

Regional Water Resources Plan South East

Strategic Environmental
Assessment Appendix H:
Study Area K – 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 reflects 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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Table of Contents

1	Introduction and Background	2
1.1	Options Assessment Methodology	2
1.2	Regional Plan Strategic Environmental Assessment	4
1.3	Study Area: Strategic Environmental Assessment	4
1.4	Study Area: Water Framework Directive	5
1.5	Study Area: Appropriate Assessment	6
1.6	Study Area K	6
2	Study Area K Environmental Baseline Context	10
2.1	Population, Economy, Tourism and Recreation, and Human Health	10
2.1.1	Population	10
2.1.2	Economy and Employment	13
2.1.3	Tourism and Recreation	13
2.1.4	Human Health	14
2.2	Water Environment	18
2.2.1	Water Framework Directive	19
2.2.2	Flood Risk	26
2.3	Climate Change	26
2.4	Biodiversity, Flora and Fauna	30
2.4.1	Designated Sites	30
2.4.3	Habitats	32
2.4.4	Species	33
2.5	Material Assets	33
2.6	Landscape and Visual Amenity	35
2.6.1	Seascape	40
2.7	Air Quality and Noise	40
2.7.1	Air Quality	40
2.7.2	Noise	40
2.8	Cultural Heritage	41
2.9	Geology and Soils	42
2.10	Summary of Key Issues and Trends over the Plan Period	44
3	Environmental Assessment – Options Appraisal	49
3.1	Overview	49
3.2	Stage 3: Unconstrained Options	49

3.2.1	Existing Groundwater Abstractions.....	50
3.2.2	New Groundwater Abstractions	50
3.2.3	Sustainable Abstraction in Options Assessment	50
3.3	Stage 4: Coarse Screening	51
3.4	Stage 5: Fine Screening	57
3.5	Stage 6: Feasible Options List	58
4	Environmental Assessment – Approach Development	60
4.1	Introduction to Approach Development	60
4.2	Stage 7: Approach Development Process	61
4.2.1	Environmental Assessment in the Approach Development process	62
4.2.2	SAK Approach Development Process	64
4.3	Comparison of SAK Approaches	72
4.3.1	SA Approach 1 (SA Combination 1) (QD)	75
4.3.2	SA Approach 2 (SA Combination 3) (LCo, BE)	75
4.3.3	SA Approach 3 (SA Combination 4) (LC)	76
4.3.4	SA Approach 4 (SA Combination 7) (MR)	77
4.3.5	SA Approach 5 (SA Combination 8) (BA)	78
4.4	SAK Approach Assessment Comparison	78
4.4.1	Selection of the SA Preferred Approach.....	84
5	SAK Preferred Approach Strategic Environmental Assessment	86
5.1	SAK Preferred Approach Options.....	86
5.2	Additional Measures.....	123
5.2.1	Leakage Reduction	123
5.2.2	Water Conservation	123
5.3	Interim Solutions.....	123
5.4	Approach Uncertainty and Adaptability	123
6	SEA Cumulative Effects for SAK Preferred Approach.....	127
6.1	Cumulative Effects ‘Within Plan’ for SAK	127
6.1.1	Cumulative Effects during Construction.....	128
6.1.2	Cumulative Effects during Operation	132
6.2	Cumulative Effects with Other Developments	133
6.2.1	Cumulative Effects during Construction.....	134
6.2.2	Cumulative Effects during Operation	140
7	Strategic Environmental Assessment Summary	142

8	Water Framework Directive Summary	151
9	Appropriate Assessment Summary	153
10	Recommendations for Implementation.....	155
	References	156
Appendix A	Fine Screening Summaries	A-1
Appendix B	SA Approaches for SAK.....	B-1
Appendix C	Figure Index Table	C-1

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, SAL, and SAM) as appendices.

This Study Area K 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 K within the South East Region for the options and approaches considered and as outlined in the Study Area K Technical Report (RWRP-SE Appendix 1). 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.

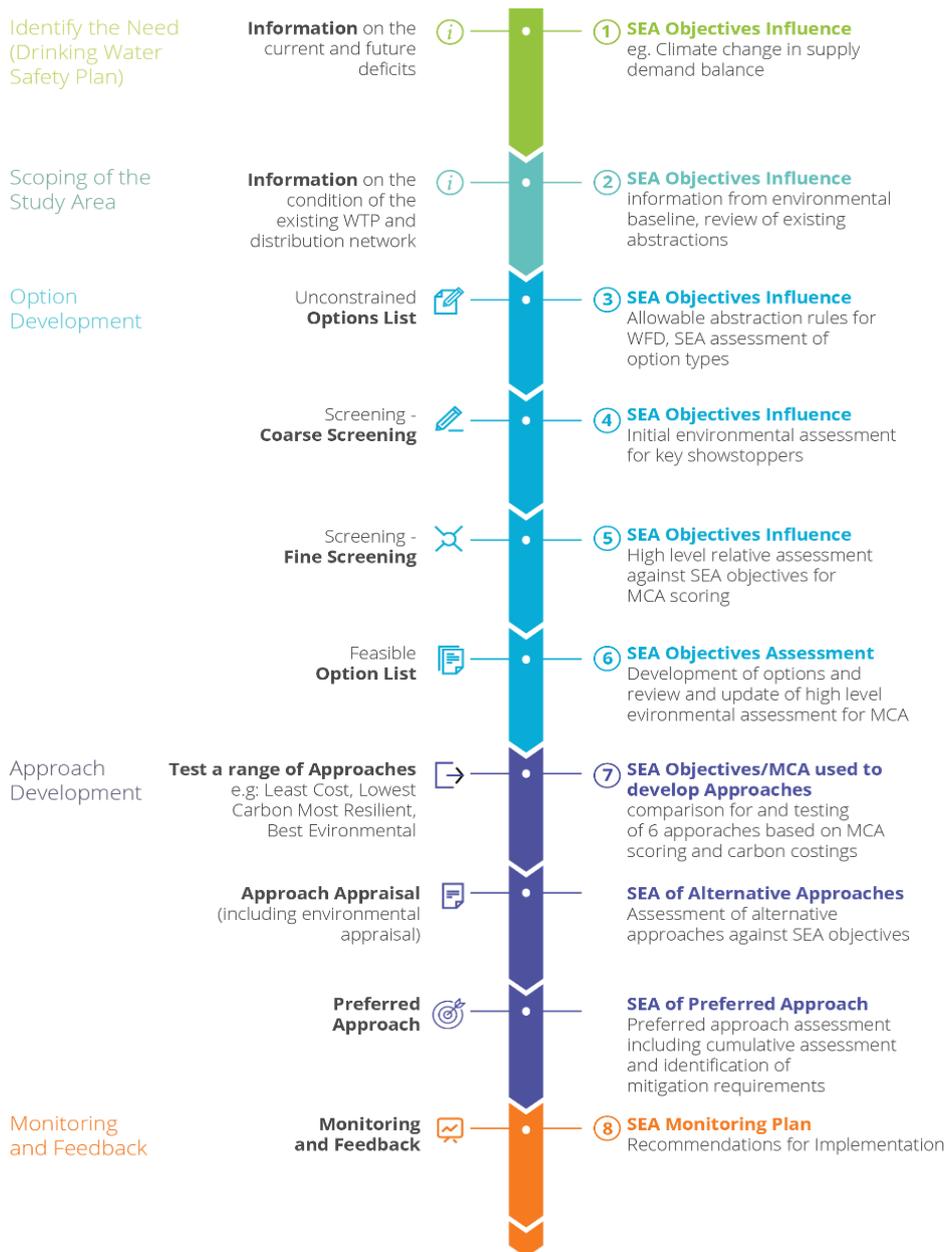


Figure 1.1 Option and Approach Development Process

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	<u>Water quality and resources</u> 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.
	<u>Flood risk</u> Protect and, where possible, reduce risk from ground water and surface water flooding as a result of Uisce Éireann’s activities.
Biodiversity	Protect and, where possible, enhance terrestrial, aquatic and soil biodiversity; particularly regarding European sites and protected species in providing water services.

SEA Topic	SEA Objective
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>
Landscape and visual amenity	Protect and, where possible, enhance designated landscapes in providing water services.
Climate change	<p><u>Climate change mitigation</u></p> <p>Minimise contributions to climate change emissions to air (including greenhouse gas emissions) as a result of Uisce Éireann's activities.</p> <p><u>Climate change adaptation</u></p> <p>Promote the resilience of the environment, water supply and treatment infrastructure to the effects of climate change.</p>
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 SAK 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 SAK 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 SAK are provided in chapter 9 of this review.

1.6 Study Area K

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 SAK, the location of SAK in relation to the South East Region is shown in Figure 1.2.

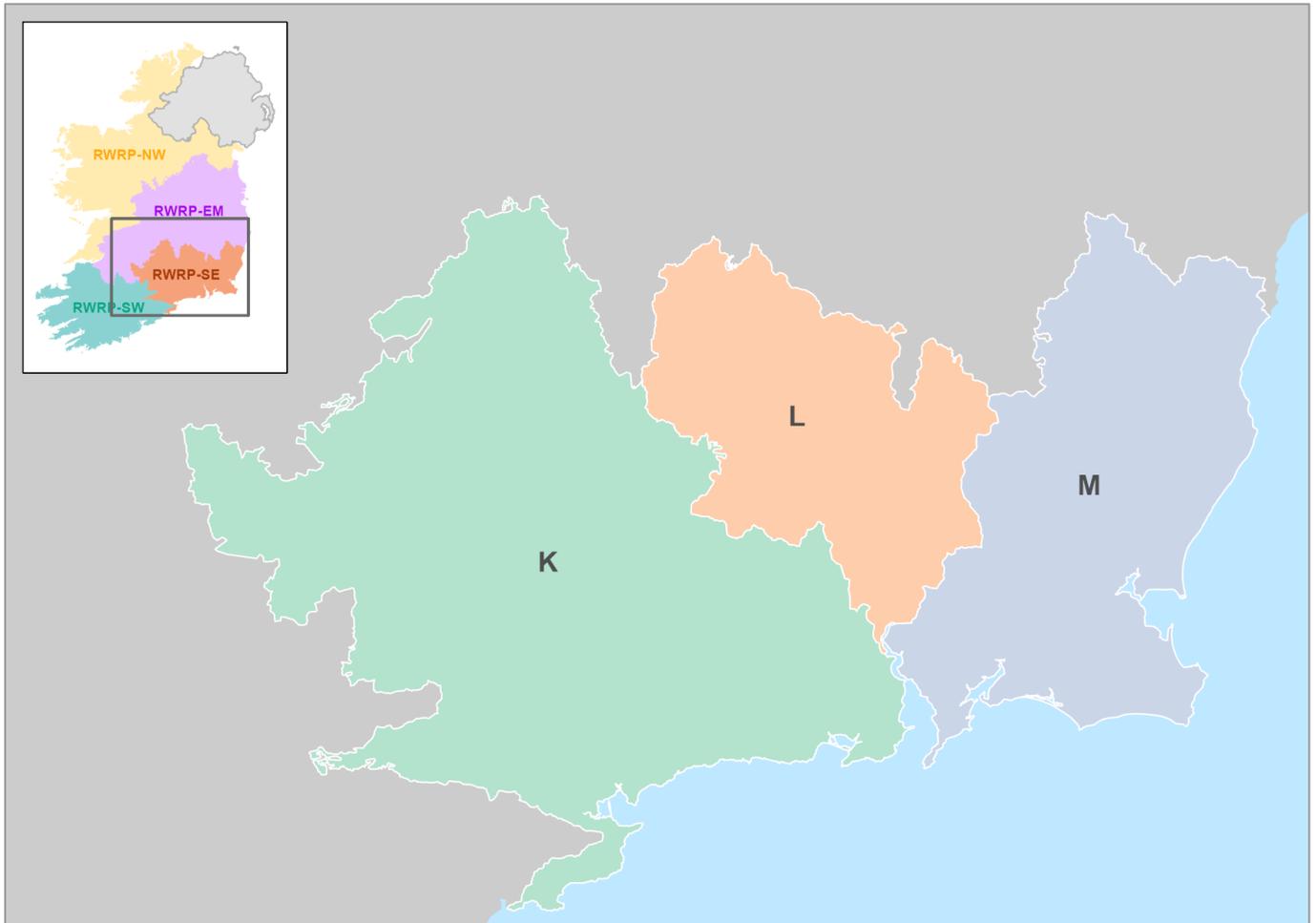


Figure 1.2 South East Region Study Areas

Study Area K lies within the counties of Kilkenny, Limerick, Tipperary, Waterford, Laois, Wexford and Cork, and its total area is approximately 5,056km². There are four principal settlements (with a population of over 10,000) within SAK, including Waterford City, Clonmel, Dungarvan (includes the satellite town of Ballinroad) and Tramore. The largest settlement is Waterford City and suburbs, with a population of 53,504 (CSO, 2016a).

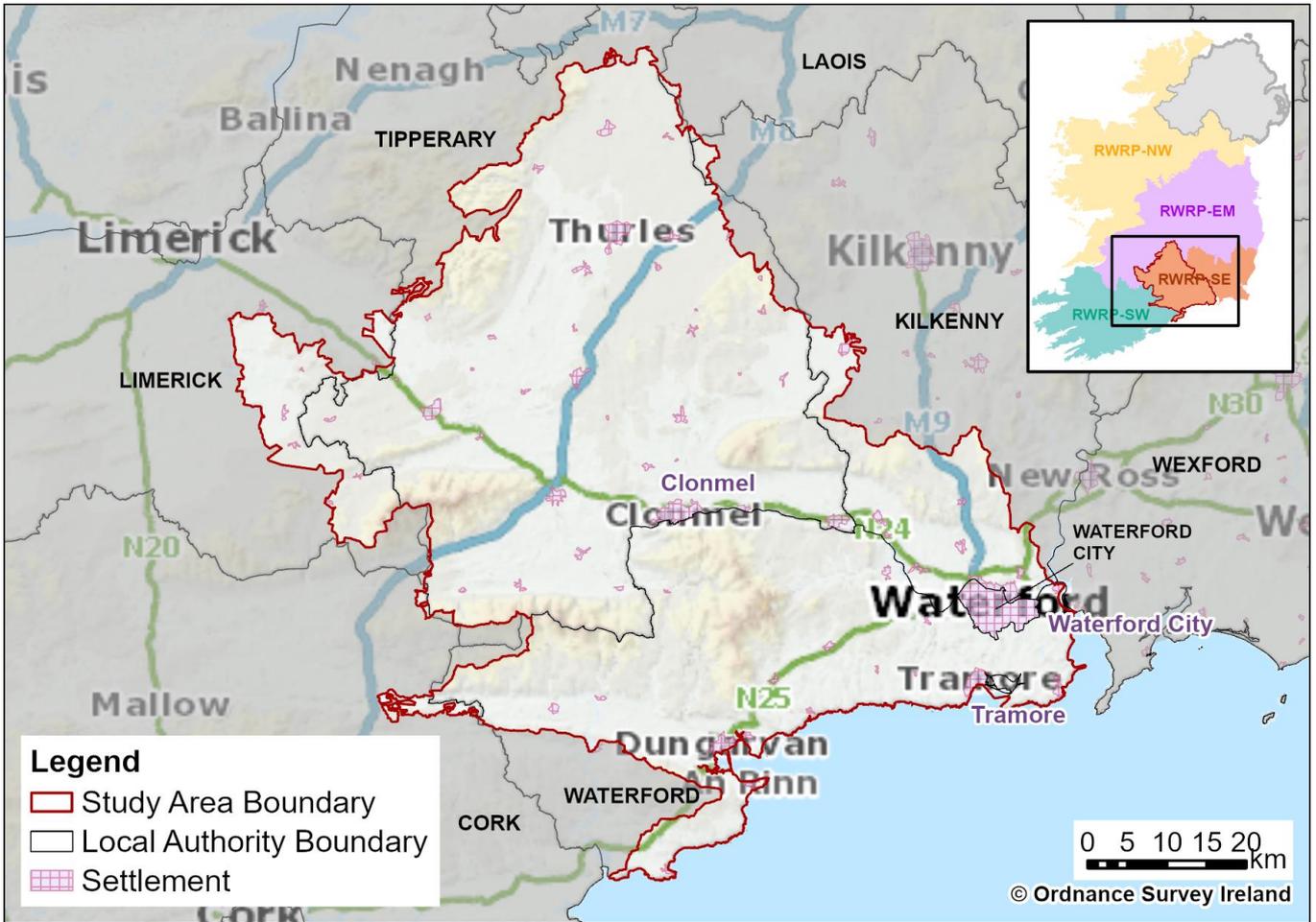


Figure 1.3 Study Area K

2

Study Area K Environmental Baseline Context

2 Study Area K Environmental Baseline Context

This chapter provides environmental baseline information for SAK 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 SAK

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
3100SC0079 - Adramone/Kilrossanty	366	15
2900SC0020 - Ahenny	69	15
1900SC0026 - Anglesboro Water Supply	24	15
2900SC0021 - Ardfinnan Regional	11,336	24
3100SC0005 - Ardmore	426	15
3100SC0115 - Ardmore Grange	203	15
2900SC0022 - Ballinvir	23	15
3100SC0051 - Ballyguiry	101	15
3100SC0107 - Ballyknock	11	15
1900SC0012 – Ballylanders Water Supply	559	15
3100SC0054 - Ballymacarbry	652	15
3100SC0077 - Ballynoe/Melleray	206	15
3100SC0097 - Ballyogarty	594	15
3100SC0024 - Ballysaggart	71	15
3100SC0098 - Ballyshunnock	34	15
3100SC0102 - Bonmahon	278	15
3100SC0027 - Boolavonteen/Kilcooney/ Tooraneena	349	15
2900SC0023 - Burncourt Ballylooby	4,079	15
1500SC0005 - Callan PWS	2,725	15
2900SC0024 - Carrick-On-Suir	6,094	15
3100SC0123 - Carrigeen	15	15
1900SC0038 - Carrigmore	377	15
3100SC0127 - Carrignagower	37	15
3100SC0030 - Carrowgarraiff	45	15
2900SC0025 - Clonmel & Environs	15,919	47
2900SC0067 - Coalbrook/Commons	1,751	14
3100SC0045 - Comeragh	185	15
3100SC0110 - Crehanagh	17	15
3100SC0111 - Deelish/Ballinacourty/Kilnafrehan	156	15

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
2900SC0029 - Dundrum Regional	7,914	17
3100SC0111 - Dungarvan	13,379	20
3100SC0091 - Dunhill	145	15
3100SC0092 - Dunhill Ballinageeragh	44	15
3100SC0033 - East Waterford Water Supply Scheme	64,936	25
3100SC0042 - Faha	66	15
2900SC0026 - Fethard & Mullenbawn Regional Public Water Supply	9,077	18
1900SC0011 - Galbally Water Supply	368	15
2900SC0032 - Galtee Regional	16,192	15
3100SC0108 - Garravoone	37	15
3100SC0044 - Garrahylish	3	15
3100SC0087 - Glenagad	57	15
2900SC0069 - Glengar	512	15
3100SC0093 - Graiguenageeha	42	15
1900SC0008 - Herbertstown	687	15
2900SC0013 - Horse & Jockey PWS	643	15
3100SC0053 - Inchinleamy	25	15
3100SC0116 - Kilbrien	88	15
2900SC0036 - Kilcash	218	15
3100SC0102 - Kill/Ballylaneen	829	15
3100SC0099 - Kilmacthomas	356	15
3100SC0129 - Kilmanahan	39	15
1900SC0030 - Killeely	484	15
1900SC0010 - Knocklong/Hospital	3,424	15
3100SC0113 - Lacken	69	15
3100SC0114 - Liskealty	5	15
3100SC0095 - Lismore/Cappoquin/Ballyduff	3,805	15
2900SC0016 - Littleton PWS	492	15
3100SC0120 - Lyrenaleara	40	15
3100SC0112 - Modeligo	192	15

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
3100SC0126 - Monatarrif	13	15
3100SC0081 - Moores Well	91	15
1500SC0019 - Piltown-Fiddown	3,075	24
3100SC0124 - Portlaw	1,608	15
3100SC0119 - Poulmagunoge (Waterford)	100	15
3100SC0089 - Rathgormuck	502	15
3100SC0118 - Russelstown	28	15
3100SC0101 - Scrahan	24	15
3100SC0035 - Smoor	65	15
1500SC0001 - South Kilkenny	12,671	40
3100SC0083 - Stradbally	658	15
2900SC0042 - Templemore/Templetuohy	4,061	15
2900SC0039 - Templetney/Brackford Bridge PWS	3,884	15
2900SC0014 - Thurles/Borrisoleigh	12,317	19
2900SC0049 - Tipperary Town Supply	4,860	12
2900SC0031 - Tulllohea	460	15
2900SC0009 - Twomileborris	809	15

*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

SAK had a below average household disposable income per person in 2019, although, at a county level the counties of Cork and Limerick are above average (CSO, 2023a). The unemployment rate was 6.0% in the South East, 4.2% in the South West, 3.6% in the Midland and 4.8% in the Mid West 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, 1,025 in the South West, 416 in the Midland, and 354 in the Mid-West regions (NUTS3) of Ireland (CSO, 2023c).

2.1.3 Tourism and Recreation

Tourism in SAK 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 the county of Cork contains internationally recognised Camden Fort Meagher, and it has been described as “Ireland’s

Maritime Haven”, with emphasis placed on the cultural and historical attractions many of which located along the coastal environments (Pure Cork, 2021). Waterford City is the oldest city in Ireland, and it is said to be the perfect blend of ancient and modern. The county of Limerick includes Limerick City, the first city of culture, and emphasises the importance of sports in its touristic appeal (Limerick City and County Council, 2020). Additionally, the study area 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). County Waterford is home to the Copper Coast, a UNESCO Global Geopark which offers winding trails for walking, driving, and cycling (Tourism Ireland, 2022). 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)
Mid West	Male: 79.0 Female: 82.5	52%	Good
Midland	Male: 80.0 Female: 83.2	47%	Good
South East	Male: 79.3 Female: 83.1	44%	Good
South West	Male: 79.1 Female: 83.2	47%	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 SAK.

Table 2.3 Areas Supplied by the WTPs in SAK

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Ahenny (Ahenny) WTP	2900SC0020 - Ahenny	Tipperary
Anglesboro WTP	1900SC0026 - Anglesboro Water Supply	Limerick
Ardmore Grange WTP	3100SC0115 - Ardmore Grange	Waterford
Ballinamuck WTP	3100SC0001 - Dungarven	Waterford
Ballincurry WTP, Coalbrook WTP and Commons WTP	2900SC0067 - Coalbrook/Commons	Tipperary
Ballinvir WTP	2900SC0022 - Ballinvir	Tipperary
Ballyguiry WTP	3100SC0051 - Ballyguiry	Waterford
Ballyknock WTP	3100SC0107 - Ballyknock	Waterford
Ballylanders WTP	1900SC0012 - Ballylanders Water Supply	Limerick
Ballylaneen WTP	3100SC0102 - Kill/Ballylaneen	Waterford
Ballylooby Springs WTP, Glengarra WTP and Lissava WTP	2900SC0023 - Burncourt Ballylooby	Tipperary
Ballyogarty WTP	3100SC0097 - Ballyogarty	Waterford
Ballyrohan WTP	3100SC0054 - Ballymacarbry	Waterford
Ballysaggart WTP	3100SC0024 - Ballysaggart	Waterford
Ballyshonnock WTP	3100SC0098 - Ballyshonnock	Waterford
Callan WTP	1500SC0005 - Callan PWS	Kilkenny
Carrick-on-Suir (Linguan) WTP, Coolnamuck WTP and Crottys Lake WTP	2900SC0024 - Carrick-On-Suir	Tipperary
Carrigeen WTP	3100SC0123 - Carrigeen	Waterford
Carrigmore WTP	1900SC0038 - Carrigmore	Limerick
Carrignagower WTP	3100SC0127 - Carrignagower	Waterford
Carrowgarriff WTP	3100SC0030 - Carrowgarriff	Waterford
Clonmel-Poulnagunoge WTP, Glenary WTP and Monroe WTP	2900SC0025 - Clonmel & Enviorns	Tipperary
Crehanagh WTP	3100SC0110 - Crehanagh	Waterford
Deelish WTP	3100SC0111 - Deelish/Ballinacourty/ Kilnafrehan	Waterford
Dualla WTP, Fethard WTP and Mullinbawn WTP	2900SC0026 - Fethard & Mullenbawn Regional Public Water Supply	Tipperary
Dunhill Ballynageeragh WTP	3100SC0092 - Dunhill Ballinageeragh	Waterford

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Dunhill Cois Coille WTP	3100SC0091 - Dunhill Ballinageeragh	Waterford
East Waterford (Adamstown)WTP	3100SC0033 - East Waterford Water Supply Scheme	Waterford
Faha WTP	3100SC0042 - Faha	Waterford
Farranamanagh WTP, Golden to Cashel Town (Springmount Source) WTP, Rossadrehid WTP and Thomastown Augmentation WTP	2900SC0032 - Galtee Regional	Tipperary
Fawnagown WTP	2900SC0049 - Tipperary Town Supply	Tipperary
Fews WTP	3100SC0045 - Fews	Waterford
Galbally WTP	1900SC0011 - Galbally Water Supply	Limerick
Garrahylish WTP	3100SC0044 - Garrahylish	Waterford
Garravoone WTP	3100SC0108 - Garravoone	Waterford
Glengar WTP	2900SC0069 - Glengar	Tipperary
Glennagad WTP	3100SC0087 - Glenagad	Waterford
Goatenbridge WTP	2900SC0021 - Ardfinnan Regional	Tipperary
Graiguenageeha WTP	3100SC0093 - Graiguenageeha	Waterford
Herbertstown WTP	1900SC0008 - Herberstown	Limerick
Hollyford WTP, Ironmills WTP and Stooke WTP	2900SC0029 - Dundrum Regional	Tipperary
Horse & Jockey (Curragheen) WTP	2900SC0013 - Horse & Jockey PWS	Tipperary
Hospital WTP 1, Hospital WTP 2, Knocklong Church Road WTP and Knocklong WTP	1900SC0010 - Knocklong/Hospital	Limerick
Inchinleamy WTP	3100SC0053 - Inchinleamy	Waterford
Kilbrien (Ballinakill) WTP	3100SC0116 - Kilbrien	Waterford
Kilcash WTP	2900SC0036 - Kilcash	Tipperary
Kilmacthomas WTP and Pairc an Aonaigh WTP	3100SC0099 - Kilmacthomas	Waterford
Kilmanahan WTP	3100SC0129 - Kilmanahan	Waterford
Kilrossanty WTP	3100SC0079 - Adramone/Kilrossanty	Waterford
Kilteely WTP	1900SC0030 - Kilteely	Limerick
Lacken WTP	3100SC0113 - Lacken	Waterford

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
LCB Ballyduff WTP, LCB Cappoquin WTP and LCB Lismore Deerpark WTP	3100SC0095 - Lismore/Cappoquin/Ballyduff (LCB)	Waterford
Liskealty WTP	3100SC0114 - Liskealty	Waterford
Littleton WTP	2900SC0016 - Littleton PWS	Tipperary
Lyrenaleara WTP	3100SC0120 - Lyrenaleara	Waterford
Melleray WTP	3100SC0077 - Ballynoe/Melleray	Waterford
Modeligo WTP	3100SC0112 - Modeligo	Waterford
Monatarrif WTP	3100SC0126 - Monatarrif	Waterford
Monea WTP	3100SC0005 - Ardmore	Waterford
Mooncoin (Clonassy) WTP and Mullinabro WTP	1500SC0001 - South Kilkenny	Kilkenny
Moore's Well WTP	3100SC0081 - Moores Well	Waterford
Piltown-Fiddown (Jamestown) WTP	1500SC0019 - Piltown-Fiddown	Kilkenny
Portlaw WTP	3100SC0124 - Portlaw	Waterford
Poulavanogue WTP	3100SC0119 - Pounagunoge (Waterford)	Waterford
Rathgormuck WTP	3100SC0089 - Rathgormuck	Waterford
Russelstown WTP	3100SC0118 - Russelstown	Waterford
Scrahan WTP	3100SC0101 - Scrahan	Waterford
Smoorbeg WTP	3100SC0035 - Smoor	Waterford
Stradbally WTP	3100SC0083 - Stradbally	Waterford
Templemore (College Hill) WTP, Templetouhy WTP and Whitefield WTP	2900SC0042 - Templemore/ Templetuohy	Tipperary
Templetney WTP	2900SC0039 - Templetney/Brackford Bridge PWS	Tipperary
Thurles WTP	2900SC0014 - Thurles/Borrisoleigh	Tipperary
Tooraneena WTP	3100SC0027 - Boolavonteen/Kilcooney/ Tooraneena	Waterford
Tullohea WTP	2900SC0031 - Tullohea	Tipperary
Twomileborris WTP	2900SC0009 - Twomileborris	Tipperary

Currently for day-to-day operations, 46 out of 75 of the WRZs in SAK have a current deficit and 48 out of 75 have a 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, this does not manifest as an interruption to supply for all WRZs. During recent dry periods, particularly the summer of 2018 and

2020 when water conservation orders were implemented, a number of the supplies in SAK were impacted.

Poor water quality can be linked to risks to health. The Uisce Éireann Barrier Assessment identified eighty of ninety-nine WTPs within the study area 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 SAK 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 nine WRZs on the EPA Remedial Action List within SAK, namely South Kilkenny, Glengar, Thurles, Clonmel Poulavanogue, Galtee Regional, Graiguenageeha, Dungarvan, Kilcash and Templemore/Templetuohy Uisce Éireann is currently progressing immediate corrective action in relation to a number of supplies within SAK in advance of the NWRP. Details of these are included in the SAK 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 SAK.

Table 2.4 provides a summary of the WFD catchments within SAK.

Table 2.4 Catchments within SAK (EPA, 2020)

WFD Catchments	Total Catchment Area (km ²)	Catchment Area within SAK (km ²)
Blackwater (Munster)	3,307	367
Colligan-Mahon	662	660
Lower Shannon	1,041	116
Nore	2,585	147
Shannon Estuary South	2,038	212
Suir	3,553	3,537

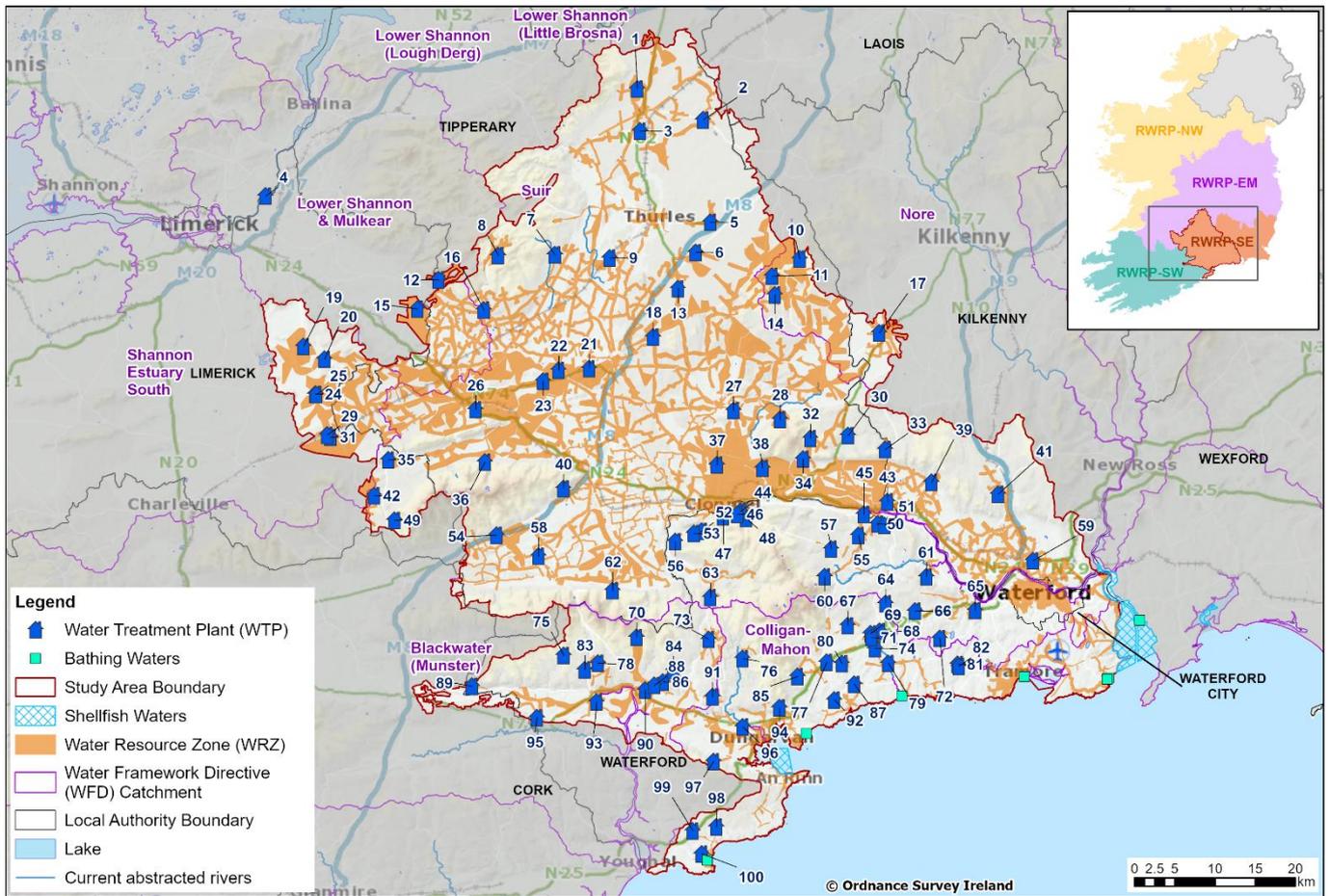


Figure 2.1 Water Environment of SAK

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 SAK 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 SAK supplies, Uisce Éireann has assessed its twenty six surface water abstractions, namely, Ahernes Glen Abstraction (Ardfinnan Regional), Glenbreda Stream Abstraction (Ardfinnan Regional), Glengarra River (Burncourt Ballylooby), Crottys Lake (Carrick-On-Suir), Lingaun River (Carrick-On-Suir), Boola River Intake (Clonmel & Environs), Poulavanogue Abstraction 1 (Clonmel & Environs), Poulavanogue Abstraction 2 (Clonmel & Environs), Glenary Abstraction 2 (Clonmel & Environs), Deelish Reservoir (Deelish/Ballinacourty/Kilnafrehan), Multeen River Intake (Dundrum Regional), Clodagh River (East Waterford Water Supply Scheme), Ballyshonock Impoundment (East Waterford Water Supply Scheme), Mahon River Intake (East Waterford Water Supply Scheme), Gurtnapisha (Fethard & Mullenbawn Regional Public Water Supply), Walshbog (Fethard & Mullenbawn Regional Public Water Supply), Cloran Stream (Fethard & Mullenbawn Regional Public Water Supply), Anner River (Fethard & Mullenbawn Regional Public Water Supply), College Stream Intake (Galtee Regional), Muskry Stream Intake (Galtee Regional), Ballylaneen (Kill/Ballylaneen), Portlaw Springs (Portlaw), Clonassy/Pollanasa River (South Kilkenny), River Blackwater, Mullinavat (South Kilkenny), Stradbally (Stradbally), and River Clodiagh (Thurles/Borrisoleigh). Based on this initial assessment, the volume abstracted at Crottys Lake (Carrick-On-Suir), Ballylaneen (Kill/Ballylaneen), Lingaun River (Carrick-On-Suir) and Stradbally (Stradbally) would appear to comply with sustainability guidelines. However, under the proposed regulatory regime, sustainable abstraction quantities will be adjudicated by the EPA who will have the benefit of detailed project level information.

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 six WFD catchments in SAK and the total number of surface and groundwater waterbodies within SAK are provided in Table 2.5 below.

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

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
Rivers	Blackwater (Munster)	21	0
	Colligan-Mahon	35	7
	Lower Shannon	9	5
	Nore	13	1
	Shannon Estuary South	8	4

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
	Suir	168	40
Lakes	Blackwater (Munster)	0	0
	Colligan-Mahon	3	0
	Lower Shannon	0	0
	Nore	0	0
	Shannon Estuary South	0	0
	Suir	6	1
Transitional and Coastal	N/A	14	1
Groundwater	N/A	64	5

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

- Blackwater (Munster): Agriculture (53%), Other (Including: Abstraction, Historically Polluted Sites, Windfarm, and Unknown anthropogenic) (32%) and Forestry (28%);
- Colligan-Mahon: Agriculture (78%);
- Lower Shannon: Agriculture (50%);
- Nore: Agriculture (78%);
- Shannon Estuary South: Agriculture (93%); and
- Suir: Agriculture (72%).

