Spring 2023

Regional Water Resources Plan – South West

Strategic Environmental Assessment

Appendix H: Study Area J – 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 legislates 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. Therefore in this Environmental Review, which was developed prior to the name change, all references to Irish Water shall be construed as Uisce Éireann.

Baseline data included in the RWRP-SW 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 Irish Water data sets. Data sources will be detailed in the relevant sections of the RWRP-SW. 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client (Irish Water), and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

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1 Introduction and Background

1 Introduction and Background

This Study Area Environmental Review forms part of the SEA Environmental Report for the Regional Water Resources Plan (RWRP) for the South West Region (referred to as the Regional Plan). The Regional Plan includes three individual study area reviews (SAH-J) as appendices.

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

Environmental Reviews have been undertaken for each study area and form appendices to the SEA Environmental Report for the Regional Plan as part of Phase 2 of the National Water Resources Plan (NWRP). Phase 1 in the development of the NWRP was the preparation of the Framework Plan, which was adopted in Spring 2021 following SEA, Appropriate Assessment (AA) and extensive public consultation. The Framework Plan and supporting documentation are available at https://www.water.ie/projects/strategic-plans/national-water-resources/.

Phase 2 of the NWRP comprises development of the four RWRPs. The RWRP for the South West Region (RWRP-SW) was published for consultation in June 2022 with the timeframe for submissions closing on 24th August 2022. Where relevant, submissions received on the RWRP-SW have also informed the development of this Regional Plan, to the extent they had general application. Further, the cumulative impacts of the RWRP-SW along with this Regional Plan have been assessed, and are considered in section 9 of the SEA Environmental report for the RWRP-SW.

1.1 Options Assessment Methodology

The Options Assessment Methodology implemented as part of the RWRP-SW 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 eliminating 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

