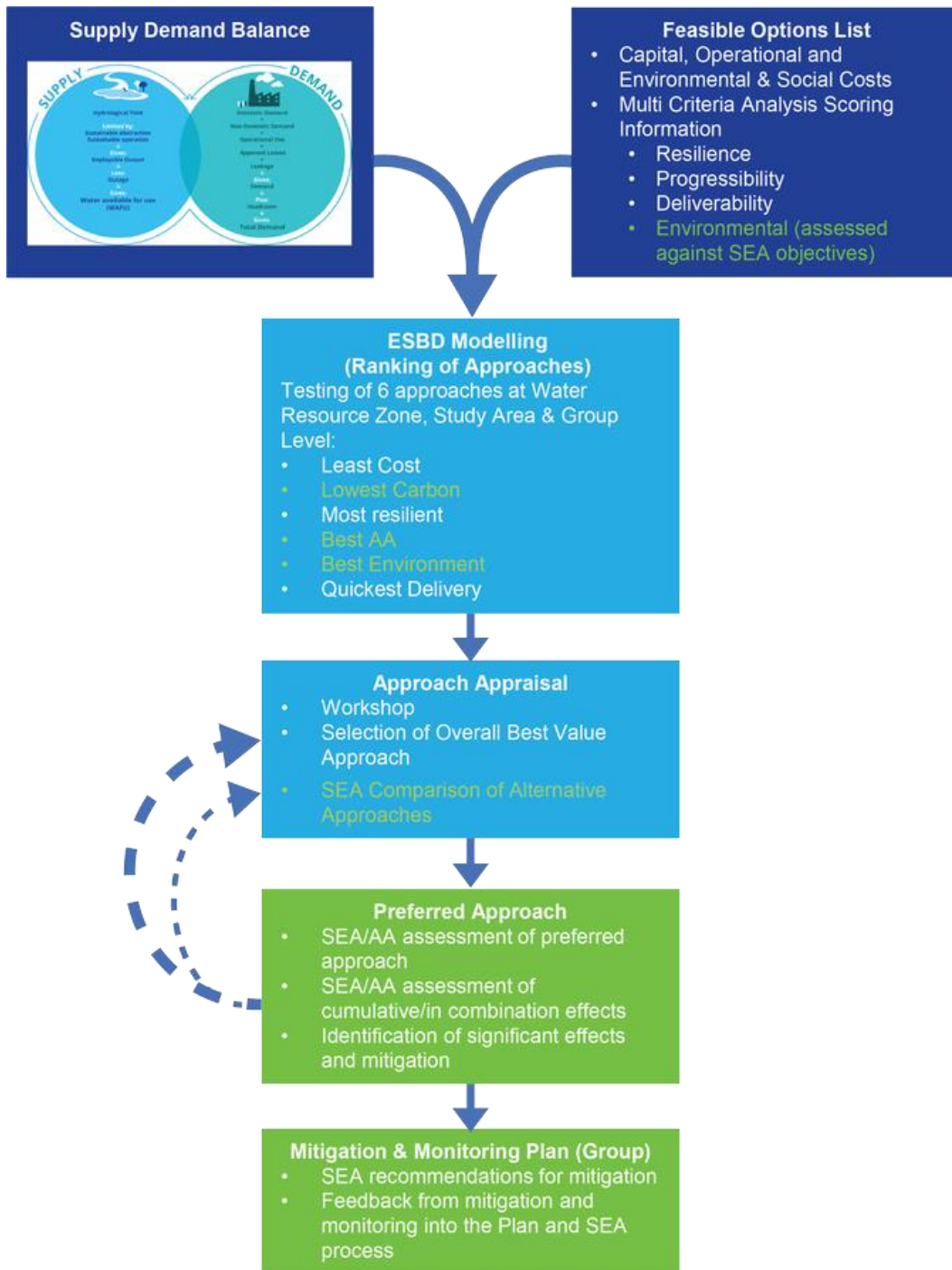


Figure 4.2 Approach Development Process

4.2.2 SAM Approach Development Process

The approach assessment process was undertaken through structured workshops and reviews involving relevant environmental expertise (including ecologists, hydrogeologists, hydrologists and environmental scientists) and included Local Authority involvement and feedback. This process was supported by information on the feasible options; including the environmental assessment against SEA criteria in the MCA and the option costings. The options were then taken through the sequential testing (the 7 step process detailed in section 4.2, Figure 4.1 above) against the six SA categories (lowest carbon, best environmental, best AA, least cost, quickest delivery and most resilient) to identify the best overall options and combinations at WRZ and study area levels applying the three stages:

Stage 1 - comparing WRZ options and identify the preferred WRZ level approach. For SAM there are 39 WRZ options and these are listed in Table 5.2 in the SAM Technical Report, providing option reference

numbers and the relevant WRZ. These options were taken through the 7 step process to identify the preferred WRZ approach.

Stage 2 - creating combinations of WRZ options and SA options (group options) for comparison. These are the possible SA combinations and are presented and ranked against the approach categories (see Table 4.4).

Stage 3 - selecting the Preferred Approach at study area level – this stage compares the WRZ level preferred approach and the SA combinations to determine the Preferred Approach that provides the best outcome for the study area. The best performing SA combinations under each of the six approach categories are identified and then compared using the 7 step process applied in the workshop to establish the Preferred Approach at study area level.

Performance ranking against the assessment criteria was based on the MCA scoring, including the fine screening environmental assessments, and costings. Further environmental assessment has also been undertaken to compare the alternative approaches in line with SEA requirements and this assessment is presented in Table 4.7 and Table 4.9 below.

For SAM, a total of 42 combinations were compared, including the WRZ Level Approach. These are presented in Table 4.2. Note that the Preferred Approach selected at the end of the process has been outlined in red throughout this section.

Table 4.2 SAM Summary of SA Combination of Performance against Approach Category

Category	WRZ Level Approach	SA Combination 1	SA Combination 2	SA Combination 3	SA Combination 4	SA Combination 5	SA Combination 6	SA Combination 7	SA Combination 8	SA Combination 9	SA Combination 10	SA Combination 11	SA Combination 12	SA Combination 13	SA Combination 14	SA Combination 15	SA Combination 16	SA Combination 17	SA Combination 18	SA Combination 19	SA Combination 20	SA Combination 21	SA Combination 22	SA Combination 23	SA Combination 24	SA Combination 25	SA Combination 26	SA Combination 27	SA Combination 28	SA Combination 29	SA Combination 30	SA Combination 31	SA Combination 32	SA Combination 33	SA Combination 34	SA Combination 35	SA Combination 36	SA Combination 37	SA Combination 38	SA Combination 39	SA Combination 40	SA Combination 41	
Least Cost		Best*																																									
Quickest Delivery					Best																																						
Number of -3 Biodiversity Scores	One -3	One -3	Three -3s	Two -3s	One -3	One -3	One -3	One -3	One -3	One -3	No -3s	One -3	One -3	One -3	One -3	One -3	One -3	One -3	One -3	Two -3s	Two -3s	One -3	Two -3s	One -3	Two -3s	Two -3s	One -3	One -3	One -3	One -3	One -3	One -3	One -3	One -3	No -3s	No -3s	One -3	One -3	One -3	One -3	One -3	No -3s	
Lowest Carbon																																											
Most Resilient																																											
Best Environmental										Worst									Worst																								Best**

Key																				
Ranked order (best to worst)	Best																			Worst

*Combination 1 is within 5% of the least cost combination and is the most resilient, best environmental and is similar in carbon compared to the other 22 combination that are within 5% of the least cost. Therefore combination 1 has been selected as the least cost approach.

**Combination 41 has the best environmental score of all the combinations that have no -3 biodiversity scores (no higher risk options that could impact on European sites). Therefore, it was selected as the best environmental approach.

Through comparing the potential SA combinations, the best SA approach for each of the six approach categories was identified (also see section 5 of the Study Area Technical Report); these aligned as three approaches (see Table 4.3).

Table 4.3 Study Area Approach Categories

Category	SA Approach 1 (SA Combination 1) (SA Options 1, 47, 75 and 76)	SA Approach 2 (SA Combination 4) (SA Options 2, 7, 32, 47, 49, 75)	SA Approach 3 (SA Combination 41) (SA Option 1, 47 and 81)
Least cost (LCo)	✓	-	-
Quickest Delivery (QD)	-	✓	-
Best Environmental (BE)	-	-	✓
Most Resilient (MR)	-	-	✓
Lowest Carbon (LC)	-	-	✓
Best AA (BA)	-	-	✓

The WRZ options and SA options (group options) that make up each SA approach are listed in Table 4.4. More detailed descriptions of the options are provided in Appendix A and a full list of options for each approach is given in Appendix B of this report.

Table 4.4 Study Area Approaches

Options included	Do Minimum	Least Cost Approach (SA Combination 1)	Best Appropriate Assessment Approach (SA Combination 41)	Quickest Delivery Approach (SA Combination 4)	Best Environmental Approach (SA Combination 41)	Most Resilient Approach (SA Combination 41)	Lowest Carbon Approach (SA Combination 41)
SA options (Group options)	No options	SA option 1: 004	SA option 1: 004	SA option 2: 005	SA option 1: 004	SA option 1: 004	SA option 1: 004
		SA option 47: 140	SA option 47: 140	SA option 7: 021, 022, 233	SA option 47: 140	SA option 47: 140	SA option 47: 140
		SA option 75: 224, 225	SA option 81: 278, 279, 280, 281, 282,	SA option 32: 093, 094	SA option 81: 278, 279, 280, 281, 282,	SA option 81: 278, 279, 280, 281, 282,	SA option 81: 278, 279, 280, 281, 282,
		SA option 76: 226, 227, 228, 229, 230	283, 284, 285, 286, 287, 288, 289, 312	SA option 47: 140	283, 284, 285, 286, 287, 288, 289, 312	283, 284, 285, 286, 287, 288, 289, 312	283, 284, 285, 286, 287, 288, 289, 312
				SA option 49: 145			

Options included	Do Minimum	Least Cost Approach (SA Combination 1)	Best Appropriate Assessment Approach (SA Combination 41)	Quickest Delivery Approach (SA Combination 4)	Best Environmental Approach (SA Combination 41)	Most Resilient Approach (SA Combination 41)	Lowest Carbon Approach (SA Combination 41)
				SA option 75: 224, 225			
WRZ options	No options	017 029 036 044 050 061 073 100 105 108 127 141 144 146 148 149 198 207	017 029 044 050 100 105 108 141 144 146 198	036 044 050 057 061 068 073 100 105 108 118 127 141 146 148 149 198 207	017 029 044 050 100 105 108 141 144 146 198	017 029 044 050 100 105 108 141 144 146 198	017 029 044 050 100 105 108 141 144 146 198

* For the option references - all options are part of SAM e.g. SAM-017 is shown as 017 above

For the purposes of the Approach Development Process as set out in the SA Technical Report and for the purpose of the SEA comparison as set out in this Environmental Review, Uisce Éireann has only considered the options that were identified as the "best" performing options for each approach category. The identification of the approaches and 7 step process are outlined in detail in section 5 of the SAM Technical Report.

Within SAM, this resulted in three approaches being selected from the forty-two SA combinations identified in Table 4.2, as they were identified as the best performing against the six approach categories - Least Cost, Best Environmental, Quickest Delivery, Most Resilient, Best AA and Lowest Carbon. This means that when comparing the three identified approaches against each other (representing the Stage 3 analysis for the selection of the Preferred Approach used in the workshop - see Table 4.5), their relative performance against categories they were not identified as "best" in in Table 4.2 may be different. This because Table 4.2 compares all of the combinations to give a wider ranking,

whereas Table 4.5 only compares the best performing combinations that have been selected as approaches. For example, an option identified as the "worst" performer against a particular approach category in Table 4.5 may not be the overall worst performing option when considered alongside all of the combinations in Table 4.2.

Table 4.5 includes a summary of the MCA scoring and cost comparison used in the approach development for the each of the SA approaches identified as performing best against at least one of the approach categories.

The three stages identified above were applied through a final workshop with all of the background MCA and option costing information available for each option and the ranking from the Economic Balance of Supply and Demand (EBS) tool.

Table 4.5 Summary of the MCA Scoring Costing for the SA Approaches

Category Criteria	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)
Least Cost Score	Best	Worst	
Quickest Delivery Score		Best	Worst
Best AA Score	One -3 Biodiversity Score	One -3 Biodiversity Score	No -3 Biodiversity Scores
Lowest Carbon Score		Worst	Best
Most Resilient Score		Worst	Best
Best Environmental Score		Worst	Best

Key		
Ranked order (best to worst) within the three selected approaches		
Worst		Best

4.3 Comparison of SAM Approaches

An overall summary of the infrastructure components and abstractions for each of the SA approaches identified for SAM is provided below in Table 4.6 and has been used to inform the environmental assessment.

Table 4.6 Study Area Approach Components Summary

Infrastructure Summary	Do Minimum	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)
New pipeline network (km)	0	99	94	157
New WTPs	0	4	5	1
Upgrade WTPs	0	22	28	15

Infrastructure Summary	Do Minimum	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)
New / upgraded abstractions	0	15	19	6
WTPs decommissioned	0	9	5	16
Abstractions abandoned	0	9	5	19
Raw Water Storage	0	0	0	0
Treated Water Storage	0	14	13	19

A comparative assessment of the three SA approaches based on the environmental option scores is summarised in Table 4.7 below. This covers:

- Scores across the options summed for all the sub-criteria against each SEA objective topic heading;
- Total numbers of -3 scores representing higher risk of effect, or likely greater requirement for mitigation, against each SEA objective topic heading; and
- Indication of the extent of difference in performance across the options to help identify if the differences between the SA approaches are small or large.