The Ballyshunnock lake waterbody is at particular risk due to abstraction pressures in SAK. Table 2.6 includes a summary of the 'at risk' waterbodies within SAK.

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

Waterbody Type	Water Catchments	Number of Waterbodies Identified as 'At Risk'	Surface Waterbodies Status 'At Risk' Due to Abstraction Pressure*
Rivers	Blackwater (Munster)	6	20
	Colligan-Mahon	8	
	Lower Shannon	5	
	Nore	4	
	Shannon Estuary South	4	
	Suir	88	
Lakes	Blackwater (Munster)	0	2
	Colligan-Mahon	1	
	Lower Shannon	0	

Waterbody Type	Water Catchments	Number of Waterbodies Identified as 'At Risk'	Surface Waterbodies Status 'At Risk' Due to Abstraction Pressure*
	Nore	0	
	Shannon Estuary South	0	
	Suir	3	
Transitional and Coastal	N/A	7	0
Groundwater	N/A	21	N/A
Total		147	22

* 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 SAK 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 SAK (catchments.ie, 2021g)

Areas for Action	Key Reasons for Selection
Aherlow	<ul style="list-style-type: none"> • Building on ongoing work by Inland Fisheries Ireland (IFI) regarding a riparian management scheme • Strong community groups • Entire subcatchment project • Headwaters of the river Aherlow • Three waterbodies are failing to meet protected area objectives for Salmonids • Five deteriorated waterbodies
Ara	<ul style="list-style-type: none"> • County town (Tipperary), with multiple pressures. Long term challenge - four waterbodies with consistently Poor or Moderate status. • Catchment-based Flood Risk Assessment and Management (CFRAM) identified this river as potential for Natural Water Retention Measures • Headwater of the river Ara • Local community group. Application for leader funding to transfer management of the river to the school/local community. • Potential to work with local co-operative
Borrisoleigh	<ul style="list-style-type: none"> • Multiple pressures on stream that flows through Borrisoleigh town • Headwaters to the river Fishmoyne

Areas for Action	Key Reasons for Selection
Camoge	<ul style="list-style-type: none"> • Strong local development association • Shared ground with the Corcas • Build on improvements as a result of instream works completed by Inland Fisheries Ireland • Headwaters of the river Camoge • Active angling clubs • One potential 'quick win' • Two deteriorated waterbodies
Clashawley	<ul style="list-style-type: none"> • Building on work completed by Tipperary County Council • Potential to work with community group • Large water abstraction • Potential to work IFI project • Two deteriorated waterbodies • Three potential 'quick wins '
Clodiagh (Portlaw)	<ul style="list-style-type: none"> • Headwaters of the Clodiagh (Portlaw) • The only waterbody in the subcatchment that is less than Good status • Not meeting protected area objective for Freshwater Pearl Mussel habitat (19 of 27 catchments of S.I. 296 2009) • Potential pilot project in an area with a high number of derogation farms
Colligan-Bricky-Dungarvan Harbour	<ul style="list-style-type: none"> • One deteriorated waterbody that is discharging into Colligan estuary (moderate status) • One Poor status waterbody that is discharging into Bricky estuary, an estuary where macroalgae is increasing • Opportunity to build on existing knowledge of IFI and Uisce Éireann regarding two unlicensed discharges from pumping stations at Moate and Ballynagaul in Killongford_010 into Dungarvan Harbour shellfish area • Important fisheries (sea trout, seabass, oyster industry) • Important for birds (SPA) • Active CLAMs (Coordinated Local Aquaculture Management) group in Newry • Important habitat for natural oyster beds
Dead and Cauteen	<ul style="list-style-type: none"> • Headwaters to the river Cauteen and the river Dead • Strong local farming involvement • Opportunity to build on awareness initiatives by Limerick County Council

Areas for Action	Key Reasons for Selection
Drumcomoge	<ul style="list-style-type: none"> • Multi-agency effort/cross county opportunity • Headwaters to the Camoge which is already a project • Similar issues to the Arra • Another test case for poorly drained soils • Good tidy towns group that could be incorporated (Emly)
Dunhill	<ul style="list-style-type: none"> • Building on work completed by Waterford County Council • Discharges into green coast bathing area • Potential to coordinate with recent work: Integrated Constructed Wetland development, local community work to naturalise stream and biodiversity study completed by Uisce Éireann. • One deteriorated waterbody
Erkina	<ul style="list-style-type: none"> • Groundwater abstraction at Durrow is failing for nitrates • Potential to work with active community groups • Important amenity – local groups are in the process of trying to establish a blue way • Potential to work with active group water schemes • Two deteriorated waterbodies
Groody	<ul style="list-style-type: none"> • Building on improvement to fishery; salmon has returned to the lower section of the river • Zoned for amenity use in Local Area Plan • Active community interest, including Caherconlish tidy towns • Urban stream • Potential to tie in with Limerick regeneration project • One potential 'quick win'
Inch (Bilboa)	<ul style="list-style-type: none"> • Opportunity to look at integration of planning and forestry activities • Headwaters of one of the most important spawning streams in the system • One deteriorated waterbody • Waterbody is not meeting protected area objectives for Salmon
Johns	<ul style="list-style-type: none"> • Longer term challenge • Discharges into the Middle Suir Estuary which is a Nutrient Sensitive Area that is not meeting its protected area objective • Upstream of estuary where locals have reported mussel die off • Building on planned Drainage Area Plan for Waterford city

Areas for Action	Key Reasons for Selection
	<ul style="list-style-type: none"> • Building on upcoming biodiversity audit that Waterford County Council are funding • Active community group with an interest in invasive species
Licky	<ul style="list-style-type: none"> • Failing to meet protected area objectives for Freshwater Pearl Mussel (19 of 27 catchments of S.I. 296 2009) • Building on existing work by IFI • Heritage: St Declans trail crosses the river Licky • One deteriorated waterbody
Lingaun	<ul style="list-style-type: none"> • Would bring all waterbodies in the subcatchment to Good status • One deteriorated waterbody • One waterbody that failed to meet protected area objective for drinking water (MCPA failure)
Lough Gur	<ul style="list-style-type: none"> • Opportunity to work with a strong group water scheme here. Many farmers in the area are members of the scheme. • Active community and angling groups • High recreational and amenity value • Important for biodiversity and heritage
Mulkear (Limerick)	<ul style="list-style-type: none"> • Building on completed and ongoing work by the MulkearLIFE project • Building on improvements from in-stream works • Important trout spawning streams • Failing to meet protected area objective for salmon • One deteriorated waterbody
Tay	<ul style="list-style-type: none"> • Discharges into popular bathing area (Stradbally) • Discharges into an important seabass fishery • One deteriorated High Ecological Status objective waterbody • One potential 'quick win'
Toem and Cappawhite	<ul style="list-style-type: none"> • Opportunity to look at integration of planning and forestry activities • Potential to link with the Mulkear AfterLIFE Plan • Important salmon spawning rivers • Headwaters to the river Dead • One deteriorated waterbody
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.

Areas for Action	Key Reasons for Selection
	<ul style="list-style-type: none"> • Building on planned Irish Water 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

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 SAK.

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 Improve treatment capacity and network functions for water services infrastructure Water resource planning and conservation – on both supply and demand sides

Summary

- 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 SAK

County	Key Risk Areas
Cork County (Cork County Council, 2019)	<ul style="list-style-type: none"> • Flooding • Storm frequency and intensity • Extreme cold/Heavy snowfall and ice • Extreme heat/Drought conditions • Coastal erosion • Wind speeds
Kilkenny County (Kilkenny 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 • Air quality or pollution
Laois County	<ul style="list-style-type: none"> • Extreme rainfall

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

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 SAK, 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 SAK 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, Ramsar Sites 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.

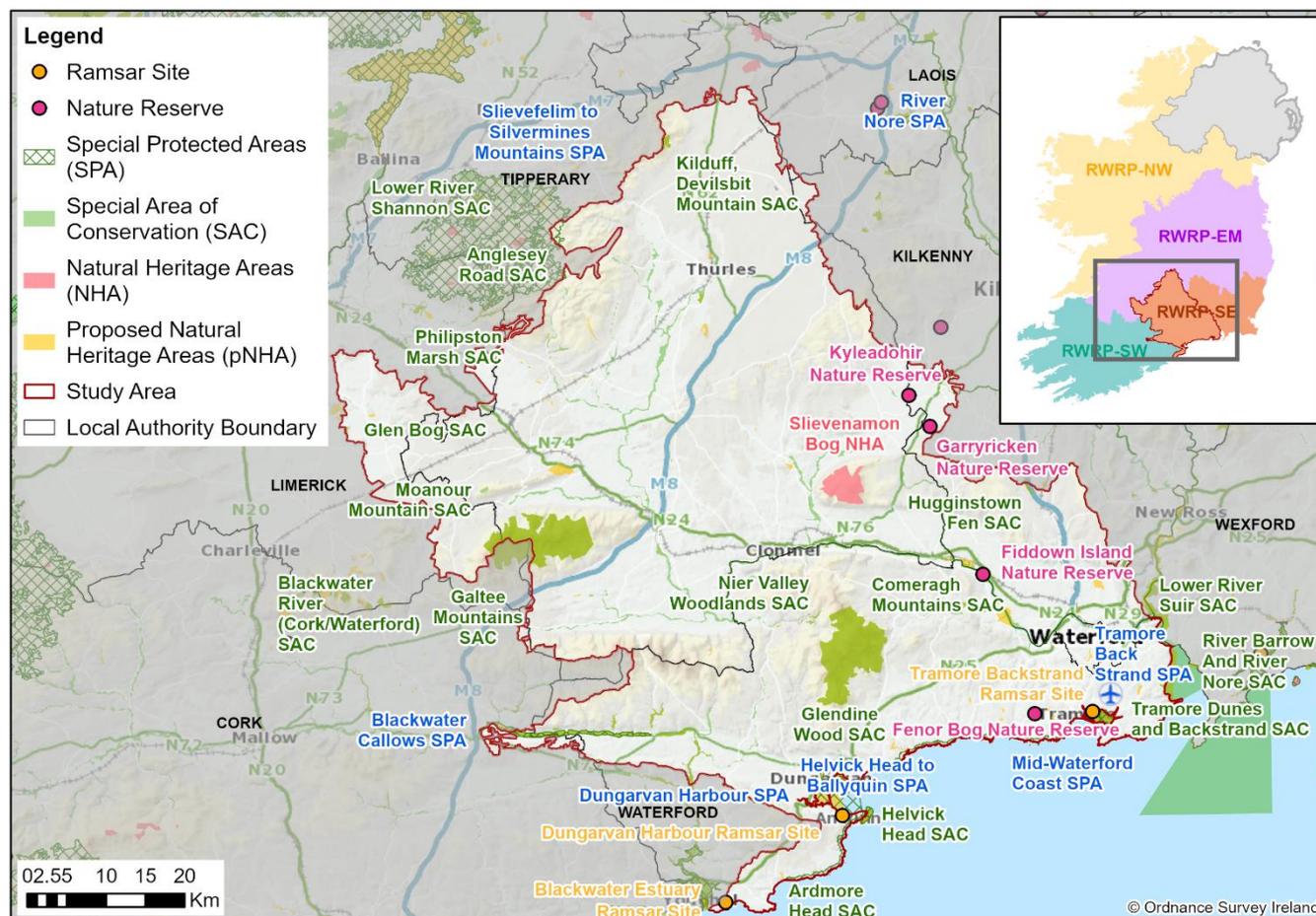


Figure 2.2 Designated Sites in SAK

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

Receptor	Name	Total Number
Special Protected Area (SPA)	Blackwater Callows SPA	7
	Dungarvan Harbour SPA	
	Helvick Head to Ballyquin SPA	
	Mid-Waterford Coast SPA	
	River Nore SPA	
	Slievefelim to Silvermines Mountains SPA	
	Tramore Back Strand SPA	
Special Area of Conservation (SAC)	Anglesey Road SAC	17
	Ardmore Head SAC	

Receptor	Name	Total Number
	Blackwater River (Cork/Waterford) SAC	
	Comeragh Mountains SAC	
	Galtee Mountains SAC	
	Glen Bog SAC	
	Glendine Wood SAC	
	Helvick Head SAC	
	Hugginstown Fen SAC	
	Kilduff, Devilsbit Mountain SAC	
	Lower River Shannon SAC	
	Lower River Suir SAC	
	Moanour Mountain SAC	
	Nier Valley Woodlands SAC	
	Philipston Marsh SAC	
	River Barrow And River Nore SAC	
	Tramore Dunes and Backstrand SAC	
Ramsar Sites	Dungarvan Harbour	3
	Blackwater Estuary	
	Tramore Backstrand	
Nature Reserves	Fenor Bog	4
	Fiddown Island	
	Kyleadohir	
	Garryricken	
National Parks	N/A	0
Natural Heritage Areas (NHAs)	Slievenamon Bog	1
Proposed Natural Heritage Areas (pNHAs)	See Figure 2.2	92

2.4.3 Habitats

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

Table 2.11 Habitat Areas for SAK (EPA, 2018)

Habitat	Ha	% of Study Area
Agricultural Land		
Pastures	376,890	74.58%
Non-irrigated arable land	22,491	4.45%
Land principally occupied by agriculture, with significant areas of natural vegetation	5,019	0.99%
Complex cultivation patterns	3,629	0.72%
Natural Habitats		
Peat bogs	25,376	5.02%
Moors and heathland	5,193	1.03%
Natural grasslands	2009	0.40%
Sparsely vegetated areas	694	0.08%
Water bodies	118	0.02%
Forest		
Coniferous forest	30,586	6.05%
Transitional woodland-shrub	12,668	6.05%
Mixed forest	4,785	0.95%
Broad-leaved forest	4,352	0.86%

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

- Oligotrophic waters containing very few minerals of sandy plains;
- Bog habitats – transition mires and quaking bog habitats;
- Alkaline fens;
- Groundwater dependant terrestrial habitats, such as petrifying springs with tufa formation and blanket bogs;
- Northern Atlantic wet heaths with *Erica tetralix*;
- Coastal lagoons;
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); and

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.

- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

2.4.4 Species

The key species (Nelson et al, 2019) of concern within SAK 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*);
- Slender green feather-moss (*Hamatocaulis vernicosus*);
- 'Qualifying interest' bird species e.g. peregrine falcon (*Falco peregrinus*), chough (*Pyrrhocorax pyrrhocorax*), hen harrier (*Circus cyaneus*) and kingfisher (*Alcedo atthis*); and
- Waterbirds of 'qualifying interest' e.g. Brent goose (*Branta bernicla*), whooper swan (*Cygnus cygnus*), curlew (*Numenius arquata*) and winter migratory waders.

The key invasive species to consider (European Communities (Birds and Natural Habitats) Regulations, 2011) for developing options within SAK 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 SAK are listed in Table 2.12, such as agricultural land, coniferous forests, and bog areas. 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 99 WTPs in SAK, meeting the demand of 101 Ml/d as of 2019.

There is one port of national or regional significance in SAK, namely Waterford Port, and no canals of significance. There are two airports of local significance, namely Kilkenny Airport, and Waterford Airport. Other significant transport infrastructure includes the main road network (particularly the N24, N25, N29, N62, N72, N74, N75, M8 and M9).

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

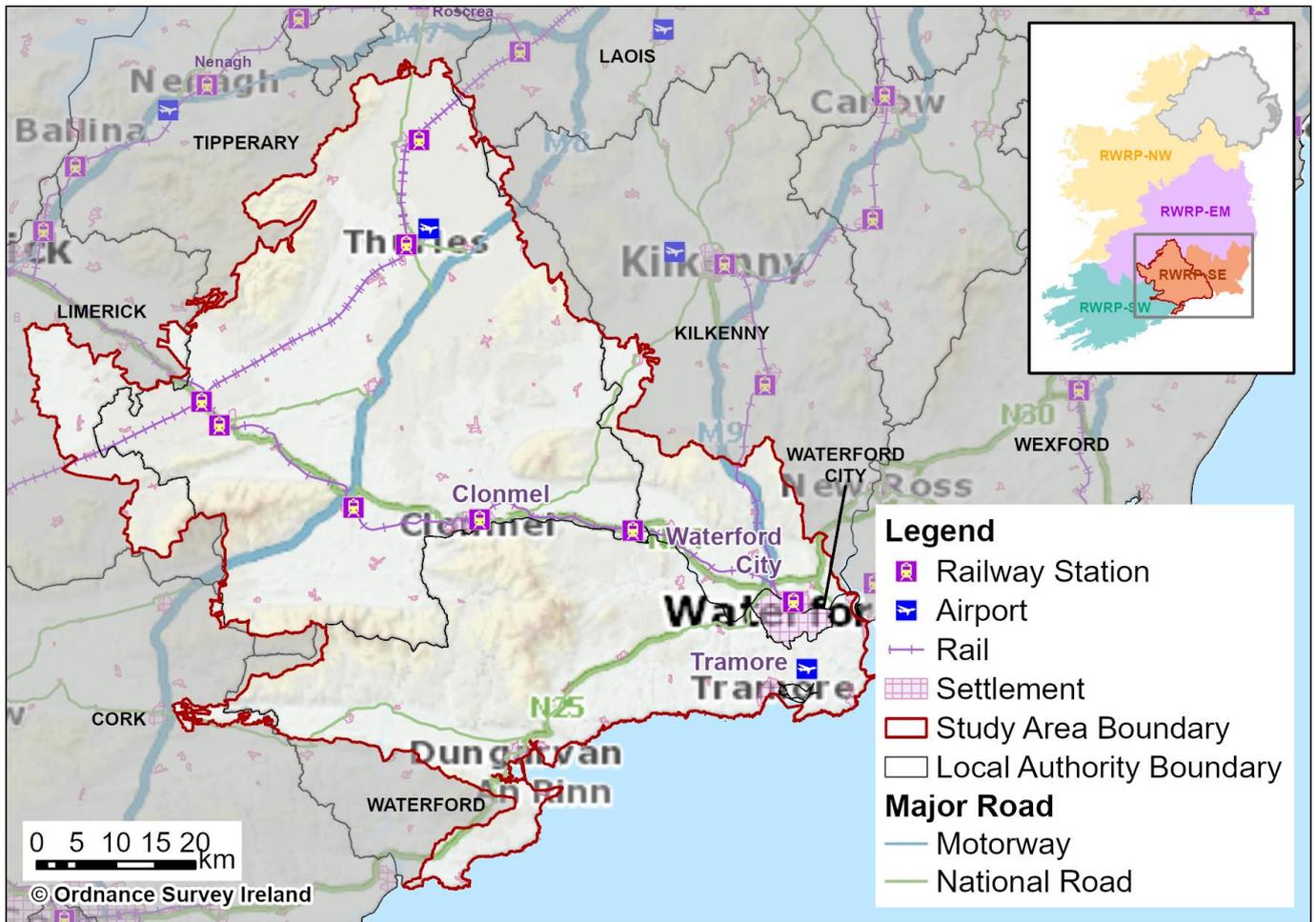


Figure 2.3 Transport Infrastructure in SAK

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

Land use	Ha	% of Study Area	Comparison to Overall South East Region %
Agriculture	408,215	80.77%	84.50%
Urban	8,854	1.75%	1.81%
Natural Habitats	35,145	6.95%	4.92%
Forest	52,391	10.37%	8.56%
Industry	737	0.15%	0.18%
Other	39	0.01%	0.03%

Proposals for other strategic developments within SAK 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

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.

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.

Table 2.13 gives an overview of the project developments which are available from myProjectIreland (2022) for SAK³. 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		
A Pathway to the Regeneration of Cahir Town Centre	Clonmel Garda Station - PPP: Garda Station Bundle	Suir Blueway - Waterford Greenway Link - Carrick on Suir to Kilmeaden
An Duiche, Tipperary Town, County Tipperary	Clonmel Ward Accommodation (modular unit) (South Tipperary General Hospital)	Templemore Town Hall: Enterprise and Cultural Centre, with associated Civic Plaza
Blackwater Community School, Lismore, Waterford - 91509E	Developing inhaled bioengineered exosome therapeutics, delivered by tailored aerosol delivery technology for the treatment of Chronic Obstructive Pulmonary Disease	Thurles Market Quarter - Regeneration through Recreation, Education and Support for Local Producers
Blackwater River Valley	East Limerick Greenway	Tipperary Town Regeneration
Callan Friary Complex/Upper Bridge St Regeneration & Masterplan for the historic core of Callan Town	Fermoy Town Centre Renewal Project	Waterford City and Environs - North Quays
Callan Town Regeneration	Kilbarry, Waterford	Waterford City Regeneration
Carrick-on-Suir Regeneration Plan	Prior Park, Clonmel	Waterford City Wastewater Treatment Plant
Cashel to Cahir Greenway - Cashel to Cahir Town	Regeneration of Youghal Town Centre and the Development of a future vision for the disused former Courthouse	Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper
Clonmel 2030	Suir Blueway - Gas House Bridge - Suir Island, Clonmel	WIT Engineering, ICT and Teaching Building
Clonmel Community Nursing Unit	Suir Blueway - Marlfield to Cahir - Marlfield Village to Swiss Cottages	

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

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

available from the local authorities. This will be considered when identifying landscape character areas and protected areas at the project level in the future. Table 2.14 shows, where possible, 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 the counties Limerick and Laois⁴.

The value of the landscape in SAK 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 SAK (Ordnance Survey Ireland, 2021)

Landscape Character Area	Value	Sensitivity
County: Cork (Cork County Council, 2007)		
City Harbour and Estuary	Very High	Very High
Broad Bay Coast	Very High	Very High
Indented Estuarine Coast	Very High	Very High
Rugged Ridge Peninsula	Very High	Very High
Fertile Plain with Moorland Ridge	Very High	Very High
Broad Fertile Lowland Valleys (Blarney-Ballincollig-Carrigaline-West to Dunmanway)	High	High
Broad Fertile Lowland Valleys (Cloyne, Castlemartyr, Killeagh and Environs)	Medium	Medium
Broad Fertile Lowland Valleys (Castlelyons-Rathcormack)	Medium	Medium
Rolling Patchwork Farmland (Bandon-Clonakilty-Leap Environs)	Medium	Medium
Rolling Patchwork Farmland (Dunderrow-Belgooly and Environs)	Medium	Medium
Hilly River and Reservoir Valleys	High	High
Broad Marginal Middleground and Lowland Basin	Low	Medium
Fissured Fertile Middleground (South of the Gearagh)	Low	Low
Fissured Fertile Middleground (Rylane east to Waterford)	Medium	High

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

Landscape Character Area	Value	Sensitivity
Broad Marginal Middleground Valley	High	High
Rolling Marginal and Forested Middleground (BallyvourneyGaeltacht)	High	High
Rolling Marginal and Forested Middleground (South)	Medium	Medium
Valleyed Marginal Middleground (Macroom and Environs)	High	High
Valleyed Marginal Middleground (Glenville and Environs)	Medium	Medium
Fissured Marginal and Forested Rolling Upland (NorthwestRockchapel)	Medium	Medium
Fissured Marginal and Forested Rolling Upland (Lyre and Nad)	Medium	Medium
Ridged and Peaked Upland (Mullaghanish to Millstreet)	High	High
Ridged and Peaked Upland (Millstreet)	Medium	Medium
Glaciated and Forested Cradle Valley (Gougane Barra)	High	High
Glaciated Cradle Valleys (Cullenagh Lake)	Low	Medium
Glaciated Cradle Valleys (Foilanumera)	Medium	Medium
County: Limerick City and County (Limerick County Council, 2010)		
No values or sensitivity information available		
County: Tipperary (Tipperary County Council, 2016)		
Urban and Fringe Areas	-	Low
Thurles Hinterland	-	Low
Nenagh Corridor	-	Low
River Suir Central Plain / Nenagh Corridor	-	Low
Templemore Plains	-	Low
West Tipperary Farmland Mosaic	-	Low
Borrisokane Lowlands	-	Dominant Moderate with some Low and High
Littleton Raised Bog	-	Dominant High with some Low and Moderate

Landscape Character Area	Value	Sensitivity
Littleton Farmland Mosaic and Marginal Peatland	-	Dominant Low with some Moderate and High
Upper Lough Derg	-	Dominant High with some Low, Moderate, Special and Unique
The Shannon Callows	-	Dominant High with some Low, Moderate, Special and Unique
River Shannon - Newport	-	Dominant Special with some Low, Moderate, High and Unique
Arra Mountains - Lower Lough Derg	-	Dominant Special with some Low, Moderate, High and Unique
Slieveardagh Hills Farmland Mosaic	-	Dominant Moderate with some Low
Linguan Valley Marginal and Farmland Mosaic	-	Dominant Moderate with some Low
Slievenamuck Marginal Mosaic	-	Dominant High with some Moderate and Special
Upperchurch - Kilcommon / Hollyford Hills Mountain Mosaic	-	Dominant High with some Moderate and Special
Silvermines - Rearcross	-	Dominant High with some Low, Moderate, Special and Unique
Slievenamon Mountain Mosaic	-	Dominant Unique with some Low, Moderate, High and Special
Glen of Aherlow Uplands	-	Dominant Unique with some Moderate, High and Special
Galtee Mountains Mosaic	-	Dominant Unique with some Moderate, High and Special
Devilsbit Uplands	-	Dominant Unique with some Moderate, High and Special
Knockmealdown Mountain Mosaic	-	Dominant Unique with some Moderate, High and Special
County: Waterford (Waterford City and County Development Plan, 2021)		
Lower Waterford Estuary	-	Most Sensitive
Tramore Bay	-	Most Sensitive
Copper Coast East	-	Most Sensitive
Copper Coast West	-	Most Sensitive
Dungarvan	-	Most Sensitive

Landscape Character Area	Value	Sensitivity
Helvic Head	-	Most Sensitive
Ardmore Head	-	Most Sensitive
Blackwater Estuary	-	Most Sensitive
Suir Estuary	-	Most Sensitive
Blackwater and Bridge River Corridor	-	Most Sensitive
Suir River Corridor	-	Most Sensitive
Comeragh Mountains	-	Most Sensitive
Knockmealdown Mountains	-	Most Sensitive
Knockaturnory Munsboro	-	High
Ballymacarbry / Nire Valley	-	High
Tooraneena Foothills	-	High
Knockmealdown Foothills	-	High
Drumhills	-	High
Glendine	-	High
Rathgormuck Lowlands	-	Low
Kilmacthomas Lowlands	-	Low
East Waterford Lowlands	-	Low
Clashmore and Newport Lowlands	-	Low
Blackwater and Bridge Lowlands Kinsalebeg	-	Low
Waterford City Environs	-	Least Sensitive
Tramore Environs	-	Least Sensitive
Dungarvan Environs	-	Least Sensitive

County: Kilkenny (Kilkenny County Council, 2008)

The Slieveardagh Uplands	No significant landscape value but high ecological value in the northern hills	Low but High in the northern hills
The Castlecomer Plateau	Special scenic value	High
Brandon Hill Uplands	Significant visual amenity value	High
The South Western Uplands	Certain landscape value, in particular the western hills of the unit	High

Landscape Character Area	Value	Sensitivity
The South Eastern Hills	Generally, no special value except environs of Glenmore have special scenic value	Medium
The Kilkenny Basin	No significant landscape value	Low
South Kilkenny Lowlands	Special	High
The Nore Valley	Scenic and special	High
The Barrow Valley	Scenic and special	High
The Suir Valley	Scenic and special	Medium
The Slieveardagh Transition	No significant landscape value	Low
The Castlecomer Transition	Scenic and special	High
The Brandon Hill Transition	No significant landscape value	Low
The South Western Transition	No significant landscape value	Medium
County: Laois (Laois County Council, 2016)		
No values or sensitivity information available		

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 SAK; Atlantic Celtic Bays and Estuaries, and Celtic Sea Bays and Beaches.

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 SAK falls within Air Zone D: Rural Ireland, with Waterford and Clonmel 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 N24, N25, N29, N62, N72, N74, N75, M8 and M9.

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 SAK, 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.

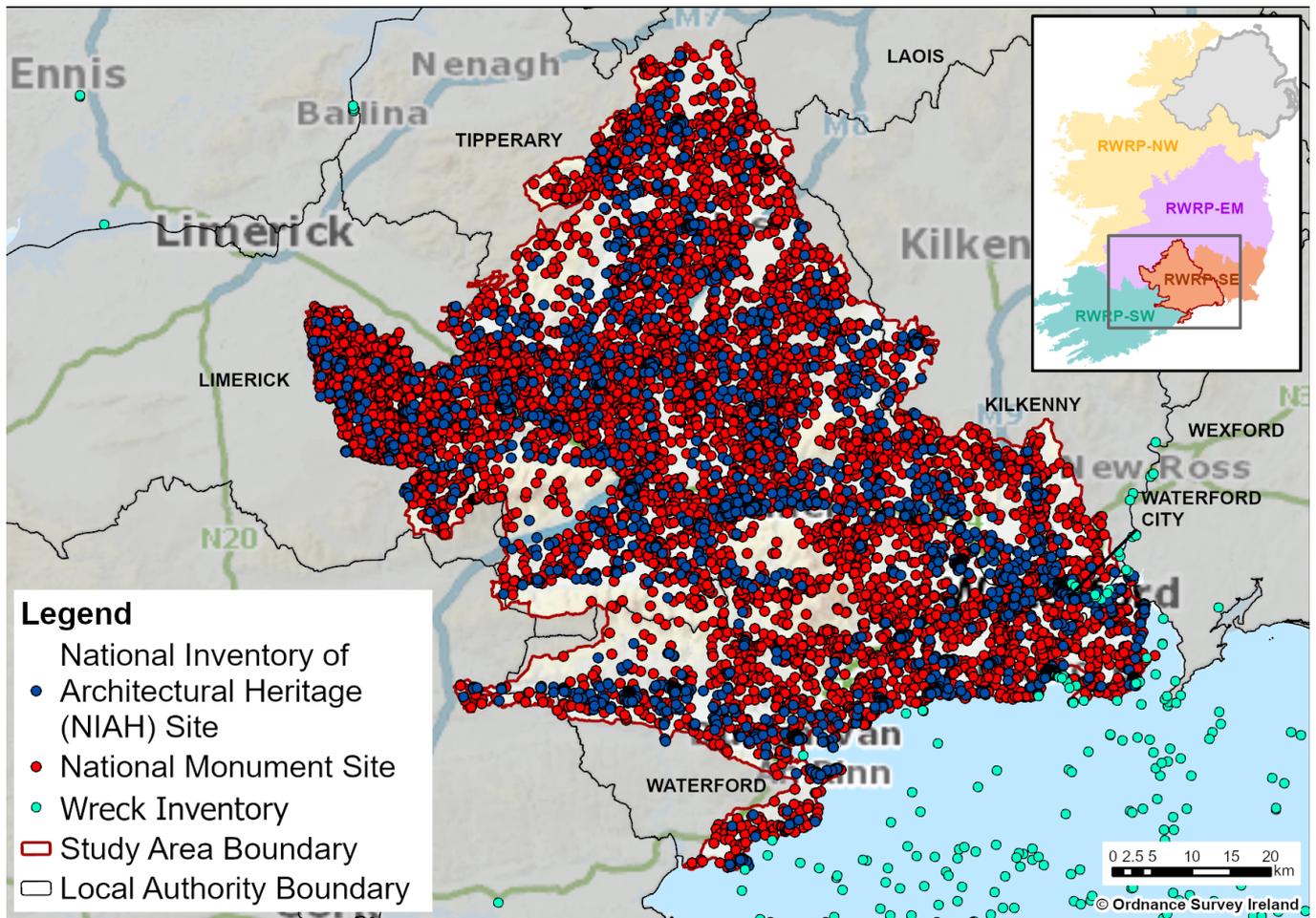


Figure 2.4 SAK Cultural Heritage Assets

Table 2.15 Cultural Heritage Assets within SAK

Assets	Total Number
National Monuments Service Sites	11,095
National Inventory of Architectural Heritage Sites	4,726
Sites and Monuments Record Zones	6,056

2.9 Geology and Soils

Table 2.12 lists the land uses within SAK. SAK has a mixture of coarse loamy soil, and peat, with areas of fine loamy drift to the north 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 SAK are shown in Figure 2.5.

The predominant aquifer type of the area is made up of poorly productive bedrock (60%), followed by karstic (28%) and productive fissured (12%). There are extensive swathes of regionally important karst (Rkd) aquifer present in the Suir catchment/south Tipperary, which could offer potential for groundwater

development. Similar feasible, but challenging, prospects exist in Waterford with an extensive body of productive fissured bedrock stretching from Wexford in the north east to Stradbally on the coast of Waterford.

Devonian Old Red Sandstone (ORS) consist mainly of coarse and fine sandstones, siltstones, shales, and conglomerates, and along with the Dinantian Lower Impure Limestones, make up the dominant bedrock geology in SAK. The limestones are often characterised by the occurrence of chert and shale bands and are generally less productive than the Pure Bedded Limestones. These sandstones are predominantly of a poorly productive bedrock flow regime and assumed to be generally devoid of intergranular permeability, with groundwater flow occurring predominantly through fractures and faults. Much of western and central Waterford, as well as parts of western Tipperary, is characterised by a larger proportion of ORS bedrock resulting in lower groundwater potential in these areas.

There are extensive swathes of regionally important karst aquifer (diffuse Rkd) in some areas, particularly in southern Tipperary. The regionally important aquifers are generally smaller in extent in this part of the country and are banded by locally important ORS.

An extensive body of productive fissured bedrock, made up primarily of volcanics, stretches along southern Waterford to Stradbally at the coast. 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. Although covering a less extensive area than the Ordovician Volcanics, the Devonian Kiltorcan Sandstones form a Regionally Important Fissured aquifer and can be found along the base of the Galtee Mountains, while also extending in a narrow band through Waterford, Tipperary to Kilkenny. The cleaner sandstones are likely to have a denser network of fracturing and fracture permeability in the shalier sandstones.

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, 97 of which have the potential to constrain water resource options in SAK.