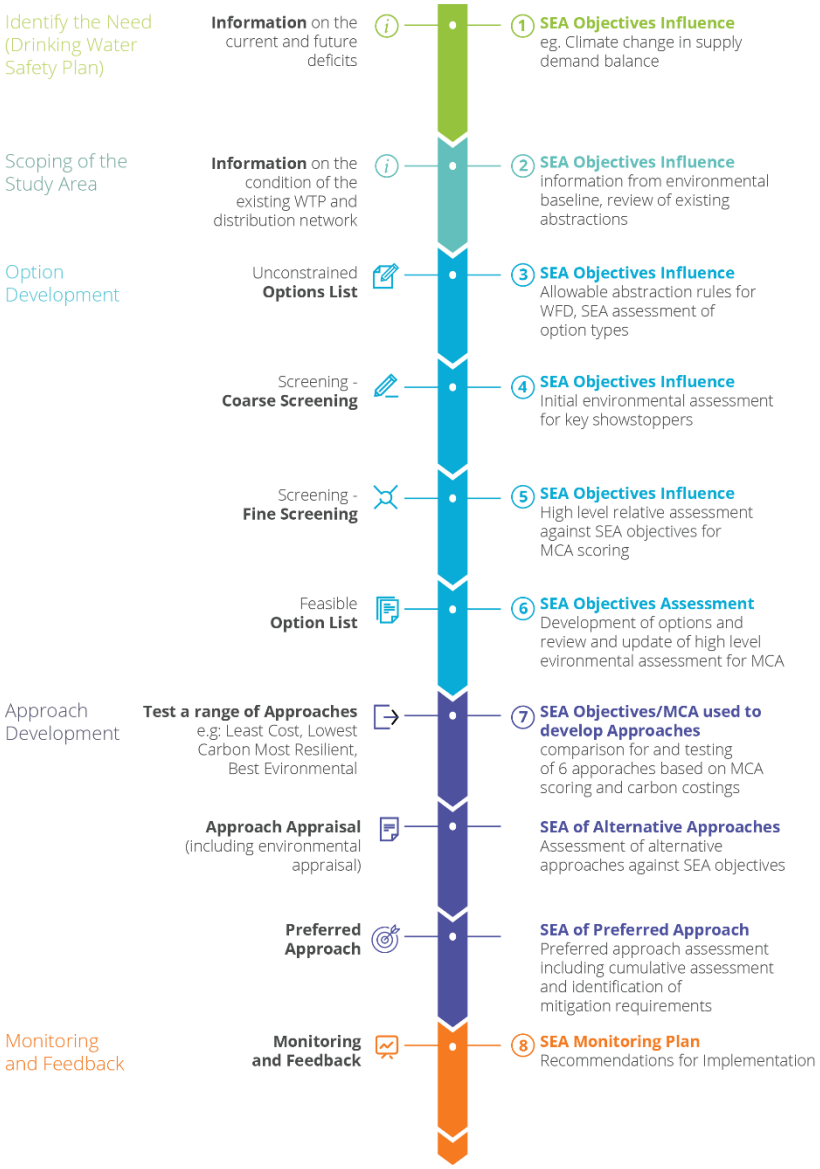

Figure 1.1 Option and Approach Development Process

the 5 year plan cycle and includes an annual review to identify actions required within the plan cycle.

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 will follow the outline methodology established by the Framework Plan. The SEA Environmental Reports are being published for consultation alongside the draft Regional Plans for each of the four regions.

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	Water quality and resources Prevent deterioration of the WFD status of waterbodies with regard to both water quality and quantity due to Irish Water's provision of water services. 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 meet WFD objectives.
	Flood risk Protect and, where possible, reduce risk from ground water and surface water flooding as a result of Irish Water's provision of water services.
Biodiversity	Protect and, where possible, enhance terrestrial, aquatic and soil biodiversity; particularly regarding European sites and protected species in providing water services.
Material assets	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. Minimise impacts on other material assets and existing water abstractions.

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

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

The Regional Plan SEA Environmental Report was completed only after all study area reports for the South West region were available. At that point, Irish Water 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 West region. The conclusions of that cumulative assessment are presented in the SEA Environmental Report for the South West region.

If appropriate, the Preferred Approach identified for SAJ 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). An assessment of the cumulative effects of the Preferred Approaches identified in this Regional Plan is set out in section 9 of the RWRP-SW SEA. The assessment includes consideration of the cumulative effects along with the preferred approaches identified in the RWRP-SW.

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 0 and a summary of the assessment for SAJ 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 Irish Water is required to carry out. Habitats Directive requirements have been integrated into the options development process and conclusions from the NIS for SAJ are provided in chapter 9 of this review.

1.6 Study Area J

The South West 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 SAJ, the location of SAJ in relation to the South West Region is shown in Figure 1.2.

Study Area J lies within the counties of Limerick, Cork, Kerry, Tipperary and Waterford and its total area is approximately 3,000 km^2. There is one principal settlement (with a population of over 10,000), namely Mallow (CSO, 2016a), as shown in Figure 1.3.