Table 4.7 Study Area Approach Comparison Summary

Topic	Total No. of	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)	Range (Difference between Lowest and Highest Score)
Population, health, economy and recreation	-3 scores	No Difference			0
	MCA score	Yellow	Worst	Best	17
Water Environment: quality and resources	-3 scores	Yellow	Worst	Best	8
	MCA score	Yellow	Worst	Best	25
Biodiversity, Flora and Fauna	-3 scores	Worst	Worst	Best	1
	MCA score	Yellow	Worst	Best	65
Material Assets	-3 scores	Best	Worst	Worst	1

Topic	Total No. of	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)	Range (Difference between Lowest and Highest Score)
	MCA score		Worst	Best	15
Landscape and Visual	-3 scores	No Difference			0
	MCA score		Worst	Best	9
Climate Change	-3 scores	Best	Best	Worst	1
	MCA Score		Worst	Best	5
Culture, Heritage and Archaeology	-3 scores	No Difference			0
	MCA Score	Worst	Best		3
Geology and Soils	-3 scores	No Difference			0
	MCA Score	No Difference			0

Key

MCA/No. of -3 scores against each criterion			
<table border="1"> <tr> <td>Worst</td> <td></td> <td>Best</td> </tr> </table>	Worst		Best
Worst		Best	

*approaches are showing similar level of risk on climate change adaptation and therefore represented as no difference. However, carbon mitigation is covered separately based on estimated emissions and carbon cost (NPV). See lowest carbon approach.

** approaches are showing similar level of risk on culture, heritage and archaeology. Routing and siting is only indicative at this stage. Most options involving new construction include a level of risk to buried unknown archaeology, this would need to be investigated further at the project level.

4.3.1 SA Approach 1 (SA Combination 1) (LCo)

SA approach 1, key comparison points:

- Identified as the best in the Least Cost category;
- Option types included:

- SA option (group options): 2 groundwater abstraction and rationalisation options, and 2 surface water abstraction and rationalisation options;
- WRZ options: 13 groundwater abstraction options and 5 WTP upgrade options;
- One -3 biodiversity score associated with SAM-036 as Slaney River Valley SAC is in the Zone of Contribution (ZOC); and
- The key differences for SA approach 1 in terms of infrastructure development are that it requires the highest number of new WTPs (same number as SA approach 2).

4.3.2 SA Approach 2 (SA Combination 4) (QD)

SA approach 2, key comparison points:

- Identified as the best in the Quickest Delivery category;
- Option types included:
 - SA options (group options): 2 groundwater abstractions and interconnection options, 2 groundwater abstraction and rationalisation options, and 2 surface water abstraction and rationalisation options;
 - WRZ options: 13 groundwater abstraction options, 1 surface water abstraction option and 4 WTP upgrade options;
- One -3 biodiversity score associated with SAM-036 as Slaney River Valley SAC is in the ZOC; and
- The key differences for SA approach 2 in terms of infrastructure development are that it requires:
 - The shortest length of pipeline;
 - The highest number of new WTPs (same number as SA approach 1);
 - The highest number of WTP upgrades;
 - The highest number of new/upgraded abstractions;
 - The lowest number of WTPs decommissioned and abstractions abandoned; and
 - The lowest number of treated water storages.

4.3.3 SA Approach 3 (SA Combination 41) (BA, LC, MR, BE)

SA approach 3, key comparison points:

- Identified as the best in the following categories: Best AA, Lowest Carbon, Most Resilient and Best Environmental;
- Option types included:
 - SA options (group options): 1 transfer option, 1 groundwater abstraction and rationalisation option, and 1 surface water abstraction and rationalisation option;
 - WRZ options: 7 groundwater abstraction options, and 4 WTP upgrade options;
- No -3 biodiversity scores (so no higher risk options that could impact on European sites); and
- The key differences for SA approach 3 in terms of infrastructure development are that it requires:
 - The longest length of pipeline;
 - The lowest number of new WTPs;
 - The lowest number of WTP upgrades;
 - The lowest number of new/upgraded abstractions;
 - The highest number of WTPs decommissioned and abstractions abandoned; and
 - The highest number of treated water storages.

4.4 SAM Approach Assessment Comparison

The 'Do Minimum' approach is the 'without plan' approach, meaning that this is the approach that would occur without the NWRP. As a result, the 'Do Minimum' approach would only include reactive, unplanned interim measures to address failures in infrastructure.

The SDB shows a current deficit, applying the level of service in the area with the corresponding requirements for reserves, indicating operation of supplies with an SDB ranging from -13,830 m³/d in 2019 during normal conditions, to a projected maximum of -18,524 m³/d in 2044 during dry conditions under a 'Do Minimum' scenario. As a result, public water supplies in this area are vulnerable, particularly under drought conditions. In addition, there may be ongoing reliability issues with the supplies and the situation is expected to further deteriorate due to climate change driven reductions in water resources and increased demand growth within the area. Table 4.8 shows the SDB for the WRZs in SAM.

Table 4.8 Supply Demand Balance for SAM

WRZ Name	WRZ Code	Population	Maximum Deficit m ³ /day*	
			2019	2044
Ballingate Public Supply	3400SC0053	8	-1	-2
Ballynavortha Public Supply	3400SC0045	8	-2	-2
Raheengraney Public Supply	3400SC0013	8	No Deficit	No Deficit
Coolboy Coolafancy Public Supply	3400SC0010	492	No Deficit	No Deficit
Wexford Town	3300SC0081	21,790	-4,372	-6,713
Sow Regional	3300SC0080	11,774	-1,141	-1,624
South Regional	3300SC0079	10,492	-2,069	-2,534
Fardystown	3300SC0078	15,604	-2,727	-3,377
Bree	3300SC0077	363	-175	-188
Raheen	3300SC0066	15	No Deficit	No Deficit
Ballyhogue	3300SC0032	359	-35	-47
Woodview Drive Adamstown	3300SC0027	98	-13	-16
Enniscorthy	3300SC0023	11,758	-1,794	-2,324
Carrickbyrne	3300SC0022	927	-305	-334
Coolgreany	3300SC0020	1,052	-4	-37
Glynn	3300SC0017	191	-42	-48
Davidstown	3300SC0015	97	No Deficit	No Deficit
Monagear	3300SC0014	194	-43	-49
Clonroche	3300SC0013	532	-74	-95
Kiltealy	3300SC0012	232	-62	-70
Ballindaggin	3300SC0011	201	-56	-61

WRZ Name	WRZ Code	Population	Maximum Deficit m ³ /day*	
			2019	2044
Marshalstown	3300SC0010	89	No Deficit	No Deficit
Bunclody	3300SC0004	2,126	-690	-732
Ferns Regional	3300SC0003	1,700	-224	-271
Camolin	3300SC0002	326	No Deficit	No Deficit
Gorey	3300SC0001	20,208	No Deficit	No Deficit

*Based on the Dry Year Critical Period (DYCP) weather event planning scenario

An overall assessment and comparison of the SA approaches considered along with the 'Do Minimum' approach (a continuation of the current situation) is provided in Table 4.9 below.

Table 4.9 Assessment of the SA Approaches and the 'Do Minimum' Approach

SEA Objectives	Phase (Construction (C) / Operation (O))	Do Minimum	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)
1. Protect public health and promote wellbeing	C	0	--	--	-
	O	---	++	++	++
2. Protect and enhance biodiversity and contribute to resilient ecosystems	C	0	--	--	-
	O	--	--	--	-
3. To protect landscapes, townscapes and visual amenity	C	0	--	--	-
	O	0	+	+	++
4. Protect and where appropriate enhance, built and natural assets and reduce waste	C	0	--	--	--
	O	-	--	--	--
5. Reduce greenhouse gas emissions	C	0	--	--	-
	O	-	--	--	-
6. Contribute to environmental climate change resilience	C	0	-	-	0
	O	--	-	-	0
7. Protect and improve surface water and groundwater status	C	0	0	0	0
	O	--	--	--	-
8. Avoid flood risk	C	0	-	-	-
	O	0	0	0	0

SEA Objectives	Phase (Construction (C) / Operation (O))	Do Minimum	SA Approach 1 (LCo) (SA Combination 1)	SA Approach 2 (QD) (SA Combination 4)	SA Approach 3 (BA, LC, MR, BE) (SA Combination 41)
9. Protect and where appropriate, enhance cultural heritage assets	C	0	--	-	--
	O	0	0	0	0
10. Protect quality and function of soils	C	0	-	-	-
	O	0	0	0	0

Key			
Major beneficial	+++	Minor adverse	-
Moderate beneficial	++	Moderate adverse	--
Minor beneficial	+	Major adverse	---
Neutral	0		

The overall assessment of the approaches against the SEA objectives indicates that SA approach 3 is likely to have less adverse impact during construction against public health and wellbeing as this approach does not require as many new WTPs or a new WTP in an urban area. However, SA approach 3 requires a significantly longer length of pipeline which could also result in disturbance and nuisance effects during construction through dust, noise and traffic.

SA approach 3 is likely to have less adverse impacts against biodiversity and water as it does not include the -3 biodiversity score associated with option 36 and there are fewer higher risk abstractions required due to the use of rationalisation. As SA approach 3 is a rationalisation focussed approach it requires fewer new abstractions than the other approaches and uses a connection to a larger and more resilient source (New Shannon Source). SA approach 3 is likely to have less adverse impacts during construction and more beneficial impacts during operation for landscape as fewer new WTPs are required and more WTPs would be decommissioned. However, because SA approach 3 is reliant on the New Shannon Source transfer (Eastern and Midlands region) it has a longer lead time before becoming operational; meaning SA approach 3 cannot meet the pressing shorter term needs in SAM.

SA approaches 1 and 2 can both meet water supply needs in the shorter term. SA approach 2 performs worse than SA approach 1 for environmental objectives; including in terms of fewer benefits from abandoned abstractions and higher carbon. However, it is likely to have less adverse impacts against cultural heritage as it does not require new above ground infrastructure on NIAH/SMR sites.

Mitigation for the Preferred Approach is taken into account in the individual options assessments presented in chapter 5, identified in chapter 6 in terms of cumulative assessment and in chapter 7 for the SEA summary. All the approaches address the identified water supply quantity and quality requirements to secure a level of service important for public health and wellbeing compared with the deficits and risk remaining with the 'Do Minimum' approach.

4.4.1 Selection of the SA Preferred Approach

Development in many of the WRZs in SAM is currently constrained by capacity limitations in Uisce Éireann's existing supply system. Ten of the twenty-six WRZs have limited connection capacity and one WRZ, Enniscorthy Town, has no capacity for new connections. SA approach 1 uses new groundwater sources in the local area and does not have the significant lead time associated with SA approach 3. SA approach 3 is reliant on the New Shannon Source transfer (Eastern and Midlands region) and has a long lead time associated with it before it can become operational; meaning it cannot meet the pressing shorter term needs in SAM. This makes SA approach 1 the more preferable approach overall as it allows Uisce Éireann to meet the shorter term needs in the study area (compared to SA approach 3) whilst providing a significantly better outcome under the environmental and carbon criteria compared to the quickest delivery approach (SA approach 2).

SA Approach 1 has been selected as the solution that is best able to address this pressing need across the study area. The solution proposes to address almost 90% of the 2044 Deficit in the study area with increased or new groundwater abstractions that will serve fourteen WRZs. Surface water availability is limited in the south-east of Ireland, however, an increased surface water abstraction from the River Slaney will address the critical need in the Enniscorthy Town WRZ and will also supply growth in Marshalstown, Glynn, Ballyhogue and Bree. Groundwater investigations will be carried out to determine available yield in the area. If it is found that the groundwater sources cannot provide the required yield then SA approach 3 will be brought forward as the second best alternative.

SA approach 1 has been selected as the best approach through the 7 step process and consideration of the specific study area needs in the shorter term. The SA Preferred Approach includes one -3 Biodiversity score for SAM-036. For options identified as having some level of risk for LSEs, mitigation measures to address these are set out in the NIS. No AESI have been identified for the SAM SA Preferred Approach.

5

**SAM Preferred
Approach:
Strategic
Environmental
Assessment**

5 SAM Preferred Approach Strategic Environmental Assessment

5.1 SAM Preferred Approach Options

This chapter provides an environmental assessment of the proposed SA Preferred Approach as required by the SEA Directive and implementing Irish regulations. The environmental effects are considered for each option individually. Additional measures proposed to be taken forward along with these options are also considered. Cumulative effects for both the 'within plan' SA Preferred Approach and the cumulative effects with other proposed developments outside the Framework Plan are addressed in chapter 6.

The SA Preferred Approach consists of WRZ options for seventeen of the WRZs in the study area. This reflects the small scale of the supplies and difficulties in transporting small volumes of water over long distances for these WRZs. Four SA options cover the remaining nine WRZs.

SA option 1 (SAM-004) rationalises the Coolgreaney WRZ to the Arklow WRZ (study area 1 – Eastern and Midland region). SA option 47 (SAM-140) rationalises the Ballingate WRZ to the Tinahely WRZ (study area 1 – Eastern and Midland region). SA option 75 (SAM-224 and 225) requires a new groundwater abstraction, new WTP and interconnects Carrigbyrne WRZ with the South Regional WRZ. SA option 76 (SAM-226, 227, 228, 229 and 230) increases the surface water abstraction from the River Slaney, upgrades Vinegar Hill WTP and rationalises Bree, Ballyhogue, Glynn WS and Marshalstown to Enniscorthy WRZ. The SA Preferred Approach for the remaining WRZs involves new and increased groundwater abstractions, upgrades and decommissions of existing WTPs.