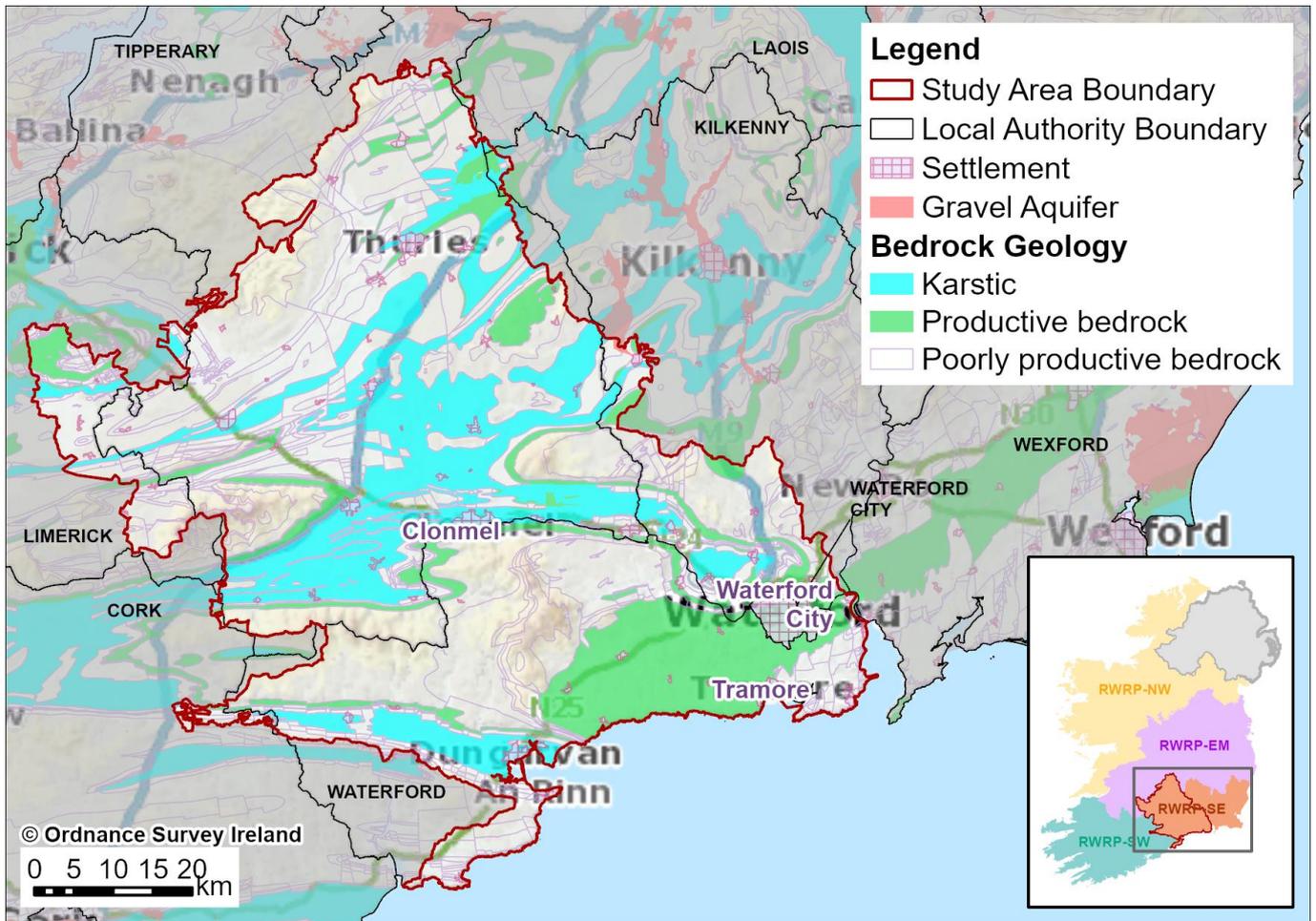


Figure 2.5 SAK Hydrogeology

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 SAK 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 SAK, 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
	<p>important part in water planning along with valuing water as part of access to environment for recreation.</p>	
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 SAK, some of the existing abstractions may not meet sustainability guidelines in the medium term; specifically, during drought periods.</p> <p>On an interim basis, Uisce Éireann has developed an initial conservative assessment based on available information (see SAK 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.</p> <p>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 SAK and opportunities for reducing pressure on resources and improving water quality.</p>	Biodiversity and climate change
Biodiversity, Flora and Fauna	<p>Issues: For SAK, the River Suir is designated as the Lower River Suir SAC, and one of its tributaries, the Clodiagh River (Portlaw), is also designated as a <i>Margaritifera</i> (Freshwater Pearl Mussel) SAC catchment.</p> <p>It is also 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</p>	Water resources, water quality and climate change

SEA Topic	Issues and Opportunities	Interrelated Topics
	and identifying potential for nature-based solutions and catchment management.	
Material Assets	<p>Issues: WTP assets and network infrastructure requiring improvement or replacement</p> <p>Opportunities: Improvements to support reliability of access to good quality water.</p>	Health and wellbeing
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 SAK.	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	<p>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.</p>	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</p>	

SEA Topic	Issues and Opportunities	Interrelated Topics
	wider benefits for environmental resilience and water supply; although this has not been specifically studied in this study area.	

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 SAK 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 SAK 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 sites 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 693 unconstrained options were identified for SAK 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 693 unconstrained options, 160 were rejected after being analysed against the coarse screening criteria of resilience, deliverability and environment.

Sustainability reasons for rejecting options were identified for 84 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 SAK. 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 SAK Technical Report.

Table 3.2 Coarse Screening Rejection Register

Option Reference	Option Description	Rejection Reasoning
SAK-079	Rationalise Callan to Kilkenny City & Bennetts bridge WRZ.	Abstracting the volume of water might be considered unfeasible. Therefore, this option did not meet the requirements of the

Option Reference	Option Description	Rejection Reasoning
		Environmental, Resilience or Deliverability criteria.
SAK-147	Rationalise Galtee Regional, Clonmel and Ardfinnan Regional WRZs to the New Shannon Source.	Abstracting the volume of water required is considered unfeasible. Not a suitable option for Cork WRZ due to location. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAK-434	New SW abstraction from Mahon River and new 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
SAK-435		
SAK-007	Rationalise Ballylanders, Kiltteely, Knocklong/Hospital and Galbally WRZs to Galtee Regional WRZ (Rossadrehid WTP and new abstraction from River Aherlow).	Abstracting the volume of water required is considered unfeasible. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAK-021	Rationalise Kiltteely and Herbertstown WRZs to Knocklong/Hospital WRZ.	
SAK-022	Increase GW abstraction at Hospital borehole 1 and upgrade Hospital borehole1 WTP to supply deficit.	
SAK-023		
SAK-024		
SAK-025		
SAK-034	Rationalise Ballylanders, Kiltteely, Knocklong/Hospital and Galbally WRZs to Galtee Regional WRZ (Rossadrehid WTP and new abstraction from River Aherlow).	
SAK-042		
SAK-053		
SAK-070	Interconnect South Kilkenny and East Waterford WRZ for improved resilience and supply deficit from Adamstown WTP.	
SAK-101	Supply spare capacity to neighbouring WRZs in deficit.	
SAK-103	Increase GW abstraction at Templetuohy borehole and upgrade Templetuohy WTP to supply deficit.	
SAK-108		
SAK-121	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit.	

Option Reference	Option Description	Rejection Reasoning
SAK-131	Rationalise Galtee Regional, Clonmel and Ardfinnan Regional WRZs to the New Shannon Source.	
SAK-135	Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit. Part of SA option 43 (SAK-843) rationalising Templetney/Brackford to Clonmel.	
SAK-136	Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit. Part of SA option 44 (SAK-844) interconnecting Templetney/Brackford to Clonmel.	
SAK-137	Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit. Part of SA option 45 (SAK-845) interconnecting Ardfinnan Regional with Clonmel.	
SAK-158	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (increase GW abstraction).	
SAK-160	Rationalise Galtee Regional, Clonmel and Ardfinnan Regional WRZs to the New Shannon Source.	
SAK-170	Rationalise Dundrum Regional to Thurles WRZ.	
SAK-189	Rationalise Templetney/Brackford Bridge to Clonmel (increase GW abstraction)	
SAK-191	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (increase GW abstraction).	
SAK-234	Increase GW abstraction from Tulllohea spring and upgrade Tulllohea WTP to supply deficit.	
SAK-238	Reintroduce old Toor GWS source and upgrade Tulllohea WTP to supply deficit.	
SAK-249	Increase GW abstraction from Kilcash Spring and upgrade Kilcash WTP to supply deficit.	
SAK-255	Increase SW abstraction from Clodiagh River and upgrade East Waterford (Adamstown) WTP to supply deficit.	
SAK-256	Increase SW abstraction from Ballyshonock Impoundment and upgrade East Waterford (Adamstown) WTP to supply deficit.	

Option Reference	Option Description	Rejection Reasoning
SAK-257	Increase SW abstraction from Mahon River and upgrade East Waterford (Adamstown) WTP to supply deficit.	
SAK-297	Increase abstraction from existing spring and upgrade Glengar WRZ to supply deficit.	
SAK-363	Increase SW abstraction from Clodiagh River, Ballyshonock impoundment and Mahon river and upgrade East Waterford (Adamstown) WTP to supply deficit.	
SAK-364	Increase SW abstraction from Ballyshonock Impoundment and upgrade East Waterford (Adamstown) (resolve algae issues) WTP to supply deficit.	
SAK-368	Increase GW abstraction from existing borehole and upgrade Lismore/Cappoquin/Ballyduff (LCB) Ballyduff WTP to partly supply deficit.	
SAK-369	Increase GW abstraction from existing borehole and upgrade LCB Cappoquin WTP to partly supply deficit.	
SAK-370	Increase GW abstraction from existing borehole and upgrade LCB Cappoquin WTP to partly supply deficit.	
SAK-376	New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.	
SAK-378	New GW abstraction and upgrade WTP LCB Cappoquin WTP to supply deficit.	
SAK-395	New SW abstraction from Mahon River and new WTP to supply deficit	
SAK-396	Rationalise Ballyogarty to Kilmacthomas WRZ (new SW abstraction from Mahon River)	
SAK-401	Rationalise Ballyogarty to Kill/Ballylneen WRZ.	
SAK-409	Rationalise Moores Well to LCB WRZ (new GW abstraction and upgrade Cappoquin WTP).	
SAK-440	Increase GW abstraction from Ballymacarbry borehole (no.2) and upgrade Ballyrohan WTP to supply deficit.	

Option Reference	Option Description	Rejection Reasoning
SAK-561	New SW abstraction from Clodiagh River and new WTP to supply deficit.	
SAK-627	Rationalise Ballysaggart/Carrignagower to LCB WRZ (new SW abstraction from Blackwater River and new WTP).	
SAK-761	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit.	
SAK-762	Interconnect Tipperary Town and Galtee Regional and supply deficit from Galtee Regional.	
SAK-061	Increase SW abstraction from River Blackwater (Mullinavat) and upgrade Mooncoin (Clonassy) 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.
SAK-062	Increase SW abstraction from River Blackwater (Mullinavat) and upgrade Mooncoin (Clonassy) WTP to supply deficit.	
SAK-063	Increase SW abstraction from Poulanassy River and upgrade Mooncoin (Clonassy) WTP to supply deficit.	
SAK-064	Increase SW abstraction from Poulanassy River and upgrade Mooncoin (Clonassy) WTP to supply deficit.	
SAK-067	Rationalise South Kilkenny to East Waterford WRZ (new GW abstraction and upgrade Adamstown WTP).	
SAK-072	Increase existing GW abstraction and upgrade Jamestown WTP to supply deficit.	
SAK-075	Rationalise Piltown-Fiddown to South Kilkenny WRZ (Mooncoin (Clonassy) WTP).	
SAK-080	Rationalise Callan to Fethard WRZ (Fethard WTP).	
SAK-082	Interconnect Callan and Fethard WRZ for improved resilience and supply deficit from Fethard WTP.	
SAK-116	Increase SW abstraction from College stream and Muskry stream and upgrade Rossadrehid WTP to supply deficit.	
SAK-149	Increase abstraction from Glenary River and upgrade Glenary WTP to supply deficit.	
SAK-150	Increase abstraction from Glenary River and upgrade Glenary WTP to supply deficit.	

Option Reference	Option Description	Rejection Reasoning
SAK-151	Increase SW abstraction from Poulavanogue stream and upgrade Poulavanogue WTP to address water quality issues and partly supply deficit.	
SAK-154	Increase SW abstraction from Glengalla stream (Ahernes Glen Abstraction) and upgrade Goatenbridge WTP to partly supply deficit.	
SAK-155	Increase SW abstraction from Kildanoge stream (Glenbreda Stream) and upgrade Goatenbridge WTP to partly supply deficit.	
SAK-164	Increase SW abstraction from Muiteen (East) River and upgrade Stooke WTP to supply deficit.	
SAK-167	Interconnect Dundrum Regional with Fethard Regional WRZs and supply deficit from Fethard Regional WRZ.	
SAK-169	New SW abstraction from Muiteen (East) River further south of Stooke WTP to replace existing abstraction and upgrade Stooke WTP	
SAK-175	Rationalise Hollyford to Stooke WTP. Rationalisation within WRZ.	
SAK-198	Increase SW abstraction from Crottys Lake and upgrade Crottys Lake WTP to partly supply deficit.	
SAK-210	New SW abstraction from Clodiagh River and upgrade Crottys Lake WTP to partly supply deficit.	
SAK-215	Increase SW abstraction from Burncourt River and upgrade Glengarra WTP to supply deficit.	
SAK-224	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in deficit.	
SAK-229	Increase SW abstraction from Anner River and upgrade Fethard WTP to supply spare capacity to neighbouring WRZ in deficit.	
SAK-230	Increase SW abstraction from Anner River and upgrade Fethard WTP to supply spare capacity to neighbouring WRZ in deficit.	
SAK-231	Increase SW abstraction from Anner River and upgrade Fethard WTP to supply spare capacity to neighbouring WRZ in deficit.	

Option Reference	Option Description	Rejection Reasoning
SAK-253	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply deficit.	
SAK-263	Rationalise Glennagad to Clonmel WRZ (Glenary WTP).	
SAK-267	Rationalise Poulavanogue (Waterford) to Clonmel WRZ (Glenary WTP).	
SAK-602	Increase SW abstraction from Mahon River and upgrade Ballylaneen WTP to supply spare capacity to neighbouring WRZ in deficit.	
SAK-621	Increase existing GW abstraction and upgrade Carrignagower WTP to supply deficit.	
SAK-527	New SW abstraction from Knockaderry impoundment and new WTP to supply deficit.	As per Local Authority information this reservoir is out of use, therefore not an option. Screened out due to resilience and sustainability issues.
SAK-487	New SW abstraction from Ballyshunnock impoundment and new WTP	The desktop assessments undertaken indicate that the abstraction cannot increase due to WFD AA limits and other constraints such as water quality issues. Therefore, there is no scope to increase abstraction. This option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAK-010	Rationalise Killeely and Herbertstown WRZs to Knocklong/Hospital WRZ.	Turbidity issues when over pumping at Hospital borehole 1 WTP. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.

3.4 Stage 5: Fine Screening

A total of 533 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 SAK.

3.5 Stage 6: Feasible Options List

A total of 533 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 SAK 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 (tCO_{2e}) 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 (tCO_{2e}) 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.

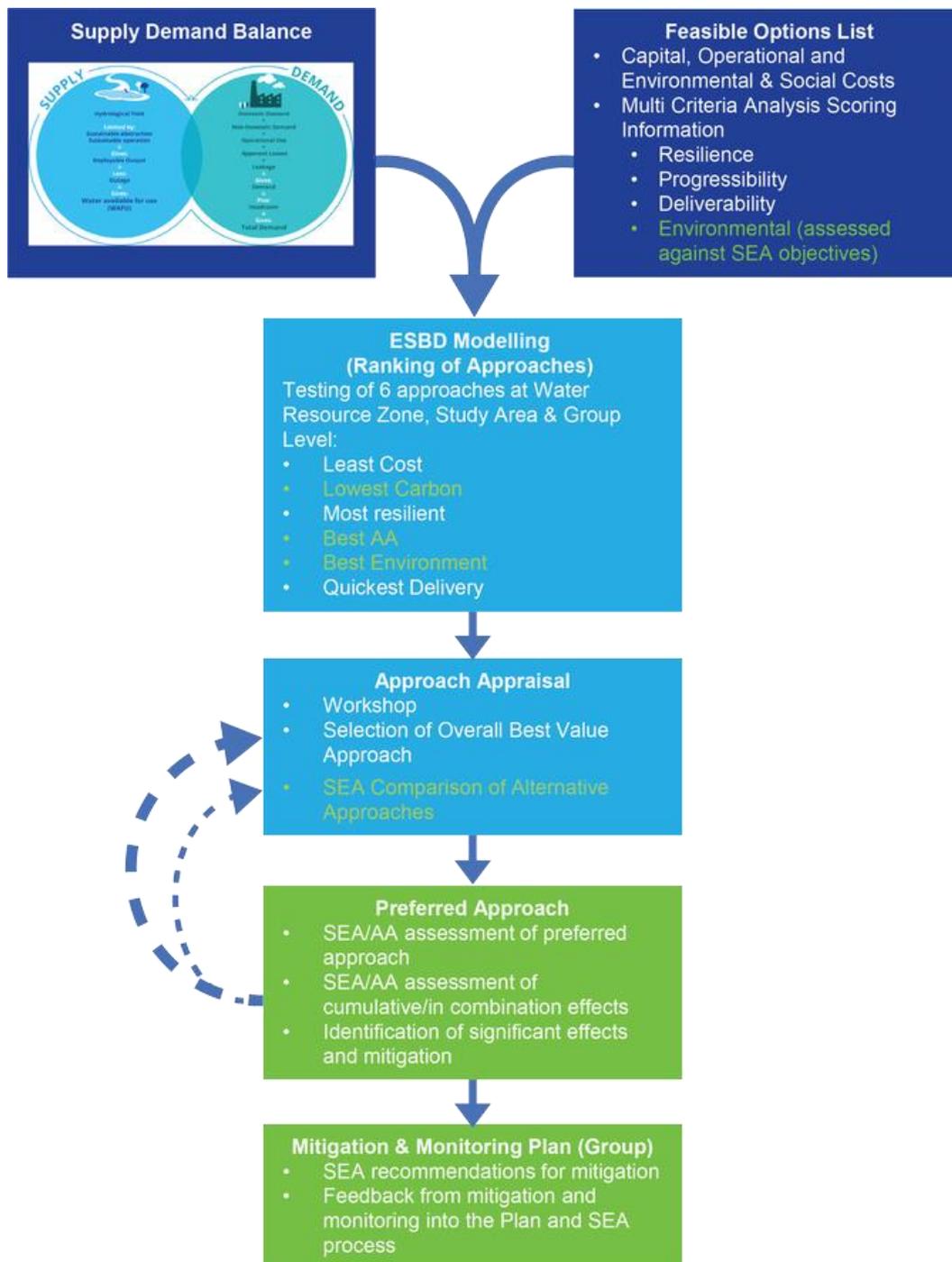


Figure 4.2 Approach Development Process

4.2.2 SAK 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 SAK there are 154 WRZ options and these are listed in Table 5.2 in the SAK 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 SAK, a total of 12 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 SAK Summary of SA Combination of Performance against Approach Category

Category	WRZ Level Approach	SA Combination 1 (SA Option 6, 7, 10, 20, 34, 47, 58, 66, 73, 77, 78, 119, 125 and 141)	SA Combination 2 (SA Option 1, 9, 18, 40, 46, 153, 183, 190, 191 and 192)	SA Combination 3 (SA Option 37, 53, 149, 173, 175, 183, 185 and 195)	SA Combination 4 (SA Option 23, 34, 51, 66, 78, 119 and 185b)	SA Combination 5 (SA Option 12, 20, 28, 33, 57, 59, 63, 69, 74, 77, 119, 127, 129, 133, 135, 140, 141, 187 and 193)	SA Combination 6 (SA Option 135, 169, 170, 176, 184, 187, 190, 191, 192 and 193)	SA Combination 7 (SA Option 38, 69, 149, 173, 180 and 185)	SA Combination 8 (SA Option 3, 12, 34, 37, 40, 50, 61, 75, 78, 129, 142, 153, 171, 187 and 192)	SA Combination 9 (SA Option 149)	SA Combination 10 (SA Option 183)	SA Combination 11 (SA Option 175)
Least Cost				Best		Worst						
Quickest Delivery		Best		Worst								
Number of -3 Biodiversity Scores	Nine -3 Scores	Seven -3 Scores	Eleven -3 Scores	Nine -3 Scores	Seven -3 Scores	Eleven -3 Scores	Seven -3 Scores	Nine -3 Scores	Seven -3 Scores	Nine -3 Scores	Eight -3 Scores	Eight -3 Scores
Lowest Carbon					Best					Worst		
Most Resilient								Best				Worst
Best Environmental	Worst			Best								

Key															
Ranked order (best to worst)	Best														Worst

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 five approaches (see Table 4.3).

Table 4.3 Study Area Approach Categories

Category	SA Approach 1 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)
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 3)	Best Appropriate Assessment Approach (SA Combination 8)	Quickest Delivery Approach (SA Combination 1)	Best Environmental Approach (SA Combination 3)	Most Resilient Approach (SA Combination 7)	Lowest Carbon Approach (SA Combination 4)
SA options	No options	SA option 37:	SA option 3: 002, 019	SA option 6: 009	SA option 37:	SA option 38:	SA option 23: 059, 259

Options included	Do Minimum	Least Cost Approach (SA Combination 3)	Best Appropriate Assessment Approach (SA Combination 8)	Quickest Delivery Approach (SA Combination 1)	Best Environmental Approach (SA Combination 3)	Most Resilient Approach (SA Combination 7)	Lowest Carbon Approach (SA Combination 4)
(Group options)		265, 269, 271, 273, 289 SA option 53: 222, 239 SA option 149: 356, 399, 438, 495, 501, 530, 538, 555, 604, 608 SA option 173: 672, 673, 674, 675, 676, 677, 756 SA option 175: 684, 685, 686, 687, 688, 689 SA option 183: 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743 SA option 185c:	SA option 12: 045, 048 SA option 34: 134, 264, 277 SA option 37: 265, 269, 271, 273, 289 SA option 40: 184, 232 SA option 50: 157, 218 SA option 61: 097, 111 SA option 75: 291, 292 SA option 78: 299, 300 SA option 142: 352, 484, 565 SA option 153: 619, 620	SA option 7: 014, 036 SA option 10: 052 SA option 20: 076, 208 SA option 34: 134, 264, 277 SA option 47: 162, 213 SA option 58: 186, 235, 251 SA option 66: 128, 178 SA option 73: 278, 285 SA option 77: 296 SA option 78: 299, 300 SA option 119:	265, 269, 271, 273, 289 SA option 53: 222, 239 SA option 149: 356, 399, 438, 495, 501, 530, 538, 555, 604, 608 SA option 173: 672, 673, 674, 675, 676, 677, 756 SA option 175: 684, 685, 686, 687, 688, 689 SA option 183: 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743 SA option 185c:	209, 266, 270, 272, 274 SA option 69: 129, 166 SA option 149: 356, 399, 438, 495, 501, 530, 538, 555, 604, 608 SA option 173: 672, 673, 674, 675, 676, 677, 756 SA option 180: 710, 711, 712, 713, 714, 715, 716 SA option 185: 748, 749, 750, 751, 752, 753	SA option 34: 134, 264, 277 SA option 51: 185, 203 SA option 66: 128, 178 SA option 78: 299, 300 SA option 119: 465, 475 SA option 185b: 748, 749, 750, 751, 752, 753

Options included	Do Minimum	Least Cost Approach (SA Combination 3)	Best Appropriate Assessment Approach (SA Combination 8)	Quickest Delivery Approach (SA Combination 1)	Best Environmental Approach (SA Combination 3)	Most Resilient Approach (SA Combination 7)	Lowest Carbon Approach (SA Combination 4)
		749, 750, 751, 752, 753 SA option 195: 783, 784, 785	SA option 171: 665, 666, 667 SA option 188: 758, 759, 760 SA option 192: 767, 768	465, 475 SA option 125: 403, 520 SA option 141: 419, 573	748, 49, 750, 751, 752, 753 SA option 195: 783, 784, 785		
WRZ options	No options	055 073 077 106 120 180 211 386 387 392 416 441 444 450 472 476 477 478 481 509 525	029 055 073 077 085 089 113 123 219 225 247 248 386 387 388 392 402 411 416 441 444	038 055 077 085 089 113 123 219 225 233 248 260 386 387 388 392 393 411 416 420 428	055 073 077 106 120 180 211 386 387 392 416 441 444 450 472 476 477 478 481 509 525	055 073 077 085 089 092 106 113 180 211 219 225 233 237 247 248 250 298 386 387 392	055 073 077 085 089 092 106 113 156 211 219 225 233 237 247 248 250 386 387 388 392

Options included	Do Minimum	Least Cost Approach (SA Combination 3)	Best Appropriate Assessment Approach (SA Combination 8)	Quickest Delivery Approach (SA Combination 1)	Best Environmental Approach (SA Combination 3)	Most Resilient Approach (SA Combination 7)	Lowest Carbon Approach (SA Combination 4)
		548	450	441	548	411	393
		560	461	444	560	416	402
		569	472	450	569	441	411
		618	476	468	618	444	416
		625	477	476	625	450	420
		648	478	477	648	461	428
			498	478		472	441
			499	481		476	444
			505	488		477	450
			509	498		478	468
			514	499		481	476
			525	505		505	477
			526	509		509	478
			548	525		525	481
			557	526		548	488
			569	532		560	498
			574	548		569	499
			601	557		618	505
			625	560		625	509
			648	569		648	514
			987	574			525
				580			526
				585			532
				595			548
				601			557
				618			560
				625			569
				648			570
				987			574
							580
							585
							595

Options included	Do Minimum	Least Cost Approach (SA Combination 3)	Best Appropriate Assessment Approach (SA Combination 8)	Quickest Delivery Approach (SA Combination 1)	Best Environmental Approach (SA Combination 3)	Most Resilient Approach (SA Combination 7)	Lowest Carbon Approach (SA Combination 4)
							601
							618
							622
							625
							987

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 SAK Technical Report.

Within SAK, this resulted in five approaches being selected from the twelve 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 five 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 is 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 (EBSD) tool. Table 4.5 suggests that SA approach 1, SA approach 3 and SA approach 5 are the best AA because they have the same number of -3 biodiversity scores (i.e. all of these approaches have seven -3 scores). However, SA approach 5 was selected as the best AA approach in Table 4.3 after comparing the number of -2 and -1 biodiversity scores.

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

Category Criteria	SA Approach 1 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)
Least Cost Score	Worst	Best			
Quickest Delivery Score	Best	Worst			
Best AA Score	Seven -3 Biodiversity Scores	Nine -3 Biodiversity Scores	Seven -3 Biodiversity Scores	Nine -3 Biodiversity Scores	Seven -3 Biodiversity Scores
Lowest Carbon Score			Best	Worst	
Most Resilient Score				Best	Worst
Best Environmental Score		Best	Worst		
Key					
Ranked order (best to worst) within the five selected approaches					
					

4.3 Comparison of SAK Approaches

An overall summary of the infrastructure components and abstractions for each of the SA approaches identified for SAK 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 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)
New pipeline network (km)	0	203	300	167	282	147
New WTPs	0	7	6	7	10	7

Infrastructure Summary	Do Minimum	SA Approach 1 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)
Upgrade WTPs	0	89	53	85	66	77
New/upgraded abstractions	0	37	22	40	27	34
WTPs decommissioned	0	10	46	14	33	22
Abstractions abandoned	0	10	48	14	33	23
Raw Water Storage	0	1	0	1	1	0
Treated Water Storage	0	27	42	25	39	37

A comparative assessment of the five 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 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)	Range (Difference between Lowest and Highest Score)
Population, health, economy and recreation	-3 scores	Worst		Worst		Best	4
	MCA score	Worst	Best	Worst			80
Water Environment:	-3 scores	Worst	Best				14

Topic	Total No. of	SA Approach 1 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)	Range (Difference between Lowest and Highest Score)	
quality and resources	MCA score	Worst	Best	Worst			59	
Biodiversity, Flora and Fauna	-3 scores	Best	Worst	Best	Worst	Best	2	
	MCA score		Best	Worst			162	
Material Assets	-3 scores	Best	Worst	Best	Worst	Best	1	
	MCA score		Best	Worst			32	
Landscape and Visual	-3 scores	Best		Best	Worst		2	
	MCA score		Best	Worst			16	
Climate Change	-3 scores	No Difference						0
	MCA Score	Worst	Best				20	
Culture, Heritage and Archaeology	-3 scores	No Difference						0
	MCA score		Best	Worst			7	
Geology and Soils	-3 scores	No Difference						0
	MCA Score	Worst	Best				12	

Key				
MCA/No. of -3 scores against each criterion				
Worst				Best

Key

*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) (QD)

SA approach 1, key comparison points:

- Identified as the best in the Quickest Delivery category;
- Option types included:
 - SA option (group option): 3 groundwater abstraction and interconnection options, 9 groundwater abstraction and rationalisation options, 1 surface water abstraction and interconnection option, and 1 surface water abstraction and rationalisation option;
 - WRZ options: 23 groundwater abstraction options, 2 surface water abstraction options and 25 WTP upgrade options;
- SA approach 1 has seven -3 biodiversity scores, including:
 - SAK-077: Increase in abstraction has the potential to impact groundwater terrestrial ecosystems (GWDTEs) within the River Barrow And River Nore SAC;
 - SAK-260: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and construction of the proposed pipeline which crosses the SAC;
 - SAK-618: Potential to impact the Lower River Suir SAC which is adjacent to the proposed new groundwater abstraction;
 - SA option 20: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and a pipeline crossing over one of the water courses within the SAC;
 - SA option 66: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC;
 - SA option 78: Potential to impact the Lower River Suir SAC through the new abstraction which is within the SAC's zone of contribution; and
 - SA option 141: Potential to impact the Blackwater River (Cork/Waterford) SAC through the abstraction from the Owenashad River which forms part of the SAC.
- The key differences in terms of infrastructure development for SA approach 1 are that it requires:
 - The highest number of WTP upgrades;
 - The lowest number of abstractions abandoned and WTPs decommissioned; and
 - One new raw water storage area (same number as SA approaches 3 and 4).

4.3.2 SA Approach 2 (SA Combination 3) (LCo, BE)

SA approach 2, key comparison points:

- Identified as the best in the Least Cost and Best Environmental categories;
- Option types included:

- SA option (group option): 1 groundwater abstraction and interconnection option, 3 groundwater abstraction and rationalisation options, and 4 surface water abstraction and rationalisation options;
- WRZ options: 13 groundwater abstraction options, 1 groundwater abstraction and rationalisation option, 1 surface water abstraction option and 12 WTP upgrade options;
- SA approach 2 has nine -3 biodiversity scores, including:
 - SAK-077: Increase in abstraction has the potential to impact GWDTEs within the River Barrow And River Nore SAC;
 - SAK-120: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and potential for pollution impacts during construction due to hydrological links;
 - SAK-211: Potential to impact the Lower River Suir SAC through the abstraction that is adjacent to the River Tar which forms part of the SAC;
 - SAK-618: Potential to impact the Lower River Suir SAC which is adjacent to the proposed new groundwater abstraction;
 - SA option 53: Potential to impact the Lower River Suir SAC through the abstraction that is adjacent to the Clashawley River which forms part of the SAC;
 - SA option 149: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline which crosses the SAC;
 - SA option 173: Potential to impact the River Blackwater SAC through the new groundwater abstraction within the SAC;
 - SA option 183: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline which crosses the SAC; and
 - SA option 185c: Potential for the increase in abstraction to exacerbate existing hydrological pressures from the hydropower station on the Lower River Shannon SAC.
- The key differences in terms of infrastructure development for SA approach 2 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 abstractions abandoned and WTPs decommissioned; and
 - The highest number of new treated water storage facilities.

4.3.3 SA Approach 3 (SA Combination 4) (LC)

SA approach 3, key comparison points:

- Identified as the best in the Lowest Carbon category;
- Option types included:
 - SA option (group option): 2 groundwater abstraction and interconnection options, 3 groundwater abstraction and rationalisation options, 1 surface water abstraction and interconnection option, and 1 surface water abstraction and rationalisation option;
 - WRZ options: 29 groundwater abstraction options, 1 groundwater abstraction and rationalisation option, 2 surface water abstraction options and 26 WTP upgrade options;
- SA approach 3 has seven -3 biodiversity scores, including:

- SAK-077: Increase in abstraction has the potential to impact GWDTEs within the River Barrow And River Nore SAC;
- SAK-211: Potential to impact the Lower River Suir SAC through the abstraction that is adjacent to the River Tar which forms part of the SAC;
- SAK-618: Potential to impact the Lower River Suir SAC which is adjacent to the proposed new groundwater abstraction;
- SA option 66: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC;
- SA option 78: Potential to impact the Lower River Suir SAC through the new abstraction which is within the SAC's zone of contribution;
- SA option 149: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline which crosses the SAC; and
- SA option 185b: Potential for the increase in abstraction to exacerbate existing hydrological pressures from the hydropower station on the Lower River Shannon SAC.
- The key differences in terms of infrastructure development for SA approach 3 are that it requires:
 - The highest number of new/upgraded abstractions;
 - One new raw water storage area (same number as SA approaches 1 and 4); and
 - The lowest number of new treated water storage facilities.

4.3.4 SA Approach 4 (SA Combination 7) (MR)

SA approach 4, key comparison points:

- Identified as the best in the Most Resilient category;
- Option types included:
 - SA option (group option): 1 groundwater abstraction and rationalisation option, 2 surface water abstraction and interconnection options, and 3 surface water abstraction and rationalisation options;
 - WRZ options: 20 groundwater abstraction options, 1 groundwater abstraction and rationalisation option, 1 surface water abstraction option and 19 WTP upgrade options;
- SA approach 4 has nine -3 biodiversity scores, including:
 - SAK-077: Increase in abstraction has the potential to impact GWDTEs within the River Barrow And River Nore SAC;
 - SAK-211: Potential to impact the Lower River Suir SAC through the abstraction that is adjacent to the River Tar which forms part of the SAC;
 - SAK-618: Potential to impact the Lower River Suir SAC which is adjacent to the proposed new groundwater abstraction;
 - SA option 173: Potential to impact the River Blackwater SAC through the new groundwater abstraction within the SAC;
 - SA option 38: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC;
 - SA option 69: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline within the SAC;

- SA option 78: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline which crosses the SAC;
- SA option 149: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline which crosses the SAC; and
- SA option 185: Potential for the increase in abstraction to exacerbate existing hydrological pressures from the hydropower station on the Lower River Shannon SAC.
- The key differences in terms of infrastructure development for SA approach 4 are that it requires:
 - The highest number of new WTPs; and
 - One new raw water storage area (same number as SA approaches 1 and 3).

4.3.5 SA Approach 5 (SA Combination 8) (BA)

SA approach 5, key comparison points:

- Identified as the best in the Best AA category;
- Option types included:
 - SA option (group option): 10 groundwater abstraction and rationalisation options, 2 surface water abstraction and interconnection options, and 2 surface water abstraction and rationalisation options;
 - WRZ options: 20 groundwater abstraction options, 1 surface water abstraction option and 21 WTP upgrade options;
- SA approach 5 has seven -3 biodiversity scores, including:
 - SAK-077: Increase in abstraction has the potential to impact GWDTEs within the River Barrow And River Nore SAC;
 - SA option 40: Increase in abstraction has the potential to impact the Lower River Suir SAC which is within the Zone of Contribution;
 - SA option 50: New surface water abstraction and pipeline are within the Lower River Suir SAC and have the potential to impact water dependent Qualifying Interests (QIs);
 - SA option 75: New groundwater abstraction has the potential to impact the Lower River Suir SAC which is within the Zone of Contribution;
 - SA option 78: Potential to impact the Lower River Suir SAC through the new abstraction within the SAC and the proposed pipeline which crosses the SAC;
 - SA option 142: New surface water is located within the Lower River Suir SAC which is designated for a number of aquatic species and hydrologically sensitive habitats; and;
 - SA option 192: New surface water abstraction from the Aherlow River which forms part of the Lower River Suir SAC.
- The key differences in terms of infrastructure development for SA approach 4 are that it requires:
 - The shortest length of pipeline; and
 - One new raw water storage area (same number as SA approach 2).

4.4 SAK 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 44,022 m³/d in 2019 during normal conditions, to a projected maximum of 58,817 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 SAK.