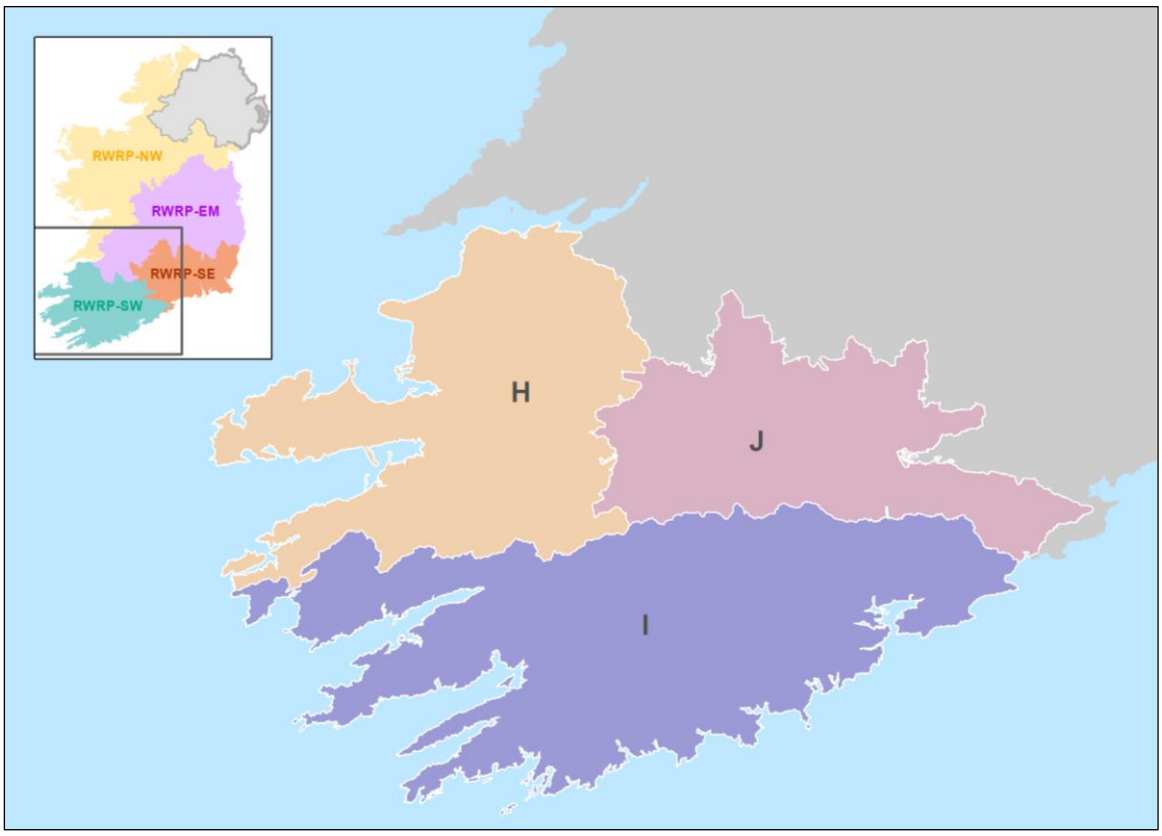

Figure 1.2 South West Region Study Areas

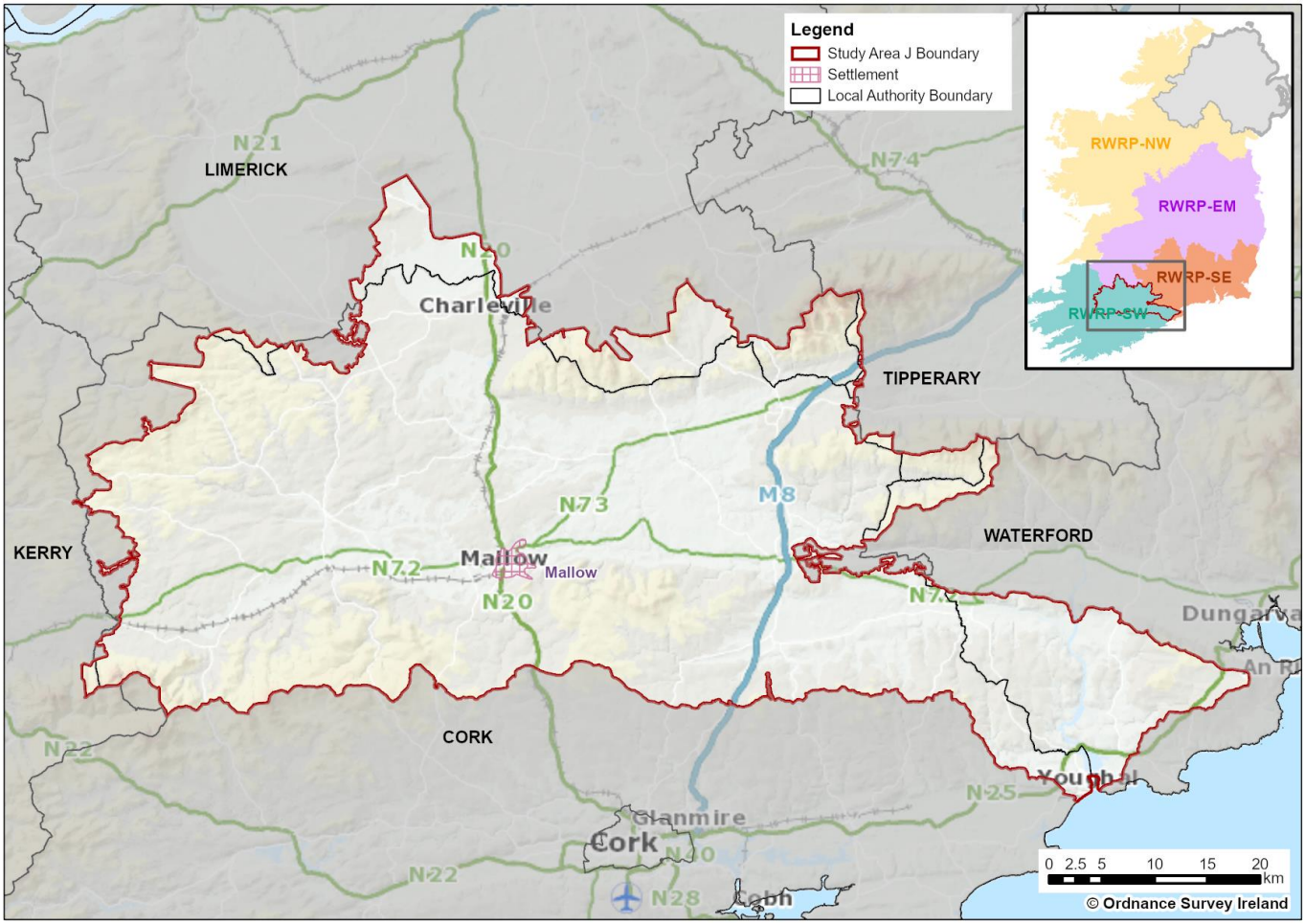

Figure 1.3 Study Area J

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Study Area J Environmental Baseline Context

2 Study Area J Environmental Baseline Context

This chapter provides environmental baseline information for SAJ 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 planning 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. Irish Water has 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).

Table 2.1 Overview of the Population within the WRZs of SAJ

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
0500SC0002 – Conna Regional	4,451	+15%
0500SC0004 – Ballynoe	309	+15%

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
0500SC0006 – Bottlehill	97	+15%
0500SC0056 – Bweeng	640	+15%
0500SC0061 – Carrigcleena	48	+15%
0500SC0062 – Monaparson	33	+15%
0500SC0131 – Burnfort	63	+16%
0500SC0064 – Monee & Knockabrack	163	+15%
0500SC0065 – Ballinamona	17	+18%
0500SC0066 – Lyre	359	+15%
0500SC0075 – Kilcorney	117	+15%
0500SC0076 – Glenleigh	13	+15%
0500SC0088 – Knockdrumaclough	83	+14%
0500SC0089 – Coolagown	195	+15%
0500SC0090 – Kilmagnier	308	+15%
0500SC0092 – Kilmurry (Mitchelstown)	55	+15%
0500SC0143 – Ballydesmond	307	+15%
0500SC0143 – Kiskeam	165	+15%
0500SC0096 – Boherascrub	18	+17%
0500SC0121 – Castlecooke	15	+20%
0500SC0099 – Glenduff	26	+19%
0500SC0100 – Mitchelstown	5,496	+15%
0500SC0101 – Mountain Barracks	14	+14%
0500SC0102 – Gortnaskehy	45	+16%