Table 5.1 gives a breakdown of the options in SAM and the associated abstractions.

Table 5.1 Preferred Approach Breakdown

WRZ Name and Option Reference*	Option Description	Abstraction/ Demand
SAM-004 (SA Option 1) 3300SC0020 Coolgreaney WS	Rationalise Coolgreaney to Arklow WRZ (Study Area 1 - Eastern Midlands increase groundwater (GW) abstraction) <ul style="list-style-type: none"> Coolgreaney WRZ to be rationalised to Arklow WRZ. Existing GW abstraction to be decommissioned Existing GW abstraction: Inch groundwater body (GWB) WFD status 2016-2021 – Good 	679 m ³ /d
SAM-198 3300SC0001 Gorey	Upgrade Creagh WTP for water quality improvements. Rationalise Kilmuckbridge (Ballygarron) WTP to new Ballyminaunhill WTP. Rationalisation within WRZ. <ul style="list-style-type: none"> WRZ in projected surplus. Ballygarron WTP to be rationalised to Ballyminaunhill WTP Existing Ballygarron WTP GW abstraction to be decommissioned Existing GW abstractions: Inch GWB WFD status 2016-2021 – Good and Gorey GWB WFD status 2016-2021 – Good Existing SW abstractions: Bann_010 river waterbody (RWB) WFD status 2016-2021 – Good and Bann_030 RWB WFD status 2016-2021 – Good 	11,451 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAM-017 3300SC0002 Camolin WSS	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. <ul style="list-style-type: none"> WRZ in projected surplus. WTP water quality upgrade only. Existing GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	N/A
SAM-029 3300SC0003 Ferns WS	New GW abstraction and new WTP to supply deficit <ul style="list-style-type: none"> New GW abstraction and WTP to meet future deficit New GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	867 m ³ /d
SAM-036 3300SC0004 Bunclody WS	New GW abstraction and upgrade Carrickduff WTP to supply deficit <ul style="list-style-type: none"> New and increased GW abstraction to meet future deficit New GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	1,436 m ³ /d
SAM-044 3300SC0012 Kiltealy	Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit <ul style="list-style-type: none"> Increase GW abstraction to meet future deficit Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	108 m ³ /d
SAM-050 3300SC0011 Ballindaggin	Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit <ul style="list-style-type: none"> Increase GW abstraction to meet future deficit Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	144 m ³ /d
SAM-061 3300SC0014 Monageer	Increase GW abstraction and upgrade Monageer WTP to supply deficit <ul style="list-style-type: none"> Increase GW abstraction to meet future deficit Existing GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	113 m ³ /d
SAM-073 3300SC0015 Davidstown	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. <ul style="list-style-type: none"> WRZ in projected surplus. WTP water quality upgrade only. Existing GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	N/A
SAM-100 3300SC0013 Clonroche	New GW abstraction and upgrade Clonroche WTP to supply full demand <ul style="list-style-type: none"> New GW abstraction to meet future deficit New GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	370 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAM-105 3300SC0027 Woodview Drive Adamstown	Increase GW abstraction and upgrade WTP to supply deficit <ul style="list-style-type: none"> Increase GW abstraction to meet future deficit Existing GW abstraction: Adamstown GWB WFD status 2016-2021 – Good 	34 m ³ /d
SAM-108 3300SC0066 Raheen (Adamstown)	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. <ul style="list-style-type: none"> WRZ in projected surplus. WTP water quality upgrade only. Existing GW abstraction: Adamstown GWB WFD status 2016-2021 – Good 	N/A
SAM-148 3300SC0078 Fardystown	New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused boreholes back to production (GW abstraction from existing boreholes currently not in supply). <ul style="list-style-type: none"> New GW abstraction to meet future deficit Existing GW abstraction: Fardystown GWB WFD status 2016-2021 – Good New GW abstraction: Fardystown GWB WFD status 2016-2021 – Good 	13,827 m ³ /d
SAM-127 & SAM-207 3300SC0080 Sow Regional	Increase GW abstraction and upgrade WTP to partly supply deficit. New GW and new WTP to partly supply deficit. <ul style="list-style-type: none"> Increase GW abstraction, new GW abstraction and new WTP to meet future deficit. Existing GW abstractions: Curraclloe Gravels GWB WFD status 2016-2021 – Good and Castlebridge North GWB WFD status 2016-2021 – Good Existing SW abstraction: Sow_020 RWB WFD status 2016-2021 – Moderate. New GW abstraction (Castlebridge North GWB) WFD status 2016-2021 – Good 	4,970 m ³ /d
SAM-141 3400SC0045 Ballynavortha Public Supply	Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit <ul style="list-style-type: none"> Increase GW abstraction to meet future deficit Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	3 m ³ /d
SAM-144 3400SC0010 Coolboy Coolafancy Public Supply	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. <ul style="list-style-type: none"> WRZ in projected surplus, WTP water quality upgrade only. Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	N/A

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAM-146 3400SC0013 Raheengraney Public Supply	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. <ul style="list-style-type: none"> WRZ in projected surplus, WTP water quality upgrade only. Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	N/A
SAM-149 3300SC0081 Wexford Town	New GW wellfield at Adamstown and new WTP to supply deficit <ul style="list-style-type: none"> New GW abstraction and new WTP to supply future deficit New GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	11,208 m ³ /d
SAM-140 3400SC0053 (SA Option 47) Ballingate Public Supply	Ballingate Public Supply - Rationalise Ballingate to Tinahely WRZ <ul style="list-style-type: none"> WRZ to be rationalised to Tinahely WRZ Existing GW abstraction to be decommissioned Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	5 m ³ /d
SAM-224 3300SC0022 (SA Option 75) Carrigbyrne WS	Rationalise Carrigbyrne to South Regional WRZ. New GW abstraction and new WTP to supply deficit. <ul style="list-style-type: none"> WRZ to be rationalised to South Regional WRZ Existing GW abstraction to be decommissioned Existing GW abstraction: (Adamstown GWB WFD status 2016-2021 – Good 	746 m ³ /d
SAM-225 3300SC0079 (SA Option 75) South Regional	Rationalise Carrigbyrne to South Regional WRZ. New GW abstraction and new WTP to supply deficit. <ul style="list-style-type: none"> New GW abstraction and new WTP to meet future deficit New GW abstraction: Adamstown GWB WFD status 2016-2021 – Good 	7,530 m ³ /d
SAM-226 3300SC0023 (SA Option 76) Enniscorthy Town	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit. Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ. <ul style="list-style-type: none"> Increase SW abstraction to meet future deficit Existing GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good Existing SW abstraction: Slaney_170 RWB WFD status 2016-2021 – Good 	6,453 m ³ /d
SAM-227 3300SC0077 (SA Option 76) Bree	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit. Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ. <ul style="list-style-type: none"> WRZ to be rationalised to Enniscorthy WRZ Existing GW abstraction to be decommissioned 	316 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW abstraction: Enniscorthy GWB WFD status 2016-2021 – Good 	
SAM-228 3300SC0032 (SA Option 76) Ballyhogue	<p>Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit. Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.</p> <ul style="list-style-type: none"> WRZ to be rationalised to Enniscorthy WRZ Existing GW abstraction to be decommissioned Existing GW abstraction: Castlebridge North GWB WFD status 2016-2021 – Good 	109 m ³ /d
SAM-229 3300SC0017 (SA Option 76) Glynn WS	<p>Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit. Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.</p> <ul style="list-style-type: none"> WRZ to be rationalised to Enniscorthy WRZ Existing GW abstraction to be decommissioned Existing GW abstraction: Castlebridge North GWB WFD status 2016-2021 – Good 	84 m ³ /d
SAM-230 3300SC0010 (SA Option 76) Marshalstown	<p>Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit. Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.</p> <ul style="list-style-type: none"> WRZ in projected surplus deficit, however WRZ to be rationalised to Enniscorthy WRZ Existing GW abstraction to be decommissioned Existing GW abstraction: Ballyglass GWB WFD status 2016-2021 – Good 	25 m ³ /d

*SA Options are the same as Group Options

The SA Preferred Approach options are shown in Figure 5.1, in relation to key environmental designations. Note that SA option 1, 47, 75 and 76 is labelled as SAM-501, 547, 575 and 576 respectively.

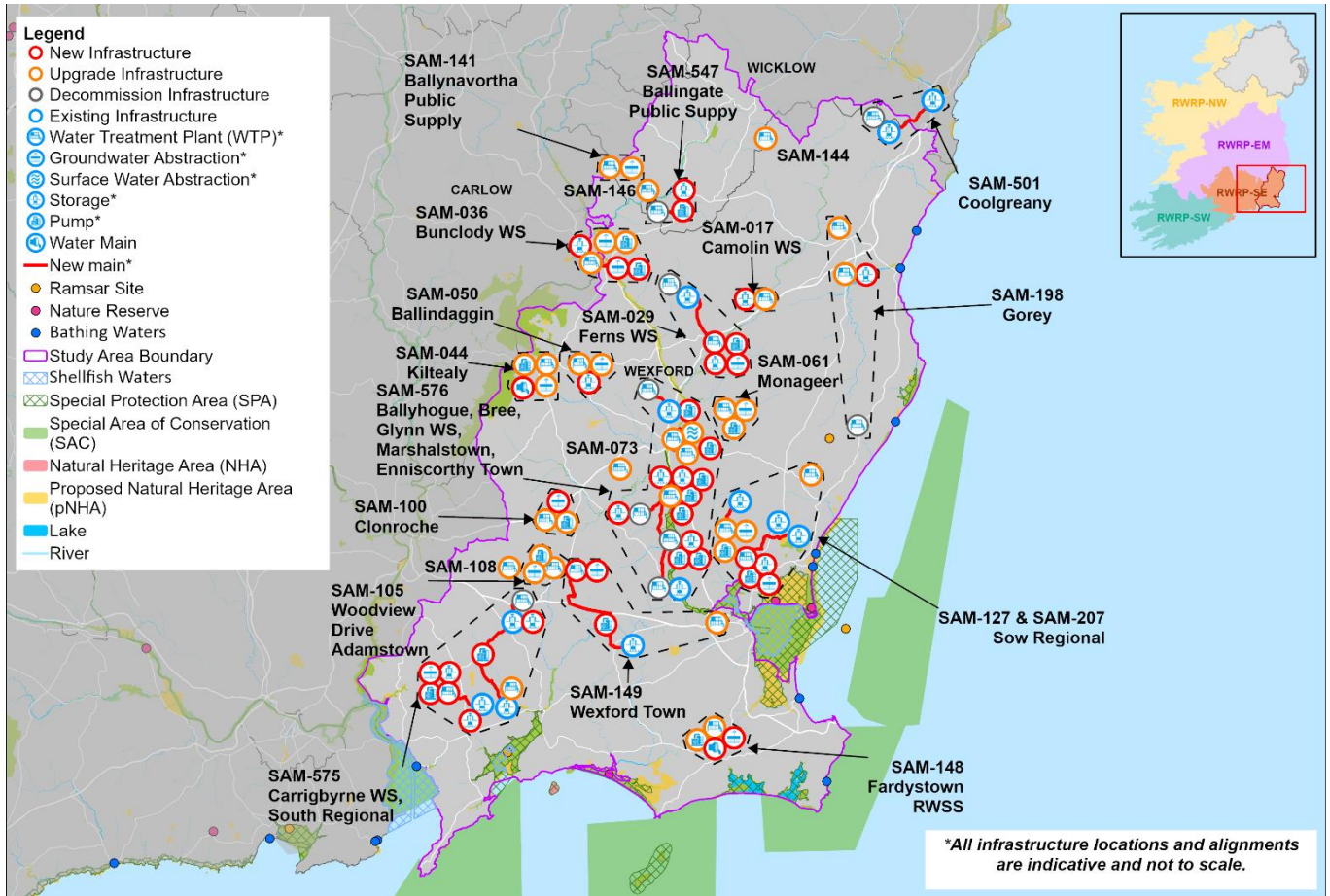


Figure 5.1 SA Preferred Approach and Key Environmental Designations

The SA Preferred Approach options have each been assessed against the SEA objectives, taking account of construction and operational phases, long term and short term, permanent and temporary, and indirect and direct impacts. Mitigation requirements to avoid or reduce effects have also been taken into consideration. Table 5.2 provides a breakdown of the infrastructural components and Table 5.3 provides an assessment summary of the options included in the SA Preferred Approach. Individual options assessments are available on request. The overall Preferred Approach assessment, including all the options combined, is summarised in Table 7.1.