Table 4.8 Supply Demand Balance for SAK

WRZ Name	WRZ Code	Population	Maximum Deficit m ³ /day*	
			2019	2044
Kilmanahan	3100SC0129	39	No Deficit	No Deficit
Carrignagower	3100SC0127	37	-17	-18
Monatarrif	3100SC0126	13	-22	-24
Portlaw	3100SC0124	1,608	-343	-405
Carrigeen	3100SC0123	15	No Deficit	No Deficit
Lyrenaleara	3100SC0120	40	No Deficit	No Deficit
Poulavanogue (Waterford)	3100SC0119	100	-65	-69
Russelstown	3100SC0118	28	No Deficit	No Deficit
Kilbrien	3100SC0116	88	No Deficit	No Deficit
Ardmore Grange	3100SC0115	203	-107	-116
Liskealty	3100SC0114	5	No Deficit	No Deficit
Lacken	3100SC0113	69	-4	-6
Modeligo	3100SC0112	192	No Deficit	No Deficit
Deelish/Ballinacourty/Kilnafrehan	3100SC0111	377	No Deficit	No Deficit
Crehanagh	3100SC0110	17	-10	-10
Garravoone	3100SC0108	37	No Deficit	No Deficit
Ballyknock	3100SC0107	11	-11	-11
Kill/Ballylaneen	3100SC0102	1,107	No Deficit	No Deficit
Scrahan	3100SC0101	24	No Deficit	No Deficit
Kilmacthomas	3100SC0099	357	-65	-81
Ballyshunnock	3100SC0098	34	-15	-16
Ballyogarty	3100SC0097	594	-180	-211
Lismore/Cappoquin/Ballyduff	3100SC0095	3,779	-951	-1,077
Graiguenageeha	3100SC0093	42	-9	-10
Dunhill Ballinageeragh	3100SC0092	44	-1	-3

WRZ Name	WRZ Code	Population	Maximum Deficit m ³ /day*	
			2019	2044
Dunhill	3100SC0091	145	-11	-15
Rathgormuck	3100SC0089	502	No Deficit	No Deficit
Glenagad	3100SC0087	57	No Deficit	No Deficit
Stradbally	3100SC0083	658	No Deficit	No Deficit
Moores Well	3100SC0081	91	-59	-66
Adramone/Kilrossanty	3100SC0079	366	-45	-60
Ballynoe/Melleray	3100SC0077	207	No Deficit	No Deficit
Ballymacarbry	3100SC0054	652	-46	-65
Inchinleamy	3100SC0053	25	No Deficit	No Deficit
Ballyguiry	3100SC0051	101	-34	-37
Fews	3100SC0045	185	-2	-10
Garrahylish	3100SC0044	3	No Deficit	No Deficit
Faha	3100SC0042	66	-6	-10
Smoor	3100SC0035	65	-21	-22
East Waterford Water Supply Scheme	3100SC0033	64,243	-11,728	-19,990
Carrowgarriff	3100SC0030	45	No Deficit	No Deficit
Boolavonteen/Kilcooney/Tooraneena	3100SC0027	349	-54	-62
Ballysaggart	3100SC0024	71	No Deficit	No Deficit
Ardmore	3100SC0005	426	No Deficit	No Deficit
Dungarvan	3100SC0001	13,159	-1,025	-1,911
Glengar	2900SC0069	512	-52	-77
Coalbrook/Commons	2900SC0067	1,751	-494	-609
Tipperary Town Supply	2900SC0049	4,860	-1,347	-1,299
Templemore/Templetuohy	2900SC0042	4,061	-307	-462
Templetney/Brackford Bridge PWS	2900SC0039	3,884	-1,062	-1,249
Kilcash	2900SC0036	218	-9	-16
Galtee Regional	2900SC0032	16,191	-6,825	-7,446
Tullohea	2900SC0031	460	-34	-53
Dundrum Regional	2900SC0029	7,914	-3,571	-4,116
Fethard & Mullenbawn Regional Public Water Supply	2900SC0026	9,077	No Deficit	No Deficit

WRZ Name	WRZ Code	Population	Maximum Deficit m ³ /day*	
			2019	2044
Clonmel & Environs	2900SC0025	15,918	-5,499	-7,230
Carrick-On-Suir	2900SC0024	6,094	-1,240	-1,457
Burncourt Ballylooby	2900SC0023	4,096	-1,060	-1,333
Ballinvir	2900SC0022	23	No Deficit	No Deficit
Ardfinnan Regional	2900SC0021	11,336	-5,623	-6,276
Ahenny	2900SC0020	69	No Deficit	No Deficit
Littleton PWS	2900SC0016	492	No Deficit	No Deficit
Thurles/Borrisoleigh	2900SC0014	12,317	No Deficit	No Deficit
Horse & Jockey PWS	2900SC0013	643	No Deficit	No Deficit
Twomileborris	2900SC0009	809	-19	-44
Carrigmore	1900SC0038	377	-175	-186
Kilteely	1900SC0030	484	-99	-113
Anglesboro Water Supply	1900SC0026	24	No Deficit	No Deficit
Ballylanders Water Supply	1900SC0012	559	-190	-207
Galbally Water Supply	1900SC0011	368	-87	-99
Knocklong/Hospital	1900SC0010	2,287	-60	-119
Herbertstown	1900SC0008	687	-20	-39
Piltown-Fiddown	1500SC0019	3,075	-1,025	-1,188
Callan PWS	1500SC0005	2,725	-413	-511
South Kilkenny	1500SC0001	12,671	No Deficit	-403

*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 (SA Combination 1) (QD)	SA Approach 2 (SA Combination 3) (LCo, BE)	SA Approach 3 (SA Combination 4) (LC)	SA Approach 4 (SA Combination 7) (MR)	SA Approach 5 (SA Combination 8) (BA)
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	-	-	--	-	--
	O	--	-	-	--	-	--
7. Protect and improve surface water and groundwater status	C	0	0	0	0	0	0
	O	--	--	-	--	-	--
8. Avoid flood risk	C	0	-	-	-	-	-
	O	0	0	0	0	0	0
9. Protect and where appropriate, enhance cultural heritage assets	C	0	-	--	-	--	-
	O	0	0	0	0	0	0
10. Protect quality and function of soils	C	0	-	-	-	--	--
	O	0	0	0	0	0	0

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

The overall assessment and comparison of the approaches against the SEA objectives indicates the following:

- SA approach 1 has the potential to result in lower adverse impacts during construction for population and health as it requires less infrastructure in urban areas.
- SA approach 1 and 5 are likely to result in lower adverse impacts against biodiversity during operation. In the case of SA approach 1 this is because it does not include the additional higher rate of abstraction associated with option 211 (SA approaches 2, 3 and 4) or 232 (SA approach 5) that could impact the Lower River Suir SAC. SA approach 5 is likely to have lower adverse impacts against biodiversity during construction as less new infrastructure is required overall that has the potential to impact designated sites.
- SA approaches 3 and 5 requires less infrastructure overall and so are likely to result in lower adverse impacts against landscape and materials during construction. SA approach 1 is also likely to result in lower adverse impacts related to the materials objective during construction as it requires less new infrastructure compared with SA approaches 2 and 4.
- SA approach 2 is likely to have a more beneficial impact for landscape objectives during operation as it decommissions significantly more WTPs compared with the other approaches. During operation SA approaches 2 and 4 have the potential to result in more adverse impacts in terms of the materials objective as they require land take for above ground infrastructure on land with strategic land use potential.
- SA approaches 2 and 4 are likely to provide greater water supply and environmental resilience as they involve rationalisation options to larger, more resilient water sources. SA approaches 2 and 4 are likely to have reduced adverse impacts on waterbodies as they require fewer options with a higher rate of abstraction and are more likely to be sustainable in the long term. SA approach 2 also decommissions the most abstractions, several of which are from 'At Risk' waterbodies; therefore, reduced abstraction could have a beneficial impact on the associated waterbodies.
- SA approaches 1, 3 and 5 are likely to have lower adverse impacts against cultural heritage objectives during construction as they do not require as much above ground infrastructure to be built on NIAH/SMR sites. SA approaches 4 and 5 have the potential to have greater adverse impacts related to the soil and potential for geological heritage disturbance during construction as they require above construction of infrastructure within geological heritage 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

SA approach 2 has been selected through the 7 step process as the best performing approach overall across the different categories.

Although SA approach 2 has nine -3 biodiversity score options it has been selected as the best environmental approach. This is because SA approach 2 requires the lowest number of new/upgraded abstractions, which has the potential to reduce adverse impacts on waterbodies and is more likely to be sustainable in the long term. SA approach 2 also has a significantly higher number of decommissions when compared with the other approaches; four of which are from 'At Risk' waterbodies. Therefore, reduced abstraction could have a beneficial impact on the associated waterbodies.

The SA Preferred Approach includes nine -3 Biodiversity score options associated with SAK-077, 120 and 211, SAK-618 and SA options 53, 149, 173, 183 and 185c. These options are associated with potential impacts to the River Barrow and River Nore SAC (SAK-077), Lower River Shannon SAC (SA option 185c), River Blackwater SAC (SA option 173) and Lower River Suir SAC (SAK-120, 211, 618 and SA options 53, 149 and 183); primarily as a result of potential effects of abstraction pressure.

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.

For options identified as having some level of risk for LSEs, mitigation measures to address these are set out in the NIS. No AESI are identified for the SAK Preferred Approach.

5

**SAK Preferred
Approach:
Strategic
Environmental
Assessment**

5 SAK Preferred Approach Strategic Environmental Assessment

5.1 SAK 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 twenty-seven 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. The other forty-eight WRZs are covered by eight SA options, including:

- SA option 37: New groundwater abstraction, new Linguan WTP and rationalisation of Rathgormuck, Ballyknock, Crehanagh and Garravoone to the Carrick on Suir WRZ;
- SA option 53: Increased groundwater abstraction, WTP upgrade and interconnection of Coalbrook/Commons and Fethard & Mullenbawn;
- SA option 149: New surface water abstraction and rationalisation of Ballyogarty, Stradbally, Kilmacthomas, Adramone/Kilrossanty, Dunhill - Cois Coille, Faha, Graiguenageeha, Garrahylish, Smoor, Dunhill Ballinageeragh, Fews, Kill/Ballylaneen and Scrahan to the East Waterford WRZ;
- SA option 173: Increased groundwater abstraction, WTP upgrade and rationalisation of Ballysaggart, Lacken and Morees Well, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff WRZ;
- SA option 175: Interconnect Dundrum Regional and Thurles, rationalise Horse and Jockey, Littleton and Twomileborris to Thurles WRZ. Rationalise Glengar to Dundrum regional WRZ;
- SA option 183: New surface water abstraction, new WTP, interconnect Templetney/Brackford Bridge and Ardfinnan Regional with Clonmel WRZ. Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ. Rationalise Russelstown, Kilmanahan, Glennagad and Poulavanogue (Waterford) to the Clonmel WRZ;
- SA option 185c: Rationalise Carrigmore, Kiltely, Herbertstown, Knocklong/Hospital, Ballylanders and Galbally to Limerick City (Clareville WTP); and
- SA option 195: Increase groundwater abstraction, upgrade WTP and rationalise Stradbally and Graiguenageeha to Dungarvan WRZ.

The SA Preferred Approach for the remaining WRZs involves new and increased groundwater abstractions, rationalisation, new surface water abstractions and upgrades to existing WTPs.

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

Table 5.1 Preferred Approach Breakdown

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAK-055 1900SC0026 Anglesboro Water Supply	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. <ul style="list-style-type: none"> • WRZ not in deficit. WTP upgrade works only. 	N/A

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW (Groundwater) abstraction maintained Existing GW source: Knockaskallen GWB (Groundwater Body) WFD status 2016-2021 – Good 	
SAK-648 1500SC0001 South Kilkenny Environs	<p>Bring back Silverspring WTP to production and supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. Recommission Silverspring WTP and abstraction to meet WRZ future deficit. Existing GW abstraction recommissioned Existing GW source: Clonmel GWB WFD status 2016-2021 – Good. 	10,192 m ³ /d
SAK-073 1500SC0019 Piltown-Fiddown	<p>New GW and upgrade Jamestown WTP to supply deficit</p> <ul style="list-style-type: none"> New GW abstraction to meet WRZ future deficit. New GW source: Carrick-on-Suir GWB WFD status 2016-2021 – Good. 	1,567 m ³ /d
SAK-077 1500SC0005 Callan PWS	<p>Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.</p> <ul style="list-style-type: none"> Increase existing GW abstractions within Kings River which forms part of the River Nore SAC. Existing GW source: Clifden Northwest GWB WFD status 2016-2021 – Good. 	1,501 m ³ /d
SAK-106 2900SC0042 Templemore/Templetuohy	<p>Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.</p> <ul style="list-style-type: none"> Increase GW abstraction to meet WRZ future deficit (DYCP 2044) Existing GW source: Templemore GWB WFD status 2016-2021 – Good. 	2,536 m ³ /d
SAK-120 2900SC0032 Galtee Regional	<p>New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. New SW abstraction to supply future deficit. New SW source: Aherlow river waterbody (RWB) WFD status 2016-2021 – Good. 	12,819 m ³ /d
SAK-180 2900SC0049 Tipperary Town Supply	<p>New GW abstraction and new WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. New GW abstraction to supply future deficit. 	3,591 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> New GW source: Tipperary GWB WFD status 2016-2021 – Good. 	
SAK-211 2900SC0023 Burncourt Ballylooby	<p>Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to supply future deficit. Existing GW source: Clonmel GWB WFD status 2016-2021 – Good. 	3,853 m ³ /d
SAK-386 3100SC0077 Ballynoe/Melleray	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in projected surplus. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	N/A
SAK-387 3100SC0111 Deelish/Ballinacourty/ Kilnafrehan	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in projected surplus. Existing SW source: Deelish Reservoir WFD status 2016-2021 – Moderate. 	N/A
SAK-392 3100SC0005 Ardmore	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in projected surplus. Existing GW source: Helvick Head GWB WFD status 2016-2021 – Good. 	N/A
SAK-416 3100SC0030 Carrowgarraiff	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in projected surplus Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	N/A
SAK-441 3100SC0054 Ballymacarbry	<p>New GW abstraction (karstic) and new WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. New GW abstraction to meet future deficit. New GW source: Comeragh GWB WFD status 2016-2021 – Good. 	294 m ³ /d
SAK-444 3100SC0027 Boolvonteen/Kilcooney/ Tooraneena	<p>Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to meet future deficit. 	191 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	
SAK-450 3100SC0079 Adramone/Kilrossanty	<p>Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to meet future deficit. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	173 m ³ /d
SAK-472 3100SC0051 Ballyguiry	<p>Increase GW abstraction from Ballyguiry borehole and upgrade Ballyguiry WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to meet future deficit. Existing GW source: Helvick Head GWB WFD status 2016-2021 – Good. 	74 m ³ /d
SAK-476 3100SC0053 Inchinleamy	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ not in deficit. WTP upgrade works only. This option has previously been assessed as part of SA option 114 in SAJ (South West region) and will not be reassessed for the South East region to avoid duplication other than as part of the cumulative assessment considering impacts with the other regional plans. It is only listed as part of the Preferred Approach for SAK for informative purposes regarding the approach for this WRZ. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	N/A
SAK-477 3100SC0112 Modeligo	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in surplus, WTP upgrade works only. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	N/A
SAK-478 3100SC0114 Liskealty	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in surplus, WTP upgrade works only. Existing GW source: Helvick Head GWB WFD status 2016-2021 – Good. 	N/A
SAK-481 3100SC0098	<p>Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.</p>	44 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
Ballyshunnock	<ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to meet future deficit. Existing GW source: Waterford GWB WFD status 2016-2021 – Good. 	
SAK-509 3100SC0116 Kilbrien	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in surplus, WTP upgrade works only. Existing GW source: Kilrion GWB WFD status 2016-2021 – Good. 	N/A
SAK-525 3100SC0044 Garrahylish	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in surplus, WTP upgrade works only. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	N/A
SAK-548 3100SC0123 Carrigeen	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in surplus, WTP upgrade works only. Existing GW source: Waterford GWB WFD status 2016-2021 – Good. 	N/A
SAK-560 & SAK-618 3100SC0124 Portlaw	<p>Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit. New GW abstraction and new WTP to partly supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. New GW abstraction & new WTP and increase existing GW abstraction to meet future deficit. Existing GW source: Waterford GWB WFD status 2016-2021 – Good. New GW source: Clonmel GWB WFD status 2016-2021 – Good. 	693 m ³ /d
SAK-569 3100SC0120 Lyrenaleara	<p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.</p> <ul style="list-style-type: none"> WRZ in surplus, WTP upgrade works only. Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	N/A
SAK-625 3100SC0115 Ardmore Grange	<p>Increase GW abstraction and upgrade WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to meet future deficit. 	254 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW source: Glenville GWB WFD status 2016-2021 – Good. 	
SAK-265 (SA Option 37) 3100SC0089 Rathgormuck	<p>New GW abstraction and new Linguan WTP to supply deficit. Rationalise Rathgormuck. Ballyknock, Crehanagh and Garravoone WRZs</p> <ul style="list-style-type: none"> WRZ not in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ. Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	160 m ³ /d
SAK-269 (SA Option 37) 3100SC0107 Ballyknock	<p>New GW abstraction and new Linguan WTP to supply deficit. Rationalise Rathgormuck. Ballyknock, Crehanagh and Garravoone WRZs</p> <ul style="list-style-type: none"> WRZ in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ. Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	15 m ³ /d
SAK-271 (SA Option 37) 3100SC0110 Crehanagh	<p>New GW abstraction and new Linguan WTP to supply deficit. Rationalise Rathgormuck. Ballyknock, Crehanagh and Garravoone WRZs.</p> <ul style="list-style-type: none"> WRZ in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	19 m ³ /d
SAK-273 (SA Option 37) 3100SC0108 Garravoone	<p>New GW abstraction and new Linguan WTP to supply deficit. Rationalise Rathgormuck. Ballyknock, Crehanagh and Garravoone WRZs.</p> <ul style="list-style-type: none"> Garravoone WRZ not in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ. Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	45 m ³ /d
SAK-289 (SA Option 37) 2900SC0024 Carrick-On-Suir	<p>New GW abstraction and new Linguan WTP to supply deficit. Rationalise Rathgormuck. Ballyknock, Crehanagh and Garravoone WRZs.</p> <ul style="list-style-type: none"> WRZ in deficit. New GW abstraction to meet future deficit. New GW source: Clonmel GWB WFD status 2016-2021 – Good. 	3,064 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAK-222 (SA Option 53) 2900SC0026 Fethard & Mullenbawn Regional Public Water Supply	Interconnect Coalbrook/Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP). <ul style="list-style-type: none"> Fethard & Mullenbawn Regional Public Water Supply not in deficit. Increase GW abstraction to meet future deficit. Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	8,304 m ³ /d
SAK-239 (SA Option 53) 2900SC0067 Coalbrook/Commons	Interconnect Coalbrook / Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP). <ul style="list-style-type: none"> WRZ in deficit. Interconnect with Fethard & Mullenbawn Regional Public Water Supply WRZ to supply future deficit Existing GW sources: Silveardagh Hills GWB WFD status 2016-2021 – Good and Ballingarry GWB WFD status 2016-2021 – Good. 	1,652 m ³ /d
SAK-672 (SA Option 173) 3100SC0024 Ballysaggart	Increase GW (to include commissioning new trial well) abstraction from existing borehole and upgrade Lismore/Cappoquin/Ballyduf (LCB) Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. Rationalise Lacken, Kereen and Moores Well, Monatarriff, Carrignagower and Ballysaggart to LCB WRZ. <ul style="list-style-type: none"> Ballysaggart WRZ not in deficit however WTP to be rationalised to the LCB WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good 	19 m ³ /d
SAK-673 (SA Option 173) 3100SC0126 Monatarrif	Increase GW (to include commissioning new trial well) abstraction from existing borehole and upgrade Lismore/Cappoquin/Ballyduf (LCB) Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. Rationalise Lacken, Kereen and Moores Well, Monatarriff, Carrignagower and Ballysaggart to LCB WRZ. <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to LCB WRZ. Existing GW abstraction to be decommissioned. 	43 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	
SAK-674 (SA Option 173) 3100SC0127 Carrignagower	Increase GW (to include commissioning new trial well) abstraction from existing borehole and upgrade Lismore/Cappoquin/Ballyduf (LCB) Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. Rationalise Lacken, Kereen and Moores Well, Monatarriff, Carrignagower and Ballysaggart to LCB WRZ. <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to LCB WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	55 m ³ /d
SAK-675 (SA Option 173) 3100SC0095 Lismore/Cappoquin/Ballyduff	Increase GW (to include commissioning new trial well) abstraction from existing borehole and upgrade Lismore/Cappoquin/Ballyduf (LCB) Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. Rationalise Lacken, Kereen and Moores Well, Monatarriff, Carrignagower and Ballysaggart to LCB WRZ. <ul style="list-style-type: none"> WRZ in deficit. Increase existing GW abstraction and new GW abstraction to supply future deficit. Existing GW source: Lismore GWB WFD status 2016-2021 – Good. 	2,624 m ³ /d
SAK-676 (SA Option 173) 3100SC0113 Lacken	Increase GW (to include commissioning new trial well) abstraction from existing borehole and upgrade Lismore/Cappoquin/Ballyduf (LCB) Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. Rationalise Lacken, Kereen and Moores Well, Monatarriff, Carrignagower and Ballysaggart to LCB WRZ. <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to LCB WRZ. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	39 m ³ /d
SAK-677 (SA Option 173)	Increase GW (to include commissioning new trial well) abstraction from existing borehole and upgrade	134 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
3100SC0081 Moores Well	Lismore/Cappoquin/Ballyduff (LCB) Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. Rationalise Lacken, Kereen and Moores Well, Monatarriff, Carrignagower and Ballysaggart to LCB WRZ. <ul style="list-style-type: none"> WRZ in deficit and WTP is to be rationalised to LCB WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Knockmealdown GWB WFD status 2016-2021 – Good. 	
SAK-756 (SA Option 173) 3100SC0095 Lismore/Cappoquin/Ballyduff	New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit. <ul style="list-style-type: none"> WRZ in deficit. Increase existing GW abstraction and new GW abstraction to supply future deficit. Existing GW source: Lismore GWB WFD status 2016-2021 – Good 	2,624 m ³ /d
SAK-684 (SA Option 175) 2900SC0013 Horse & Jockey PWS	Rationalise Horse & Jockey, Littleton, Glengar and Twomileborris to Thurles and interconnect with Dundrum Regional. <ul style="list-style-type: none"> Horse & Jockey WRZ not in deficit however WTP to be rationalised to Thurles WRZ. Existing GW source: Templemore GWB WFD status 2016-2021 – Good. 	252 m ³ /d
SAK-685 (SA Option 175) 2900SC0016 Littleton PWS	Rationalise Horse & Jockey, Littleton, Glengar and Twomileborris to Thurles and interconnect with Dundrum Regional. <ul style="list-style-type: none"> Littleton PWS not in deficit, however WTP to be rationalised to Thurles/Borrisoleigh WRZ. Existing GW to be decommissioned. Existing GW source: Templemore GWB WFD status 2016-2021 – Good. 	205 m ³ /d
SAK-686 (SA Option 175) 2900SC0029 Dundrum Regional	Rationalise Horse & Jockey, Littleton, Glengar and Twomileborris to Thurles and interconnect with Dundrum Regional. <ul style="list-style-type: none"> WRZ in deficit and is to be interconnected to Thurles/Borrisoleigh WRZ. Existing GW source: Templemore GWB WFD status 2016-2021 – Good. 	8,800 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing SW source: Multeen (East) RWB WFD status 2016-2021 – Good. 	
SAK-687 (SA Option 175) 2900SC0009 Twomileborris	<p>Rationalise Horse & Jockey, Littleton, Glengar and Twomileborris to Thurles and interconnect with Dundrum Regional.</p> <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Thurles WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Templemore GWB WFD status 2016-2021 – Good. 	347 m ³ /d
SAK-688 (SA Option 175) 2900SC0014 Thurles/Borrisoleigh	<p>Rationalise Horse & Jockey, Littleton, Glengar and Twomileborris to Thurles and interconnect with Dundrum Regional.</p> <ul style="list-style-type: none"> WRZ in projected surplus. Existing GW source: Templemore GWB WFD status 2016-2021 – Good. Existing SW source: Clodiagh (Tipperary) RWB WFD status 2016-2021 – Good. 	6,588 m ³ /d
SAK-689 (SA Option 175) 2900SC0069 Glengar	<p>Rationalise Horse & Jockey, Littleton, Glengar and Twomileborris to Thurles and interconnect with Dundrum Regional.</p> <ul style="list-style-type: none"> WRZ in deficit. WTP to be rationalised to Thurles/Borrisoleigh WRZ. Existing abstraction to be decommissioned. Existing GW source: Slieve Phelim GWB WFD status 2016-2021 – Good. 	362 m ³ /d
SAK-733 (SA Option 183) 2900SC0039 Templetney/Brackford Bridge PWS	<p>Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).</p> <ul style="list-style-type: none"> WRZ in deficit and is to be interconnected with Clonmel WRZ. Existing GW source: Clonmel GWB WFD status 2016-2021 – Good. 	4,549 m ³ /d
SAK-734 (SA Option 183) 2900SC0025 Clonmel & Environs	<p>New abstraction from the River Suir and new WTP at Barnes (site identified).</p> <ul style="list-style-type: none"> WRZ in deficit. New SW abstraction to supply future deficit. Existing GW source: Clonmel GWB WFD status 2016-2021 – Good. 	11,486 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing SW sources: Suir RWB WFD status 2016 – Good and Glasha (Waterford) RWB WFD status 2016-2021 – High and Glenary RWB WFD status 2016-2021 – Good. New SW source: Suir RWB WFD status 2016-2021 – Good. 	
SAK-735 (SA Option 183) 2900SC0021 Ardfinnan Regional	<p>Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> WRZ in deficit. Interconnect with Clonmel WRZ to supply future deficit. Existing SW source: Glengalla RWB WFD status 2016-2021 – Good. 	7,415 m ³ /d
SAK-736 (SA Option 183) 2900SC0031 Tullohea	<p>Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p> <ul style="list-style-type: none"> WRZ in deficit and the WTP is to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Mullinavat GWB WFD status 2016-2021 – Good. 	356 m ³ /d
SAK-737 (SA Option 183) 2900SC0036 Kilcash	<p>Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p> <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Carrick-on-Suir GWB WFD status 2016-2021 – Good. 	75 m ³ /d
SAK-738 (SA Option 183) 2900SC0020 Ahenny	<p>Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p> <ul style="list-style-type: none"> Ahenny WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Clonmel GWB WFD status 2016-2021 – Good. 	58 m ³ /d
SAK-739 (SA Option 183) 2900SC0022 Ballinvir	<p>Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p> <ul style="list-style-type: none"> Ballinvir WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. 	41 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW source: Mullinavat GWB WFD status 2016-2021 – Good. 	
SAK-740 (SA Option 183) 3100SC0118 Russelstown	<p>Rationalise Russelstown to Clonmel WRZ.</p> <ul style="list-style-type: none"> Russelstown WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Carrick-on-Suir GWB WFD status 2016-2021 – Good. 	39 m ³ /d
SAK-741 (SA Option 183) 3100SC0129 Kilmanhan	<p>Rationalise Kilmanahan to Clonmel WRZ.</p> <ul style="list-style-type: none"> Kilmanahan WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Carrick-on-Suir GWB WFD status 2016-2021 – Good. 	16 m ³ /d
SAK-742 (SA Option 183) 3100SC0087 Glenagad	<p>Rationalise Glennagad to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).</p> <ul style="list-style-type: none"> Glenagad WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Comeragh GWB WFD status 2016-2021 – Good. 	25 m ³ /d
SAK-743 (SA Option 183) 3100SC0119 Poulavanogue (Waterford)	<p>Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).</p> <ul style="list-style-type: none"> WRZ in deficit. Existing GW abstraction to be decommissioned. Existing GW source: Carrick-on-Suir GWB WFD status 2016-2021 – Good. 	82 m ³ /d
SAK-748 (SA Option 185c) 1900SC0038 Carrigmore	<p>Rationalise Carrigmore, Killeely, Herberstown, Knocklong/Hospital, Ballylanders and Galbally to Clareville WTP (Limerick City).</p> <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clareville WTP. Existing GW abstraction to be decommissioned. Existing GW source: Slieve Phelim GWB WFD status 2016-2021 – Good. 	278 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAK-749 (SA Option 185c) 1900SC0030 Kilteely	Rationalise Carrigmore, Kilteely, Herberstown, Knocklong/Hospital, Ballylanders and Galbally to Clareville WTP (Limerick City). <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clareville WTP. Existing GW abstraction to be decommissioned. Existing GW source: Knockroe Southwest GWB WFD status 2016-2021 – Good. 	370 m ³ /d
SAK-750 (SA Option 185c) 1900SC0008 Herbertstown	Rationalise Carrigmore, Kilteely, Herberstown, Knocklong/Hospital, Ballylanders and Galbally to Clareville WTP (Limerick City). <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clareville WTP. Existing GW abstraction to be decommissioned. Existing GW source: Herbertstown GWB WFD status 2016-2021 – Good 	314 m ³ /d
SAK-751 (SA Option 185c) 1900SC0010 Knocklong/Hospital	Rationalise Carrigmore, Kilteely, Herberstown, Knocklong/Hospital, Ballylanders and Galbally to Clareville WTP (Limerick City). <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clareville WTP. Existing GW abstractions to be decommissioned. Existing GW source: Herbertstown GWB WFD status 2016-2021 – Good and Hospital GWB WFD status 2016-2021 – Good. 	1,475 m ³ /d
SAK-752 (SA Option 185c) 1900SC0012 Ballylanders Water Supply	Rationalise Carrigmore, Kilteely, Herberstown, Knocklong/Hospital, Ballylanders and Galbally to Clareville WTP (Limerick City). <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clareville WTP. Existing GW abstraction to be decommissioned. Existing GW source: Knockaskallen GWB WFD status 2016-2021 – Good. 	436 m ³ /d
SAK-753 (SA Option 185c) 1900SC0011 Galbally Water Supply	Rationalise Carrigmore, Kilteely, Herberstown, Knocklong/Hospital, Ballylanders and Galbally to Clareville WTP (Limerick City). <ul style="list-style-type: none"> WRZ in deficit and WTP to be rationalised to Clareville WTP. Existing GW abstraction to be decommissioned. 	283 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW source: Bansha GWB WFD status 2016-2021 – Good. 	
SAK-356 (SA Option 149) 3100SC0033 East Waterford Water Supply Scheme	<p>New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.</p> <ul style="list-style-type: none"> WRZ in deficit. New GW abstraction to supply the future deficit. Existing SW sources: Mahon RWB WFD 2016-2021 – Poor, Ballyshunnock lake waterbody (LWB) 2016-2021 – Poor and Clodiagh (Portlaw) RWB WFD 2016-2021 – Good. New SW source: Suir RWB WFD status 2016-2021 – Moderate. 	42,153 m ³ /d
SAK-399 (SA Option 149) 3100SC0097 Ballyogarty	<p>Rationalise Ballyogarty to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> WRZ in deficit. Rationalise Ballyogarty WRZ to East Waterford WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	367 m ³ /d
SAK-438 (SA Option 149) 3100SC0099 Kilmacthomas	<p>Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> WRZ in deficit WTP. Rationalise Kilmacthomas WRZ to East Waterford WRZ. Existing abstractions to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good 	246 m ³ /d
SAK-495 (SA Option 149) 3100SC0091 Dunhill - Cois Coille	<p>Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Dunhill - Cois Coille WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	34 m ³ /d
SAK-501 (SA Option 149) 3100SC0042 Faha	<p>Rationalise Faha to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Faha WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ. Existing GW abstraction to be decommissioned. 	14 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
	<ul style="list-style-type: none"> Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	
SAK-530 (SA Option 149) 3100SC0035 Smoor	<p>Rationalise Smoor to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Smoor WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Waterford GWB WFD status 2016-2021 – Good. 	22 m ³ /d
SAK-538 (SA Option 149) 3100SC0092 Dunhill Ballinageeragh	<p>Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Dunhill Ballinageeragh WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	14 m ³ /d
SAK-555 (SA Option 149) 3100SC0045 Fews	<p>Rationalise Fews to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Fews WRZ in deficit and WRZ to be rationalised to Kilmacthomas WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	70 m ³ /d
SAK-604 (SA Option 149) 3100SC0102 Kill/Ballylaneen	<p>Rationalise Kill/Ballylaneen to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Kill/Ballylaneen WRZ in surplus but WRZ to be rationalised to East Waterford WRZ. Existing SW abstraction to be decommissioned. Existing SW source: Mahon RWB WFD status 2016-2021 – Poor. 	402 m ³ /d
SAK-608 (SA Option 149) 3100SC0101 Scrahan	<p>Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).</p> <ul style="list-style-type: none"> Scrahan WRZ not in deficit however WRZ to be rationalised to Kilmacthomas WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	284 m ³ /d

WRZ Name and Option Reference*	Option Description	Abstraction/Demand
SAK-783 (SA Option 195) 3100SC0001 Dungarvan	Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit. <ul style="list-style-type: none"> WRZ in deficit. Increase GW abstraction to meet future deficit. Existing GW source: Dungarvan GWB WFD status 2016-2021 – Good. 	8,549 m ³ /d
SAK-784 (SA Option 195) 3100SC0083 Stradbally	Rationalise Stradbally to Dungarvan WRZ. <ul style="list-style-type: none"> Stradbally WRZ in projected surplus. Existing SW abstraction to be decommissioned. Existing SW source: Tay RWB WFD status 2016-2021 – Good. 	372 m ³ /d
SAK-785 (SA Option 195) 3100SC0093 Graigueageeha	Rationalise Graigueageeha to Dungarvan WRZ. <ul style="list-style-type: none"> Graigueageeha WRZ in deficit and is to be rationalised to Stradbally WRZ. Existing GW abstraction to be decommissioned. Existing GW source: Tramore GWB WFD status 2016-2021 – Good. 	24 m ³ /d

*SA Options are the same as Group Options

The SA Preferred Approach options are shown in Figure 5.1 and Figure 5.2, in relation to key environmental designations (Note that SA option 37, 53, 149, 173, 175, 183, 185c and 195 are labelled as SAK-837, 853, 949, 973, 975, 983, 985c and 995 respectively).