0500SC0103 – Knockanevin	12	+17%
0500SC0104 – Skahanagh	66	+15%
0500SC0105 – Knockeragh	55	+15%
0500SC0106 – Labbamollogga	46	+15%
0500SC0107 – Monabricka	12	+17%
0500SC0108 – Rockchapel	75	+16%
0500SC0109 – Stagmount	5	+20%
0500SC0110 – Castlewrixon	24	+17%
0500SC0113 – Allow Regional	3,329	+15%

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
0500SC0114 – Charleville / Doneraile	10,572	+15%
0500SC0118 – Ballyhooly	4,170	+15%
0500SC0121 – Macroney	120	+16%
0500SC0122 – Ballyvadonna	18	+17%
0500SC0124 – Castletownroche	1,106	+15%
0500SC0126 – Dromahane / Kilcolman / Cois Tobair	1,168	+26%
0500SC0128 – Killavullen	824	+15%
0500SC0130 – Lombardstown_Glantane	712	+15%
0500SC0131 – Mallow	13,238	+29%
0500SC0186 – Mallow	270	+30%
0500SC0136 – Banteer	1,637	+15%
0500SC0138 – Millstreet	3,822	+15%
0500SC0139 – Toureen _Derry	32	+13%
0500SC0143 – Newmarket	8,587	+15%
0500SC0144 – Kilbrin Garran an Darra	101	+15%
0500SC0165 – Strawhall	10	+20%
0500SC0166 – Knoppogue	39	+15%
0500SC0175 – Glanworth /Ballykenley/Johnstown	2,051	+15%
0500SC0176 – Fermoy	7,522	+15%
0500SC0182 – Gortnagreige	814	+30%
0500SC0185 – Ballyclough & Mount North	2,041	+19%
1900SC0018 – CastletownBallyagran Water Supply	1,233	+15%
3100SC0007 – Grallagh	56	+16%
3100SC0008 – Tinkock\Tinnabinna	93	+15%
3100SC0010 – Strancally	38	+13%
3100SC0016 – Villierstown	304	+15%
3100SC0017 – Camphire	22	+18%
3100SC0020 – Tallow	1,045	+15%
3100SC0052 – Ballyheaphy	40	+15%
3100SC0082 – Aglish Cul Rua	239	+15%
3100SC0084 – Ballycurrane/Clashmore/Kilmaloo	681	+15%