Table 5.2 Component Table

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs	New / Upgraded Abstractions	WTPs Decommissioned	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SAM-017	-	-	✓	-	-	-	-	✓
SAM-029	✓	✓	-	✓	✓	✓	-	✓
SAM-036	-	✓	✓	✓	-	-	-	✓
SAM-044	✓	-	✓	✓	-	-	-	-

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs	New / Upgraded Abstractions	WTPs Decommissioned	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SAM-050	-	-	✓	✓	-	-	-	✓
SAM-061	-	-	✓	✓	-	-	-	-
SAM-073	-	-	✓	-	-	-	-	-
SAM-100	-	-	✓	✓	-	-	-	-
SAM-105	-	-	✓	✓	-	-	-	-
SAM-108	-	-	✓	-	-	-	-	-
SAM-127	✓	-	✓	✓	-	-	-	-
SAM-141	-	-	✓	✓	-	-	-	-
SAM-144	-	-	✓	-	-	-	-	-
SAM-146	-	-	✓	-	-	-	-	-
SAM-148	✓	-	✓	✓	-	-	-	-
SAM-149	✓	✓	✓	✓	-	-	-	-
SAM-198	-	-	✓	-	✓	✓	-	✓
SAM-207	✓	✓	-	✓	-	-	-	✓
SA Option 1 (SAM-004)	✓	-	-	-	✓	✓	-	-
SA Option 47 (SAM-140)	✓	-	-	-	✓	✓	-	✓
SA Option 75 (SAM-224 and 225)	✓	✓	✓	✓	✓	✓	-	✓
SA Option 76 (SAM-226, 227, 228, 229 and 230)	✓	-	✓	✓	✓	✓	-	✓

*SA Options are the same as Group Options

Table 5.3 Options Assessment Summary

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
SA Option 1 (SAM-004)	Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	Construction	--	-	-	0	0	0	0	-	-	-
		Operation	+	-	+	0	0	0	0	0	0	0
SAM-198	Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	Construction	-	-	-	-	--	0	0	-	-	-
		Operation	++	0	-	-	--	0	0	0	0	0
SAM-017	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	-	-	0	0	0	0	0	0
		Operation	+	-	0	0	0	0	0	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
SAM-029	New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	Construction	-	--	-	-	0	-	0	-	-	-
		Operation	+	-	-	-	0	-	--	0	0	0
SAM-036	New GW abstraction and upgrade Carrickduff WTP to supply deficit.	Construction	-	--	-	-	-	--	0	0	-	-
		Operation	0	-	0	0	-	--	--	0	0	0
SAM-044	Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	Construction	-	-	-	-	0	--	0	0	-	-
		Operation	+	0	0	0	0	--	--	0	0	0
SAM-050		Construction	-	-	-	-	0	--	0	0	-	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
	Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	Operation	0	0	0	0	0	--	--	0	0	0
SA Option 76 (SAM-226, 227, 228, 229 and 230)	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.	Construction	--	--	-	-	--	-	0	-	--	-
	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	Operation	+	-	++	0	--	-	-	0	0	0
SAM-061		Construction	-	-	-	-	-	--	0	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
	Increase GW abstraction and upgrade Monageer WTP to supply deficit.	Operation	0	0	0	0	-	--	--	0	0	0
SAM-073	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	0	0	0
		Operation	+	0	0	0	0	0	0	0	0	0
SAM-100	New GW abstraction and upgrade Clonroche WTP to supply full demand.	Construction	-	--	-	-	-	-	0	-	-	0
		Operation	-	0	-	-	-	-	-	0	0	0
SAM-105		Construction	-	-	0	0	0	--	0	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
	Increase GW abstraction and upgrade WTP to supply deficit.	Operation	+	0	0	0	0	--	--	0	0	0
SAM-108	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	0	0	0
		Operation	+	0	0	0	0	0	0	0	0	0
SA Option 75 (SAM-224 and 225)	Rationalise Carrigbyrne to South Regional WRZ.	Construction	-	--	-	-	-	-	0	0	-	-
	New GW abstraction and new WTP to supply deficit.	Operation	++	-	-	-	-	-	--	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
SAM-148	New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused boreholes back to production (GW abstraction from existing boreholes currently not in supply).	Construction	-	-	-	-	--	-	0	0	-	-
		Operation	+	-	-	0	--	-	--	0	0	0
SAM-207	New GW and new WTP to partly supply deficit.	Construction	--	--	-	-	-	-	0	0	-	-
		Operation	-	0	-	-	-	-	-	0	0	0
SAM-127		Construction	-	-	-	-	-	--	0	0	-	-

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
	Increase GW abstraction and upgrade WTP to partly supply deficit.	Operation	+	-	0	0	-	--	--	0	0	0
SA Option 47 (SAM-140)	Rationalise Ballingate to Tinahely WRZ (not in deficit).	Construction	-	-	-	-	0	0	0	0	0	0
		Operation	+	-	+	0	0	0	0	0	0	0
SAM-141	Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	Construction	-	-	-	-	0	--	0	0	0	0
		Operation	0	0	0	0	0	--	--	0	0	0
SAM-144	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	0	0	0
		Operation	+	0	0	0	0	0	0	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L-1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
SAM-146	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	0	0	0
		Operation	+	0	0	0	0	0	0	0	0	0
SAM-149	New GW wellfield at Adamstown and new WTP to supply deficit.	Construction	-	-	-	-	--	-	0	-	-	-
		Operation	-	0	-	-	--	-	--	0	0	0

*SA Options are the same as Group Options

**Total lifetime comparative tCO₂e categories: minor beneficial = -ve negligible/neutral = <1000 minor = 1000 to <10,000, Moderate = 10,000 to <50,000, Major = 50,000+

5.2 Additional Measures

In addition to the SA Preferred Approach supply options, Uisce Éireann is already implementing measures across the three pillars of Lose Less, Use Less and Supply Smarter to improve the level of service to their customers in this study area. These are described in the SAM Technical Report and include leakage reduction and water conservation.

5.2.1 Leakage Reduction



The leakage reduction measures across the public water supply are based on what Uisce Éireann assess to be both achievable and sustainable and include:

- Ongoing leakage management including active leakage control, pressure management, and find and fix activities to offset Natural Rate of Leakage Rise; and
- Further net leakage reductions, to move towards achieving the national SELL target by 2034, in the WRZ: Fardystown, Enniscorthy and Gorey.

5.2.2 Water Conservation



At present, Uisce Éireann is conducting pilot studies in relation to water conservation stewardship in businesses and is actively progressing water conservation messaging campaigns. During drought conditions in 2018, a Water Conservation Order was implemented, in order to protect their water supplies and reduce pressure on the natural environment during this period. Uisce Éireann will continue to promote 'Water Conservation Activities', collecting and monitoring data over a number of years to assess the benefits. As part of the Framework Plan, Uisce Éireann have not applied reductions to the SDB for unquantifiable water conservation gains. However, they do assume that any gain will offset consumer usage growth factors.

5.3 Interim Solutions

The SAM Technical Report identifies potential interim solutions that allow shorter term interventions to be identified and prioritised, when needed. These are expected to be small scale, within site works and are not likely to give rise to significant environmental effects. However, they would need to be subject to relevant assessments, including AA screening as and when they are required.

5.4 Approach Uncertainty and Adaptability

A summary of the adaptability criteria and sensitivity analysis Uisce Éireann have undertaken for the SAM Preferred Approach is provided in the SAM Technical Report. A high-level assessment of what this could mean for the SEA is shown in Table 5.4.

Table 5.4 SAM Sensitivity Analysis and Environmental Impacts

Uncertainty	Likelihood	Increase (+) / Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
Sustainability	Moderate/High (as Uisce Éireann's current)	+6,000 m ³ /d	The impact of sustainability reductions would reduce the volumes that can be abstracted from our existing sources therefore increasing the SDB deficit. There are some

Uncertainty	Likelihood	Increase (+) / Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
	<p>abstractions are large compared to the waterbodies from which they abstract)</p>		<p>surface water sources in SAM that would be impacted through sustainability reductions. However, the Preferred Approach is designed to relieve pressure on these sources by supplementing from more resilient groundwater and surface water sources. This includes developing new groundwater supplies and increasing the abstraction from the River Slaney at Enniscorthy WRZ.</p> <p>Groundwater sustainability is more difficult to assess at desktop level, however, as the abstractions in SAM are small in scale any impacts are likely to be minimal.</p> <p>The SA Preferred Approach addresses reductions and Uisce Éireann will decommission the River Currlane source that could be impacted through sustainability reductions. However, additional sustainability reductions could increase pressure for additional supply from outside the study area.</p>
Climate Change	<p>High (international climate change targets have not been met)</p>	<p>+700 m³/d</p>	<p>Higher climate change scenarios would impact Uisce Éireann's existing supplies and result in decreased water availability at certain times of year. Although the likelihood of this scenario is high based on climate change adaptation to date, potential impacts may be mitigated against by optimising Uisce Éireann's operations on a more environmentally sustainable basis across the range of supplies.</p> <p>Within SAM, nine surface water abstractions would be vulnerable to increased climate change impact scenarios. One of these (River Currlane) is to be decommissioned as part of the Preferred Approach.</p> <p>Regarding the existing and proposed new groundwater abstractions, there is more difficulty and uncertainty in assessing increased climate change impacts. However, it is generally understood that groundwater will be more resilient than surface water sources.</p> <p>Although the Preferred Approach provides more operational flexibility to use less sensitive water sources, this could still result in more pressure on sources.</p>
Demand Growth		<p>-18,524 m³/d</p>	<p>The impact of lower than expected growth would reduce the SDB deficit and the overall need requirement. The SDB deficit spreads across nineteen of the twenty six WRZs in</p>

Uncertainty	Likelihood	Increase (+) / Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
	Low/Moderate (growth has been based on policy)		<p>the area. This is driven by quality as well as quantity issues. In this rural area, growth is relatively low.</p> <p>This could allow lower than expected energy and carbon costs and lower increased abstraction requirements</p>
Leakage Targets	Low (Uisce Éireann is focused on sustainability and aggressive leakage reduction)	+238 m ³ /d	<p>The impact of lower than expected leakage savings would increase the SDB deficit and the overall need requirement. Due to the length and condition of Uisce Éireann's networks, Uisce Éireann could potentially fail to achieve target leakage reductions within the timeframes set out. However, as Uisce Éireann is committed to achieving leakage reductions, the likely scenario would be an extension in the period of time taken to achieve leakage targets as opposed to accepting lower targets.</p> <p>This could increase carbon and the effects of abstraction pressure on the environment.</p>
	Moderate/High (Uisce Éireann is focused on sustainability and aggressive leakage reduction)	-5,241 m ³ /d	<p>Increased leakage savings beyond SELL would reduce the SDB deficit and the overall need requirement. The need drivers span across the WRZs in SAM and are driven by quality as well as availability issues.</p> <p>This could allow lower than expected energy and carbon emissions and lower increased abstraction requirements.</p>

6

SEA Cumulative Effects for SAM Preferred Approach

6 SEA Cumulative Effects for SAM Preferred Approach

Secondary, cumulative and the synergistic nature of the effects of the SAM Preferred Approach proposals are required to be considered as part of SEA. These include:

- 'Within plan' or 'in-combination' effects; and
- Interaction with other plans and programmes.

Cumulative effects are also considered for the proposals across the three study areas within the South East Region and reported in the SEA Environmental Report of the Regional Plan. Further consideration of any inter regional cumulative effects will be addressed in each Regional Plan SEA sequentially.

6.1 Cumulative Effects 'Within Plan' for SAM

The potential 'within plan' cumulative effects for SAM are considered at the following different levels:

- Option level: Identification of mutually exclusive or dependent options – this was considered through the options screening and approach development process;
- SA approaches: Cumulative effects are taken into account in the selection of approaches for key aspects such as abstraction from the same waterbody through the sustainability rules applied for Uisce Éireann abstractions (see section 3.2);
- SA Preferred Approach: The combined effect of options within the SA Preferred Approach – these are addressed in this chapter; and
- The South East Region level: Considering combined effects from proposals in the three study areas (see the SEA Environmental Report of the Regional Plan).

For cumulative effects to occur, there needs to be an overlap of temporal periods in some way for the impact and/or the effect. For example, two schemes being constructed at the same time could result in cumulative traffic movements, while two schemes being operated together could result in additional drawdown of groundwater levels. A precautionary approach has been taken for the cumulative effect's assessment, which assumes that all options could be constructed at the same time and then all options would be operated at the same time (Table 6.1). However, this is very unlikely to be the case for construction impacts due to budget resources and regulatory constraints.

The assessment has considered the cumulative effects across all environmental topics to identify those interactions that are likely to generate significant effects. These are likely to be around:

- Biodiversity – for example, a cumulative loss of habitats or changes to a habitat's quality through changes in water quality or groundwater levels;
- Water environment (surface water and groundwater WFD status) – for example, changes to water flow due to combined abstraction pressure;
- People and health – for example, disruption due to 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 and are also reported here to identify

potential requirements for mitigation. Combined effects on climate change adaptation are also considered.

6.1.1 Cumulative Effects during Construction

In general, the SA Preferred Approach options are geographically spaced out and most are small scale construction works. Therefore, there are unlikely to be many cumulative effect interactions during construction.