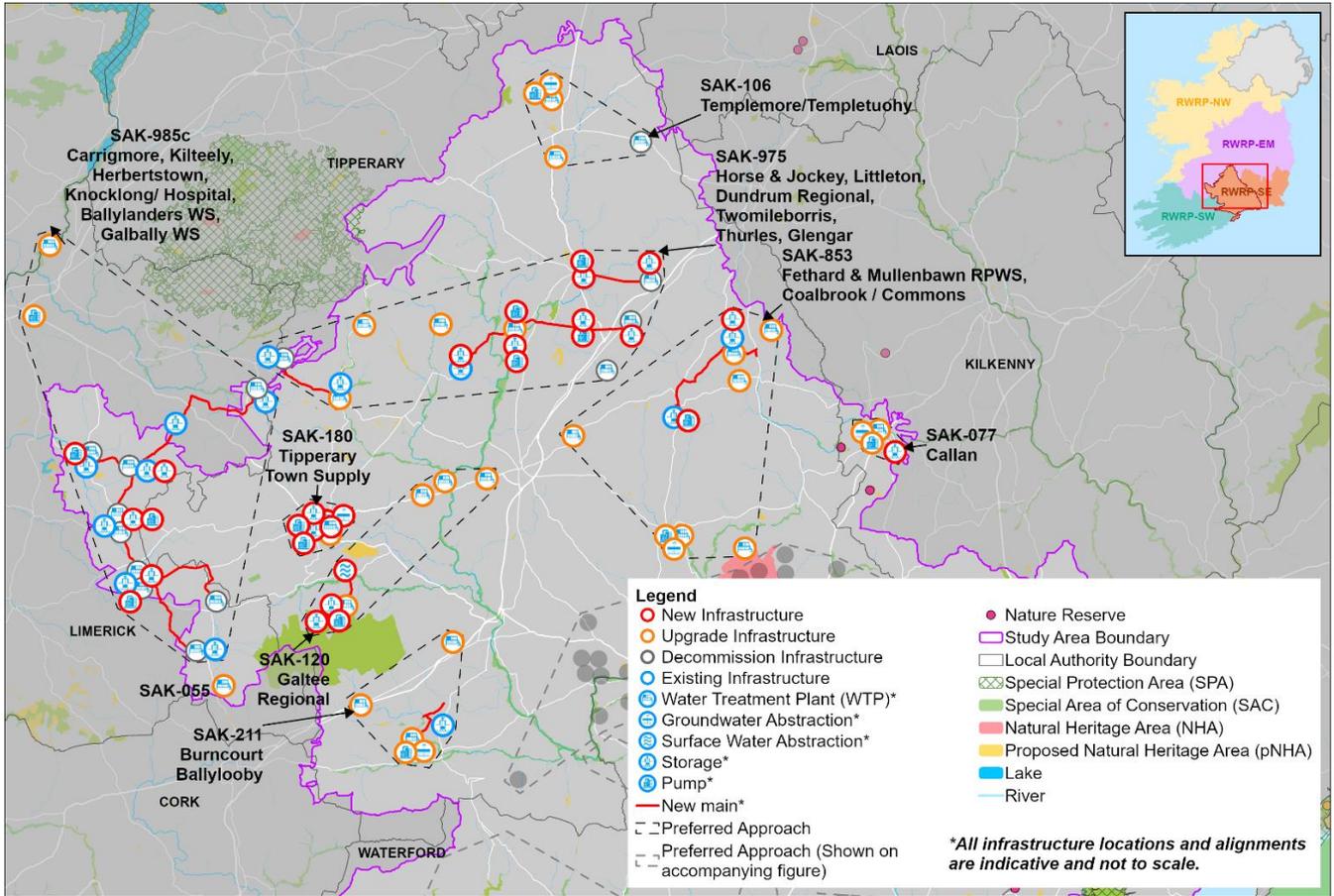


Figure 5.1 SAK (North) Preferred Approach and Key Environmental Designations

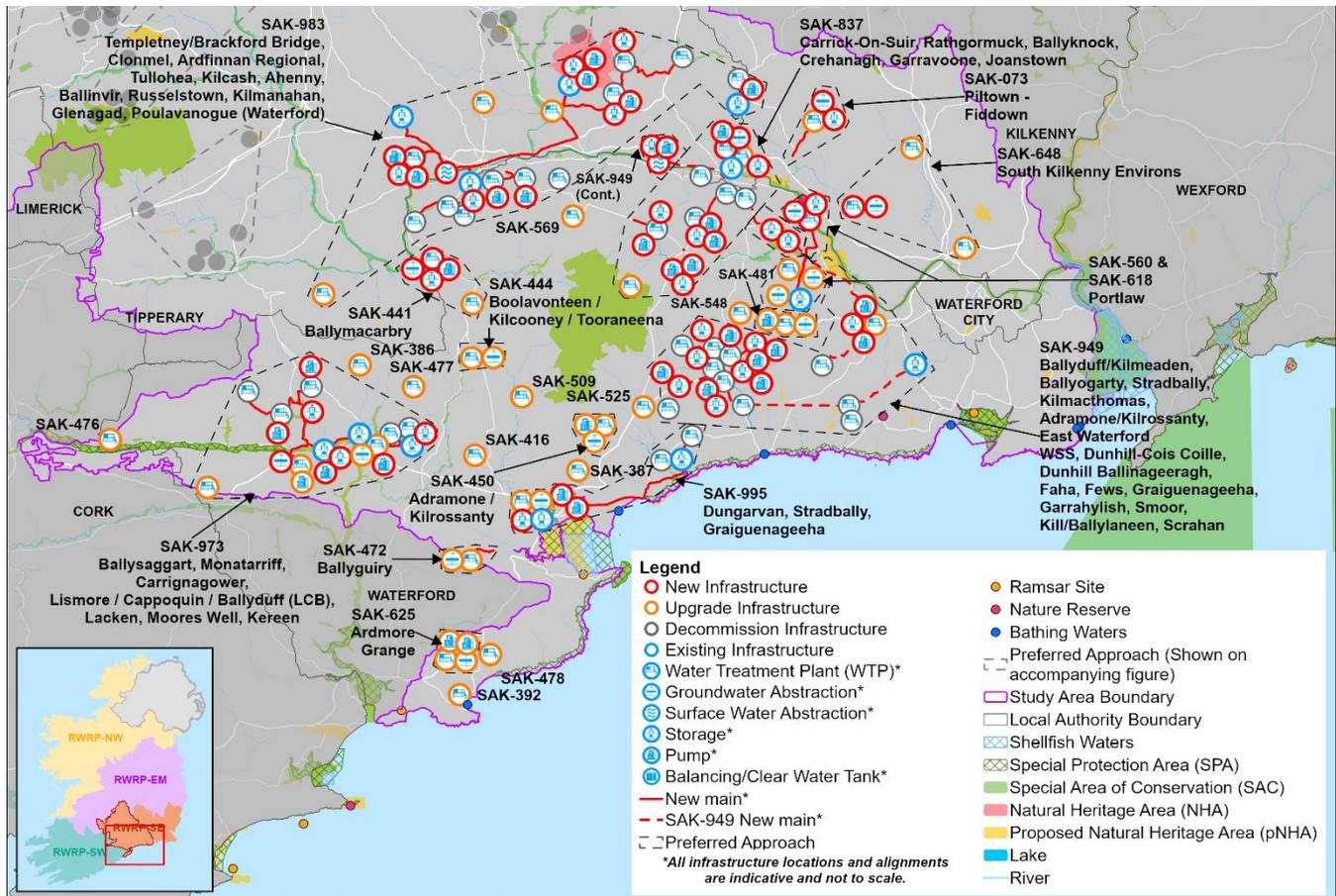


Figure 5.2 SAK (South) Preferred Approach and Key Environmental Designations

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
SAK-055	-	-	✓	-	-	-	-	-
SAK-073	✓	-	✓	✓	-	-	-	✓
SAK-077	-	-	✓	✓	-	-	-	✓
SAK-106	-	-	✓	✓	✓	✓	-	-
SAK-120	✓	-	✓	✓	-	-	-	✓
SAK-180	✓	✓	✓	✓	-	-	-	✓
SAK-211	✓	-	✓	✓	-	-	-	✓
SAK-386	-	-	✓	-	-	-	-	-
SAK-387	-	-	✓	-	-	-	-	-
SAK-392	-	-	✓	-	-	-	-	-
SAK-416	-	-	✓	-	-	-	-	-
SAK-441	✓	✓	✓	✓	-	-	-	✓
SAK-444	-	-	✓	✓	-	-	-	-
SAK-450	-	-	✓	✓	-	-	-	-
SAK-472	✓	-	✓	✓	-	-	-	-
SAK-476	-	-	✓	-	-	-	-	-
SAK-477	-	-	✓	-	-	-	-	-
SAK-478	-	-	✓	-	-	-	-	-
SAK-481	-	-	✓	✓	-	-	-	✓
SAK-509	-	-	✓	-	-	-	-	-
SAK-525	-	-	✓	-	-	-	-	-

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs	New / Upgraded Abstractions	WTPs Decommissioned	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SAK-548	-	-	✓	-	-	-	-	-
SAK-560	✓	-	✓	✓	-	-	-	-
SAK-569	-	-	✓	-	-	-	-	-
SAK-618	✓	✓	-	✓	-	-	-	✓
SAK-625	-	-	✓	✓	-	-	-	-
SAK-648	-	✓	✓	✓	-	-	-	-
SA Option 37 (SAK-265, 269, 271, 273 and 289)	✓	✓	✓	✓	✓	✓	-	✓
SA Option 53 (SAK-222 and 239)	✓	-	✓	✓	-	-	-	✓
SA Option 149 (SAK-356, 399, 438, 495, 501, 530, 538, 555, 604 and 608)	✓	-	✓	✓	✓	✓	-	✓
SA Option 173 (SAK-672, 673, 674, 675, 676, 677 and 756)	✓	-	✓	✓	✓	✓	-	✓
SA Option 175 (SAK-684, 685, 686, 687, 688, 689)	✓	-	✓	-	✓	✓	-	✓
SA Option 183 (SAK-733, 734, 735, 736, 737, 738, 739, 740, 741, 742 and 743)	✓	✓	✓	✓	✓	✓	-	✓
SA Option 185c (SAK-749, 750, 751, 752 and 753)	✓	-	-	-	✓	✓	-	✓
SA Option 195 (SAK-783, 784 and 785)	✓	-	✓	✓	✓	✓	-	✓

*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 37 (SAK-265, 269, 271, 273 and 289)	Rationalise Rathgormuck, Crehanagh, Garravoone and Ballyknock to Carrick on Suir WRZ (Linguan WTP). New GW abstraction and new Linguan WTP to supply deficit.	Construction	--	-	-	-	--	--	0	-	-	-
		Operation	++	-	+	--	---	-	-	-	0	0
SA Option 53 (SAK-222 and 239)	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in	Construction	-	--	-	--	-	--	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 (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)
	deficit. Interconnect Coalbrook/Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP).	Operation	+	-	0	-	-	--	--	0	0	0
SA Option 149 (SAK-356, 399, 438, 495, 501, 530, 538, 555, 604 and 608)	Rationalise Ballyogarty, Dunhill - Cois Coille, Dunhill Ballinageeragh, Faha, Smoor, Fews, Kill/Ballylaneen, Scrahan and Kilmacthomas to East Waterford WRZ (new SW	Construction	--	--	-	--	---	-	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 (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)
	abstraction from River Suir). New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.	Operation	++	-	++	--	---	-	0	-	--	-
SA Option 173 (SAK-672, 673, 674, 675, 676, 677 and 756)	Rationalise Ballysaggart, Monatariff and Carrognagower, and Lacken and Morees Well to Lismore/Cappoquin/Ballyduff (LCB) (Deerpark WTP). Increase GW (to	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 (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)
	include commissioning new trial well) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly 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 (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 175 (SAK-684, 685, 686, 687, 688, 689)	Rationalise Twomileborris to Thurles WRZ. Interconnect Callan and Caherlesk/ Coolaghmore Group Water Scheme (GWS) and supply deficit from GWS. Increased and new GW abstractions from Twomileborris and upgrade Twomileborris WTP to	Construction	-	--	-	--	-	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 (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)
	supply deficit. Increase GW from Curraheen borehole and upgrade Curragheen WTP supply deficit spare capacity to neighbouring scheme. Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Operation	++	-	+	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 (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 183 (SAK-733, 734, 735, 736, 737, 738, 739, 740, 741, 742 and 743)	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir). New abstraction from the River Suir and new WTP at Barnes (site identified). Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW	Construction	--	--	---	-	---	-	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 (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)
	abstraction from River Suir). Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir). Rationalise Russelstown, Kilmanahan, Poulavanogue (Waterford) and Glennagad to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).	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 (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 185c (SAK-749, 750, 751, 752 and 753)	Rationalise Carrigmore, Killeely, Herbertstown, Knocklong/Hospital, Ballylanders and Galbally to Limerick City (Clareville WTP)	Construction	-	--	-	--	-	0	0	0	--	-
		Operation	++	--	+	0	-	++	0	0	0	0
SA Option 195 (SAK-783, 784 and 785)	Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit. Rationalise Stradbally and Graigenageeha to Dungarvan WRZ.	Construction	-	-	-	-	--	--	0	0	--	-
		Operation	+	--	+	0	--	--	--	0	0	0
SAK-055		Construction	-	-	-	-	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 (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)
	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Operation	+	0	0	0	0	0	0	0	0	0
SAK-648	Bring back Silverspring WTP to production and supply deficit.	Construction	-	-	-	-	0	-	0	0	-	-
		Operation	+	-	-	-	0	-	0	0	0	0
SAK-073	New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).	Construction	-	--	-	--	-	--	0	-	-	-
		Operation	--	-	-	-	-	--	--	0	0	0
SAK-077	Increase GW abstraction from existing spring and	Construction	--	--	-	-	-	--	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 (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)
	borehole and upgrade Callan WTP to supply deficit.	Operation	-	-	0	-	-	--	-	0	0	0
SAK-106	Rationalise Templetoohy to Templemore (rationalise to College Hill WTP).	Construction	-	-	-	-	-	--	0	0	-	-
	Rationalisation within WRZ.	Operation	++	0	+	0	-	--	--	0	0	0
SAK-120	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP,	Construction	-	--	-	-	---	--	0	0	-	-
	Thomas Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality.	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 (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)
SAK-180	New GW abstraction, new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes.	Construction	-	--	-	-	--	--	0	-	-	-
		Operation	+	-	0	0	--	--	-	0	0	0
SAK-211	Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.	Construction	-	--	-	-	-	--	0	0	-	-
		Operation	+	-	0	0	-	--	--	0	0	0
SAK-386	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
SAK-387		Construction	-	--	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 (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)
	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Operation	+	-	0	0	-	0	0	0	0	0
SAK-392	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
SAK-416	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
SAK-441	New GW abstraction (karstic) and new WTP to supply deficit.	Construction	-	--	-	-	-	-	0	0	-	-
		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 (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)
SAK-444	Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	Construction	-	-	-	-	0	--	0	0	0	0
		Operation	0	0	-	0	0	--	--	0	0	0
SAK-450	Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.	Construction	-	-	-	-	0	--	0	0	0	0
		Operation	+	-	-	0	0	--	--	0	0	0
SAK-472	Increase GW abstraction from Ballyguiry borehole and upgrade Ballyguiry WTP to supply deficit.	Construction	-	-	0	-	0	--	0	0	0	0
		Operation	0	-	0	0	0	--	--	0	0	0
SAK-477		Construction	-	-	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 (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)
	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Operation	+	-	0	0	0	0	0	0	0	0
SAK-478	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
SAK-481	Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.	Construction	-	-	-	-	0	--	0	0	0	0
		Operation	-	-	-	0	0	--	--	0	0	0
SAK-509		Construction	-	-	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 (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)
	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Operation	+	-	0	0	0	0	0	0	0	0
SAK-525	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
SAK-548	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
SAK-618	New GW abstraction and new WTP to partly supply deficit.	Construction	--	--	-	-	-	-	0	-	-	-
		Operation	--	--	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 (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)
SAK-560	Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.	Construction	--	--	-	-	0	--	0	-	-	-
		Operation	-	--	-	-	0	--	--	0	0	0
SAK-569	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	-	0	0
		Operation	+	-	0	0	0	0	0	0	0	0
SAK-625	Increase GW abstraction and upgrade WTP to supply deficit.	Construction	-	-	-	-	0	--	0	0	-	-
		Operation	-	0	-	-	0	--	--	0	0	0

*SA Options are the same as Group Options

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)
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**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+

Note that SAK-476 has previously been assessed as part of SA option 114 in SAJ (South West region) and will not be reassessed for the South East region to avoid duplication. It is only listed as part of the Preferred Approach for SAK for informative purposes regarding the approach for this WRZ.

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 SAK 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: Fethard & Mullenbawn Regional Public Water Supply, Galtee Regional and Tipperary Town Supply.

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 SAK 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 SAK Preferred Approach is provided in the SAK Technical Report. A high-level assessment of what this could mean for the SEA is shown in Table 5.4.

Table 5.4 SAK 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		The impact of sustainability reductions would reduce the volumes that can be abstracted from existing sources,

Uncertainty	Likelihood	Increase (+) / Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
	current abstractions are large compared to the waterbodies from which they abstract)	+39,400 m ³ /d	<p>therefore, increasing the SDB deficit. There are some surface water sources in SAK that would be impacted through sustainability reductions. However, the Preferred Approach is designed to relieve pressure on these sources by supplementing from more resilient sources.</p> <p>Groundwater sustainability is more difficult to assess at desktop level, however, as the abstractions in SAK are small in scale any impacts are likely to be minimal.</p> <p>The SA Preferred Approach addresses reductions and Uisce Éireann have identified alternative supplies to supplement the abstractions at several sources. However, additional sustainability reductions could increase pressure for additional supply from outside the study area.</p>
Climate Change	High (international climate change targets have not been met)	+7,600 m ³ /d	<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 SAK, there are 21 sources that would be particularly vulnerable to increased climate change impact scenarios. The Poulavanogue, Boola River and Glenary sources are proposed 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 overall.</p>
Demand Growth	Low/Moderate (growth has been based on policy)	-5,946 m ³ /d	<p>The impact of lower than expected growth would reduce the SDB deficit and the overall need requirement. The SDB deficit is currently spread across 46 of the 75 WRZs in the area and is projected to spread across 48. This is driven by</p>

Uncertainty	Likelihood	Increase (+) / Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
			<p>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)	+347 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)	-36,233 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 SAK 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 SAK Preferred Approach

6 SEA Cumulative Effects for SAK Preferred Approach

Secondary, cumulative and the synergistic nature of the effects of the SAK 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 SAK

The potential 'within plan' cumulative effects for SAK 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.

Note that SAK-476 has previously been assessed as part of SA option 114 in SAJ (South West region) and will not be reassessed for the South East region to avoid duplication. It is listed as part of the Preferred Approach for SAK for information regarding the approach for this WRZ. Cumulative effects with other regional plans are considered in the SEA Environmental Report.

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 SAK

Preferred Approach Option References	SAK-648	SAK-625	SAK-618	SAK-569	SAK-560	SAK-548	SAK-525	SAK-509	SAK-481	SAK-478	SAK-477	SAK-476	SAK-472	SAK-450	SAK-444	SAK-441	SAK-416	SAK-392	SAK-387	SAK-386	SAK-211	SAK-180	SAK-120	SAK-106	SAK-077	SAK-073	SAK-055	SA Option 195	SA Option 185c	SA Option 183	SA Option 175	SA Option 173	SA Option 149	SA Option 53	SA Option 37		
SA Option 37	LSU		LSU	LSU	LSU											LSU					LSU	LSU N24	LSU			LSU			LSU	LSU	LSU		LSU	LSU			
SA Option 53	RBN LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU		RBN	LSU			LSU	LSU	LSU		RBN	LSU			
SA Option 149	RBN N25 LSU	N25	TBS LSU	LSU	TBS LSU		MC N25						DH	DH MC		DH			DH		LSU	LSU	LSU		RBN	LSU		DH MC N25	LSU	LSU	LSU	DH					
SA Option 173											BR		BC DH	DH	BR	BC DH			DH	BR	BC							BC DH		BC							
SA Option 175	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU			LSU			LRS LSU	LSU							
SA Option 183	LSU		LSU	LSU	LSU								BC			BC LSU					BC LSU	LSU	LSU			LSU		BC	LSU								
SA Option 185c	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU			LSU											
SA Option 195	N25	N25					MC N25						BC DH	DH MC		BC DH			DH		BC																
SAK-055																																					
SAK-073	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU														
SAK-077	RBN																																				
SAK-106																							LSU														
SAK-120	LSU		LSU		LSU											LSU					LSU	LSU	LSU N74														
SAK-180	LSU		LSU	LSU	LSU											LSU					LSU																
SAK-211	LSU		LSU		LSU								BC			BC LSU																					
SAK-386											BR				BR																						
SAK-387													DH	DH		DH																					

Preferred Approach Option References	SAK-648	SAK-625	SAK-618	SAK-569	SAK-560	SAK-548	SAK-525	SAK-509	SAK-481	SAK-478	SAK-477	SAK-476	SAK-472	SAK-450	SAK-444	SAK-441	SAK-416	SAK-392	SAK-387	SAK-386	SAK-211	SAK-180	SAK-120	SAK-106	SAK-077	SAK-073	SAK-055	SA Option 195	SA Option 185c	SA Option 183	SA Option 175	SA Option 173	SA Option 149	SA Option 53			
SAK-392																																					
SAK-416																																					
SAK-441	LSU		LSU		LSU										BC																						
SAK-444											BR				DH																						
SAK-450							MC								DH																						
SAK-472																																					
SAK-476																																					
SAK-477																																					
SAK-478																																					
SAK-481																																					
SAK-509																																					
SAK-525	N25	N25																																			
SAK-548																																					
SAK-560	LSU																																				
SAK-569	LSU																																				
SAK-618	LSU																																				
SAK-625	N25																																				

Key		
Construction Phase		M8 Road
Operation Phase		Mid-Waterford Coast SPA
Construction and Operation		N24 Road
Blackwater Callows SPA	BC	N25 Road
Blackwater River (Cork/Waterford) SAC	BR	N74 Road
Dungarvan Harbour SPA	DH	River Barrow And River Nore SAC
Lower River Shannon SAC	LRS	Tramore Back Strand SPA
Lower River Suir SAC	LSU	

There could be cumulative effects associated with construction in terms of traffic, noise and dust for the options located along the N24, N25, N74 and M8 roads (indicated by 'N24', 'N25', 'N74' and 'M8' 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 for the options located close to the Blackwater Callows SPA (indicated by 'BC' in Table 6.1). The Blackwater Callows SPA contains surface water dependent Qualifying Interests (QIs), including, Salmon, Otter, Twaite Shad, Lamprey, Freshwater Pearl Mussel and White-clawed Crayfish. Cumulative construction works for SAK-211, 441 and 472, and SA options 173, 183 and 195 could cause disturbance impacts if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Blackwater River (Cork/Waterford) SAC (indicated by 'BR' in Table 6.1). The Blackwater River (Cork/Waterford) SAC contains surface water dependent QIs, including, Salmon, Otter, Twaite Shad, Lamprey, Freshwater Pearl Mussel and White-clawed Crayfish. Cumulative construction works within the area could cause pollution (SAK-386, 444, 477 and SA option 173) and disturbance (SAK-444 and SA option 173) impacts if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Dungarvan Harbour SPA (indicated by 'DH' in Table 6.1). The Dungarvan Harbour SPA contains water dependent QI bird species. Cumulative construction works within the area could cause pollution (SAK-387, 472, and SA option 195) and disturbance (SAK-387, 441, 450 and 472, and SA options 149, 173 and 195) impacts if construction phases are concurrent.

There could be cumulative effects during construction from SA option 175 and 185c to the Lower River Shannon SAC (indicated by 'LRS' in Table 6.1). The Lower River Shannon SAC contains hydrologically sensitive habitats and QIs such as Atlantic salt meadows and Alluvial forests. The Lower River Shannon SAC also includes water dependent QI species such as Otter, Salmon, Lamprey and Fresh Water Pearl Mussel. Cumulative construction works could cause impacts including pollution, disturbance and spread of invasive non-native species) if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Lower River Suir SAC (indicated by 'LSU' in Table 6.1). The Lower River Suir SAC contains hydrologically sensitive habitats and QIs including water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation, *Hydrophilous* tall herb fringe communities of plains and of the montane to alpine levels, Atlantic salt meadows and Alluvial forests. The Lower River Suir SAC also includes water dependent QI species such as Otter, Salmon, Lamprey, Fresh Water Pearl Mussel, White-clawed Crayfish and Twaite Shad. Cumulative construction works within the river valley could cause impacts including habitat loss (SAK-120, 211, 560 and 618, and SA options 53, 149, 175 and 183), pollution (SAK-073, 106, 120, 180, 211, 441, 560, 569, 618 and 648, and SA options 37, 53, 149, 175, 183 and 185c), mortality (SAK-120, 211, 560 and 618 and SA options 37, 53, 149, 175, 183), spread of invasive species (SAK-120, 211, 560 and 618, and SA options 37, 53, 149, 175, 183), and disturbance (SAK-073, 120, 180, 211, 441, 560, 569, 618 and 648, and SA options 37, 53, 149, 175, 183 and 185c) if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Mid-Waterford Coast SPA (indicated by 'MC' in Table 6.1). The Mid-Waterford Coast SPA contains water dependent QI bird species, including Cormorant, Peregrine and Chough. Cumulative construction works within the area

could cause pollution (SAK-450 and 525, and SA option 149 and 195) and disturbance (SA option 149 and 195) impacts if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the River Barrow And River Nore SAC (indicated by 'RBN' in Table 6.1). The River Barrow And River Nore SAC contains groundwater dependent terrestrial ecosystems, including Petrifying springs and water dependent QIs, namely, Salmon, Lamprey, Fresh Water Pearl Mussel, White-clawed Crayfish and Twaite Shad.

Cumulative construction works for SAK-077 and 648, and SA options 53 and 149 could cause pollution impacts if construction phases are concurrent.

There could be cumulative effects during construction for the options located close to the Tramore Back Strand SPA (indicated by 'TBS' in Table 6.1). The Tramore Back Strand SPA contains water dependent QI bird species such as Wetland and Waterbirds. Cumulative construction works for SAK-560 and 618, and SA option 149 could cause disturbance impacts 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 Blackwater Callows SPA, Blackwater River (Cork/Waterford) SAC, Dungarvan Harbour SPA, Lower River Shannon SAC, Lower River Suir SAC, Mid-Waterford Coast SPA, River Barrow And River Nore SAC, and Tramore Back Strand 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 SAK.

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 Carrick-on-Suir, Lismore and Tramore groundwater bodies have a good quantitative status but are 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 Lower River Suir SAC (indicated by 'LSU' in Table 6.1). Cumulative effects during operation could result in habitat degradation (SAK-120, 211, 441, 560, 618 and 648, and SA options 53, 149 and 183) and water table/availability (SAK-120, 211, 441, 560, 618 and 648, and SA options 53, 149 and 183) impacts. See Figure 6.1 for the Preferred Approach abstractions in SAK.

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.

There could also be cumulative effects in terms of carbon across the SA Preferred Approach. The whole life carbon estimate (including construction and operation) for the SA Preferred Approach indicates increased contribution to carbon emissions related to carbon embodied in materials used for construction

and through operational energy use and water treatment. Generally, in terms of carbon emissions, increase in carbon emissions can be considered a significant effect, as these add cumulatively across all developments and contribute to the national target for carbon. However, consideration also needs to be given to the additional water supply provided from the options and therefore the overall carbon efficiency in terms of carbon emissions per ML of supply is an appropriate metric and for SAK this averages as 0.53 tCO₂e/ML (lifetime sum). Mitigation for carbon emissions could include increased sourcing of energy from renewable sources and improving energy efficiency. This could be undertaken alongside leakage reduction and campaigns to raise awareness of measures to reduce water consumption (which in turn would reduce energy consumption). This could include the promotion of water efficient devices and working with planning authorities and developers to encourage new development to be water efficient.

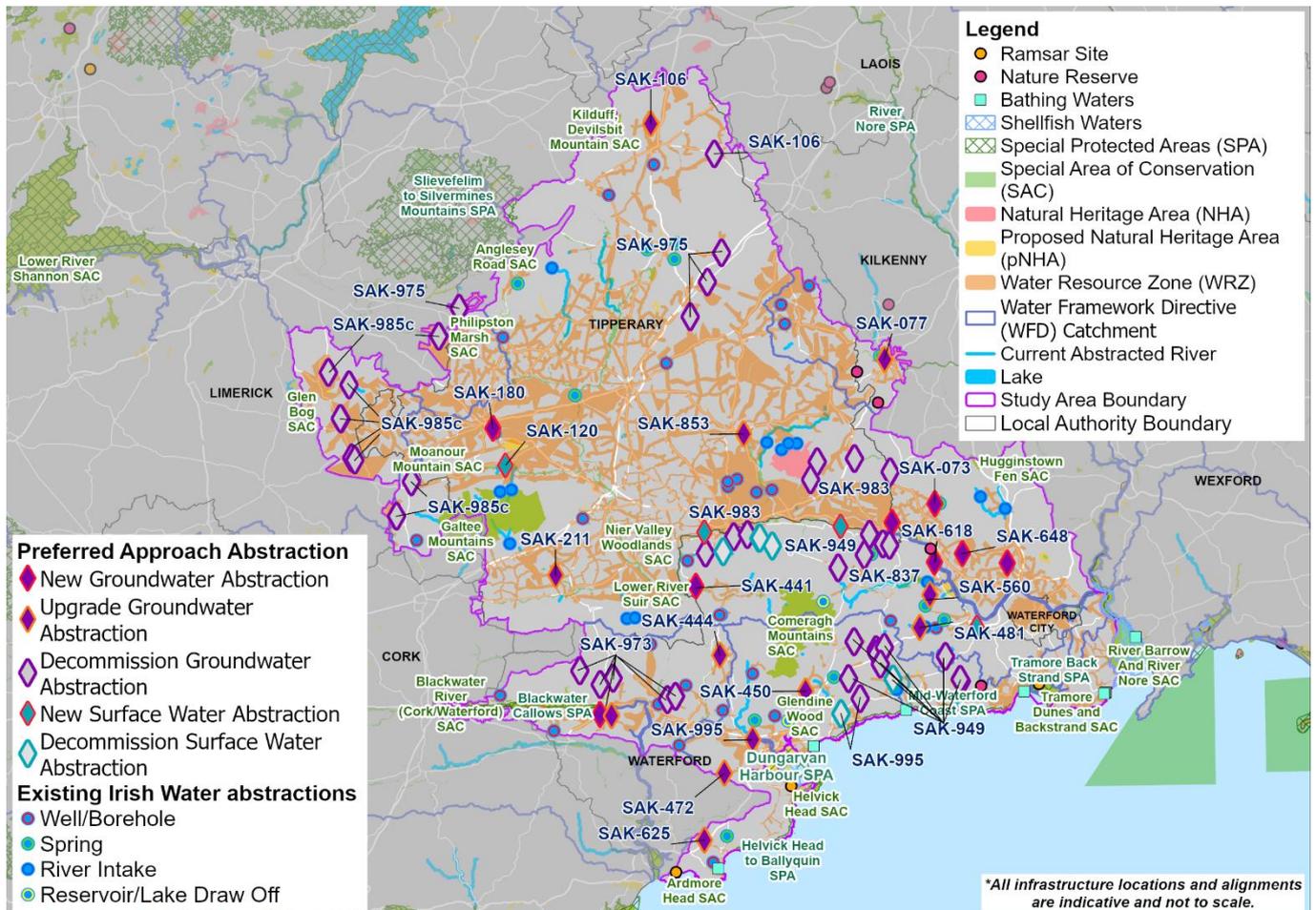


Figure 6.1 SA Preferred Approach Abstractions in SAK

6.2 Cumulative Effects with Other Developments

The SAK Preferred Approach has been assessed alongside other developments that could occur within the plan area. Potential cumulative effects could include increased traffic and noise. These 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.

Table 6.2 shows that within SAK there are eighteen developments that have been considered for cumulative effects with the SA Preferred Approach. 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: Thurles Market Quarter - Regeneration through Recreation, Education and Support for Local Producers; An Duiche, Tipperary Town, Co. Tipperary; Blackwater Community School, Lismore, Waterford - 91509E; Clonmel Community Nursing Unit; Clonmel Garda Station - PPP: Garda Station Bundle; Clonmel Ward Accommodation (modular unit) (South Tipperary General Hospital); Developing inhaled bioengineered exosome therapeutics, delivered by tailored aerosol delivery technology for the treatment of Chronic Obstructive Pulmonary Disease (COPD); Kilbarry, Waterford; Prior Park, Clonmel; Waterford City Wastewater Treatment Plant; and WIT Engineering, ICT and Teaching Building.

6.2.1 Cumulative Effects during Construction

The projects near or in Cappoquin, Clonmel, Lismore and Tipperary 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 'Cap', 'Clo', 'Lis' and 'Tip' respectively). 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 could be cumulative effects associated with construction in terms of traffic, noise and dust for the projects located near or along the N24, N56, N72 and N74 roads (indicated by 'N24', 'N56', 'N72' and 'N74' respectively in Table 6.2). These could be mitigated by standard mitigation measures such as planning of construction traffic routes and movements and engaging with local residents about the disruption. With these standard good practice measures in place, there are unlikely to be significant cumulative effects.

There is potential for cumulative effects from pollution and disturbance impacts on the Blackwater Callows SPA (represented in Table 6.2 'BC') if the construction phase of the Blackwater River Valley; Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper; and Fermoy Town Centre Renewal Project are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from pollution impacts on the Blackwater Estuary SPA (represented in Table 6.2 'BE') if the construction phase of the Blackwater River Valley; Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper; and Regeneration of Youghal Town Centre and the Development of a future vision for the disused former Courthouse are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from habitat loss, mortality, pollution, spread of invasive species and disturbance impacts on the Blackwater River (Cork/Waterford) SAC (represented in Table 6.2 'BR') if the construction phase of the Blackwater River Valley; Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper; Fermoy Town Centre Renewal Project; and Regeneration of Youghal Town Centre and the Development of a future vision for the disused former Courthouse are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from habitat loss, pollution and disturbance impacts on the Dungarvan Harbour SPA (represented in Table 6.2 'DH') if the construction phase of the Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper is concurrent with the SA Preferred Approach. There is also the potential for disturbance impacts if the Blackwater River Valley, and the

Regeneration of Youghal Town Centre and the Development of a future vision for the disused former Courthouse are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from pollution impacts on the Helvick Head to Ballyquin SPA (represented in Table 6.2 'HHB') if the construction phase of the Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper is concurrent with the SA Preferred Approach.

There is potential for cumulative effects from habitat loss, mortality, pollution, spread of invasive species and disturbance impacts on the Lower River Suir SAC (represented in Table 6.2 'LSU') if the construction phase of the Cashel to Cahir Greenway - Cashel to Cahir Town; Clonmel 2030; East Limerick Greenway; Suir Blueway - Gas House Bridge - Suir Island, Clonmel; Suir Blueway - Marlfield to Cahir - Marlfield Village to Swiss Cottages; Suir Blueway - Waterford Greenway Link - Carrick on Suir to Kilmeaden; and Waterford City Regeneration are concurrent with the SA Preferred Approach. There is potential for cumulative effects from mortality, pollution, spread of invasive species and disturbance impacts if the construction phase of the Carrick-on-Suir Regeneration Plan is concurrent with the SA Preferred Approach. There is potential for cumulative effects from habitat loss, mortality, pollution, and disturbance impacts if the construction phase of the Waterford City and Environs - North Quays is concurrent with the SA Preferred Approach. There is also potential for cumulative effects from pollution impacts if the construction phase of the Templemore Town Hall: Enterprise and Cultural Centre, with associated Civic Plaza; and Tipperary Town Regeneration are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from pollution, mortality, spread of invasives and disturbance impacts on the River Barrow And River Nore SAC (represented in Table 6.2 'RBN') if the construction phase of the Callan Friary Complex/Upper Bridge St Regeneration & Masterplan for the historic core of Callan Town, and Callan Town Regeneration are concurrent with the SA Preferred Approach. There is potential for cumulative effects from pollution, mortality and disturbance if the construction phase of the Waterford City Regeneration is concurrent with the SA Preferred Approach. There is potential for cumulative effects from pollution and disturbance if the construction phase of the Waterford City and Environs - North Quays is concurrent with the SA Preferred Approach. There is also potential for cumulative effects from pollution impacts if the construction phase of the Suir Blueway - Waterford Greenway Link - Carrick on Suir to Kilmeaden is concurrent with the SA Preferred Approach.

There is potential for cumulative effects from pollution and disturbance impacts on the River Nore SPA (represented in Table 6.2 'RN') if the construction phase of the Callan Friary Complex/Upper Bridge St Regeneration & Masterplan for the historic core of Callan Town; and Callan Town Regeneration are concurrent with the SA Preferred Approach.

There is potential for cumulative effects from pollution and disturbance impacts on the River Shannon and River Fergus Estuaries SPA (represented in Table 6.2 'RSF') if the construction phase of the East Limerick Greenway is concurrent with the SA Preferred Approach.