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
3100SC0106 – Kilmore-Kilbeg	23	+17%
3100SC0121 – Ballymoate Upper	98	+15%

*The estimated population has been based on the 2016 Census data. Irish Water 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

SAJ had a below average household disposable income per person in 2019 at a regional level, although, at a county level the counties of Cork and Limerick are above average (CSO, 2022a). The unemployment rate was 3.6% in the South West, 4.5% in the Mid West and 3.8% in the South East regions of the country for Q3 of 2022 (CSO, 2022b).

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 Q4 2022 was 1,045 for the South West region, 503 for the Mid West and 693 for the South East region (CSO, 2022c).

2.1.3 Tourism and Recreation

Tourism in SAJ 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). The county of Cork 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, n.d.). The county also contains one of Ireland's UNESCO World Heritage Sites, namely Sceilg Mhichíl and a site on the UNESCO tentative list: Western Stone Forts: Staigue.

Additionally, the study area is located within Ireland's Ancient East and the Wild Atlantic Way. Ireland's Ancient East is part of a tourism development strategy that covers the South, East and part of the Midlands and places emphasis on the importance of historic sites in the area (National Tourism Development Authority, 2016). Ireland's Wild Atlantic Way is a tourism development strategy that aims to achieve greater visibility for the west coast of Ireland and is Ireland's first long-distance touring route (Fáilte Ireland, 2020).

Ireland's natural heritage is also recognised as an important tourism asset by the Department of Transport, Tourism and Sport (2019). For SAJ, the national park of note in SAJ is Killarney National Park. 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 West, Mid West and South East regions 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 West, Mid West and 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, 2020a)
South West	Male: 79.2 Female: 83.2	47%	Good
Mid West	Male: 79.0 Female: 82.5	52%	Good
South East	Male: 79.3 Female: 83.1	44%	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 Irish Water'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 SAJ.

Table 2.3 Areas Supplied by the WTPs in SAJ

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Conna Regional WTP and Glenville WTP	0500SC0002 – Conna Regional/Glenville	Cork
Booladurragh WTP	0500SC0004 – Ballynoe	Cork
Bottlehill WTP	0500SC0006 – Bottlehill	Cork
Bweeng WTP	0500SC0056 – Bweeng	Cork
Carrigacleena WTP	0500SC0061 – Carrigacleena	Cork
Monaparson WTP	0500SC0062 – Monaparson	Cork
Monee WTP and Knockbrack WTP	0500SC0064 – Monee/Knockbrack	Cork
Ballynamona WTP	0500SC0065 – Ballynamona	Cork
Lyre WTP	0500SC0066 – Lyre	Cork
Kilcorney WTP	0500SC0075 – Kilcorney	Cork
Glenleigh WTP	0500SC0076 – Glenleigh p.p	Cork
Knockdrumaclough WTP	0500SC0088 – Knockdrumaclough	Cork
Coolagown WTP Site	0500SC0089 – Coolagown	Cork
Kilmaginer WTP	0500SC0090 – Kilmagnier	Cork