Table 6.1 Potential In-Combination Effects between Preferred Options in SAM

Preferred Approach Option References	SAM-207	SAM-198	SAM-149	SAM-148	SAM-146	SAM-144	SAM-141	SAM-127	SAM-108	SAM-105	SAM-100	SAM-073	SAM-061	SAM-050	SAM-044	SAM-036	SAM-029	SAM-017	SA Option 76	SA Option 75	SA Option 47	
SA Option 1	M11																					
SA Option 47	SRV		SRV		SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV		SRV			
SA Option 75	WHS		BB1	BT2				WHS			BB2		WHS	WHS	WHS	WHS	WHS	WHS	WHS	WHS	BT2	
			BB2								BB2										BB2	
			WHS								BB2										BB2	
			N25								WHS										WHS	
SA Option 76	SRV		SRV	BT2	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	SRV	SRV	WHS		
			BT2					BT2			BT2											
	TR		BB2	BB2				BB2			BB2											
			TL	TL				TL			TL											
			TR	TR				TR			TR											
WHS	WHS	WHS	WHS	WHS																		
	WHS	WHS	WHS	WHS																		
SAM-017	CM		WHS	WHS				CM			WHS		CM	WHS	WHS	WHS	WHS	CM	WHS			
	WHS							WHS			WHS											
SAM-029	SRV		SRV	WHS	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	SRV	SRV	WHS		
	CM							CM			CM											
	WHS							WHS			WHS		WHS									
SAM-036	SRV		SRV	WHS	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	SRV	SRV	SRV		
	WHS							WHS			WHS											
SAM-044	SRV		WHS	WHS	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	SRV	SRV	SRV		
	WHS							WHS			WHS											
SAM-050	SRV		WHS	WHS	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	SRV	SRV	SRV		
	WHS							WHS			WHS											
SAM-061	SRV		SRV	TR	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	SRV	SRV	SRV	SRV	
	CM							CM			CM											
	TR							TR			TR											
	WHS							WHS			WHS											
SAM-073																						

Preferred Approach Option References	SAM-207	SAM-198	SAM-149	SAM-148	SAM-146	SAM-144	SAM-141	SAM-127	SAM-108	SAM-105	SAM-100	SAM-073	SAM-061	SAM-050	SAM-044	SAM-036	SAM-029	SAM-017	SA Option 76	SA Option 75	SA Option 47				
SAM-100	SRV		BB2	BB2	SRV	SRV	SRV	SRV																	
	WHS	WHS	WHS	WHS																					
SAM-105																									
SAM-108																									
SAM-127			SRV	TR	SRV	SRV	SRV																		
			TR					WHS	WHS																
			WHS	WHS																					
SAM-141	SRV				SRV	SRV																			
SAM-144	SRV				SRV																				
SAM-146	SRV		SRV																						
SAM-148	TR		BT1																						
			BT2																						
			BB2																						
			TL																						
			TR																						
	WHS		WHS																						
SAM-149	SRV																								
	TR																								
	WHS																								
SAM-198																									

Key			
Construction Phase		Bannow Bay SPA	BB2
Operation Phase		Cahore Marshes SPA	CM
Construction and Operation		Tacumshin Lake SPA	TL
Ballyteige Burrow SAC	BT1	The Raven SPA	TR
Bannow Bay SAC	BB1	Wexford Harbour and Slobs SPA	WHS
Slaney River Valley	SRV	M11 Road	M11
Ballyteige Burrow SPA	BT2	N25 Road	N25

There could be cumulative effects associated with construction in terms of traffic, noise and dust for the options located along the N25 and M11 roads (indicated by 'N25' and 'M11' respectively in Table 6.1). These could be mitigated by standard mitigation measures such as planning of construction traffic routes and movements and engaging with local residents about the potential for any disruption where relevant. With these standard good practice measures in place, there are unlikely to be significant cumulative effects.

There could be cumulative effects during construction from SAM-148 and 149 to the Ballyteige Burrow SAC (indicated by 'BT1' in Table 6.1). Ballyteige Burrow SAC is a coastal site containing Qualifying Interests (QIs) and priority habitat such as coastal lagoons, fixed dunes and decalcified dune heath. Cumulative construction works could cause pollution impacts if construction phases are concurrent.

There could be cumulative effects during construction from SAM-149 and SA option 75 to the Bannow Bay SAC (indicated by 'BB1' in Table 6.1). Bannow Bay SAC is a large estuarine site containing QIs and priority habitat such as coastal lagoons, and the dominating feature is the large, fixed dune system. Cumulative construction works could cause pollution impacts if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Slaney River Valley SAC (indicated by 'SRV' in Table 6.1). The Slaney River Valley is an SAC and is important for salmon and the freshwater pearl mussel, which rely on high quality water. Cumulative construction works for could cause habitat loss (SAM-036 and SA option 76), mortality (SAM-036 and SA option 76), pollution (SAM-029, 036, 044, 050, 061, 100, 127, 207 141, 144 and 146, and SA option 47 and 76), spread of invasive non-native species (SAM-036 and SA option 76) and disturbance (SAM-029, 036, 061, 127, 207, 146 and 149, and SA options 47 and 76) if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Ballyteige Burrow SPA (indicated by 'BT2' in Table 6.1). Ballyteige Burrow SPA has a range of coastal habitats including various types of sand dunes, salt meadows, and intertidal sand and mud flats, and is of special conservation interest for a number of bird species including the Light-bellied Brent Goose, Shelduck, Golden Plover, Lapwing, and Black-tailed Godwit. Cumulative construction works could cause impacts including pollution (SAM-148 and 149), and disturbance (SAM-148 and 149, and SA options 75 and 76) if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Bannow Bay SPA (indicated by 'BB2' in Table 6.1). Bannow Bay SPA is a large, sheltered, estuarine system with extensive intertidal mud and sand flats rich in macroinvertebrate fauna and algal mats, and salt marsh habitats. Cumulative construction works could cause impacts including pollution (SAM-149 and SA option 75), and disturbance (SAM-100, 148 and 149, and SA option 75 and 76) if construction phases are concurrent.

There could be cumulative effects during construction from SAM-017, 029, 061 127 and 207 to the Cahore Marshes SPA (indicated by 'CM' in Table 6.1). Cahore Marshes SPA comprises an area of polder grassland and some arable land and is of ornithological importance as a site for wintering waterfowl. Cumulative construction works for could cause disturbance impacts if construction phases are concurrent.

There could be cumulative effects during construction from SAM-148, 149, and SA option 75 to the Tacumshin Lake SPA (indicated by 'TL' in Table 6.1). Tacumshin Lake is a shallow coastal lagoon which supports large numbers of birds throughout the year, which is unusual among Irish wetlands. Cumulative construction works for could cause disturbance impacts if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the The Raven SPA (indicated by 'TR' in Table 6.1). The Raven SAC is a coastal site which encompasses important areas of shallow water utilised by numerous species of special conservation interest. Cumulative construction works for could cause impacts including pollution (SAM-127, 207, 149 and SA option 76), and disturbance (SAM-061, 127, 207, 148, 149 and SA option 76) if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Wexford Harbour and Slobs SPA (indicated by 'WHS' in Table 6.1). Shallow marine water is the principal habitat at Wexford Harbour and Slobs SPA, with extensive areas of intertidal flats being exposed at low tide. The site is of international importance for several species of waterbirds and is one of the top three sites in the country for numbers and diversity of wintering birds. Cumulative construction works for could cause impacts including pollution (SAM-029, 044, 050, 061, 100, 127, 207 and SA option 76), and disturbance (SAM-017, 029, 036, 044, 050, 061, 100, 127, 207, 148 and 149, and SA options 75 and 76) if construction phases are concurrent.

These potential impacts can be managed by standard good practice mitigation, such as having seasonal restrictions, pre-construction surveys, buffers along the edge of the river and an emergency plan in place during construction. With these standard good practice measures in place, there are unlikely to be significant cumulative effects to the Ballyteige Burrow SAC, Bannow Bay SAC, Slaney River Valley SAC, Ballyteige Burrow SPA, Bannow Bay SPA, Cahore Marshes SPA, Tacumshin Lake SPA, The Raven SPA, and Wexford Harbour and Slobs SPA. The impacts on the European designations are provided in the NIS and are also summarised in chapter 9 of this review. Any option specific mitigation measures are included in section 6.3.4 of the NIS.

6.1.2 Cumulative Effects during Operation

Due to the distances between options, the SEA identified, at a plan level, that there are unlikely to be significant cumulative effects outside of the hydrological connections, see Figure 6.1 for the Preferred Approach abstractions in SAM.

The potential for cumulative effects on groundwater bodies have been considered in a hydrogeological assessment of the groundwater abstractions commissioned by Uisce Éireann (Irish Water, 2022). This hydrogeological assessment considers the abstraction quantities and proximities and potential interactions. The assessment concludes that all of the WFD groundwater bodies affected by abstractions have a good quantitative status, therefore, the likelihood of affecting their WFD objectives is low. It should be noted that the Enniscorthy groundwater body has a good quantitative status but is currently 'At Risk' of failing WFD objectives. However, there is no indication of cumulative impact or impact on quantitative status of the groundwater bodies.

There could be adverse cumulative effects during operation for the options linked to the Slaney River valley SAC (indicated by 'SRV' in Table 6.1). Cumulative effects during operation could result in habitat degradation, and water table/availability impacts (SAM-029 and 036). See Figure 6.1 for the Preferred Approach abstractions in SAM.

The NIS concluded that with general mitigation measures, option specific mitigation, hydrological modelling and hydrogeological modelling, there will be no adverse cumulative effects on the integrity of European sites.

Table 6.2 shows that within SAM there are four developments that have been considered for cumulative effects with the SA Preferred Approach, these are Enniscorthy Flood Relief Scheme, Ferrycarraig and the Hook Peninsula (written as Ferrycarraig Experimental Archaeology in NIS), Trinity Wharf, and Trinity Wharf 2. Other developments that were not considered further due to the small extent of development required and the distance of the developments from the SA Preferred Approach are Clonhastan, Enniscorthy, Wexford; Enterprise Hub New Ross; Kerlogue Manor, Roxborough, Drinagh, Wexford; Ramstown, Gorey, County Wexford; Roxborough, Mulgannon, Wexford; Wexford General Hospital Ward Block; Whiterock Hill, Wexford, Phase 1; and Whiterock Hill, Wexford, Phase 2

6.2.1 Cumulative Effects during Construction

The projects near or in Enniscorthy could result in cumulative effects with the SA Preferred Approach if they were to be constructed at the same time (represented in Table 6.2 as 'Enn'). Potential effects could include increased traffic and noise to the residential and commercial properties in these towns. This could be mitigated by standard mitigation measures, such as planning of construction traffic routes and informing local residents about the works. With these standard good practice measures in place, there are unlikely to be significant cumulative effects.

There is potential for cumulative effects from habitat loss, mortality, pollution and disturbance impacts on the Slaney River Valley SAC (represented in Table 6.2 'SRV') if the construction phase of the Enniscorthy Flood Relief Scheme, are concurrent with the SA Preferred Approach. There is potential for cumulative effects from habitat loss, mortality, pollution, spread of non-native invasive species and disturbance impacts if the construction phase of the Ferrycarraig and the Hook Peninsula is concurrent with the SA Preferred Approach. There is potential for cumulative effects from pollution and disturbance if the construction phase of the Trinity Wharf and Trinity Wharf 2 are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from pollution and disturbance on the Wexford Harbour and Slobs SPA (represented in Table 6.2 'WHS') if the construction phase of the Enniscorthy Flood Relief Scheme is concurrent with the SA Preferred Approach. There is potential for cumulative effects from habitat loss, pollution, and disturbance if the construction phase of the Ferrycarraig and the Hook Peninsula is concurrent with the SA Preferred Approach. There is potential for cumulative effects from habitat loss and pollution if the construction phases of the Trinity Wharf and Trinity Wharf 2 are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from disturbance on The Raven SPA, Bannow Bay SPA, Ballyteige Bay SPA, and Tacumshin Lake SPA (represented in Table 6.2 'TR', 'BB', 'BT', and 'TL' respectively) if the construction phase of Ferrycarraig and the Hook Peninsula is concurrent with the SA Preferred Approach.

These impacts can be managed by standard good practice mitigation, such as having seasonal restrictions, pre-construction surveys, buffers along the edge of the river and an emergency plan in place during construction. With these standard good practice measures in place, there are unlikely to be significant cumulative effects to the European designated sites. The impacts on the European designations are provided in the NIS and also summarised in chapter 9 of this review. Any option specific mitigation measures are included in section 6.3.4 of the NIS.

The plan level assessment indicates that there is potential for cumulative effects on cultural heritage assets including archaeological resources related to the total extent of the ground works required, this will need to be considered further as detailed route alignments and site locations are determined along with approaches for more detailed desk studies, investigation and mitigation.

Table 6.2 Potential Cumulative Effects between Preferred Options and Other Developments in SAM

Preferred Approach Options																								
Project Developments	SAM-207	SAM-198	SAM-149	SAM-148	SAM-146	SAM-144	SAM-141	SAM-127	SAM-108	SAM-105	SAM-100	SAM-073	SAM-061	SAM-050	SAM-044	SAM-036	SAM-029	SAM-017	SA Option 76	SA Option 75	SA Option 47	SA Option 1		
Enniscorthy Flood Relief Scheme	SRV		SRV	WHS	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	WHS	Enn	WHS	SRV			
	WHS		WHS					WHS			WHS		WHS	WHS	WHS	WHS	WHS		SRV					
																			WHS	WHS				
Ferrycarraig and the Hook Peninsula (written as Ferrycarraig Experimental Archaeology in NIS)	SRV		SRV	TL	SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV	WHS	SRV	SRV	BB	SRV		
	WHS		TR	WHS				WHS			WHS		WHS						WHS	WHS	TR		BT	BT
	TR		BT	TR				TR			BB		TR						WHS	WHS	WHS		WHS	BT
			TL	BB				TR			BB		TR						WHS	WHS	WHS		WHS	TL
Trinity Wharf and Trinity Wharf 2	SRV		SRV		SRV	SRV	SRV	SRV			SRV		SRV	SRV	SRV	SRV	SRV		SRV		SRV			
	WHS							WHS			WHS		WHS	WHS	WHS	SRV	WHS		WHS					

Key			
Construction Phase		Wexford Harbour and Slob's SPA	WHS
Operation Phase		The Raven SPA	TR
Construction and Operation		Bannow Bay SPA	BB
Enniscorthy Town	Enn	Ballyteige Burrow SPA	BT
Slaney River Valley SAC	SRV	Tacumshin Lake SPA	TL

6.2.2 Cumulative Effects during Operation

There could be cumulative effects on Slaney River Valley SAC from habitat degradation and water table/availability if operation of the SAM Preferred Approach and the Enniscorthy Flood Relief Scheme are concurrent as the project could impact the River Slaney and the Preferred Approach proposes new ground water abstractions (SAM-029 and 036) both of which are hydrologically linked to the SAC and could result in a reduction in flow and water availability. Additionally there could be cumulative effects from habitat degradation if the operation of the SAM Preferred Approach and Trinity Wharf and Trinity Wharf 2 are concurrent.