There is potential for cumulative effects from disturbance impacts on the Tramore Back Strand SPA (represented in Table 6.2 'TBS') if the construction phase of the Waterford City and Environs - North Quays, and Waterford City Regeneration are 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 SAK

Preferred Approach Options																																							
Project Developments	SAK-648	SAK-625	SAK-618	SAK-569	SAK-560	SAK-548	SAK-525	SAK-509	SAK-481	SAK-478	SAK-477	SAK-476	SAK-472	SAK-450	SAK-444	SAK-441	SAK-416	SAK-392	SAK-387	SAK-386	SAK-211	SAK-180	SAK-120	SAK-106	SAK-077	SAK-073	SAK-055	SA Option 195	SA Option 185c	SA Option 183	SA Option 175	SA Option 173	SA Option 149	SA Option 53	SA Option 37				
A Pathway to the Regeneration of Cahir Town Centre																																							
Blackwater River Valley											BR		DH BC	DH	BR	DH BC			DH	BR	BC														BR BC DH BE N72 Lis	DH			
Callan Friary Complex/Upper Bridge St Regeneration & Masterplan for the historic core of Callan Town	RBN																									RBN RN											RBN	RBN	
Callan Town Regeneration	RBN																									RBN RN											RBN	RBN	
Carrick-on-Suir Regeneration Plan	LSU		LSU	LSU	LSU											LSU						LSU	LSU	LSU	LSU		LSU									LSU	LSU	LSU	
Cashel to Cahir Greenway - Cashel to Cahir Town	LSU		LSU	LSU	LSU											LSU						LSU	LSU	LSU	LSU		LSU									LSU	LSU	LSU	
Clonmel 2030	LSU		LSU	LSU	LSU											LSU						LSU	LSU	LSU	LSU		LSU								LSU	LSU	LSU		
East Limerick Greenway	LSU		LSU	LSU	LSU											LSU						LSU	LSU	LSU	LSU		LSU									LSU	LSU	LSU	

Preferred Approach Options																																					
Project Developments	SAK-648	SAK-625	SAK-618	SAK-569	SAK-560	SAK-548	SAK-525	SAK-509	SAK-481	SAK-478	SAK-477	SAK-476	SAK-472	SAK-450	SAK-444	SAK-441	SAK-416	SAK-392	SAK-387	SAK-386	SAK-211	SAK-180	SAK-120	SAK-106	SAK-077	SAK-073	SAK-055	SA Option 195	SA Option 185c	SA Option 183	SA Option 175	SA Option 173	SA Option 149	SA Option 53	SA Option 37		
Suir Blueway - Gas House Bridge - Suir Island, Clonmel	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU		LSU			LSU	LSU			LSU	LSU	LSU		
																																Clo					
Suir Blueway - Marfield to Cahir - Marfield Village to Swiss Cottages	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU		LSU			LSU	LSU	LSU			LSU	LSU	LSU	
Suir Blueway - Waterford Greenway Link - Carrick on Suir to Kilmeaden	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU	RBN	LSU			LSU	LSU	LSU			LSU	LSU	LSU	
	RBN																																	RBN	RBN		
Templemore Town Hall: Enterprise and Cultural Centre, with associated Civic Plaza	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU		LSU			LSU	LSU	LSU			LSU	LSU	LSU	
Tipperary Town Regeneration	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU		LSU			LSU	LSU	LSU			LSU	LSU	LSU	
																																					LSU
																																					Tip
																																					N24
																																					N56
N74																																					
Waterford City and Environs - North Quays	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU	RBN	LSU			LSU	LSU	LSU			LSU	LSU	LSU	
	RBN		TBS		TBS																														RBN	RBN	
																																		TBS			
Waterford City Regeneration	LSU		LSU	LSU	LSU											LSU					LSU	LSU	LSU	LSU	RBN	LSU			LSU	LSU	LSU			LSU	LSU	LSU	
	RBN		TBS		TBS																															RBN	RBN
																																			TBS		

Preferred Approach Options																																						
Project Developments	SAK-648	SAK-625	SAK-618	SAK-569	SAK-560	SAK-548	SAK-525	SAK-509	SAK-481	SAK-478	SAK-477	SAK-476	SAK-472	SAK-450	SAK-444	SAK-441	SAK-416	SAK-392	SAK-387	SAK-386	SAK-211	SAK-180	SAK-120	SAK-106	SAK-077	SAK-073	SAK-055	SA Option 195	SA Option 185c	SA Option 183	SA Option 175	SA Option 173	SA Option 149	SA Option 53	SA Option 37			
	Waterford Greenway - Dungarvan - County Boundary West of Ballyduff Upper										HHB	BR		DH			DH																					
														DH	BR					DH	BR	BC							DH								BR	
															DH																							BC
														BC																BC								BE
																																						N72
																																						Cap
Fermoy Town Centre Renewal Project											BR																											BR
														BC		BR	BC				BR	BC															BC	
Regeneration of Youghal Town Centre and the Development of a future vision for the disused former Courthouse																																						BR
											BR			DH	DH	BR	DH																					DH
																					DH	BR																BE

Key					
Construction Phase		Clonmel	Clo	N74 Road	N74
Operation Phase		Dungarvan Harbour SPA	DH	River Barrow And River Nore SAC	RBN
Construction and Operation		Helvick Head to Ballyquin SPA	HHB	River Nore SPA	RN
Blackwater Callows SPA	BC	Lismore	Lis	River Shannon and River Fergus Estuaries SPA	RSF
Blackwater Estuary SPA	BE	Lower River Suir SAC	LSU	Tipperary	Tip
Blackwater River (Cork/Waterford) SAC	BR	N56 Road	N56	Tramore Back Strand SPA	TBS
Cappoquin	Cap	N72 Road	N72		

6.2.2 Cumulative Effects during Operation

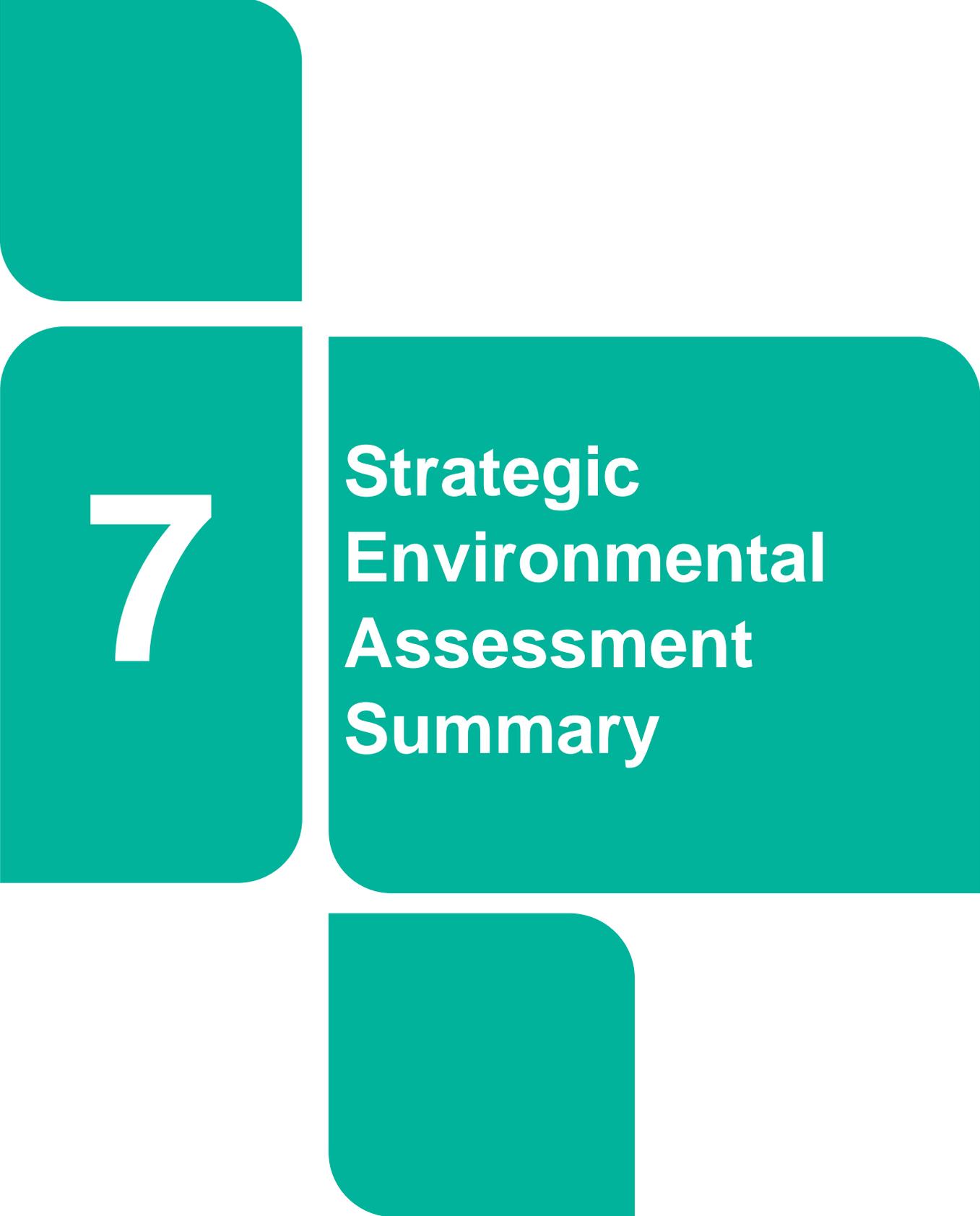
There is potential for cumulative effects from habitat degradation impacts on the Blackwater River (Cork/Waterford) SAC (represented in Table 6.2 'BR') if the operation of the Blackwater River Valley is concurrent with the SA Preferred Approach.

There is potential for cumulative effects from habitat degradation impacts on the Lower River Suir SAC (represented in Table 6.2 'LSU') if operation of the Carrick-on-Suir Regeneration Plan; Clonmel 2030; Suir Blueway - Gas House Bridge - Suir Island, Clonmel; Suir Blueway - Marlfield to Cahir - Marlfield Village to Swiss Cottages; Suir Blueway - Waterford Greenway Link - Carrick on Suir to Kilmeaden; and Waterford City Regeneration are concurrent with the SA Preferred Approach. There is also the potential for water table/availability impacts if the operational phase of the Waterford City Regeneration is concurrent as the project could impact the River Suir and the Preferred Approach proposes a new surface water abstraction from the Aherlow River (SAK-120) and the River Suir (SA option 149 and 183), increased groundwater abstractions (SA option 53, SAK-211 and 560), new groundwater abstractions (SAK-441 and 618), and a recommissioned groundwater abstraction (SAK-648); all of which are either hydrologically linked or within the SAC and could result in a reduction in flow and water availability.

There is potential for cumulative effects from habitat degradation impacts on the River Barrow And River Nore SAC (represented in Table 6.2 'RBN') operation of the Suir Blueway - Waterford Greenway Link - Carrick on Suir to Kilmeaden; and Waterford City Regeneration are concurrent with the SA Preferred Approach. There is also the potential for water table/availability impacts if the operational phase of the Waterford City Regeneration is concurrent with the Preferred Approach as the project could impact the River Suir and the Preferred Approach proposes an increased groundwater abstraction (SAK-077), both of which are hydrologically linked to the SAC and could result in a reduction in flow and water availability.

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 SAK 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 SAK 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 SAK-106 and SA options 185c, 175, 183, 37, 149, and 173, and minor beneficial impacts for SA option 53 and 195, and options SAK-55, 648, 120, 180, 211, 386, 387, 392, 416, 441, 450, 476, 477, 478, 509, 548 and 569 associated with improving the quality of water supply for local communities; and the subsequent benefits of this for public health. There are moderate beneficial impacts for SA option 149 and minor beneficial impacts for SA options 185c, 175, 183, 37, 173 and 195, and SAK-106 associated with the decommissioning of WTPs reducing landscape and visual disruption in the localised area. There are also moderate beneficial impacts associated with SA options 185c and 175 as these options provide increased resilience through rationalisation to more resilient sources.

Key potential adverse impacts identified at plan level include:

- Moderate adverse effects during construction for SA options 183, 149 and 37, and SAK-077, 560 and 618 regarding public health and/or quality of life from dust, noise and/traffic in urban/rural areas, and temporary amenity area loss/loss of access to amenity area during construction. SAK-073 and 618 also have the potential for moderate adverse effects during operation due to long term impacts on recreational assets;
- Moderate adverse effects during construction of SA options 185c, 175, 183, 53, 149, 173 and 195, and SAK-73, 77, 120, 180, 211, 387, 441, 618 and 560 due to potential for impacts to European sites. SA options 185c and 173, and SAK-441, 476, 618 and 560 also have the potential for impacts during operation;
- Major adverse effects during construction of SA option 183 associated with the potential for impacts to the local landscape and visual amenity of the area;
- Moderate adverse effects to environmental climate change resilience for SA options 37, 53, 173 and 195, and options SAK-73, 77, 106, 120, 180, 211, 444, 450, 472, 481, 560 and 625 due to the level of increase or new abstraction required from their associated water sources;
- Major adverse effects for greenhouse gas emissions for SA option 183, 149 and SAK-120 due to the emissions associated with abstracting and pumping water;
- Potential for moderate adverse effects during operation for SA options 37, 53, 173 and 195, and options SAK-73, 77, 106, 120, 211, 441, 444, 450, 472, 481, 618, 560 and 625 due to the level of abstraction required from their associated abstraction sources; and

Moderate adverse impacts for SA options 185c, 183, 149 and 195 during construction associated with cultural heritage. These options are located at known archaeological sites. Further cultural heritage and archaeological assessment will be required to inform option alignment and avoid impacts where possible.

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 SAK 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 2) 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 Moderate 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 of are impeded
2. Protect and enhance biodiversity and	<p>C Minor Adverse to Moderate Adverse</p> <p>O Neutral to Moderate 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 2) 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 Major 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 2) 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 Moderate Adverse O Neutral to Moderate 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 Major Adverse O Neutral to Major 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 2) 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 Moderate Adverse to Moderate Beneficial</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. SA options 37, 53, 173 and 195, and options SAK-073, 077, 106, 120, 180, 211, 444, 450, 472, 481, 560 and 625 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 SA options 37, 53, 173 and 195, and options SAK-073, 077, 106, 120, 180, 211, 444, 450, 472, 481, 560 and 625.</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 status</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 2) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
	risk of adverse effect on WFD waterbody status objectives.			
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 options 37, 53, 149 and 183, and SAK-055, 073, 077, 180, 387, 560, 569 and 618.	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/ 	<ul style="list-style-type: none"> Number of archaeological finds recorded during construction

SEA Objectives	SA Preferred Approach (PA) (SA Approach 2) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
			interpretation of interest features	
10. Protect quality and function of soils	C Neutral to Minor Adverse O Neutral Potential for loss and damage to valuable soils during construction but impacts to geological assets are expected to be avoided.	Standard good practice to conserve and reinstate soils.	<ul style="list-style-type: none"> • Soil Management Plans implemented • Volume of contaminated land restored, or soils removed 	<ul style="list-style-type: none"> • Total volume of soil removed or reused on site

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 SAK 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 SAK 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 SAK-211, SAK-444, SAK-481 require more investigation to determine their feasibility and effects. It should be noted that the Carrick-on-Suir, Lismore and Tramore groundwater bodies have a good quantitative status but are 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

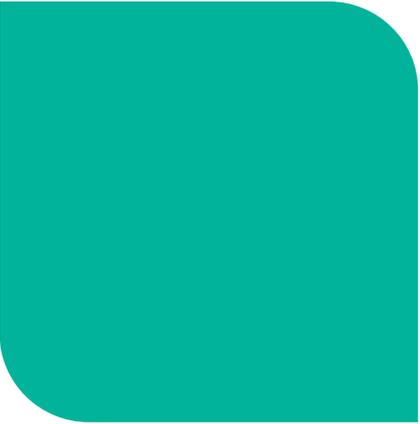
9 Appropriate Assessment Summary

The NIS of the Regional Plan identifies potential operational and construction LSEs as a result of progressing Preferred Approaches associated with SAK. Four of these options include surface water abstractions (SAK-120, SA option 149, SA option 183 and SA option 185c). The other seven options involve groundwater abstractions (SAK-077, SAK-211, SAK-441, SAK-560 & SAK-618 combined, SAK-648, SA option 53 and SA option 173). The NIS sets out the general and option specific mitigation measures in section 6.3 and Appendix D, to ensure any potential adverse effects on site integrity are avoided as a result of progressing the Preferred Approach for SAK.

Potential for 'In-combination effects with other plans and projects' and 'In-combination effects between Preferred Options', as set out below, are addressed in section 7 and Appendix E of the NIS for the Regional Plan and are summarised below.

Potential in-combination effects with other projects and plans were identified for the preferred options on the Lower River Suir SAC, River Barrow And River Nore SAC, River Nore SPA, Blackwater Callows SPA, Blackwater River (Cork/Waterford) SAC, Dungarvan Harbour SPA, Helvick Head to Ballyquin SPA, Tramore Back Strand SPA, Blackwater Estuary SPA, Lower River Shannon SAC, and River Shannon and River Fergus Estuaries SPA. The potential effects include pollution, disturbance, habitat degradation, habitat loss, mortality of Qualifying Interest (QI) species, spread of invasive non-native species and water table/availability effects. 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 Blackwater River (Cork/Waterford) SAC, Lower River Shannon SAC, Lower River Suir SAC, River Barrow And River Nore SAC, Blackwater Callows SPA, Dungarvan Harbour SPA, Mid-Waterford Coast SPA, and Tramore Back Strand SPA. The potential impacts include habitat loss, habitat degradation, water table/availability, mortality of QI species, spread of invasive non-native species, pollution and disturbance. With the implementation of mitigation for potential cumulative effects as detailed in Section 7 and 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.

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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 Desalination Options in SAK

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
SAK-350	New desalination plant for East Waterford WRZ to supply full demand - Suir Estuary.									4	0	-29
SAK-351	New desalination plant for East Waterford WRZ to supply full demand - Tramore or Dunmore East.									4	0	-29

Table A.2 Fine Screening Summary of Groundwater Options in SAK

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
SAK-001	Increase GW abstraction at Killeely borehole and upgrade existing Killeely WTP to supply deficit.									1	0	-9
SAK-002	Increase GW abstraction at Killeely borehole and upgrade existing Killeely WTP to supply deficit.									1	2	-8
SAK-003	New GW abstraction (karstic) and new WTP to supply deficit.									1	0	-18
SAK-011	Increase GW abstraction at Herberstown Pump Station borehole and upgrade Herbertstown WTP to supply deficit.									0	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
SAK-012	Increase GW abstraction at Herberstown Pump Station borehole and upgrade Herberstown WTP to supply deficit.									0	0	-14
SAK-013	Increase GW abstraction at Herberstown Pump Station borehole and upgrade Herberstown WTP to supply deficit.									1	0	-15
SAK-014	Increase GW abstraction at Herberstown Pump Station borehole and upgrade Herberstown WTP to supply deficit.									0	0	-11
SAK-015	New GW abstraction and new WTP to supply deficit.									1	0	-18
SAK-016	New GW abstraction (karstic) and new WTP to supply deficit.									1	0	-19

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
SAK-026	Increase GW abstraction at Knocklong Church Road and upgrade Knocklong Church Road WTP to supply deficit.									1	0	-12
SAK-027	Increase GW abstraction at Knocklong Church Road and upgrade Knocklong Church Road WTP to supply deficit.									1	0	-13
SAK-028	Increase GW abstraction at Knocklong Church Road and upgrade Knocklong Church Road WTP to supply deficit.									1	0	-10
SAK-029	Increase GW abstraction at Knocklong borehole and upgrade Knocklong borehole WTP to supply deficit.									0	0	-13

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		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
SAK-030	Increase GW abstraction at Knocklong borehole and upgrade Knocklong borehole WTP to supply deficit.									1	0	-13
SAK-031	Increase GW abstraction at Knocklong borehole and upgrade Knocklong borehole WTP to supply deficit.									1	0	-10
SAK-032	New GW abstraction (karstic) and new WTP to supply deficit.									1	0	-18
SAK-038	Increase GW abstraction at Galbally borehole and upgrade Galbally WTP to supply deficit.									1	0	-14
SAK-039	New GW abstraction and upgrade Galbally									0	0	-16

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		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
	WTP/new WTP to supply deficit.											
SAK-046	Increase GW abstraction at Ballylanders borehole and upgrade Ballylanders Pump Station WTP to supply deficit.									1	0	-17
SAK-048	Increase GW abstraction at Ballylanders borehole and upgrade Ballylanders Pump Station WTP to supply deficit.									1	0	-13
SAK-057	Increase GW abstraction from existing boreholes and upgrade Mullinabro WTP to supply deficit.									3	0	-23
SAK-058	Increase GW abstraction from existing boreholes and upgrade Mullinabro WTP to supply deficit.									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
SAK-059	Increase GW abstraction from existing boreholes and upgrade Mullinabro WTP to supply deficit.									1	0	-21
SAK-060	New GW abstraction (productive fissured bedrock) and new WTP to supply deficit.									3	0	-26
SAK-073	New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).									0	0	-20
SAK-077	Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.									2	0	-20
SAK-085	Increase GW abstraction from Twomileborris borehole and upgrade									1	0	-11

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	Twomileborris WTP to supply deficit.											
SAK-086	New GW abstraction and upgrade existing Twomileborris WTP to supply deficit.									0	0	-14
SAK-088	Increase GW abstraction at Curraheen borehole and upgrade Curragheen WTP to supply deficit spare capacity to neighbouring scheme.									1	0	-14
SAK-104	New GW abstraction and new WTP to supply deficit.									1	0	-19
SAK-107	Increase GW abstraction at College Hill borehole and upgrade Templemore College Hill WTP to supply deficit.									1	0	-15

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		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
SAK-122	Increase abstraction at Springmount spring and upgrade Springmount Source WTP to partly supply deficit.									2	0	-23
SAK-123	Increase GW abstraction at Carrigmore borehole and upgrade Carrigmore borehole to supply deficit.									1	0	-19
SAK-124	New GW abstraction in karstic region near Springmount and upgrade Springmount Source WTP to partly supply deficit.									2	0	-25
SAK-125	New GW abstraction near Kilross and new WTP to partly supply deficit.									3	0	-24
SAK-133	Increase abstraction at Monroe boreholes and									1	0	-11

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		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 Monroe WTP to partly supply deficit.											
SAK-134	Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit.									1	0	-19
SAK-138	New GW abstraction at Monroe wellfield and upgrade Monroe WTP to partly supply deficit.									1	0	-11
SAK-139	New GW abstraction in vicinity of Clonmel and new WTP to partly supply deficit.									3	0	-26
SAK-148	New GW abstraction at Showgrounds site in Clonmel town and new WTP to partly supply deficit.									3	0	-27

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		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
SAK-161	New GW abstraction and new WTP to supply deficit.									1	0	-20
SAK-168	Increase GW abstraction at Ironmills borehole and upgrade Ironmills WTP to partly address deficit.									1	0	-11
SAK-172	New GW abstraction to east of Dundrum WRZ and new WTP to partly supply deficit.									0	0	-17
SAK-173	New GW abstraction at Hollyford WSZ and new WTP to partly supply deficit.									1	0	-21
SAK-174	Increase GW abstraction at Hollyford spring and upgrade Hollyford WTP to partly supply deficit.									1	0	-11

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		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
SAK-180	New GW abstraction and new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes.									0	0	-16
SAK-183	Increase GW abstraction from existing no.3 boreholes and upgrade Templetney WTP to supply deficit.									1	0	-14
SAK-184	Increase GW abstraction from existing no.3 boreholes and upgrade Templetney WTP to supply deficit.									1	0	-19
SAK-185	Increase GW abstraction from existing no.3 boreholes and upgrade Templetney WTP to supply deficit.									1	0	-19

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		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
SAK-186	Increase GW abstraction from existing no.3 boreholes and upgrade Templetny WTP to supply deficit.									1	0	-19
SAK-187	New GW abstraction and new WTP to supply deficit.									1	0	-20
SAK-202	New GW abstraction and new Linguan WTP to supply deficit. Crottys Lake WTP and Coolnamuck WTP upgraded for water quality purposes.									2	0	-21
SAK-211	Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.									2	0	-12
SAK-212	Increase GW abstraction from Lissava borehole and									1	0	-11

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		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 Lissava WTP to supply deficit.											
SAK-213	New GW abstraction and upgrade Lissava WTP to supply deficit.									1	0	-22
SAK-214	New GW abstraction at Lissava and new WTP to supply deficit.									0	0	-20
SAK-216	New GW abstraction and new WTP to supply deficit.									0	0	-17
SAK-220	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighboring WRZ in deficit.									2	0	-16
SAK-221	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP									1	0	-23

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		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
	to supply deficit to neighboring WRZ in deficit.											
SAK-222	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighboring WRZ in deficit.									1	0	-18
SAK-237	New GW abstraction at Ninemilehouse and new WTP to supply deficit.									0	0	-18
SAK-223	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighboring WRZ in deficit.									2	0	-20
SAK-247	New GW abstraction and new WTP to supply deficit.									0	0	-17

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		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
SAK-250	New GW abstraction in karstic region and new WTP to supply deficit.									0	0	-18
SAK-254	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									2	1	-24
SAK-278	Bring Borrisoleigh WTP into production and upgrade WTP. Interconnect with Templemore/Templetuohy WRZ.									1	0	-14
SAK-282	New wellfield and new WTP supply deficit.									0	0	-18
SAK-283	New wellfield and new WTP supply deficit.									3	0	-27
SAK-489	Increase GW abstraction from borehole and upgrade									1	0	-17

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		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
	Dunhill Cois Coille WTP to supply deficit.											
SAK-289	New GW abstraction and new Linguan WTP to supply deficit.									1	0	-21
SAK-293	New GW abstractio at Ninemilehouse and new WTP to supply deficit.									0	0	-20
SAK-290	Bring Thomastown WTP into production and increase GW abstraction.									2	0	-16
SAK-291	New GW abstraction at Ninemilehouse and new WTP to supply deficit.									1	0	-21
SAK-300	Increase GW abstraction at Ironmills borehole and upgrade Ironmills WTP to partly address deficit.									2	0	-16

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		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
SAK-298	New GW abstraction and new WTP to supply deficit.									1	0	-22
SAK-303	Bring Mullinahone/Killaghy WTP into production and upgrade WTP. Supply spare capacity to neighbouring schemes in deficit.									2	0	-16
SAK-304	Bring Mullinahone/Killaghy WTP into production and upgrade WTP. Supply spare capacity to neighbouring schemes in deficit.									2	0	-15
SAK-306	Increase existing GW abstraction and upgrade Farranamanagh WTP to partly supply deficit.									1	0	-19
SAK-490	Increase GW abstraction from borehole and upgrade									1	0	-17

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		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
	Dunhill Cois Coille WTP to supply deficit.											
SAK-361	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									1	0	-25
SAK-462	New GW abstraction from Mapestown wellfield and new WTP and supply deficit.									3	0	-27
SAK-371	Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.									1	0	-19
SAK-372	Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB									1	0	-18

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		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
	Lismore Deerpark WTP to supply deficit.											
SAK-429	Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.									1	0	-17
SAK-394	New GW abstraction and new WTP to supply deficit.									0	0	-13
SAK-402	Increase GW abstraction from existing borehole and upgrade Moore's Well WTP to supply deficit.									1	0	-14
SAK-403	Increase GW abstraction from existing borehole and upgrade Moore's Well WTP to supply deficit.									1	0	-18

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		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
SAK-404	New GW abstraction (karstic) and new WTP to supply deficit.									0	0	-18
SAK-406	New GW abstraction (productive fissured bedrock) and new WTP to supply deficit.									0	0	-20
SAK-405	New GW abstraction (karstic) and new WTP to supply deficit.									1	0	-23
SAK-591	Increase existing GW abstraction from Garravoone borehole and upgrade Garravoone WTP to supply spare capacity to neighbouring WRZ in deficit.									1	0	-13
SAK-987	Increase GW abstraction from existing borehole and upgrade LCB Lismore									1	0	-18

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		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
	Deerpark WTP to partly supply deficit. New GW (commission 2018 trial well) abstraction and upgrade Lismore Deerpark WTP to partly supply deficit.											
SAK-428	Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.									1	0	-13
SAK-433	Increase GW abstraction from Parc an Aonaigh Kilmacthomas borehole and upgrade Parc an Aonaigh Kilmacthomas WTP to supply deficit.									1	0	-14

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		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
SAK-441	New GW abstraction (karstic) and new WTP to supply deficit.									0	0	-17
SAK-442	New GW abstraction and new WTP to supply deficit.									0	0	-19
SAK-444	Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.									1	0	-11
SAK-446	New GW abstraction and new WTP to supply deficit.									0	0	-15
SAK-450	Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.									1	0	-12
SAK-451	New GW abstraction and new WTP to supply deficit.									0	0	-17
SAK-465	New GW abstraction from Mapestown wellfield and									2	0	-28

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	new WTP and supply deficit.											
SAK-458	Recommission Knockeylan WTP (GW) and supply deficit.									0	0	-16
SAK-461	Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.									1	0	-14
SAK-466	New GW abstraction from Mapestown wellfield and new WTP and supply deficit.									2	0	-25
SAK-472	Increase GW abstraction from Ballyguiry borehole and upgrade Ballyguiry WTP to supply deficit.									1	0	-14
SAK-473	New GW abstraction and new WTP to supply deficit.									0	0	-20

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		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
SAK-481	Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.									1	0	-13
SAK-482	New GW abstraction and new WTP to supply deficit.									0	0	-20
SAK-359	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									0	0	-20
SAK-407	New GW abstraction (productive fissured bedrock) and new WTP to supply deficit.									1	0	-23
SAK-499	Increase GW abstraction from Faha borehole and upgrade Faha WTP to supply deficit.									1	0	-16

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		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
SAK-500	New GW abstraction and upgrade Faha WTP to supply deficit.									0	0	-16
SAK-505	Increase GW abstraction from borehole and upgrade Graiguenageeha WTP to supply deficit.									1	0	-15
SAK-358	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									0	0	-18
SAK-514	Increase GW abstraction from borehole and upgrade Lacken WTP to supply deficit.									1	0	-16
SAK-515	New GW abstraction and new WTP to supply deficit.									1	0	-23

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		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
SAK-516	New GW abstraction (karstic) and new WTP to supply deficit.									1	0	-23
SAK-393	Increase GW abstraction from existing borehole and upgrade Ballyogarty WTP to supply deficit.									1	0	-18
SAK-632	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									0	0	-19
SAK-526	Increase GW abstraction from Smoor Beg borehole and upgrade Smoorbeg WTP to supply deficit.									0	0	-14
SAK-362	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									0	0	-16

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		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
SAK-758	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									0	0	-19
SAK-432	Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.									1	0	-13
SAK-557	Increase GW abstraction from Fews borehole and upgrade Fews WTP to supply deficit.									0	0	-15
SAK-559	New GW abstraction and upgrade Fews WTP to supply deficit.									0	0	-19
SAK-560	Increase GW abstraction from Portlaw borehole and Portlaw spring and									1	0	-21

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		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 Portlaw WTP to partly supply deficit.											
SAK-357	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									1	0	-21
SAK-570	Increase existing GW abstraction and upgrade Monattarriff WTP to supply deficit.									0	0	-16
SAK-575	Increase GW abstraction from Poulavanogue borehole and upgrade Poulavanogue WTP to supply deficit.									1	0	-19
SAK-580	Increase GW abstraction from Ballyknock borehole and upgrade Ballyknock WTP to supply deficit.									1	0	-14

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		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
SAK-583	New GW abstraction and upgrade Ballyknock WTP to supply deficit.									0	0	-13
SAK-585	Increase GW abstraction from Crehanagh borehole and upgrade Grehanagh WTP to supply deficit.									1	0	-19
SAK-586	New GW abstraction and upgrade Crehanagh WTP to supply deficit.									0	0	-20
SAK-391	Increase GW abstraction and supply spare capacity to neighbouring schemes in deficit.									1	0	-11
SAK-419	New GW abstraction and new WTP to supply deficit.									2	0	-15
SAK-360	New GW abstraction (no.2 wellfields) and treat at									0	0	-15

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		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
	Adamstown WTP to supply partial deficit.											
SAK-618	New GW abstraction and new WTP to partly supply deficit.									2	0	-28
SAK-620	Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.									1	0	-16
SAK-622	New GW abstraction and new WTP to supply deficit.									1	0	-22
SAK-624	New GW abstraction and new WTP to supply deficit.									1	0	-21
SAK-625	Increase GW abstraction and upgrade WTP to supply deficit.									1	0	-13

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		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
SAK-626	Rationalise Carrignagower to Ballysaggart (spare capacity).									0	3	-13
SAK-488	Increase GW abstraction from borehole and upgrade Dunhill Cois Coille WTP to supply deficit.									1	0	-16
SAK-641	Increase GW abstraction at Knocklong Church Road and upgrade Knocklong Church Road WTP to supply deficit.									1	0	-13
SAK-646	New GW abstraction and new WTP to supply deficit.									1	0	-20
SAK-648	Bring back Silverspring WTP to production and supply deficit.									0	0	-15
SAK-649	New GW abstraction and new WTP									1	0	-19

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		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
SAK-651	Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.									1	0	-14
SAK-654	Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.									1	0	-15
SAK-658	Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.									1	1	-14
SAK-665	Rationalise Carrignagower and Monattariff 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
	Ballysaggart (spare capacity).											
SAK-671	Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.									1	0	-14
SAK-675	Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.									2	0	-16
SAK-697	Increase GW abstraction from existing no.3 boreholes and upgrade Templetney WTP to supply deficit.									1	1	-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
SAK-757	New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.									1	0	-14
SAK-755	New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.									1	0	-15
SAK-756	New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.									2	0	-16
SAK-491	New GW abstraction and new WTP to supply deficit.									0	0	-16
SAK-532	Increase GW abstraction from Dunhill borehole and upgrade Dunhill Ballynageeragh WTP to supply deficit.									1	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
SAK-533	New GW abstraction and upgrade Dunhill Ballynageeragh WTP to supply deficit.									0	0	-13
SAK-764	Increase GW abstraction and upgrade WTP to supply deficit.									1	0	-12
SAK-766	Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.									1	0	-18
SAK-773	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply partial deficit.									0	0	-20
SAK-783	Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.									1	0	-18

Table A.3 Fine Screening Summary of Groundwater and Interconnection Options in SAK

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
SAK-004	Interconnect Killeely and Herbertstown WRZs for increased resilience and supply deficit from Herbertstown WRZ.									0	0	-14
SAK-036	Interconnect Knocklong/Hospital and Herbertstown WRZ and supply deficit from Herbertstown WRZ.									0	0	-11
SAK-259	Interconnect East Waterford and South Kilkenny WRZs and supply partial deficit from Mullinabro WTP.									1	0	-21
SAK-069	Interconnect South Kilkenny and East Waterford WRZs for improved resilience and									2	1	-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
	supply deficit (new GW abstraction and upgrade Adamstown WTP).											
SAK-083	Interconnect Callan and Fethard WRZs for improved resilience and supply deficit from Mullinbawn WTP.									1	0	-23
SAK-162	Interconnect Ardfinnan Regional and Burncourt/Ballylooby WRZs and partly supply deficit from Burncourt/Ballylooby (Lissava WTP).									1	0	-22
SAK-203	Interconnect Carrick-On-Suir and Templetney/Brackford Bridge WRZs and supply deficit from									1	0	-19

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
	Templetney/Brackford Bridge (Templetney WTP)											
SAK-239	Interconnect Coalbrook / Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP).									1	0	-18
SAK-284	Interconnect East Waterford and South Kilkenny WRZs and supply deficit from South Kilkenny (new wellfield).									3	0	-27
SAK-296	Interconnect Coalbrook / Commons to Urlingford WRZ (SA6) (new GW abstraction) to supply partial deficit.									0	0	-16
SAK-540	Interconnect Dunhill Ballinageeragh and Dunhill									1	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
	and supply deficit from Dunhill WRZ.											
SAK-385	Interconnect Lismore / Cappoquin / Ballyduff (LCB) and Dungarvan WRZs and supply deficit from Dungarvan.									3	0	-27
SAK-768	New GW abstraction and new WTP to supply deficit. Interconnect with Galtee Regional for increased resilience.									1	0	-20

Table A.4 Fine Screening Summary of Groundwater and Rationalisation Options in SAK

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
SAK-005	Rationalise Killeely to Herbertstown WRZ (Herbertstown WTP).									1	0	-15
SAK-009	Rationalise Killeely to Pallasgreen WRZ (Oola WTP).									0	0	-9
SAK-019	Rationalise Herbertstown to Killeely WRZ (Killeely WTP).									1	2	-8
SAK-041	Rationalise Galbally to Knocklong/Hospital WRZ.									1	0	-13
SAK-052	Rationalise Ballylanders to Martinstown WRZ.									1	2	-10
SAK-045	Rationalise Galbally to Ballylanders WRZ.									1	0	-13
SAK-051	Rationalise Ballylanders to Knocklong/Hospital WRZ.									1	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
SAK-074	Rationalise Piltown-Fiddown to South Kilkenny WRZ (Mullinabro WTP).									1	0	-13
SAK-081	Rationalise Callan to Fethard WRZ (Mullinbawn WTP).									2	0	-16
SAK-106	Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.									1	3	-9
SAK-110	Rationalise Templemore/Templetuohy to Roscrea WRZ (Glenbeagh WTP).									1	2	-15
SAK-114	Rationalise Littleton to neighbouring Horse and Jockey WRZ.									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
SAK-176	Rationalise Hollyford to Ironmills WTP. Rationalisation within WRZ.									1	0	-12
SAK-232	Rationalise Ahenny to Templetney/Brackford Bridge WRZ.									2	0	-20
SAK-235	Rationalise Tullrohea and Kilcash WRZs to Templetney/Brackford Bridge WRZ.									1	0	-19
SAK-240	Rationalise Coalbrook/Commons to Fethard & Mullenbawn WRZ.									2	0	-20
SAK-251	Rationalise Tullrohea and Kilcash WRZs to Templetney/Brackford Bridge WRZ.									1	0	-19

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
SAK-264	Rationalise Glennagad to Clonmel WRZ (Monroe WTP).									1	0	-19
SAK-265	Rationalise Rathgormuck to Carrick on Suir WRZ (Linguan WTP).									1	0	-21
SAK-269	Rationalise Ballyknock to Carrick-on-Suir WRZ (Linguan WTP).									1	0	-21
SAK-271	Rationalise Crehanagh to Carrick-on-Suir WRZ (Linguan WTP).									1	0	-21
SAK-273	Rationalise Garravoone to Carrick on Suir WRZ (Linguan WTP).									1	0	-21
SAK-277	Rationalise Poulavanogue (Waterford) to Clonmel WRZ (Monroe WTP).									1	0	-19

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
SAK-285	Bring Borrisoleigh WTP into production and upgrade WTP. Interconnect with Templemore/Templetuohy WRZ.									1	0	-14
SAK-292	Rationalise Kilcash to Tulloea WRZ (new GW abstraction).									1	0	-21
SAK-294	Rationalise Ballinvir to Tulloea WRZ (new GW abstraction).									0	0	-20
SAK-299	Rationalise Glengar to Dundrum regional WRZ.									2	0	-16
SAK-305	Interconnect Callan with Fethard & Mullenbawn Regional WTZ (Kilaghy WTP) and supply deficit.									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
SAK-534	Rationalise Dunhill Ballinageeragh to Dunhill WRZ (Dunhill Cois Coille WTP).									1	0	-17
SAK-408	Rationalise Moores Well to Lismore/Cappoquin/Ballyduf (LCB) WRZ.									1	0	-19
SAK-517	Rationalise Lacken to LCB WRZ.									1	0	-18
SAK-389	Rationalise Scrahan to Kilmacthomas to address water quality issues (bromate) (Kilmacthomas WTP).									1	0	-17
SAK-589	Rationalise Crehanagh to Garravoone WRZ.									1	0	-13
SAK-520	Rationalise Lacken to Moore's Well WRZ (Moore's Well WTP).									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
SAK-521	Rationalise Lacken to Moore's Well WRZ (new GW abstraction and new WTP).									1	0	-23
SAK-475	Rationalise Ballyguiry to Dungarvan WRZ.									2	0	-28
SAK-470	Rationalise Rathgormuck to East Waterford WRZ (new GW abstraction).									0	0	-20
SAK-486	Rationalise Ballyshunnock to East Waterford WRZ (new GW abstraction).									0	0	-20
SAK-522	Rationalise Lacken to Moore's Well WRZ (new GW abstraction and new WTP).									1	0	-23
SAK-552	Rationalise Carrigeen to East Waterford WRZ (new GW abstraction).									0	0	-20