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Kilmurray WTP	0500SC0092 – Kilmurry (Mitchelstown)	Cork
Bohernascrub WTP	0500SC0096 – Bohernascrub	Cork
Glenduff WTP	0500SC0099 – Glenduff	Cork
Mitchelstown Galtee WTP and Mitchelstown South WTP	0500SC0100 – Mitchelstown North/Mitchelstown South	Cork
Mountain Barracks WTP	0500SC0101 – Mountain Barracks	Cork
Gortnaskethy WTP	0500SC0102 – Gortnaskehy	Cork
Knockanevin WTP	0500SC0103 – Knockanevin WS	Cork
Skahanagh WTP	0500SC0104 – Skahanagh	Cork
Knockeragh WTP	0500SC0105 – Knockeragh WS	Cork
Labbamollogga WTP	0500SC0106 – Labbamollogga P.P.	Cork
Monabricka WTP	0500SC0107 – Monabricka	Cork
Rockchapel WTP	0500SC0108 – Rockchapel	Cork
Stagmount WTP	0500SC0109 – Stagmount	Cork
Castlewrixon WTP	0500SC0110 – Castlewrixon	Cork
Freemount WTP	0500SC0113 – Allow Regional	Cork
Charleville WTP and Doneraile Shanballymore WTP	0500SC0114 – Charleville/Doneraile	Cork
Castletownroche (Ballyhooley) WTP, Dowing Bridge WTP, Kilally WTP and Killdorrery WTP	0500SC0118 – Ballyhooly/Downing Bridge/Kilally (Kilworth)/Kildorrery	Cork
Macroney WTP	0500SC0121 – Macroney	Cork
Ballyvadonna WTP	0500SC0122 – Ballyvadonna	Cork
Castletownroche WTP	0500SC0124 – Castletownroche	Cork
Hammond Place WTP and Cois Tobair WTP	0500SC0126 – Dromahane/Tobair	Cork
Killavullen WTP	0500SC0128 – Killavullen	Cork
Laharan Abbeys Well WTP and Laharan Cross WTP	0500SC0130 – Lombardstown/Glantane	Cork
Mallow WTP, Rahan WTP and Box Cross WTP	0500SC0131 – Mallow/Rahan/Box Cross	Cork
Creggane WTP and Poulgrom WTP	0500SC0136 – Cregane/Banteer	Cork

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Caherbarnagh WTP, Cockhill WTP and Millstreet WTP	0500SC0138 – Caherbarnagh/Cockhill/Millstreet	Cork
Derry WTP	0500SC0139 – Toureen/Derry	Cork
Ballinatona WTP	0500SC0143 – Newmarket	Cork
Kilbrin WTP	0500SC0144 – Kilbrin Garran an Darra	Cork
Strawhall Public WTP	0500SC0165 – Strawhill	Cork
Knoppogue WTP	0500SC0166 – Knoppogue	Cork
Ballykenly (Johnstown) WTP and Dunmahon WTP	0500SC0175 – Ballykenley/Johnstown/Glanworth	Cork
Coolrue WTP	0500SC0176 – Fermoy	Cork
Gortnagreige WTP	0500SC0182 – Gortnagreige	Cork
Mountnorth WTP and Ballyclough WTP	0500SC0185 – Ballyclough & Mount North	Cork
Ballyagran WTP	1900SC0018 – CastletownBallyagran Water Supply	Limerick
Grallagh WTP	3100SC0007 – Grallagh	Waterford
Tinnabinna WTP	3100SC0008 – Tinnabinna	Waterford
Killenagh (Strancally) WTP	3100SC0010 – Strancally	Waterford
Villierstown WTP	3100SC0016 – Villierstown	Waterford
Camphire WTP	3100SC0017 – Camphire	Waterford
Ballymoate Upper WTP and Tallow WTP	3100SC0020 – Ballymote/Tallow	Waterford
Ballyheaphy WTP	3100SC0052 – Ballyheaphy	Waterford
Aglish Cul Rua WTP	3100SC0082 – Aglish Cul Rua	Waterford
Coolboa WTP and Clashmore White Well (Laurentum) WTP	3100SC0084 – Clashmore Coolboa/ White Well Laurentum	Waterford
Kilmore Kilbeg WTP	3100SC0106 – Kilmore-Kilbeg	Waterford

Currently for day-to-day operations, thirty-one out of sixty-two of the WRZs in the area have a current SDB deficit and thirty-three have a projected SDB deficit (based on a ‘Do Minimum’ approach – see section 4.5 for further clarification). However, under normal weather and demand conditions, the current deficit does not manifest as an interruption to supply for all WRZs.

Poor water quality can be linked to risks to health. The Barrier Assessment identified fifty-nine of the seventy-nine WTPs within the study area at high risk of failing to achieve the Irish Water’s conservative Barrier Assessment standards in relation to maintaining chlorine residual in the network (Barrier 2.1) and

the effectiveness of Irish Water's protozoa removal processes (Barrier 3) (see Table 2.1 in the SAJ Technical Report – RWRP-SW Appendix 3).