The NIS concluded that with general mitigation measures, option specific mitigation, hydrological modelling and hydrogeological modelling, there will be no adverse cumulative effects on the integrity of European sites.

The plan level assessment indicates that there could be cumulative effects in terms of carbon emissions, as all developments will generate carbon emissions from operation whether this is from routine maintenance activities to water treatment and the energy required for moving water. As outlined in section 6.1.2, any increase in carbon can be considered a significant effect, as these add cumulatively across all developments and contribute to the national target for carbon. The same mitigation measures suggested for the SAM Preferred Approach apply, including increased sourcing of energy from renewable sources and raising awareness of measures to reduce water consumption (which in turn would reduce energy consumption). Working with third parties, including planning authorities and other developers, to identify water efficient measures and joint promotion of water issues would also further mitigate this effect.



7

**Strategic
Environmental
Assessment
Summary**

7 Strategic Environmental Assessment Summary

SEA objectives have been taken into account at each stage of the approach development process for SAM and a range of options and SA approaches have been considered and assessed, including a 'Do Minimum' approach.

Key beneficial impacts assessed include moderate beneficial impacts for SA option 75 and SAM-198, and minor beneficial impacts for SA options 1, 47 and 76, and SAM-017, 029, 044, 073, 105, 108, 127, 140, 144, 146 and 148. The beneficial impacts are associated with decommissioning of WTPs and the reduction of noise and traffic disruption in localised areas and/or increasing resilience and the quality of water supply for local communities; and the subsequent benefits of this for public health. Moderate beneficial impacts for SA option 76 and minor beneficial impacts for SA options 1 and 47 associated with the decommissioning of WTPs and the benefits of this for the local landscape. There is also the potential for beneficial effects on the River Currlane. The abstraction at the River Currlane is currently unsustainable but is proposed to be decommissioned as part of the Preferred Approach.

Key potential adverse impacts identified at plan level include:

- Moderate adverse effects during construction for SA options 1 and 76 and SAM-207 due to impacts on public health and/or quality of life from dust, noise and traffic in rural and urban areas;
- Moderate adverse effects during construction for SA option 75 and 76, and SAM-029, 036, 100 and 207 against biodiversity. SAM-036 and SA option 76 are within, and SAM-029, 100 and 207 are hydrologically linked to, the Slaney River Valley SAC. SAM-029, 100 and 207 are within the Zone of Influence (ZOI) and are hydrologically linked to, SAM-036 and SA option 75 are within the ZOI, and SA option 76 is hydrologically linked to the Wexford Harbour and Slobbs SPA. SAM-029 and 207 are within the ZOI of Cahore Marshes SPA. SAM-100 and SA option 76 are within the ZOI, and SA option 75 is within the ZOI and hydrologically linked to the Bannow Bay SPA. SAM-207 is hydrologically linked to the Screen Hills SAC. SAM-207 and SA option 76 are within the ZOI and hydrologically linked to The Raven SPA. SA option 75 is hydrologically linked to the Bannow Bay SAC. SA option 75 and 76 are within the ZOI of the Ballyteige Burrow SPA. SA option 75 is within the ZOI of Tramore Back Strand SPA. SA option 76 is within the ZOI of the Tacumshin Lake SPA. For SAM-100 and 207, and SA option 75 there is the potential for the pollution of protected and supporting habitats for Qualifying Interest (QI) birds and disturbance to birds given the proximity of works. For SAM-029 there is the potential for the disturbance to QI species and the pollution of QI habitats and supporting habitats. For SAM-036 and SA option 76 there is the potential for the loss and pollution of QI habitats and supporting habitats, the risk of mortality and disturbance to QI species and their prey, and the risk of spread of invasive species within the SACs;
- Moderate adverse effects for SA option 76, SAM-148, 149 and 198 against greenhouse gas emissions due to the total lifetime carbon emissions between 10,000 and 50,000 tCO₂;
- Moderate adverse effects to environmental climate change resilience due to increasing existing groundwater (SAM-198, SAM-044, SAM-050, SAM-061, SAM-105, SAM-127 and SAM-141) and new groundwater (SAM-036) abstractions being taken at a potentially unsustainable rate;
- Moderate adverse effects during operation are indicated in the assessments for SA options 1 and 75, and SAM-198, 029, 036, 044, 050, 061, 105, 148, 127, 141 and 149 as a result of potential risks to groundwater quality and quantity and WFD status of hydrologically linked groundwater waterbodies from new or increased abstractions; and

- Moderate adverse effects during construction against cultural heritage for SA option 76 as these options require new assets located on known archaeological/heritage sites.

Cumulative effects assessment identified potential significant adverse effects in relation to carbon emissions, although the individual options are assessed as only neutral to moderate in relation to this SEA objective. This is because potential increases in carbon emissions contribute to national emissions. The average carbon intensity from the individual options provides an indicator for the new options in SAM but does not provide a complete picture as it does not fully take account of efficiencies from replacement of failing infrastructure, treatment technology or potential for mitigation, such as use of renewable energy sources in relation to the whole network. Insufficient information is available for the cumulative effects assessment to consider how total study area carbon emissions will change overall and per ML of water.

SEA mitigation identified to address the key adverse impacts identified above includes further hydrological or hydrogeological modelling (as appropriate) to further inform understanding of potential impacts on the European and national designated sites identified as potentially affected by increased abstractions from existing surface and groundwater sources (see the NIS of the Framework Plan for further information).

Other mitigation identified includes development of construction environmental management plans, public consultation with local residents on disruption during construction and consideration of the waste hierarchy in design. Measures to address the cumulative impact for carbon emissions include sourcing the energy supply from renewable sources. All developments will aim to achieve as far as possible requirements for no net loss in biodiversity or enhancement, as set out in the Biodiversity Action Plan (Irish Water, 2021). There may be potential to also provide opportunities for carbon sequestration with biodiversity enhancement. In addition, there are opportunities to reduce water demand (which in turn would reduce energy and carbon) by raising awareness of water issues, promoting water efficient devices and through leakage reduction.

In general, these are standard mitigation measures with some specific measures and additional requirements for further assessment or monitoring (see the SEA Appendix and the NIS Appendix for AA and SEA standard mitigation measures respectively).

An overall summary assessment, including potential for cumulative and in-combination effects and other measures, identified to be progressed alongside the supply side options is provided in Table 7.1. Key mitigation and proposed monitoring measures are also shown.

Table 7.1 SEA Summary

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
SA Preferred Approach with interim measures as required and a programme of leakage reduction and water conservation measures, taking an adaptive approach to address uncertainty				
1. Protect public health and promote wellbeing	<p>C Minor Adverse to Moderate Adverse</p> <p>O Minor Adverse to Moderate Beneficial</p> <p>The PA is expected to improve overall drinking water quality reliability and sustainability through the decommissioning of failing WTPs and the replacement of abstractions vulnerable to drought conditions. The PA is expected to reduce risks to access of good quality water supply across different conditions and over the plan period.</p>	<p>Standard good construction practice and consultation</p> <p>Further assessment of risks to water quality and consideration of catchment management initiatives to improve water quality and reduce treatment cost. For example, working with landowners and managers on practices to reduce levels of sediment and pollution from entering water courses through run off.</p>	<ul style="list-style-type: none"> Level of service, and the frequency and duration of drought orders Number of days/hours when water supply to people is disrupted due to drought, freeze-thaw or other service/infrastructure issues Number of public rights of way closures/diversions and length of paths created compared to loss 	<ul style="list-style-type: none"> Duration of construction works, and number of complaints received regarding construction works Duration of temporary closures of footpaths and other recreational assets Number of days where recreational uses are impeded
2. Protect and enhance biodiversity and	<p>C Minor Adverse to Moderate Adverse</p> <p>O Neutral to Minor Adverse</p>	<p>Routing/siting to avoid impacts.</p> <p>Standard good construction practice and specific measures as</p>	<ul style="list-style-type: none"> Temporary and permanent habitats lost vs habitats created/enhanced 	<ul style="list-style-type: none"> Monitor construction activities to ensure compliance

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
contribute to resilient ecosystems	Impacts from construction works for pipelines and service reservoirs on biodiversity. These can be minimised through careful routing and siting. Potential for construction and operational impacts on European and National designated sites.	identified in the NIS of the Framework Plan. Design to meet no net loss biodiversity or achieve enhancement, where possible, on or off site and in line with the Biodiversity Action Plan objectives. Further hydrological/hydrogeological assessments to determine impacts on designated sites. Operating rules to limit impacts on European and National sites.	<ul style="list-style-type: none"> Site condition and population data for QI of European and National designated sites. 	
3. To protect landscapes, townscapes and visual amenity	C Neutral to Minor Adverse O Minor Adverse to Moderate Beneficial Construction landscape impacts and long term impacts from above ground structures, such as new WTPs.	Routing and siting to reduce tree loss and appropriate location and design of above ground structures with landscape planting. Reinstatement of land use and vegetation.	<ul style="list-style-type: none"> Total working area of pipelines non-designated landscapes Land use/landscape features re-established for schemes over appropriate period – areas/km successfully restored to meet requirements 	<ul style="list-style-type: none"> Duration of construction works Number of complaints received regarding visual impact of construction works

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
4. Protect and where appropriate enhance, built and natural assets and reduce waste	C Neutral to Minor Adverse O Neutral to Minor Adverse New resources required for construction works, including extensive lengths of pipeline, service reservoirs and new/upgraded WTPs. Ongoing maintenance requirements.	Materials management to be integrated into design to optimise use of existing resources and minimise waste from construction and operation.	<ul style="list-style-type: none"> Loss of greenfield land, including agricultural, forestry or other land uses Disruptions to strategic infrastructure/services Use of waste management plans Volume of drinking water treatment residuals sent to landfill 	<ul style="list-style-type: none"> Construction wastes sent to landfill
5. Reduce greenhouse gas emissions	C Neutral to Moderate Adverse O Neutral to Moderate Adverse Embodied and operational carbon contribute to national level carbon emission targets. Leakage and water efficiency can contribute to reducing carbon.	Design to minimise embodied carbon emissions and optimise operational efficiency. Seek renewable energy supply sources and optimise use of leakage and water efficiency measures to reduce carbon. Consider offsetting approaches with multiple benefits for water quality, carbon sequestration and linking with other objectives.	<ul style="list-style-type: none"> Percentage of energy supply from renewable sources or reduced energy use Carbon footprint (total tonnes) per year, predicted over plan period, lifetime of schemes and carbon intensity of water resource options (tonnes/ML/d) 	<ul style="list-style-type: none"> Carbon footprint (total tonnes) during construction Operational Carbon Intensity kgsCO₂equic/ML

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
6. Contribute to environmental climate change resilience	<p>C Neutral to Moderate Adverse</p> <p>O Neutral to Moderate Adverse</p> <p>Abstractions generally reduce environmental resilience but overall improved flexibility for operation using regional schemes has the potential to reduce pressure on at risk local resources. SAM-044, SAM-050, SAM-061, SAM-105, SAM-127, SAM-141 and SAM-036 require further assessment to understand their sustainability in the longer term.</p>	<p>Consider how operation can further reduce climate change pressure on at risk sources and associated designations, particularly for SAM-044, SAM-050, SAM-061, SAM-105, SAM-127, SAM-141 and SAM-036.</p> <p>Sustainability review of sources taking account of groundwater and surface water interconnections.</p>	<ul style="list-style-type: none"> WFD waterbody status objectives at risk and designated site condition status Frequency of drought orders requiring change to normal abstractions/ compensation releases 	<ul style="list-style-type: none"> None identified
7. Protect and improve surface water and groundwater status	<p>C Neutral</p> <p>O Neutral to Moderate Adverse</p> <p>Generally, new/increased abstractions are limited to allowable limits and have a low risk of adverse effect on WFD waterbody status objectives.</p>	<p>Further investigation to consider effects on groundwater abstraction on the surface water environment.</p>	<ul style="list-style-type: none"> WFD waterbody status objectives at risk 	<ul style="list-style-type: none"> Pollution incidents during construction

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
8. Avoid flood risk	C Neutral to Minor Adverse O Neutral Potential loss of flood plain increasing flood risk from construction and location of above ground structures for SA option 1 and 76 and SAM-198, 029, 100 and 149.	Siting and design of schemes to take account of flood risk and design for flood risk resilience.	<ul style="list-style-type: none"> Number of options at risk of flooding at each AEP level 	<ul style="list-style-type: none"> Lost time to flooding Lost time to power supply interruptions
9. Protect and where appropriate, enhance cultural heritage assets	C Neutral to Moderate Adverse O Neutral Potential construction impacts on unknown archaeological interest. Impacts on known interests are expected to be avoided.	Standard good practice approaches to minimise potential impacts.	<ul style="list-style-type: none"> Number of archaeological assets adversely affected by water resource options Number of options that are rerouted to avoid cultural heritage impacts Number of schemes including improvements to access recording of archaeological assets or communication/ interpretation of interest features 	<ul style="list-style-type: none"> Number of archaeological finds recorded during construction
10. Protect quality and	C Neutral to Minor Adverse O Neutral	Standard good practice to conserve and reinstate soils.	<ul style="list-style-type: none"> Soil Management Plans implemented 	<ul style="list-style-type: none"> Total volume of soil removed or reused on site

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
function of soils	Potential for loss and damage to valuable soils during construction but impacts to geological assets are expected to be avoided.		<ul style="list-style-type: none"> Volume of contaminated land restored, or soils removed 	

8

Water Framework Directive Summary

8 Water Framework Directive Summary

Through the options identification and assessment process new options considered have been restricted to those expected to meet estimated sustainability requirements and all options have been assessed based on conservative allowable abstraction constraints. The options identified in SAM are also expected to be sustainable, based on additional plan-level desk-based assessment, in terms of avoiding deterioration of WFD status or avoiding conflict with meeting WFD objectives.