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
SAK-567	Rationalise Portlaw to East Waterford WRZ (new GW abstraction).									0	0	-20
SAK-582	Rationalise Ballyknock to East Waterford WRZ (new GW abstraction).									0	0	-20
SAK-588	Rationalise Crehanagh to East Waterford WRZ (new GW abstraction).									0	0	-20
SAK-594	Rationalise Garravoone to East Waterford WRZ (new GW abstraction).									0	0	-20
SAK-483	Rationalise Ballyshunock to East Waterford WRZ (new GW abstraction).									0	0	-18
SAK-564	Rationalise Portlaw to East Waterford WRZ (new GW abstraction).									0	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
SAK-397	Rationalise Ballyogarty to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-436	Rationalise Kilmactomas to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-493	Rationalise Dunhill - Cois Coille to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-759	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new GW abstraction).									0	0	-19
SAK-760	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new GW abstraction).									0	0	-19

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
SAK-536	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-528	Rationalise Smoor to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-609	Rationalise Kill/Ballylaneen to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-610	Rationalise Scrahan to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-778	Rationalise Fewes to East Waterford WRZ (new GW abstraction).									0	0	-16
SAK-553	Rationalise Fewes to Kilmacthomas WRZ (Kilmacthomas WTP).									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
SAK-562	Rationalise Portlaw to East Waterford WRZ to address water quality issues.									1	0	-25
SAK-479	Rationalise Ardmore Grange to Ardmore WRZ.									1	0	-11
SAK-400	Rationalise Ballyogarty to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-413	Rationalise Stradbally to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-439	Rationalise Kilmacthomas to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-573	Rationalise Monarriff to Carrignagower.									2	0	-15
SAK-455	Rationalise Adramone/ Kilrossanty to East									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
	Waterford WRZ (new GW abstraction).											
SAK-496	Rationalise Dunhill - Cois Coille to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-502	Rationalise Fahá to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-507	Rationalise Graiguenageeha to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-539	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new GW abstraction).									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
SAK-524	Rationalise Garrahylish to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-531	Rationalise Smoor to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-556	Rationalise Fewes to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-605	Rationalise Kill/Ballylaneen to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-619	Rationalise Ballyogarty to Kilmacthomas WRZ.									1	0	-16
SAK-623	Rationalise Carrignagower to Ballysaggart.									0	3	-13
SAK-636	Rationalise Ballyshunnock to East Waterford WRZ (new GW abstraction).									0	0	-19

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
SAK-611	Rationalise Scrahan to East Waterford WRZ (new GW abstraction).									0	0	-15
SAK-640	Interconnect Kiltely and Knocklong Hospital WRZs for increased resilience and supply deficit from Knocklong Hospital WRZ.									1	0	-13
SAK-652	Rationalise Lacken and Morees Well to Lismore / Cappoquin/Ballyduff (LCB) WRZ (Deerpark WTP).									1	0	-14
SAK-653	Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).									1	0	-14
SAK-655	Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).									1	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
SAK-656	Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).									1	0	-15
SAK-659	Rationalise Fewes to Kilmacthomas WRZ (Kilmacthomas WTP).									1	1	-14
SAK-660	Rationalise Scrahan to Kilmacthomas to address water quality issues (bromate) (Kilmacthomas WTP).									1	1	-14
SAK-661	Rationalise Ballyogarty to Kilmacthomas WRZ.									1	1	-14
SAK-666	Rationalise Carrignagower and Monattariff to Ballysaggart (spare capacity).									1	0	-14
SAK-667	Rationalise Carrignagower and Monattariff 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
	Ballysaggart (spare capacity).											
SAK-668	Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Cappoquin WTP).									1	0	-14
SAK-669	Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Cappoquin WTP).									1	0	-14
SAK-670	Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Cappoquin WTP).									1	0	-14
SAK-672	Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).									2	0	-16
SAK-673	Rationalise Ballysaggart, Monatariff and									2	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
	Carrognagower to LCB (Deerpark WTP).											
SAK-674	Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).									2	0	-16
SAK-676	Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).									2	0	-16
SAK-677	Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).									2	0	-16
SAK-698	Rationalise Tulliohea to Templetney/Brackford Bridge WRZ.									1	1	-12
SAK-699	Rationalise Kilcash WRZs to Templetney/Brackford Bridge WRZ.									1	1	-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
SAK-700	Rationalise Ahenny to Templetney/Brackford Bridge WRZ.									1	1	-12
SAK-701	Rationalise Ballinvir to Templetney/Brackford Bridge WRZ.									1	1	-12
SAK-763	Rationalise Liskealty to Ardmore Grange WRZ.									1	0	-12
SAK-765	Rationalise Ballyguiry to Dungarvan WRZ.									1	0	-18
SAK-774	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply deficit. Rationalise Ross/Kildermody, Ballyduff/Kilmeaden, Dunhill - Cois Coille and Dunhill Ballinageeragh to East Waterford WRZ.									0	0	-20

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
SAK-775	New GW abstraction (no.2 wellfields) and treat at Adamstown WTP to supply deficit. Rationalise Ross/Kildermody, Ballyduff/Kilmeaden, Dunhill - Cois Coille and Dunhill Ballinageeragh to East Waterford WRZ.									0	0	-20
SAK-784	Rationalise Stradbally to Dungarvan WRZ.									1	0	-18
SAK-785	Rationalise Graiguenageeha to Dungarvan WRZ.									1	0	-18

Table A.5 Fine Screening Summary of Group Water Scheme (GWS) Options in SAK

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
SAK-044	Interconnect Galbally and Ballinamona GWS and supply deficit from Ballinamona GWS.									1	3	-9
SAK-049	Interconnect Ballylanders Ballyduff GWSs and supply deficit from GWS.									1	3	-9
SAK-050	Interconnect Ballylanders and Griston GWS and supply deficit from GWS.									1	3	-11
SAK-105	Interconnect Templemore/ Templetuohy and Moyne GWS and supply deficit from GWS.									0	2	-10

Table A.6 Fine Screening Summary of New Shannon Source Options in SAK

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
SAK-295	Connect Templemore/Templetuohy to New Shannon Source.									0	0	-14

Table A.7 Fine Screening Summary of Rationalisation Options in SAK

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
SAK-754	Rationalise Carrigmore to Murroe/Cappamore Foileen WRZ (SA8).									0	0	-13

Table A.8 Fine Screening Summary of Surface Water Options in SAK

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
SAK-017	New SW abstraction from River Camoge and new WTP to for full demand and decommission existing WTPs.									0	0	-16
SAK-018	New SW abstraction from River Camoge and new WTP to for full demand and decommission existing WTPs.									0	0	-20
SAK-040	New SW abstraction from River Aherlow and new WTP to supply full deficit.									1	0	-20
SAK-078	New SW abstraction from King's River and new WTP to supply deficit.									2	0	-25

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
SAK-091	New SW abstraction from River Suir. Treat at new Thurles WTP.									1	0	-24
SAK-095	Supply spare capacity to neighbouring WRZs in deficit.									0	2	-15
SAK-096	Supply spare capacity to neighbouring WRZs in deficit.									0	2	-13
SAK-097	Supply spare capacity to neighbouring WRZs in deficit.									0	2	-11
SAK-098	Supply spare capacity to neighbouring WRZs in deficit.									0	2	-11
SAK-099	Supply spare capacity to neighbouring WRZs in deficit.									0	2	-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
SAK-102	Supply spare capacity to neighbouring WRZs in deficit.									1	0	-21
SAK-109	New SW abstraction from River Suir and new WTP to supply deficit.									2	0	-24
SAK-120	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP, Thomas Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality.									1	0	-23
SAK-126	New SW abstraction from the River Suir and new WTP to supply deficit.									2	0	-24
SAK-127	New SW abstraction from the River Suir and new WTP to supply deficit.									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
SAK-128	New SW abstraction from the River Suir and new WTP to supply deficit.									2	0	-23
SAK-129	New SW abstraction from the River Suir and new WTP to supply deficit.									2	0	-27
SAK-130	New abstraction from Suir and new WTP (Barnes site) for Galtee RWSS, Clonmel and Ardfinnan RWSS to address combined deficit. New abstraction is located at Clonmel.									0	0	-24
SAK-140	New abstraction from the River Suir and new WTP at Barnes (site identified)									1	0	-25
SAK-141	New abstraction from Suir and new WTP (Barnes site) for Galtee RWSS,									0	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
	Clonmel and Ardfinnan RWSS to address combined deficit. New abstraction is located at Clonmel.											
SAK-142	New abstraction from the River Suir and upgrade Glenary WTP to supply deficit.									1	0	-22
SAK-143	New abstraction from the River Suir and new WTP (Barnes site) to supply deficit.									0	0	-19
SAK-144	New abstraction from the River Suir and new WTP at Barnes site to supply deficit.									0	0	-22
SAK-145	New abstraction from the River Suir and new WTP									1	0	-26

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
	at Barnes site to supply deficit.											
SAK-146	New abstraction from the River Suir and new WTP at Barnes site to supply deficit.									3	0	-28
SAK-152	New SW abstraction from River Suir and new WTP to supply deficit.									1	0	-25
SAK-153	New SW abstraction from River Suir and new WTP to supply deficit.									3	0	-30
SAK-156	New SW abstraction from River Tar and upgrade Goatenbridge WTP to supply deficit.									1	0	-20
SAK-157	New SW abstraction from River Tar and upgrade									2	0	-25

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
	Goatenbridge WTP to supply deficit.											
SAK-163	New abstraction from Suir and new WTP (Barnes site) for Galtee RWSS, Clonmel and Ardfinnan RWSS to address combined deficit. New abstraction is located at Clonmel.									0	0	-24
SAK-165	New SW abstraction from River Suir and new WTP to supply deficit.									2	0	-21
SAK-177	New SW abstraction from River Multeen and new WTP to supply deficit at Hollyford WSZ.									2	0	-27
SAK-181	New SW abstraction from the River Ara new WTP to supply deficit.									2	0	-25

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
SAK-192	New SW abstraction from Anner River and new WTP to supply deficit.									1	0	-24
SAK-193	New SW abstraction from Anner River and new WTP to supply deficit.									2	0	-23
SAK-194	New SW abstraction from Anner River and new WTP to supply deficit.									2	0	-23
SAK-195	New SW abstraction from River Suir upstream of Carrick-on-Suir and new WTP to supply deficit.									0	0	-19
SAK-200	Increase SW abstraction from Lingaun River and upgrade Linguan WTP to partly supply deficit.									0	0	-14
SAK-205	New SW abstraction from River Suir upstream of									1	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
	Carrick-on-Suir and new WTP to supply deficit.											
SAK-207	New SW abstraction from River Suir upstream of Carrick-on-Suir and new WTP to supply deficit.									1	0	-21
SAK-208	New SW abstraction from River Suir upstream of Carrick-on-Suir and new WTP to supply deficit.									1	0	-20
SAK-209	New SW abstraction from River Suir upstream of Carrick-on-Suir and new WTP to supply deficit.									1	0	-20
SAK-225	Upgrade Fethard WTP for water quality improvements. WRZ is not in deficit.									0	0	-14
SAK-258	New SW abstraction from River Suir upstream of									1	0	-25

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
	Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.											
SAK-261	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									3	0	-27
SAK-279	New abstraction from Suir and new WTP for Galtee RWSS, Clonmel and Ardfinnan RWSS to address combined deficit. New abstraction is located at Caher.									1	0	-21
SAK-280	New abstraction from Suir and new WTP for Galtee RWSS, Clonmel and									1	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
	Ardfinnan RWSS to address combined deficit. New abstraction is located at Caher.											
SAK-281	New abstraction from Suir and new WTP for Galtee RWSS, Clonmel and Ardfinnan RWSS to address combined deficit. New abstraction is located at Caher.									1	0	-21
SAK-288	New abstraction from the River Suir and upgrade Glenary WTP to supply deficit.									1	0	-24
SAK-492	New SW abstraction from Dunhill River and new WTP (full deficit) to supply Dunhill and Dunhill Ballinageeragh WRZs.									1	0	-22

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
	Decommission existing WTPs.											
SAK-535	New SW abstraction from Dunhill River and new WTP (full deficit) to supply Dunhill and Dunhill Ballinageeragh WRZs. Decommission existing WTPs.									1	0	-22
SAK-352	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									1	0	-27
SAK-380	New SW abstraction from Blackwater River and new WTP to supply deficit.									1	0	-25

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
SAK-382	New SW abstraction from Blackwater River and new WTP to supply deficit.									1	0	-25
SAK-353	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									2	0	-27
SAK-415	Supply spare capacity to Graiguenageeha WRZ and upgrade Stradbally WTP.									0	0	-13
SAK-414	Supply spare capacity to Adramone/Kilrossanty WRZ and upgrade Stradbally WTP.									0	0	-14
SAK-384	New SW abstraction from Blackwater River and new WTP to supply deficit.									1	0	-25

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
SAK-354	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									2	0	-28
SAK-467	New SW abstraction from Colligan River and new WTP to supply spare capacity to neighbouring WRZs.									2	0	-25
SAK-355	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									2	0	-29
SAK-603	Supply spare capacity to Dunhill - Cois Coille and Dunhill Ballinageeragh									0	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
	WRZs and upgrade Ballylanean WTP.											
SAK-260	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									1	0	-24
SAK-356	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									2	0	-27
SAK-630	New SW abstraction from Blackwater River and new WTP to supply deficit in Lismore/Cappoquinn/Ballyduff.									1	0	-25

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
SAK-365	Reintroduce SW abstraction from Knockderry Impoundment and upgrade Adamstown WTP (algae removal) to supply partial deficit.									1	0	-20
SAK-662	Supply spare capacity to Adramone/Kilrossanty and Graiguenageeha WRZs and upgrade Stradbally WTP.									0	0	-11
SAK-683	Supply spare capacity to neighbouring WRZs in deficit.									0	0	-13
SAK-688	Supply spare capacity to neighbouring WRZs in deficit.									0	0	-16
SAK-694	Increased abstraction from Clodiagh River, WTP upgrade and supply spare									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
	capacity to neighbouring WRZs to be rationalised.											
SAK-703	New abstraction from the River Suir and new WTP at Barnes (site identified)									2	0	-26
SAK-706	New abstraction from the River Suir and new WTP at Barnes (site identified)									2	0	-27
SAK-711	New abstraction from the River Suir and new WTP at Barnes (site identified)									2	0	-27
SAK-718	New abstraction from the River Suir and new WTP at Barnes (site identified)									3	0	-27
SAK-725	New abstraction from the River Suir and new WTP at Barnes (site identified)									2	0	-27

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
SAK-734	New abstraction from the River Suir and new WTP at Barnes (site identified)									2	0	-27
SAK-745	New abstraction from the River Suir and new WTP at Barnes (site identified)									2	0	-26
SAK-633	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.									1	0	-26

Table A.9 Fine Screening Summary of Surface Water and Interconnection Options in SAK

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
SAK-037	Interconnect Knocklong/Hospital and Herbertstown WRZ and supply deficit from Herbertstown WRZ (new SW abstraction).									0	0	-20
SAK-065	Interconnect South Kilkenny and Carrick-on-Suir WRZs for improved resilience and supply deficit from Linguan WTP.									0	0	-14
SAK-066	Interconnect South Kilkenny and Carrick-on-Suir WRZs for improved resilience and supply deficit (new SW abstraction from River Suir and new WTP).									1	0	-22

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
SAK-112	Interconnect Templemore/ Templetuohy and Thurles WRZs and supply deficit from Thurles.									0	2	-11
SAK-159	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).									3	0	-28
SAK-166	Interconnect Dundrum Regional with Galtee Regional WRZ and supply deficit from Galtee Regional (new SW abstraction from River Suir).									2	0	-27
SAK-171	Interconnect Dundrum Regional and Thurles and supply deficit from Thurles.									1	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
SAK-178	Interconnect Tipperary Town and Galtee Regional and supply deficit from Galtee Regional (new SW abstraction from River Suir).									2	0	-23
SAK-190	Interconnect Templetney/ Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).									1	0	-26
SAK-204	Interconnect Carrick-On-Suir and Templetney/ Brackford Bridge WRZs and supply deficit from Templetney/Brackford Bridge (new SW abstraction from Anner River)									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
SAK-217	Interconnect Burncourt Ballylooby Ardfinnan Regional WRZs and supply deficit from Ardfinnan Regional (new SW abstraction from River Suir).									3	0	-30
SAK-218	Interconnect Burncourt Ballylooby Ardfinnan Regional WRZs and supply deficit from Ardfinnan Regional (new SW abstraction from River Tar).									2	0	-25
SAK-071	Interconnect South Kilkenny and East Waterford WRZ for improved resilience and supply deficit (new SW									3	0	-27

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 River Suir and new WTP).											
SAK-629	Interconnect Dungarvan and Lismore/Cappoquinn/Ballyduff and supply deficit from Lismore/Cappoquinn/Ballyduff WRZ.									1	0	-25
SAK-686	Interconnect Dundrum Regional and Thurles and supply deficit from Thurles.									0	0	-16
SAK-692	Interconnect Dundrum Regional and Thurles and supply deficit from Thurles.									0	0	-15
SAK-702	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).									2	0	-26
SAK-704	Interconnect Ardfinnan Regional with Clonmel									2	0	-26

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
	WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).											
SAK-705	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).									2	0	-27
SAK-707	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).									2	0	-27
SAK-710	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply									2	0	-27

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
	deficit from Clonmel (new SW from River Suir).											
SAK-712	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).									2	0	-27
SAK-717	Interconnect Templetney/ Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).									3	0	-27
SAK-719	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).									3	0	-27

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
SAK-724	Interconnect Templetney/ Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).									2	0	-27
SAK-726	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).									2	0	-27
SAK-733	Interconnect Templetney/ Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).									2	0	-25
SAK-735	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW									2	0	-27

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 River Suir).											
SAK-744	Interconnect Templetney/ Brackford Bridge, Ardfinnan Regional and Burncourt/Ballylooby with Clonmel WRZ and supply deficit from Clonmel (new SW from River Suir).									2	0	-26
SAK-746	Interconnect Templetney/ Brackford Bridge, Ardfinnan Regional and Burncourt/Ballylooby with Clonmel WRZ and supply deficit from Clonmel (new SW from River Suir).									2	0	-26
SAK-747	Interconnect Templetney/ Brackford Bridge, Ardfinnan Regional and Burncourt/Ballylooby with									2	0	-26

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
	Clonmel WRZ and supply deficit from Clonmel (new SW from River Suir).											
SAK-767	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit. Interconnect with Tipperary Town for increased resilience.									1	0	-21

Table A.10 Fine Screening Summary of Surface Water and Rationalisation Options in SAK

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
SAK-006	Rationalise Killeely to Limerick City (Clareville WTP) WRZ.									0	2	-8
SAK-008	Rationalise Ballylanders, Killeely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ (new SW abstraction from River Suir).									2	0	-24
SAK-020	Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.									0	2	-8
SAK-035	Rationalise Ballylanders, Killeely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ (new SW abstraction from River Suir).									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
SAK-043	Rationalise Ballylanders, Killeely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ (new SW abstraction from River Suir).									2	0	-24
SAK-054	Rationalise Ballylanders, Killeely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ (new SW abstraction from River Suir).									2	0	-24
SAK-076	Rationalise Piltown-Fiddown to Carrick-on-Suir (new SW abstraction from River Suir and new WTP).									1	0	-20
SAK-087	Rationalise Twomileborris to Thurles WRZ.									0	2	-14
SAK-090	Rationalise Horse and Jockey to Thurles WRZ.									0	2	-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
SAK-111	Rationalise Templemore/ Templetuohy to Thurles WRZ.									0	2	-11
SAK-115	Rationalise Littleton to Thurles WRZ.									0	2	-13
SAK-188	Rationalise Templetney/ Brackford Bridge to Clonmel (new SW from River Suir)									0	0	-22
SAK-236	Rationalise Tullوها and Kilcash WRZs to Templetney/Brackford Bridge WRZ (new SW abstraction from River Anner).									2	0	-23
SAK-252	Rationalise Tullوها and Kilcash WRZs to Templetney/Brackford Bridge WRZ (new SW									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
	abstraction from River Anner).											
SAK-068	Rationalise South Kilkenny to East Waterford WRZ (new SW abstraction from River Suir and new WTP).									1	0	-25
SAK-262	Rationalise Glennagad to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).									0	0	-19
SAK-266	Rationalise Rathgormuck to Carrick on Suir WRZ (River Suir).									1	0	-20
SAK-268	Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).									0	0	-19

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
SAK-270	Rationalise Ballyknock to Carrick-on-Suir WRZ (River Suir).									1	0	-20
SAK-272	Rationalise Crehanagh to Carrick-on-Suir WRZ (River Suir).									1	0	-20
SAK-274	Rationalise Garravoone to Carrick on Suir WRZ (River Suir).									1	0	-20
SAK-286	Rationalise Russelstown to Clonmel WRZ.									1	0	-24
SAK-287	Rationalise Kilmanahan to Clonmel WRZ.									1	0	-24
SAK-497	Rationalise Dunhill - Cois Coille to Kill/Ballylaneen WRZ.									0	0	-14
SAK-541	Rationalise Dunhill Ballinageeragh to Kill/Ballylaneen WRZ.									0	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
SAK-484	Rationalise Ballyshunnock to East Waterford WRZ (new SW abstraction from River Suir).									1	0	-27
SAK-565	Rationalise Portlaw to East Waterford WRZ (new SW abstraction from River Suir).									1	0	-27
SAK-494	Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-537	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-398	Rationalise Ballyogarty to East Waterford WRZ (new									2	0	-27

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
	SW abstraction from River Suir).											
SAK-437	Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-410	Rationalise Moores Well to Lismore/Cappoquin/ Ballyduf (LCB) WRZ (new SW abstraction from Blackwater River and new WTP).									1	0	-25
SAK-529	Rationalise Smoor to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-606	Rationalise Kill/ Ballylaneen to East Waterford WRZ (new SW									2	0	-27

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 River Suir).											
SAK-508	Rationalise Graiguenageeha to Stradbally WRZ.									0	0	-13
SAK-607	Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-453	Rationalise Adramone/ Kilrossanty to Stradbally WRZ.									0	0	-14
SAK-779	Rationalise Fewes to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-469	Rationalise Rathgormuck to East Waterford WRZ									2	0	-28

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
	(new SW abstraction from River Suir).											
SAK-485	Rationalise Ballyshunnock to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-28
SAK-551	Rationalise Carrigeen to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-28
SAK-566	Rationalise Portlaw to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-28
SAK-581	Rationalise Ballyknock to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-28
SAK-587	Rationalise Crehanagh to East Waterford WRZ (new									2	0	-28

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
	SW abstraction from River Suir).											
SAK-593	Rationalise Garravoone to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-28
SAK-519	Rationalise Lacken to Lismore/Cappoquin/ Ballyduff WRZ (new SW abstraction from Blackwater River and new WTP).									1	0	-25
SAK-563	Rationalise Portlaw to East Waterford WRZ to address water quality issues.									2	0	-29
SAK-399	Rationalise Ballyogarty to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27

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
SAK-438	Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-495	Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-538	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-501	Rationalise Faha to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-530	Rationalise Smoor to East Waterford WRZ (new SW									2	0	-27

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 River Suir).											
SAK-555	Rationalise Fewes to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-604	Rationalise Kill/ Ballylaneen to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-608	Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).									2	0	-27
SAK-644	Rationalise Ballylanders to Limerick City (Clareville WTP).									0	3	-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
SAK-663	Rationalise Graiguenageeha to Stradbally WRZ.									0	0	-11
SAK-664	Rationalise Adramone/ Kilrossanty to Stradbally WRZ.									0	0	-11
SAK-679	Rationalise Horse and Jockey to Thurles WRZ.									0	0	-13
SAK-680	Rationalise Littleton to Thurles WRZ.									0	0	-13
SAK-681	Rationalise Templemore/ Templetuohy to Thurles WRZ.									0	1	-12
SAK-682	Rationalise Twomileborris to Thurles WRZ.									0	0	-13
SAK-684	Rationalise Horse and Jockey to Thurles WRZ.									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
SAK-685	Rationalise Littleton to Thurles WRZ.									0	0	-16
SAK-687	Rationalise Twomileborris to Thurles WRZ.									0	0	-16
SAK-689	Rationalise Glengar to Dundrum regional WRZ.									0	0	-16
SAK-690	Rationalise Horse and Jockey to Thurles WRZ.									0	0	-16
SAK-691	Rationalise Littleton to Thurles WRZ.									0	0	-16
SAK-693	Rationalise Twomileborris to Thurles WRZ.									0	0	-16
SAK-695	Rationalise Glengar to Dundrum regional WRZ.									0	0	-16
SAK-696	Rationalise Templemore/ Templetuohy to Thurles WRZ.									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
SAK-708	Rationalise Russelstown to Clonmel WRZ.									2	0	-27
SAK-709	Rationalise Kilmanahan to Clonmel WRZ.									2	0	-27
SAK-713	Rationalise Russelstown to Clonmel WRZ.									2	0	-27
SAK-714	Rationalise Kilmanahan to Clonmel WRZ.									2	0	-27
SAK-715	Rationalise Glennagad to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).									2	0	-27
SAK-716	Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).									2	0	-27

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
SAK-720	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									3	0	-27
SAK-721	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									3	0	-27
SAK-722	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									3	0	-27
SAK-723	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									3	0	-27

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
SAK-727	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-27
SAK-728	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-27
SAK-729	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-27
SAK-730	Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-27

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
SAK-731	Rationalise Russelstown to Clonmel WRZ.									2	0	-27
SAK-732	Rationalise Kilmanahan to Clonmel WRZ.									2	0	-27
SAK-736	Rationalise Tullوها, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-25
SAK-737	Rationalise Tullوها, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-25
SAK-738	Rationalise Tullوها, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-25

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
SAK-739	Rationalise Tullوها, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).									2	0	-25
SAK-740	Rationalise Russelstown to Clonmel WRZ.									2	0	-25
SAK-741	Rationalise Kilmanahan to Clonmel WRZ.									2	0	-25
SAK-742	Rationalise Glennagad to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).									2	0	-25
SAK-743	Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).									2	0	-25

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
SAK-748	Rationalise Carrigmore to Limerick City (Clareville WTP).									1	1	-16
SAK-749	Rationalise Kiltely to Limerick City (Clareville WTP) WRZ.									1	1	-16
SAK-750	Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.									1	1	-16
SAK-751	Rationalise Knocklong/Hospital to Limerick City (Clareville WTP).									1	1	-16
SAK-752	Rationalise Ballylanders to Limerick City (Clareville WTP).									1	1	-16
SAK-753	Rationalise Galbally to Limerick City (Clareville WTP).									1	1	-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
SAK-769	Rationalise Carrigmore to Limerick City (Clareville WTP).									1	1	-16
SAK-770	Rationalise Kiltely to Limerick City (Clareville WTP) WRZ.									1	1	-16
SAK-771	Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.									1	1	-16
SAK-772	Rationalise Knocklong/Hospital to Limerick City (Clareville WTP).									1	1	-16
SAK-637	Rationalise Ballyshunnock to East Waterford WRZ (new SW abstraction from River Suir).									1	0	-26

Table A.10 Fine Screening Summary of Water Treatment Plant Upgrade Options in SAK

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
SAK-055	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-6
SAK-089	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-8
SAK-092	Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit.									0	1	-13
SAK-113	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-219	Upgrade existing Dualla WTP for water quality									0	0	-6

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.											
SAK-233	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. Land acquisition required due to lack of space at the WTP site.									0	0	-8
SAK-248	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-9
SAK-386	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-387	Upgrade existing WTP for water quality									0	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
	improvements. The WRZ is not in deficit.											
SAK-388	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-392	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-411	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-9
SAK-416	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-8
SAK-420	Upgrade existing WTP for water quality									0	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
	improvements. The WRZ is not in deficit.											
SAK-468	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-9
SAK-476	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-10
SAK-477	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-9
SAK-478	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-8
SAK-498	Upgrade existing WTP for water quality									0	0	-7

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.											
SAK-509	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-525	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-548	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-7
SAK-568	Upgrade WTP for water quality improvements.									1	0	-18
SAK-569	Upgrade existing WTP for water quality									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
	improvements. The WRZ is not in deficit.											
SAK-574	Upgrade WTP for water quality improvements.									0	0	-16
SAK-595	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.									0	0	-11

Appendix B SA Approaches for SAK

Note: SA Options are also referred to as Group Options

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
1900SC0030: Kiltleely	SAK-749 Rationalise Kiltleely to Limerick City (Clareville WTP) WRZ.	185c	SAK-749 Rationalise Kiltleely to Limerick City (Clareville WTP) WRZ.	185c	SAK-749 Rationalise Kiltleely to Limerick City (Clareville WTP) WRZ.	185c
1900SC0008: Herbertstown	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185c	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185c	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185c
1900SC0010: Knocklong/Hospital	SAK-751 Rationalise Knocklong/Hospital to Limerick City (Clareville WTP).	185c	SAK-751 Rationalise Knocklong/Hospital to Limerick City (Clareville WTP).	185c	SAK-751 Rationalise Knocklong/Hospital to Limerick City (Clareville WTP).	185c
1900SC0011: Galbally Water Supply	SAK-753 Rationalise Galbally to Limerick City (Clareville WTP).	185c	SAK-753 Rationalise Galbally to Limerick City (Clareville WTP).	85c	SAK-753 Rationalise Galbally to Limerick City (Clareville WTP).	85c
1900SC0012: Ballylanders Water Supply	SAK-752	185c	SAK-752	185c	SAK-752	185c

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Rationalise Ballylanders to Limerick City (Clareville WTP).		Rationalise Ballylanders to Limerick City (Clareville WTP).		Rationalise Ballylanders to Limerick City (Clareville WTP).	
1900SC0026: Anglesboro Water Supply	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
1500SC0001: South Kilkenny Environs	SAK-648 Bring back Silverspring WTP to production and supply deficit.	-	SAK-648 Bring back Silverspring WTP to production and supply deficit.	-	SAK-648 Bring back Silverspring WTP to production and supply deficit.	-
1500SC0019: Piltown-Fiddown	SAK-073 New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).	-	SAK-073 New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).	-	SAK-073 New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).	-
1500SC0005: Callan WS 1001	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
2900SC0009: Twomileborris	SAK-687 Rationalise Twomileborris to Thurles WRZ.	175	SAK-687 Rationalise Twomileborris to Thurles WRZ.	175	SAK-687 Rationalise Twomileborris to Thurles WRZ.	175
2900SC0013: Horse and Jockey	SAK-684 Rationalise Horse and Jockey to Thurles WRZ.	175	SAK-684 Rationalise Horse and Jockey to Thurles WRZ.	175	SAK-684 Rationalise Horse and Jockey to Thurles WRZ.	175
2900SC0014: Thurles	SAK-688 Supply spare capacity to neighbouring WRZs in deficit.	175	SAK-688 Supply spare capacity to neighbouring WRZs in deficit.	175	SAK-688 Supply spare capacity to neighbouring WRZs in deficit.	175
2900SC0042: Templemore/Templetuohy:	SAK-106 Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.	-	SAK-106 Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.	-	SAK-106 Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.	-
2900SC0016: Littleton	SAK-685 Rationalise Littleton to Thurles WRZ.	175	SAK-685 Rationalise Littleton to Thurles WRZ.	175	SAK-685 Rationalise Littleton to Thurles WRZ.	175
2900SC0032: Galtee Regional	SAK-120 New SW abstraction from Aherlow river and upgrade Rossadrehid WTP, Thomas	-	SAK-120 New SW abstraction from Aherlow river and upgrade Rossadrehid WTP, Thomas	-	SAK-120 New SW abstraction from Aherlow river and upgrade Rossadrehid WTP,	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality.		Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality.		Thomas Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality.	
1900SC0038: Carrigmore	SAK-748 Rationalise Carrigmore to Limerick City (Clareville WTP).	185c	SAK-748 Rationalise Carrigmore to Limerick City (Clareville WTP).	185c	SAK-748 Rationalise Carrigmore to Limerick City (Clareville WTP).	185c
2900SC0025: Clonmel	SAK-734 New abstraction from the River Suir and new WTP at Barnes (site identified)	183	SAK-734 New abstraction from the River Suir and new WTP at Barnes (site identified)	183	SAK-734 New abstraction from the River Suir and new WTP at Barnes (site identified)	183
2900SC0021: Ardfinnan Regional	SAK-735 Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).	183	SAK-735 Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).	183	SAK-735 Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).	183
2900SC0029: Dundrum Regional	SAK-686 Interconnect Dundrum Regional and Thurles and supply deficit from Thurles.	175	SAK-686 Interconnect Dundrum Regional and Thurles and supply deficit from Thurles.	175	SAK-686 Interconnect Dundrum Regional and Thurles and supply deficit from Thurles.	175

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
2900SC0049: Tipperary Town Supply	SAK-180 New GW abstraction, new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes.		SAK-180 New GW abstraction, new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes.	-	SAK-180 New GW abstraction, new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes.	-
2900SC0039: Templetney/Brackford Bridge PWS	SAK-733 Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).	183	SAK-733 Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).	183	SAK-733 Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir).	183
2900SC0024: Carrick-On-Suir	SAK-289 New GW abstraction and new Linguan WTP to supply deficit.	37	SAK-289 New GW abstraction and new Linguan WTP to supply deficit.	37	SAK-289 New GW abstraction and new Linguan WTP to supply deficit.	37
2900SC0023: Burncourt Ballylooby	SAK-211 Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.	-	SAK-211 Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.	-	SAK-211 Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
2900SC0026: Fethard & Mullenbawn Regional Public Water Supply	<p>SAK-222 Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in deficit.</p> <p>SAK-239 Interconnect Coalbrook/ Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP).</p>	53	<p>SAK-222 Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in deficit.</p> <p>SAK-239 Interconnect Coalbrook/ Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP).</p>	53	<p>SAK-222 Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in deficit.</p> <p>SAK-239 Interconnect Coalbrook/ Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn (Mullinbawn WTP).</p>	53
2900SC0020: Ahenny	<p>SAK-738 Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p>	183	<p>SAK-738 Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p>	183	<p>SAK-738 Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).</p>	183
2900SC0031: Tulllohea	<p>SAK-736 Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to</p>	183	<p>SAK-736 Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to</p>	183	<p>SAK-736 Rationalise Tulllohea, Kilcash, Ahenny and Ballinvir to</p>	183

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Templetney/Brackford Bridge WRZ (River Suir).		Templetney/Brackford Bridge WRZ (River Suir).		Templetney/Brackford Bridge WRZ (River Suir).	
2900SC0067: Coalbrook/Commons	SAK-247 New GW abstraction and new WTP to supply deficit.	-	SAK-247 New GW abstraction and new WTP to supply deficit.	-	SAK-247 New GW abstraction and new WTP to supply deficit.	-
2900SC0022: Ballinvir	SAK-739 Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).	183	SAK-739 Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).	183	SAK-739 Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).	183
2900SC0036: Kilcash	SAK-737 Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).	183	SAK-737 Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).	183	SAK-737 Rationalise Tullrohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ (River Suir).	183
3100SC0033: East Waterford Water Supply Scheme	SAK-356 New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and	149	SAK-356 New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP	149	SAK-356 New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP	149

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	treat at Adamstown WTP to supply deficit.		and treat at Adamstown WTP to supply deficit.		and treat at Adamstown WTP to supply deficit.	
2900SC0069: Glengar	SAK-695 Rationalise Glengar to Dundrum regional WRZ.	176	SAK-695 Rationalise Glengar to Dundrum regional WRZ.	176	SAK-695 Rationalise Glengar to Dundrum regional WRZ.	176
3100SC0095: Lismore/Cappoquin/Ballyduff (LCB)	SAK-675 Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.	173	SAK-675 Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.	173	SAK-675 Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.	173
3100SC0077: Ballynoe/Melleray	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0111: Deelish/Ballinacourty	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0101: Scrahan	SAK-608 Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-608 Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-608 Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0005: Ardmore	SAK-392 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-392 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-392 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0097: Ballyogarty	SAK-399 Rationalise Ballyogarty to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-399 Rationalise Ballyogarty to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-399 Rationalise Ballyogarty to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0081: Moores Well	SAK-677 Rationalise Lacken and Morees Well to Lismore / Cappoquin / Ballyduff (LCB) WRZ (Deerpark WTP).	173	SAK-677 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173	SAK-677 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173
3100SC0083: Stradbally	SAK-784	195	SAK-784	195	SAK-784	195