The "quality need– identified through the Barrier Assessment is not an indicator of compliance with the Drinking Water Regulations. It is an internal Irish Water assessment of the need to invest in areas of the Irish Water asset base through resource planning, to ensure that potential risks or emerging risks to supplies are addressed. Currently, there are two WRZs on the EPA Remedial Action List within SAJ, namely Mitchelstown and Killavullen. Irish Water is currently progressing immediate corrective action in relation to a number of supplies within SAJ in advance of the NWRP. Details of these are included in the SAJ Technical Report (RWRP-SW Appendix 3).

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 SAJ.

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

Table 2.4 Catchments within SAJ (EPA, 2020b)

WFD Catchments	Total Catchment Area (km^2)	Catchment Area within SAJ (km^2)
Blackwater (Munster)	3,308	2,804
Colligan-Mahon	662	1
Lee, Cork Harbour and Youghal Bay	2,182	4
Shannon Estuary South	2,038	172
Suir	3,553	1
Tralee Bay-Feale	1,780	9

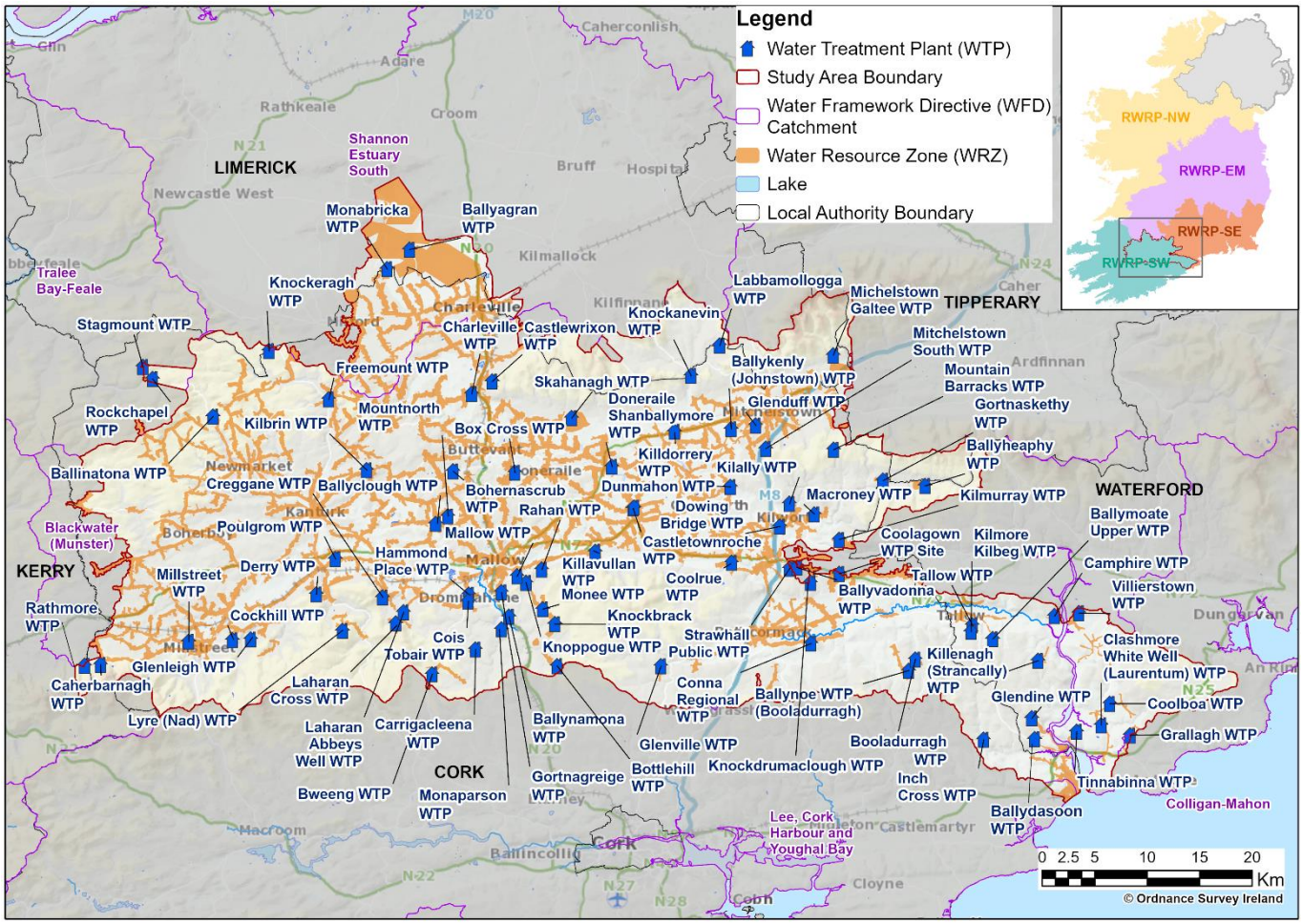

Figure 2.1 Water Environment of SAJ

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 are not yet in place.