All groundwater bodies used for the SAM abstractions have good quantitative status (Irish Water, 2022) and there is no indication of cumulative impact or impact on quantitative status of the groundwater bodies. Although the increase in demand is relatively small, the proposed refurbishment works planned for SAM-044, SAM-050, SAM-06, SAM-118, SAM-105 and SAM-100 require more investigation to determine their feasibility and effects. It should be noted that the Enniscorthy groundwater body has a good quantitative status but is currently 'At Risk' of failing WFD objectives.

Any potential impacts, including cumulative effects with non Uisce Éireann abstractions, will need to be considered in further detail as part of project level consenting to demonstrate both sustainability for any connected surface waterbodies and groundwater dependent habitats and protected areas.

9

Appropriate Assessment Summary

9 Appropriate Assessment Summary

The NIS of the Regional Plan's conclusions for SAM, regarding 'In-combination effects with other plans and projects' and 'In-combination effects between Preferred Options', as set out below, and are included in more detail in Appendix E of the NIS for the Regional Plan.

Potential in-combination effects with other projects and plans were identified for the preferred options on the Wexford Harbour and Slobs SPA, Cahore Marshes SPA, Slaney River Valley SAC, The Raven SPA, Bannow Bay SPA, Tacumshin Lake SPA, and Ballyteige Burrow SPA. The potential effects include disturbance, pollution, water table/availability impacts, habitat degradation, habitat loss, mortality of Qualifying Interest (QI) species and spread of invasive non-native species. The assessment concluded that with the mitigation identified there will be no adverse effects on the integrity of the European site in-combination with other plans or projects.

Potential in-combination effects between preferred options were identified for Ballyteige Burrow SAC and SPA, Bannow Bay SAC and SPA, Slaney River Valley SAC, Cahore Marshes SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, and The Raven SPA if construction of options is concurrent. The potential impacts include disturbance, pollution, water table/availability impacts, habitat degradation, habitat loss, mortality of QI species and spread of invasive non-native species. With the implementation of mitigation as detailed in Appendix E of the NIS, there will be no adverse effects on the integrity of European sites.

10

Recommendations for Implementation

10 Recommendations for Implementation

Environmental actions for the implementation plan and the monitoring plan are identified in:

- SEA Environmental Report of the Framework Plan – this includes general proposals and standard mitigation requirements (also see SEA Environmental Report Appendix); and
- SEA Environmental Report of the Regional Plan – this includes specific mitigation and monitoring requirements for the South East Region options and cumulative effects.

References

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Appendix A Fine Screening Summaries

Key			
0 Neutral	-1 Minor adverse	-2 Moderate Adverse	-3 Major adverse
	1 Minor beneficial	2 Moderate Beneficial	3 Major Beneficial

Table A.1 Fine Screening Summary of Conjunctive Use Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-038	Conjunctive use of Clody River during winter to allow GW recharge to use GW during summer. Involves increased GW abstraction and upgrade of Carrickduff WTP to supply partial deficit.									2	0	-26

Table A.2 Fine Screening Summary of Ground Water Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-020	New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).									2	0	-22
SAM-232	Commission TW's (drilled near reservoir) to supplement new GW and replace existing WTP to partly supply full demand (abandon existing SW source).									2	0	-22
SAM-029	New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).									1	0	-22
SAM-033	New GW abstraction (no.3 BHs) and upgrade existing wells (no.8 boreholes). New Ballyminaunhill WTP									1	0	-23

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	(proposed WTP capacity of 8MLD) - currently under development.											
SAM-036	New GW abstraction and upgrade Carrickduff WTP to supply deficit.									2	0	-13
SAM-044	Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.									1	0	-10
SAM-050	Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.									1	0	-10
SAM-061	Increase GW abstraction and upgrade Monageer WTP to supply deficit.									1	0	-10
SAM-065	Increase GW abstraction and upgrade Kilagoley WTP to partly supply deficit.									0	0	-12

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-066	Increase GW abstraction and upgrade Edermin WTP to partly supply deficit.									2	0	-15
SAM-076	Increase GW abstraction and upgrade Bree WTP to supply deficit.									1	0	-11
SAM-085	Increase GW abstraction and upgrade Bree WTP to supply deficit.									1	0	-12
SAM-090	Increase GW abstraction and upgrade WTP to supply deficit.									1	0	-13
SAM-094	Increase GW abstraction and upgrade Bree WTP to supply deficit.									1	0	-12
SAM-099	Increase GW abstraction and upgrade WTP to partly supply deficit.									1	0	-11

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-100	New GW abstraction and upgrade Clonroche WTP to supply full demand.									0	0	-17
SAM-105	Increase GW abstraction and upgrade WTP to supply deficit.									1	0	-9
SAM-109	Increase GW abstraction and upgrade WTP to partly supply deficit.									1	0	-11
SAM-110	New GW abstraction/wellfield to supply deficit at Carrigbyrne and new WTP to supply deficit.									0	0	-18
SAM-118	Increase GW abstraction and upgrade WTP to supply deficit.									1	0	-13
SAM-125	Increase GW abstraction from existing Fardystown									2	0	-14

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	scheme to partly supply deficit.											
SAM-127	Increase GW abstraction and upgrade WTP to partly supply deficit.									1	0	-10
SAM-129	New GW wellfield at Adamstown and new WTP to supply deficit.									1	0	-21
SAM-139	Increase GW abstraction and upgrade Ballingate WTP to supply deficit.									1	0	-11
SAM-141	Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.									1	0	-10
SAM-148	New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused boreholes back to production (GW abstraction from existing									1	0	-13

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	boreholes currently not in supply).											
SAM-149	New GW wellfield at Adamstown and new WTP to supply deficit.									1	0	-21
SAM-166	New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused boreholes back to production (GW abstraction from existing boreholes currently not in supply).									2	0	-23
SAM-178	New GW abstraction and new WTP to supply deficit.									0	0	-19
SAM-180	New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused boreholes back to production (GW									2	0	-24

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	abstraction from existing boreholes currently not in supply).											
SAM-192	Increase GW abstraction and upgrade Edermin WTP to partly supply deficit.									2	0	-16
SAM-197	New GW abstraction and new WTP to supply deficit.									0	0	-12
SAM-198	Rationalise Kilmuckbridge WTP to new Ballyminahill WTP. Rationalisation within WRZ.									0	0	-15
SAM-199	New GW abstraction and new WTP in the NE or SW of Rkd aquifer to supply deficit.									0	0	-20
SAM-202	New groundwater abstraction in the									0	0	-21

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	regionally important fissured (Rf) bedrock – c. 2000m ³ /d from a number of wellfields and new WTP to supply deficit.											
SAM-206	Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.									1	0	-12
SAM-207	New GW and new WTP to partly supply deficit.									0	0	-20
SAM-215	Increase GW abstraction and upgrade Edermin WTP to partly supply deficit.									2	0	-17
SAM-225	New GW abstraction and new WTP to supply deficit.									1	0	-19
SAM-231	Commission trial wells (drilled near reservoir) to supplement new GW and replace existing WTP to									1	0	-14

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	partly supply full demand (abandon existing SW source).											
SAM-022	New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).									2	0	-22
SAM-233	Commission TW's (drilled near reservoir) to supplement new GW and replace existing WTP to partly supply full demand (abandon existing SW source).									2	0	-22

Table A.3 Fine Screening Summary of Ground Water & Interconnection Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-005	Interconnect Coolgreaney with Arklow WRZ (SA1 increase GW abstraction) and supply deficit.									0	0	-9
SAM-021	Interconnect Camolin with Ferns WRZ for increased resilience.									2	0	-22
SAM-043	Interconnect Bunclody and Carlow Central Regional WRZ (new GW abstraction) and supply deficit.									0	0	-14
SAM-086	Interconnect Bree and Ballyhogue WRZs and supply deficit.									1	0	-12
SAM-165	Interconnect Wexford Town with Fardystown and increase from current									2	0	-23

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Fardystown scheme to partly supply deficit.											
SAM-179	Interconnect South Regional with Fardystown and increase from current Fardystown scheme to partly supply deficit									2	0	-24

Table A.4 Fine Screening Summary of Ground Water & Rationalisation Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-004	Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).									0	2	-10
SAM-019	Rationalise Camolin with Ferns WRZ.									2	0	-22
SAM-023	Rationalise Camolin to Gorey WRZ.									1	0	-23
SAM-032	Rationalise Ferns to Gorey via Camolin WRZ.									1	0	-23
SAM-040	Rationalise Bunclody to Carlow Central Regional WRZ (new GW abstraction) and partly supply deficit.									1	0	-17
SAM-093	Rationalise Ballyhogue to Bree WRZ.									1	0	-12

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-104	Rationalise Clonroche to New Ross WRZ (SAK - new GW abstraction at Adamstown)									0	2	-10
SAM-194	Rationalise Bree and Ballyhogue WRZs to Enniscorthy Town and Environs WSS (Edermine borehole WTP).									2	0	-16
SAM-196	Rationalise Bree and Ballyhogue WRZs to Enniscorthy Town and Environs WSS (Edermine borehole WTP).									2	0	-16
SAM-205	Rationalise Balindaggin to Killealy									1	0	-12
SAM-216	Rationalise Bree, Balluhogue and Glynn to Enniscorthy WRZ.									2	0	-17

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-217	Rationalise Bree, Balluhogue and Glynn to Enniscorthy WRZ.									2	0	-17
SAM-218	Rationalise Bree, Balluhogue and Glynn to Enniscorthy WRZ.									2	0	-17
SAM-224	Rationalise Carrigbyrne to South Regional WRZ.									1	0	-19

Table A.5 Fine Screening Summary of Group Water Scheme Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-003	Interconnect Coolgreaney with neighboring Killinerin GWS and supply deficit.									1	0	-11

Table A.6 Fine Screening Summary of Surface Water Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-060	Increase SW abstraction from River Slaney and									0	0	-15

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	upgrade Vinegar Hill WTP to supply deficit.											
SAM-068	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-14
SAM-078	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-14
SAM-098	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-15
SAM-138	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-16

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-169	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-15
SAM-172	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-16
SAM-191	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-16
SAM-211	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.									0	0	-15
SAM-226	Increase SW abstraction from River Slaney and									0	1	-15

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	upgrade Vinegar Hill WTP to supply deficit.											

Table A.7 Fine Screening Summary of Surface Water and Interconnection Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-137	Interconnect Wexford Town, Fardystown, South Regional, Sow Regional and Enniscorthy WRZs and supply deficit.									0	0	-16

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-159	Interconnect Wexford Town, Fardystown, South Regional, Sow Regional and Enniscorthy WRZs and supply deficit.									0	0	-16
SAM-160	Interconnect Wexford Town, Fardystown, South Regional, Sow Regional and Enniscorthy WRZs and supply deficit.									0	0	-16
SAM-161	Interconnect Wexford Town, Fardystown, South Regional, Sow Regional and Enniscorthy WRZs and supply deficit.									0	0	-16
SAM-168	Interconnect Sow Regional WRZs and Enniscorthy and supply deficit.									0	0	-15

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-171	Interconnect Wexford Town and Sow Regional WRZs with Enniscorthy and supply deficit.									0	0	-16
SAM-173	Interconnect Wexford Town and Sow Regional WRZs with Enniscorthy and supply deficit.									0	0	-16

Table A.8 Fine Screening Summary of Surface Water and Rationalisation Options in SAM

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-059	Rationalise Marshalstown to Enniscorthy WRZ (River Slaney).									0	0	-15
SAM-077	Rationalise Bree to Enniscorthy WRZ (River Slaney).									0	0	-14
SAM-097	Rationalise Ballyhogue to Enniscorthy WRZ (River Slaney) via Bree.									0	0	-15
SAM-140	Rationalise Ballingate to Tinahely WRZ (not in deficit).									0	2	-9
SAM-145	Rationalise Coolboy Coolafancy to Tinahely WRZ (not in deficit).									0	0	-10

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-193	Rationalise Bree to Enniscorth WRZ (River Slaney).									0	0	-16
SAM-195	Rationalise Ballyhogue to Enniscorthy WRZ (River Slaney) via Bree.									0	0	-16
SAM-212	Rationalise Bree, Balluhogue and Glynn to Enniscorthy WRZ.									0	0	-15
SAM-213	Rationalise Bree, Balluhogue and Glynn to Enniscorthy WRZ.									0	0	-15
SAM-214	Rationalise Bree, Balluhogue and Glynn to Enniscorthy WRZ.									0	0	-15
SAM-227	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.									0	1	-15