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Rationalise Stradbally to Dungarvan WRZ.		Rationalise Stradbally to Dungarvan WRZ.		Rationalise Stradbally to Dungarvan WRZ.	
3100SC0030: Carrowgarraiff	SAK-416 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-416 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-416 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0024: Ballysaggart	SAK-672 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173	SAK-672 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173	SAK-672 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173
3100SC0099: Kilmacthomas	SAK-438 Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-438 Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-438 Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0054: Ballymacarbry	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0027: Boolavonteen/Kilcooney/Tooraneena	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-
3100SC0079: Adramone/Kilrossanty	SAK-450 Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.	-	SAK-450 Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.	-	SAK-450 Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.	-
3100SC0001: Dungarvan	SAK-783 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.	195	SAK-783 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.	195	SAK-783 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.	195
3100SC0089: Rathgormuck	SAK-265 Rationalise Rathgormuck to Carrick on Suir WRZ (Linguan WTP).	37	SAK-265 Rationalise Rathgormuck to Carrick on Suir WRZ (Linguan WTP).	37	SAK-265 Rationalise Rathgormuck to Carrick on Suir WRZ (Linguan WTP).	37
3100SC0051: Ballyguiry	SAK-472 Increase GW abstraction from Ballyguiry borehole and	-	SAK-472 Increase GW abstraction from Ballyguiry borehole and	-	SAK-472 Increase GW abstraction from Ballyguiry borehole	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	upgrade Ballyguiry WTP to supply deficit.		upgrade Ballyguiry WTP to supply deficit.		and upgrade Ballyguiry WTP to supply deficit.	
3100SC0053: Inchinleamy	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0112: Modeligo	SAK-477 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-477 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-477 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0114: Liskealty	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0098: Ballyshunnock	SAK-481 Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.	-	SAK-481 Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.	-	SAK-481 Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0091: Dunhill - Cois Coille	SAK-495 Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-495 Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-495 Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0118: Russelstown	SAK-740 Rationalise Russelstown to Clonmel WRZ.	183	SAK-740 Rationalise Russelstown to Clonmel WRZ.	183	SAK-740 Rationalise Russelstown to Clonmel WRZ.	183
3100SC0042: Faha	SAK-501 Rationalise Faha to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-501 Rationalise Faha to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-501 Rationalise Faha to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0093: Graiguenageeha	SAK-783 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit	195	SAK-783 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit	195	SAK-783 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit	195
3100SC0116: Kilbrien	SAK-509 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-509 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-509 Upgrade existing WTP for water quality	-

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
					improvements. The WRZ is not in deficit.	
3100SC0113: Lacken	SAK-676 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173	SAK-676 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173	SAK-676 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173
3100SC0044: Garrahylish	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0035: Smoor	SAK-530 Rationalise Smoor to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-530 Rationalise Smoor to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-530 Rationalise Smoor to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0092: Dunhill Ballinageeragh	SAK-538 Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-538 Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-538 Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new SW abstraction from River Suir).	149

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0123: Carrigeen	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0045: Fews	SAK-555 Rationalise Fews to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-555 Rationalise Fews to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-555 Rationalise Fews to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0124: Portlaw	SAK-618 New GW abstraction and new WTP to partly supply deficit. SAK-560 Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.	-	SAK-618 New GW abstraction and new WTP to partly supply deficit. SAK-560 Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.	-	SAK-618 New GW abstraction and new WTP to partly supply deficit. SAK-560 Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.	-
3100SC0087: Glenagad	SAK-742 Rationalise Glennagad to Clonmel WRZ (new	183	SAK-742 Rationalise Glennagad to Clonmel WRZ (new	183	SAK-742 Rationalise Glennagad to Clonmel WRZ (new	183

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	abstraction from the River Suir and new WTP at Barnes site).		abstraction from the River Suir and new WTP at Barnes site).		abstraction from the River Suir and new WTP at Barnes site).	
3100SC0120: Lyreanearla	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0126: Monatarriff	SAK-756 New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.	-	SAK-756 New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.	-	SAK-756 New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.	-
3100SC0129: Kilmanahan	SAK-741 Rationalise Kilmanahan to Clonmel WRZ.	183	SAK-741 Rationalise Kilmanahan to Clonmel WRZ.	183	SAK-741 Rationalise Kilmanahan to Clonmel WRZ.	183
3100SC0119: Poulavanogue (Waterford)	SAK-743 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).	183	SAK-743 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).	183	SAK-743 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).	183

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0107: Ballyknock	SAK-269 Rationalise Ballyknock to Carrick-on-Suir WRZ (Linguan WTP).	37	SAK-269 Rationalise Ballyknock to Carrick-on-Suir WRZ (Linguan WTP).	37	SAK-269 Rationalise Ballyknock to Carrick-on-Suir WRZ (Linguan WTP).	37
3100SC0110: Crehanagh	SAK-271 Rationalise Crehanagh to Carrick-on-Suir WRZ (Linguan WTP).	37	SAK-271 Rationalise Crehanagh to Carrick-on-Suir WRZ (Linguan WTP).	37	SAK-271 Rationalise Crehanagh to Carrick-on-Suir WRZ (Linguan WTP).	37
3100SC0108: Garravoone	SAK-273 Rationalise Garravoone to Carrick on Suir WRZ (Linguan WTP).	37	SAK-273 Rationalise Garravoone to Carrick on Suir WRZ (Linguan WTP).	37	SAK-273 Rationalise Garravoone to Carrick on Suir WRZ (Linguan WTP).	37
3100SC0102: Kill/Ballylaneen	SAK-604 Rationalise Kill/Ballylaneen to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-604 Rationalise Kill/Ballylaneen to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-604 Rationalise Kill/Ballylaneen to East Waterford WRZ (new SW abstraction from River Suir).	149
3100SC0127: Carrignagower	SAK-674 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173	SAK-674 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173	SAK-674 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173

WRZ	Preferred Approach - SA Approach 2		Least Cost - SA Approach 2		Best Environmental - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0115: Ardmore Grange	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
1900SC0030: Killeely	SAK-009 Rationalise Killeely to Pallasgreen WRZ (Oola WTP).	6	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185c	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185b
1900SC0008: Herbertstown	SAK-014 Increase GW abstraction at Herberstown Pump Station borehole and upgrade Herbertstown WTP to supply deficit.	7	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185c	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185b
1900SC0010: Knocklong/Hospital	SAK-036 Interconnect Knocklong/Hospital and	7	SAK-751 Rationalise Knocklong/Hospital to	185c	SAK-751 Rationalise Knocklong/Hospital to	185b

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Herbertstown WRZ and supply deficit from Herbertstown WRZ.		Limerick City (Clareville WTP).		Limerick City (Clareville WTP).	
1900SC0011: Galbally Water Supply	SAK-038 Increase GW abstraction at Galbally borehole and upgrade Galbally WTP to supply deficit.	-	SAK-753 Rationalise Galbally to Limerick City (Clareville WTP).	185c	SAK-753 Rationalise Galbally to Limerick City (Clareville WTP).	185b
1900SC0012: Ballylanders Water Supply	SAK-752 Rationalise Ballylanders to Limerick City (Clareville WTP).	10	SAK-752 Rationalise Ballylanders to Limerick City (Clareville WTP).	185c	SAK-752 Rationalise Ballylanders to Limerick City (Clareville WTP).	185b
1900SC0026: Anglesboro Water Supply	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
1500SC0001: South Kilkenny Environs	SAK-648 Bring back Silverspring WTP to production and supply deficit.	-	SAK-648 Bring back Silverspring WTP to production and supply deficit.	-	SAK-059 Increase GW abstraction from existing boreholes and upgrade Mullinabro WTP to supply deficit.	23
1500SC0019: Piltown-Fiddown	SAK-076	20	SAK-073	-	SAK-073	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Rationalise Piltown-Fiddown to Carrick-on-Suir (new SW abstraction from River Suir and new WTP).		New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).		New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).	
1500SC0005: Callan WS 1001	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-
2900SC0009: Twomileborris	SAK-085 Increase GW abstraction from Twomileborris borehole and upgrade Twomileborris WTP to supply deficit.	-	SAK-085 Increase GW abstraction from Twomileborris borehole and upgrade Twomileborris WTP to supply deficit.	-	SAK-085 Increase GW abstraction from Twomileborris borehole and upgrade Twomileborris WTP to supply deficit.	-
2900SC0013: Horse and Jockey	SAK-089 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-089 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-089 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
2900SC0014: Thurles	SAK-278 Bring Borrisoleigh WTP into production and upgrade WTP. Interconnect with	73	SAK-092 Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit.	-	SAK-092 Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit.	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Templemore/Templetuohy WRZ.					
2900SC0042: Templemore/Templetuohy:	SAK-285 Bring Borrisoleigh WTP into production and upgrade WTP. Interconnect with Templemore/Templetuohy WRZ.	73	SAK-106 Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.	-	SAK-106 Rationalise Templetuohy to Templemore (rationalise to College Hill WTP). Rationalisation within WRZ.	-
2900SC0016: Littleton	SAK-113 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-113 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-113 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
2900SC0032: Galtee Regional	SAK-128 New SW abstraction from the River Suir and new WTP to supply deficit.	66	SAK-166 Interconnect Dundrum Regional with Galtee Regional WRZ and supply deficit from Galtee Regional (new SW abstraction from River Suir).	69	SAK-128 New SW abstraction from the River Suir and new WTP to supply deficit.	66
1900SC0038: Carrigmore	SAK-123 Increase GW abstraction at Carrigmore borehole and	-	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185c	SAK-750 Rationalise Herbertstown to Limerick City (Clareville WTP) WRZ.	185b

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	upgrade Carrigmore borehole to supply deficit.					
2900SC0025: Clonmel	SAK-134 Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit.	34	SAK-711 New abstraction from the River Suir and new WTP at Barnes (site identified)	180	SAK-134 Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit.	34
2900SC0021: Ardfinnan Regional	SAK-162 Interconnect Ardfinnan Regional and Burncourt/Ballylooby WRZs and partly supply deficit from Burncourt/Ballylooby (Lissava WTP).	47	SAK-712 Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel (new SW abstraction from River Suir).	180	SAK-156 New SW abstraction from River Tar and upgrade Goatbridge WTP to supply deficit.	-
2900SC0029: Dundrum Regional	SAK-300 Increase GW abstraction at Ironmills borehole and upgrade Ironmills WTP to partly address deficit.	78	SAK-166 Interconnect Dundrum Regional with Galtee Regional WRZ and supply deficit from Galtee Regional (new SW abstraction from River Suir).	69	SAK-300 Increase GW abstraction at Ironmills borehole and upgrade Ironmills WTP to partly address deficit.	78
2900SC0049: Tipperary Town Supply	SAK-178 Interconnect Tipperary Town and & Galtee Regional and	66	SAK-180 New GW abstraction, new WTP to supply deficit and	-	SAK-178 Interconnect Tipperary Town and & Galtee Regional and	66

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	supply deficit from Galtee Regional (new SW abstraction from River Suir).		upgrade of Fawnagown WTP for water quality purposes.		supply deficit from Galtee Regional (new SW abstraction from River Suir).	
2900SC0039: Templetney/Brackford Bridge PWS	SAK-186 Increase GW abstraction from existing no.3 boreholes and upgrade Templetney WTP to supply deficit.	58	SAK-295 Connect Templemore/Templetuohy to New Shannon Source.	180	SAK-185 Increase GW abstraction from existing no.3 boreholes and upgrade Templetney WTP to supply deficit.	51
2900SC0024: Carrick-On-Suir	SAK-076 Rationalise Piltown-Fiddown to Carrick-on-Suir (new SW abstraction from River Suir and new WTP).	20	SAK-270 Rationalise Ballyknock to Carrick-on-Suir WRZ (River Suir).	38	SAK-185 Interconnect Dundrum Regional with Galtee Regional WRZ and supply deficit from Galtee Regional (new SW abstraction from River Suir).	51
2900SC0023: Burncourt Ballylooby	SAK-213 New GW abstraction and upgrade Lissava WTP to supply deficit.	47	SAK-211 Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.	-	SAK-211 Increase GW abstraction from no.2 boreholes and upgrade Ballylooby Springs WTP to supply deficit.	-
2900SC0026: Fethard & Mullenbawn Regional Public Water Supply	SAK-225	-	SAK-225	-	SAK-225	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	<p>Upgrade Fethard WTP for water quality improvements. WRZ is not in deficit.</p> <p>SAK-219</p> <p>Upgrade existing Dualla WTP for water quality improvements. The WRZ is not in deficit.</p>		<p>Upgrade Fethard WTP for water quality improvements. WRZ is not in deficit.</p> <p>SAK-219</p> <p>Upgrade existing Dualla WTP for water quality improvements. The WRZ is not in deficit.</p>		<p>Upgrade Fethard WTP for water quality improvements. WRZ is not in deficit.</p> <p>SAK-219</p> <p>Upgrade existing Dualla WTP for water quality improvements. The WRZ is not in deficit.</p>	
2900SC0020: Ahenny	<p>SAK-233</p> <p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. Land acquisition required due to lack of space at the WTP site.</p>	-	<p>SAK-233</p> <p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. Land acquisition required due to lack of space at the WTP site.</p>	-	<p>SAK-233</p> <p>Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. Land acquisition required due to lack of space at the WTP site.</p>	-
2900SC0031: Tullohea	<p>SAK-235</p> <p>Rationalise Tullohea and Kilcash WRZs to Templetney/Brackford Bridge WRZ.</p>	58	<p>SAK-237</p> <p>New GW abstraction at Ninemilehouse and new WTP to supply deficit.</p>	-	<p>SAK-237</p> <p>New GW abstraction at Ninemilehouse and new WTP to supply deficit.</p>	-
2900SC0067: Coalbrook/Commons	<p>SAK-296</p> <p>Interconnect Coalbrook/ Commons to Urlingford WRZ</p>	77	<p>SAK-247</p> <p>New GW abstraction and new WTP to supply deficit.</p>	-	<p>SAK-247</p> <p>New GW abstraction and new WTP to supply deficit.</p>	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	(SA6) (new GW abstraction) to supply partial deficit.					
2900SC0022: Ballinvir	SAK-248 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-248 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-248 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
2900SC0036: Kilcash	SAK-251 Rationalise Tullrohea and Kilcash WRZs to Templetny/Brackford Bridge WRZ.	58	SAK-250 New GW abstraction in karstic region and new WTP to supply deficit.	-	SAK-250 New GW abstraction in karstic region and new WTP to supply deficit.	-
3100SC0033: East Waterford Water Supply Scheme	SAK-260 New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.	-	SAK-356 New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.	149	SAK-259 Interconnect East Waterford and South Kilkenny WRZs and supply partial deficit from Mullinabro WTP.	23
2900SC0069: Glengar	SAK-299 Rationalise Glengar to Dundrum regional WRZ.	78	SAK-298 New GW abstraction and new WTP to supply deficit.	-	SAK-299 Rationalise Glengar to Dundrum regional WRZ.	78

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0095: Lismore/Cappoquin/Ballyduff (LCB)	SAK-987 Increase GW abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to partly supply deficit. New GW (commission 2018 trial well) abstraction and upgrade Lismore Deerpark WTP to partly supply deficit.	-	SAK-675 Increase GW (to include commissioning new TW) abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to supply deficit.	173	SAK-987 Increase GW abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to partly supply deficit. New GW (commission 2018 trial well) abstraction and upgrade Lismore Deerpark WTP to partly supply deficit.	-
3100SC0077: Ballynoe/Melleray	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
3100SC0111: Deelish/Ballinacourty	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0101: Scrahan	SAK-388 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-608 Rationalise Scrahan to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-388 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0005: Ardmore	SAK-392	-	SAK-392	-	SAK-392	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		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.		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.	
3100SC0097: Ballyogarty	SAK-393 Increase GW abstraction from existing borehole and upgrade Ballyogarty WTP to supply deficit.	-	SAK-399 Rationalise Ballyogarty to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-393 Increase GW abstraction from existing borehole and upgrade Ballyogarty WTP to supply deficit.	-
3100SC0081: Moores Well	SAK-403 Increase GW abstraction from existing borehole and upgrade Moore's Well WTP to supply deficit.	125	SAK-677 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173	SAK-402 Increase GW abstraction from existing borehole and upgrade Moore's Well WTP to supply deficit.	-
3100SC0083: Stradbally	SAK-411 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-411 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-411 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0030: Carrowgarraff	SAK-416 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-416 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-416 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0024: Ballysaggart	SAK-420 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-756 New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.	173	SAK-420 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0099: Kilmacthomas	SAK-428 Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.	-	SAK-438 Rationalise Kilmacthomas to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-428 Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.	-
3100SC0054: Ballymacarbry	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-
3100SC0027: BooLavonteem/Kilcooney/Tooraneena	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-
3100SC0079: Adramone/Kilrossanty	SAK-450 Increase GW abstraction from Kilrossanty borehole and	-	SAK-450 Increase GW abstraction from Kilrossanty borehole	-	SAK-450 Increase GW abstraction from Kilrossanty borehole	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	upgrade Kilrossanty WTP to supply deficit.		and upgrade Kilrossanty WTP to supply deficit.		and upgrade Kilrossanty WTP to supply deficit.	
3100SC0001: Dungarvan	SAK-465 New GW abstraction from Mapestown wellfield and new WTP and supply deficit.	119	SAK-461 Increase GW abstraction from no. 4 borehole and upgrade Ballinamuck WTP to supply partial deficit.		SAK-465 New GW abstraction from Mapestown wellfield and new WTP and supply deficit.	119
3100SC0089: Rathgormuck	SAK-468 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-266 Rationalise Rathgormuck to Carrick on Suir WRZ (River Suir).	38	SAK-468 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0051: Ballyguiry	SAK-475 Rationalise Ballyguiry to Dungarvan WRZ.	119	SAK-472 Increase GW abstraction from Ballyguiry borehole and upgrade Ballyguiry WTP to supply deficit.	-	SAK-475 Rationalise Ballyguiry to Dungarvan WRZ.	119
3100SC0053: Inchinleamy	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0112: Modeligo	SAK-477	-	SAK-477	-	SAK-477	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		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.		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.	
3100SC0114: Liskealty	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0098: Ballyshunnock	SAK-481 Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.	-	SAK-481 Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit.	-	SAK-481 Increase GW abstraction from borehole and Ballyshunnock WTP to supply deficit	-
3100SC0091: Dunhill - Cois Coille	SAK-488 Increase GW abstraction from borehole and upgrade Dunhill Cois Coille WTP to supply deficit.	-	SAK-495 Rationalise Dunhill - Cois Coille to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-488 Increase GW abstraction from borehole and upgrade Dunhill Cois Coille WTP to supply deficit.	-
3100SC0118: Russelstown	SAK-498 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-713 Rationalise Russelstown to Clonmel WRZ.	180	SAK-498 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
3100SC0042: Faha	SAK-499	-	SAK-501	149	SAK-499	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Increase GW abstraction from Faha borehole and upgrade Faha WTP to supply deficit.		Rationalise Faha to East Waterford WRZ (new SW abstraction from River Suir).		Increase GW abstraction from Faha borehole and upgrade Faha WTP to supply deficit.	
3100SC0093: Graiguenageeha	SAK-505 Increase GW abstraction from borehole and upgrade Graiguenageeha WTP to supply deficit.	-	SAK-505 Increase GW abstraction from borehole and upgrade Graiguenageeha WTP to supply deficit.	-	SAK-505 Increase GW abstraction from borehole and upgrade Graiguenageeha WTP to supply deficit.	-
3100SC0116: Kilbrien	SAK-509 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-509 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-509 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0113: Lacken	SAK-520 Rationalise Lacken to Moore's Well WRZ (Moore's Well WTP).		SAK-676 Rationalise Lacken and Morees Well to LCB WRZ (Deerpark WTP).	173	SAK-514 Increase GW abstraction from borehole and upgrade Lacken WTP to supply deficit.	
3100SC0044: Garrahylish	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0035: Smoor	SAK-526	-	SAK-555	149	SAK-526	49

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Increase GW abstraction from Smoor Beg borehole and upgrade Smoorbeg WTP to supply deficit.		Rationalise Fews to East Waterford WRZ (new SW abstraction from River Suir).		Increase GW abstraction from Smoor Beg borehole and upgrade Smoorbeg WTP to supply deficit.	
3100SC0092: Dunhill Ballinageeragh	SAK-532 Increase GW abstraction from Dunhill borehole and upgrade Dunhill Ballynageeragh WTP to supply deficit.	-	SAK-530 Rationalise Smoor to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-532 Increase GW abstraction from Dunhill borehole and upgrade Dunhill Ballynageeragh WTP to supply deficit.	-
3100SC0123: Carrigeen	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0045: Fews	SAK-557 Increase GW abstraction from Fews borehole and upgrade Fews WTP to supply deficit.	-	SAK-555 Rationalise Fews to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-557 Increase GW abstraction from Fews borehole and upgrade Fews WTP to supply deficit.	-
3100SC0124: Portlaw	SAK-618 New GW abstraction and new WTP to partly supply deficit. SAK-560	-	SAK-618 New GW abstraction and new WTP to partly supply deficit.	-	SAK-618 New GW abstraction and new WTP to partly supply deficit.	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.		SAK-560 Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.		SAK-560 Increase GW abstraction from Portlaw borehole and Portlaw spring and upgrade Portlaw WTP to partly supply deficit.	
3100SC0087: Glenagad	SAK-264 Rationalise Glennagad to Clonmel WRZ (Monroe WTP).	34	SAK-715 Rationalise Glennagad to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).	180	SAK-264 Rationalise Glennagad to Clonmel WRZ (Monroe WTP).	34
3100SC0120: Lyreanearla	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0126: Monatarriff	SAK-573 Rationalise Monatarriff to Carrignagower.	141	SAK-673 Rationalise Ballysaggart, Monatarriff and Carrognagower to LCB (Deerpark WTP).	173	SAK-570 Increase existing GW abstraction and upgrade Monatarriff WTP to supply deficit.	-
3100SC0129: Kilmanahan	SAK-574	-	SAK-756	-	SAK-574	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Upgrade WTP for water quality improvements.		New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.		Upgrade WTP for water quality improvements.	
3100SC0119: Poulavanogue (Waterford)	SAK-377 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (Monroe WTP).	34	SAK-716 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (new abstraction from the River Suir and new WTP at Barnes site).	180	SAK-377 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (Monroe WTP).	34
3100SC0107: Ballyknock	SAK-580 Increase GW abstraction from Ballyknock borehole and upgrade Ballyknock WTP to supply deficit.	-	SAK-270 Rationalise Ballyknock to Carrick-on-Suir WRZ (River Suir).	38	SAK-580 Increase GW abstraction from Ballyknock borehole and upgrade Ballyknock WTP to supply deficit.	-
3100SC0110: Crehanagh	SAK-585 Increase GW abstraction from Crehanagh borehole and upgrade Grehanagh WTP to supply deficit.	-	SAK-272 Rationalise Crehanagh to Carrick-on-Suir WRZ (River Suir).	38	SAK-585 Increase GW abstraction from Crehanagh borehole and upgrade Grehanagh WTP to supply deficit.	-
3100SC0108: Garravoone	SAK-595	-	SAK-274	38	SAK-595	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		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.		Rationalise Garravoone to Carrick on Suir WRZ (River Suir).		Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	
3100SC0102: Kill/Ballylaneen	SAK-601 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	SAK-604 Rationalise Kill/Ballylaneen to East Waterford WRZ (new SW abstraction from River Suir).	149	SAK-601 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0127: Carrignagower	SAK-419 New GW abstraction and new WTP to supply deficit.	141	SAK-674 Rationalise Ballysaggart, Monatariff and Carrognagower to LCB (Deerpark WTP).	173	SAK-622 New GW abstraction and new WTP to supply deficit.	-
3100SC0115: Ardmore Grange	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
1900SC0030: Killeely	SAK-002 Increase GW abstraction at Killeely borehole and upgrade existing Killeely WTP to supply deficit.	3
1900SC0008: Herbertstown	SAK-019 Rationalise Herbertstown to Killeely WRZ (Killeely WTP).	3
1900SC0010: Knocklong/Hospital	SAK-029 Increase GW abstraction at Knocklong borehole and upgrade Knocklong borehole WTP to supply deficit.	-
1900SC0011: Galbally Water Supply	SAK-045 Rationalise Galbally to Ballylanders WRZ.	12
1900SC0012: Ballylanders Water Supply	SAK-048 Increase GW abstraction at Ballylanders borehole and upgrade Ballylanders Pump Station WTP to supply deficit.	12
1900SC0026: Anglesboro Water Supply	SAK-055 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
1500SC0001: South Kilkenny Environs	SAK-648 Bring back Silverspring WTP to production and supply deficit.	-
1500SC0019: Piltown-Fiddown	SAK-073 New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL).	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
1500SC0005: Callan WS 1001	SAK-077 Increase GW abstraction from existing spring and borehole and upgrade Callan WTP to supply deficit.	-
2900SC0009: Twomileborris	SAK-085 Increase GW abstraction from Twomileborris borehole and upgrade Twomileborris WTP to supply deficit.	-
2900SC0013: Horse and Jockey	SAK-089 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
2900SC0014: Thurles	SAK-097 Supply spare capacity to neighbouring WRZs in deficit.	61
2900SC0042: Templemore/Templetuohy:	SAK-111 Rationalise Templemore/Templetuohy to Thurles WRZ.	61
2900SC0016: Littleton	SAK-113 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
2900SC0032: Galtee Regional	SAK-767 New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit. Interconnect with Tipperary Town for increased resilience.	192
1900SC0038: Carrigmore	SAK-123	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	Increase GW abstraction at Carrigmore borehole and upgrade Carrigmore borehole to supply deficit.	
2900SC0025: Clonmel	SAK-134 Increase abstraction at Monroe boreholes and upgrade Monroe WTP to partly supply deficit.	34
2900SC0021: Ardfinnan Regional	SAK-157 New SW abstraction from River Tar and upgrade Goatenbridge WTP to supply deficit.	50
2900SC0029: Dundrum Regional	SAK-300 Increase GW abstraction at Ironmills borehole and upgrade Ironmills WTP to partly address deficit.	78
2900SC0049: Tipperary Town Supply	SAK-768 New GW abstraction and new WTP to supply deficit. Interconnect with Galtee Regional for increased resilience.	192
2900SC0039: Templetney/Brackford Bridge PWS	SAK-184 Increase GW abstraction from existing no.3 borholes and upgrade Templetney WTP to supply deficit.	40
2900SC0024: Carrick-On-Suir	SAK-289 New GW abstraction and new Linguan WTP to supply deficit.	37
2900SC0023: Burncourt Ballylooby	SAK-218	50

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	Interconnect Burncourt Ballylooby Ardfinnan Regional WRZs and supply deficit from Ardfinnan Regional (new SW abstraction from River Tar).	
2900SC0026: Fethard & Mullenbawn Regional Public Water Supply	SAK-219 Upgrade existing Dualla WTP for water quality improvements. The WRZ is not in deficit. SAK-225 Upgrade Fethard WTP for water quality improvements. WRZ is not in deficit.	-
2900SC0020: Ahenny	SAK-232 Rationalise Ahenny to Templetny/Brackford Bridge WRZ.	40
2900SC0031: Tullohea	SAK-291 New GW abstraction at Ninemilehouse and new WTP to supply deficit.	75
2900SC0067: Coalbrook/Commons	SAK-247 New GW abstraction and new WTP to supply deficit.	-
2900SC0022: Ballinvir	SAK-248 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
2900SC0036: Kilcash	SAK-292 Rationalise Kilcash to Tulloea WRZ (new GW abstraction).	75
3100SC0033: East Waterford Water Supply Scheme	SAK-352	142

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit.	
2900SC0069: Glengar	SAK-299 Rationalise Glengar to Dundrum regional WRZ.	78
3100SC0095: Lismore/Cappoquin/Ballyduff (LCB)	SAK-987 Increase GW abstraction from existing borehole and upgrade LCB Lismore Deerpark WTP to partly supply deficit. New GW (commission 2018 trial well) abstraction and upgrade Lismore Deerpark WTP to partly supply deficit.	-
3100SC0077: Ballynoe/Melleray	SAK-386 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0111: Deelish/Ballinacourty	SAK-387 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0101: Scrahan	SAK-388 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0005: Ardmore	SAK-392 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
3100SC0097: Ballyogarty	SAK-619 Rationalise Ballyogarty to Kilmacthomas WRZ.	153
3100SC0081: Moores Well	SAK-402	-
3100SC0083: Stradbally	SAK-411	-
3100SC0030: Carrowgarriff	SAK-416	-
3100SC0024: Ballysaggart	SAK-665 Rationalise Carrignagower and Monattariff to Ballysaggart (spare capacity).	-
3100SC0099: Kilmacthomas	SAK-620 Increase GW abstraction from Kilmacthomas School (spring) and upgrade Kilmacthomas WTP to supply deficit.	153
3100SC0054: Ballymacarbry	SAK-441 New GW abstraction (karstic) and new WTP to supply deficit.	-
3100SC0027: Booavonteen/Kilcooney/Tooraneena	SAK-444 Increase GW abstraction from Tooraneena borehole and upgrade Tooraneena WTP to supply deficit.	-
3100SC0079: Adramone/Kilrossanty	SAK-450 Increase GW abstraction from Kilrossanty borehole and upgrade Kilrossanty WTP to supply deficit.	-
3100SC0001: Dungarvan	SAK-461	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	Increase GW abstraction from no.4 borehole and upgrade Ballinamuck WTP to supply partial deficit.	
3100SC0089: Rathgormuck	SAK-265 Rationalise Rathgormuck to Carrick on Suir WRZ (Linguan WTP).	37
3100SC0051: Ballyguiry	SAK-472 Increase GW abstraction from Ballyguiry borehole and upgrade Ballyguiry WTP to supply deficit.	-
3100SC0053: Inchinleamy	SAK-476 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0112: Modeligo	SAK-477 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0114: Liskealty	SAK-478 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0098: Ballyshunnock	SAK-484 Rationalise Ballyshunnock to East Waterford WRZ (new SW abstraction from River Suir).	142
3100SC0091: Dunhill - Cois Coille	SAK-759	188

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new GW abstraction).	
3100SC0118: Russelstown	SAK-498 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0042: Faha	SAK-499 Increase GW abstraction from Faha borehole and upgrade Faha WTP to supply deficit.	-
3100SC0093: Graiguenageeha	SAK-505 Increase GW abstraction from borehole and upgrade Graiguenageeha WTP to supply deficit.	-
3100SC0116: Kilbrien	SAK-509 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0113: Lacken	SAK-514 Increase GW abstraction from borehole and upgrade Lacken WTP to supply deficit.	-
3100SC0044: Garrahylish	SAK-525 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0035: Smoor	SAK-526	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	Increase GW abstraction from Smoor Beg borehole and upgrade Smoorbeg WTP to supply deficit.	
3100SC0092: Dunhill Ballinageeragh	SAK-760 Rationalise Dunhill Ballinageeragh to East Waterford WRZ (new GW abstraction).	188
3100SC0123: Carrigeen	SAK-548 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0045: Fews	SAK-557 Increase GW abstraction from Fews borehole and upgrade Fews WTP to supply deficit.	-
3100SC0124: Portlaw	SAK-565 Rationalise Portlaw to East Waterford WRZ (new SW abstraction from River Suir).	142
3100SC0087: Glenagad	SAK-264 Rationalise Glennagad to Clonmel WRZ (Monroe WTP).	34
3100SC0120: Lyreanearla	SAK-569 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0126: Monattarriff	SAK-666 Rationalise Carrignagower and Monattarriff to Ballysaggart (spare capacity).	171

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
3100SC0129: Kilmanahan	SAK-574 Upgrade WTP for water quality improvements.	-
3100SC0119: Poulavanogue (Waterford)	SAK-277 Rationalise Poulavanogue (Waterford) to Clonmel WRZ (Monroe WTP).	34
3100SC0107: Ballyknock	SAK-269 Rationalise Ballyknock to Carrick-on-Suir WRZ (Linguan WTP).	37
3100SC0110: Crehanagh	SAK-271 Rationalise Crehanagh to Carrick-on-Suir WRZ (Linguan WTP).	37
3100SC0108: Garravoone	SAK-273 Rationalise Garravoone to Carrick on Suir WRZ (Linguan WTP).	37
3100SC0102: Kill/Ballylaneen	SAK-601 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-
3100SC0127: Carrignagower	SAK-667 Rationalise Carrignagower and Monattariff to Ballysaggart (spare capacity).	171
3100SC0115: Ardmore Grange	SAK-625 Increase GW abstraction and upgrade WTP to supply deficit.	-

Appendix C Figure Index Table

WTPs (Figure 2.1 Water Environment of SAK)					
WTP	Label	WTP	Label	WTP	Label
Templemore (College Hill) WTP	1	Galbally WTP	35	Pairc an Aonaigh WTP	69
Templetouhy WTP	2	Rossadrehid WTP	36	Melleray WTP	70
Whitefield WTP	3	Monroe WTP	37	Kilmacthomas WTP	71
Clareville WTP	4	Templetney WTP	38	Smoorbeg WTP	72
Twomileborris WTP	5	Piltown-Fiddown (Jamestown) WTP	39	Tooraneena WTP	73
Littleton WTP	6	Lissava WTP	40	Ballyogarty WTP	74
Stooke WTP	7	Mooncoin (Clonassy) WTP	41	Ballysaggart WTP	75
Hollyford WTP	8	Ballylanders WTP	42	Kilbrien (Ballinakill) WTP	76
Thurles WTP	9	Carrick-on-Suir (Linguan) WTP	43	Garrahylish WTP	77
Commons WTP	10	Clonmel-Poulnagunoge WTP	44	Carrignagower WTP	78
Coalbrook WTP	11	Coolnamuck WTP	45	Ballylaneen WTP	79
Glengar WTP	12	Poulavanogue WTP	46	Faha WTP	80
Horse & Jockey (Curragheen) WTP	13	Glennagad WTP	47	Dunhill Ballynageeragh WTP	81
Ballincurry WTP	14	Lyrenaleara WTP	48	Dunhill Cois Coille WTP	82
Carrigmore WTP	15	Anglesboro WTP	49	Monatarrif WTP	83
Ironmills WTP	16	Garravoone WTP	50	Modeligo WTP	84
Callan WTP	17	Crehanagh WTP	51	Kilrossanty WTP	85

WTPs (Figure 2.1 Water Environment of SAK)

WTP	Label	WTP	Label	WTP	Label
Dualla WTP	18	Glenary WTP	52	Moore's Well WTP	86
Herbertstown WTP	19	Russelstown WTP	53	Graiguenageeha WTP	87
Kilteely WTP	20	Glengarra WTP	54	Lacken WTP	88
Farranamanagh WTP	21	Ballyknock WTP	55	Inchinleamy WTP	89
Golden to Cashel Town (Springmount Source) WTP	22	Kilmanahan WTP	56	LCB Cappoquin WTP	90
Thomastown Augmentation WTP	23	Rathgormuck WTP	57	Carrowgarraiff WTP	91
Hospital WTP 2	24	Ballylooby Springs WTP	58	Stradbally WTP	92
Hospital WTP 1	25	Mullinabro WTP	59	LCB Lismore Deerpark WTP	93
Fawnagown WTP	26	Crottys Lake WTP	60	Deelish WTP	94
Mullinbawn WTP	27	Portlaw WTP	61	LCB Ballyduff WTP	95
Fethard WTP	28	Goatenbridge WTP	62	Ballinamuck WTP	96
Knocklong Church Road WTP	29	Ballyrohan WTP	63	Ballyguiry WTP	97
Ballinvir WTP	30	Carrigeen WTP	64	Liskealty WTP	98
Knocklong WTP	31	East Waterford (Adamstown)WTP	65	Ardmore Grange WTP	99
Tullohea WTP	32	Ballyshonnock WTP	66	Monea WTP	100
Ahenny (Ahenny) WTP	33	Fews WTP	67		
Kilcash WTP	34	Scrahan WTP	68		