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-228	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.									0	1	-15
SAM-229	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.									0	1	-15
SAM-230	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.									0	1	-15

Table A.9 Fine Screening Summary of Transfer Options in SAM

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-234	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-235	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany,									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-236	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-237	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-238	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree,									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-239	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-240	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-241	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-242	Interconnect Gorey, Enniscorthy, Wexford									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-243	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree,									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-244	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-245	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-246	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-247	Interconnect Gorey, Enniscorthy, Wexford									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-248	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree,									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ballyhogue, Glynn and Carrighbyrne WRZs.											
SAM-249	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional, Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs.									2	0	-18
SAM-250	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-251	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-252	Rationalise Gorey, Enniscorthy, Sow Regional,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-253	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	GDA via Ballinapark (Vartry connection).											
SAM-254	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-255	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-256	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-257	Rationalise Gorey, Enniscorthy, Sow Regional,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-258	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	GDA via Ballinapark (Vartry connection).											
SAM-259	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-260	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-261	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-262	Rationalise Gorey, Enniscorthy, Sow Regional,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-263	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	GDA via Ballinapark (Vartry connection).											
SAM-264	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin, Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-265	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown, South Regional Rationalise Coolgreany, Camolin,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Ferns, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn and Carrighbyrne WRZs to GDA via Ballinapark (Vartry connection).											
SAM-266	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional WRZ.									2	0	-18
SAM-267	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional WRZ.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-268	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional WRZ.									2	0	-18
SAM-269	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional WRZ.									2	0	-18
SAM-270	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	connection). Rationalise Sow Regional WRZ.											
SAM-271	Interconnect Gorey, Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Ballinapark (Vartry connection). Rationalise Sow Regional WRZ.									2	0	-18
SAM-272	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown and South Regional to the GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-273	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown and South Regional to the									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	GDA via Ballinapark (Vartry connection).											
SAM-274	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown and South Regional to the GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-275	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown and South Regional to the GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-276	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown and South Regional to the									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	GDA via Ballinapark (Vartry connection).											
SAM-277	Rationalise Gorey, Enniscorthy, Sow Regional, Wexford Town, Fardystown and South Regional to the GDA via Ballinapark (Vartry connection).									2	1	-18
SAM-278	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-279	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-280	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-281	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-282	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-283	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-284	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-285	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-286	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-287	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-288	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-289	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-290	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-291	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18
SAM-292	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18
SAM-293	Rationalise Enniscorthy, Wexford Town, Fardystown									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.											
SAM-294	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18
SAM-295	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.											
SAM-296	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18
SAM-297	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.											
SAM-298	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18
SAM-299	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	WRZs to the GDA via Rathvilly.											
SAM-300	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18
SAM-301	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-302	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional WRZ.									2	0	-18
SAM-303	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional WRZ.									2	0	-18
SAM-304	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional WRZ.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-305	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional WRZ.									2	0	-18
SAM-306	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional WRZ.									2	0	-18
SAM-307	Rationalise Enniscorthy, Wexford Town, Fardystown, South Regional, and Sow Regional to the GDA via Rathvilly.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-308	Rationalise Enniscorthy, Wexford Town, Fardystown, South Regional, and Sow Regional to the GDA via Rathvilly.									2	0	-18
SAM-309	Rationalise Enniscorthy, Wexford Town, Fardystown, South Regional, and Sow Regional to the GDA via Rathvilly.									2	0	-18
SAM-310	Rationalise Enniscorthy, Wexford Town, Fardystown, South Regional, and Sow Regional to the GDA via Rathvilly.									2	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-311	Rationalise Enniscorthy, Wexford Town, Fardystown, South Regional, and Sow Regional to the GDA via Rathvilly.									2	0	-18
SAM-312	Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.									2	0	-18
SAM-313	Rationalise Enniscorthy, Wexford Town, Fardystown and South Regional, Sow Regional, Marshalstown,									2	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs to the GDA via Rathvilly.											

Table A.10 Fine Screening Summary of WTP Upgrade Options in SAM

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-013	Upgrade existing WTPs for water quality									1	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	improvements. The WRZ is not in deficit.											
SAM-017	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-9
SAM-057	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAM-073	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-5
SAM-108	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-5

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAM-144	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-6
SAM-146	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7

Appendix B SA Approaches for SAM

Note: SA Options are also referred to as Group Options

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3300SC0020: Coolgreaney WS	SAM-004 Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	1	SAM-004 Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	1	SAM-004 Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	1
3300SC0003: Gorey	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	-	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	-	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	-
3300SC0002: Camolin WSS	SAM-017 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-017 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-017 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0003: Ferns WS	SAM-029 New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	-	SAM-029 New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	-	SAM-029 New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	-
3300SC0004: Bunclody WS	SAM-036 New GW abstraction and upgrade Carrickduff WTP to supply deficit.	-	SAM-036 New GW abstraction and upgrade Carrickduff WTP to supply deficit.	-	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly.	81

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
					Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0032: Kiltealy	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-
3300SC0031: Ballindaggin	SAM-050 Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	-	SAM-050 Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	-	SAM-050 Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	-
3300SC0030: Marshalstown	SAM-230 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-230 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0034: Monageer	SAM-061	-	SAM-061	-	SAM-278	81

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Increase GW abstraction and upgrade Monageer WTP to supply deficit.		Increase GW abstraction and upgrade Monageer WTP to supply deficit.		Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0023: Enniscorthy Town	SAM-226 Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.	76	SAM-226 Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.	76	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0035: Davidstown	SAM-073 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-073 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-281 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue,	81

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
					Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0077: Bree	SAM-227 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-227 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0032: Ballyhogue	SAM-228 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-228 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0033: Clonroche	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3300SC0027: Woodview Drive Adamstown	SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.		SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.		SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.	
3300SC0066: Raheen (Adamstown)	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0022: Carrigbyrne WS	SAM-224 Rationalise Carrigbyrne to South Regional WRZ.	75	SAM-224 Rationalise Carrigbyrne to South Regional WRZ.	75	SAM-289 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrigbyrne WRZs.	81
3300SC0037: Glynn WS	SAM-229 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-229 Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ.	76	SAM-285 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue,	81

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
					Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0078: Fardystown	SAM-148 New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused BHs back to production (GW abstraction from existing BHs currently not in supply).	-	SAM-148 New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused BHs back to production (GW abstraction from existing BHs currently not in supply).	-	SAM-287 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0080: Sow Regional	SAM-127 Increase GW abstraction and upgrade WTP to partly supply deficit. SAM-207 New GW and new WTP to partly supply deficit.	-	SAM-127 Increase GW abstraction and upgrade WTP to partly supply deficit. SAM-207 New GW and new WTP to partly supply deficit.	-	SAM-280 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0079: South Regional	SAM-225 New GW abstraction and new WTP to supply deficit.	75	SAM-225 New GW abstraction and new WTP to supply deficit.	75	SAM-288 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly.	81

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
					Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3400SC0053: Ballingate Public Supply	SAM-140 Rationalise Ballingate to Tinahely WRZ (not in deficit).	47	SAM-140 Rationalise Ballingate to Tinahely WRZ (not in deficit).	47	SAM-140 Rationalise Ballingate to Tinahely WRZ (not in deficit).	47
3400SC0045: Ballynavortha Public Supply	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-
3400SC0030: Coolboy Coolafancy Public Supply	SAM-144 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-144 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-144 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3400SC0033: Raheengraney Public Supply	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0081: Wexford Town	SAM-149 New GW wellfield at Adamstown and new WTP to supply deficit.	-	SAM-149 New GW wellfield at Adamstown and new WTP to supply deficit.	-	SAM-286 Interconnect Enniscorthy, Wexford Town, Fardystown and South	81

WRZ	Preferred Approach - SA Approach 1		Least Cost - SA Approach 1		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
					Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3300SC0020: Coolgreaney WS	SAM-005 Interconnect Coolgreaney with Arklow WRZ (SA 1 increase GW abstraction) and supply deficit.	2	SAM-004 Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	1	SAM-004 Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	1
3300SC0003: Gorey	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	-	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	-	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminaunhill WTP. Rationalisation within WRZ.	-
3300SC0002: Camolin WSS	SAM-021 Interconnect Camolin with Ferns WRZ for increased resilience.	7	SAM-017 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-017 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3300SC0003: Ferns WS	SAM-021 Interconnect Camolin with Ferns WRZ for increased resilience.	7	SAM-029 New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	-	SAM-029 New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	-
3300SC0004: Bunclody WS	SAM-036 New GW abstraction and upgrade Carrickduff WTP to supply deficit.	-	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0032: Kiltealy	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-
3300SC0031: Ballindaggin	SAM-050 Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	-	SAM-050 Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	-	SAM-050 Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	-
3300SC0030: Marshalstown	SAM-057	-	SAM-278	81	SAM-278	81

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.		Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.		Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0034: Monageer	SAM-061 Increase GW abstraction and upgrade Monageer WTP to supply deficit.	-	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0023: Enniscorthy Town	SAM-068 Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit.	-	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue,	81	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue,	81

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
			Glynn, Bunclody and Carrighbyrne WRZs.		Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0035: Davidstown	SAM-073 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-281 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-281 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0077: Bree	SAM-094 Increase GW abstraction and upgrade Bree WTP to supply deficit.	32	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0032: Ballyhogue	SAM-093 Rationalise Ballyhogue to Bree WRZ.	32	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly.	81	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly.	81

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
			Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.		Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0033: Clonroche	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-
3300SC0027: Woodview Drive Adamstown	SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.	-
3300SC0066: Raheen (Adamstown)	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0022: Carrighbyrne WS	SAM-224 Rationalise Carrighbyrne to South Regional WRZ.	75	SAM-289 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue,	81	SAM-289 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue,	81

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
			Glynn, Bunclody and Carrighbyrne WRZs.		Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0037: Glynn WS	SAM-118 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAM-285 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-285 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0078: Fardystown	SAM-148 New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused BHs back to production (GW abstraction from existing BHs currently not in supply).	-	SAM-287 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-287 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0080: Sow Regional	SAM-127 Increase GW abstraction and upgrade WTP to partly supply deficit.	-	SAM-280 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly.	81	SAM-280 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly.	81

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	SAM-207 New GW and new WTP to partly supply deficit.		Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.		Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0079: South Regional	SAM-225 New GW abstraction and new WTP to supply deficit.	75	SAM-288 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-288 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3400SC0053: Ballingate Public Supply	SAM-547 Rationalise Ballingate to Tinahely WRZ (not in deficit).	-	SAM-140 Rationalise Ballingate to Tinahely WRZ (not in deficit).	47	SAM-140 Rationalise Ballingate to Tinahely WRZ (not in deficit).	47
3400SC0045: Ballynavortha Public Supply	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-
3400SC0030: Coolboy Coolafancy Public Supply	SAM-145	49	SAM-144	-	SAM-144	-

WRZ	Quickest Delivery - SA Approach 2		Most Resilient - SA Approach 3		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Rationalise Coolboy Coolafancy to Tinahely WRZ (not in deficit).		Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.		Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	
3400SC0033: Raheengraney Public Supply	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0081: Wexford Town	SAM-149 New GW wellfield at Adamstown and new WTP to supply deficit.	-	SAM-286 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81	SAM-286 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
3300SC0020: Coolgreaney WS	SAM-004	1

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
	Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction).	
3300SC0003: Gorey	SAM-198 Rationalise Kilmuckbridge WTP to new Ballyminahill WTP. Rationalisation within WRZ.	-
3300SC0002: Camolin WSS	SAM-017 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0003: Ferns WS	SAM-029 New GW abstraction and new WTP to partly supply full demand (abandon existing SW source).	-
3300SC0004: Bunclody WS	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0032: Kiltealy	SAM-044 Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit.	-
3300SC0031: Ballindaggin	SAM-050	-

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
	Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit.	
3300SC0030: Marshalstown	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0034: Monageer	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0023: Enniscorthy Town	SAM-278 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0035: Davidstown	SAM-281 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown,	81

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
	Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	
3300SC0077: Bree	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0032: Ballyhogue	SAM-283 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0033: Clonroche	SAM-100 New GW abstraction and upgrade Clonroche WTP to supply full demand.	-
3300SC0027: Woodview Drive Adamstown	SAM-105 Increase GW abstraction and upgrade WTP to supply deficit.	
3300SC0066: Raheen (Adamstown)	SAM-108 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
3300SC0022: Carrighbyrne WS	SAM-289 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0037: Glynn WS	SAM-285 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0078: Fardystown	SAM-287 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3300SC0080: Sow Regional	SAM-280 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
3300SC0079: South Regional	SAM-288 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown, Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	81
3400SC0053: Ballingate Public Supply	SAM-140 Rationalise Ballingate to Tinahely WRZ (not in deficit).	47
3400SC0045: Ballynavortha Public Supply	SAM-141 Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit.	-
3400SC0030: Coolboy Coolafancy Public Supply	SAM-144 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3400SC0033: Raheengroney Public Supply	SAM-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3300SC0081: Wexford Town	SAM-286 Interconnect Enniscorthy, Wexford Town, Fardystown and South Regional with GDA via Rathvilly. Rationalise Sow Regional, Marshalstown, Monageer, Davidstown,	81

WRZ	Best Appropriate Assessment - SA Approach 3	
	Option Description	SA Option
	Bree, Ballyhogue, Glynn, Bunclody and Carrighbyrne WRZs.	