Whilst the regulations and guidelines for the new abstraction regime are being developed, Irish Water are assessing existing abstractions to identify surface water sites that may exceed future abstraction thresholds. Irish Water 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 determined by the EPA based on the project level information before them.

As there are very few long duration flow records for Irish Water's abstractions and for waterbodies within Ireland, Irish Water 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. Irish Water 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, Irish Water has developed an initial desktop assessment based on available information (see SAJ Technical Report – RWRP-SW Appendix 3). Over the coming years, Irish Water will work with the environmental regulator, 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 SAJ supplies, Irish Water has assessed its surface water abstractions for its five surface water abstractions: River Bride (Conna Regional), Clyde River (Mallow), Fiddane Reservoir (Mallow), Behanagh River (Mitchelstown), and River Allow (Allow Regional). Based on this initial assessment, the volumes of water abstracted at River Bride (Conna Regional), Clyde River (Mallow), Fiddane Reservoir (Mallow), Behanagh River (Mitchelstown), and River Allow (Allow Regional) may not meet sustainability guidelines during dry weather flows. However, under the proposed regulatory regime, sustainability abstraction quantities will be adjudicated by the EPA who will have the benefit of detailed project level information.

Irish Water 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 Irish Water. Therefore, the pressures, and the relevant priority ‘Areas for Action’ are provided below and in Table 2.7.

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

Table 2.5 WFD Waterbodies within SAJ (EPA, 2022a)

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
Rivers	Blackwater (Munster)	139	6
	Colligan-Mahon	1	0
	Lee, Cork Harbour and Youghal Bay	0	0
	Shannon Estuary South	12	4
	Suir	1	0
	Tralee Bay-Feale	3	0
Lakes	Blackwater (Munster)	0	0
	Colligan-Mahon	0	0
	Lee, Cork Harbour and Youghal Bay	0	0
	Shannon Estuary South	0	0
	Suir	0	0
	Tralee Bay-Feale	0	0
Transitional and Coastal	N/A	4	0

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
Groundwater	N/A	35	1

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 construction and unknown anthropogenic) (32%) and Forestry (28%);
- Colligan-Mahon: Agriculture (78%);
- Lee, Cork Harbour and Youghal Bay: Hydromorphology (33%), Other (including waste and unknown anthropogenic) (29%) and Urban Runoff (27%).
- Shannon Estuary South: Agriculture (94%);
- Suir: Agriculture (72%); and
- Tralee Bay-Feale: Agriculture (61%), Hydromorphology (35%) and Urban Wastewater (35%).

The Allow_050 and Allow_060 waterbodies are at particular risk of abstraction in SAJ. Table 2.6 includes a summary of the 'at risk' waterbodies within SAJ.

Table 2.6 Summary of 'At Risk' Waterbodies in SAJ (EPA, 2022b)

Waterbody Type	Water Catchments	Number of Waterbodies Identified as 'At Risk'	Surface Waterbodies Status 'At Risk' Due to Abstraction Pressure*
Rivers	Blackwater (Munster)	37	18
	Colligan-Mahon	0	
	Lee, Cork Harbour and Youghal Bay	0	
	Shannon Estuary South	8	
	Suir	1	
	Tralee Bay-Feale	0	
Lakes	Blackwater (Munster)	0	0
	Colligan-Mahon	0	
	Lee, Cork Harbour and Youghal Bay	0	
	Shannon Estuary South	0	
	Suir	0	
	Tralee Bay-Feale	0	
Transitional and Coastal	N/A	2	0
Groundwater	N/A	14	N/A
Total		**62**	**18**

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

* Based on Irish Water 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 SAJ are listed in Table 2.7.

Table 2.7 'Areas for Action' within SAJ (catchments.ie, 2021e)

Areas for Action	Key Reasons for Selection
Allow	• Failing to meet protected area objectives for Freshwater Pearl Mussel (19 of 27 catchments of S.I. 296 2009) • Build on proposed improvements at Kanturk WwTP • Life project on this waterbody – potential to build on previous work with Teagasc, NPWS, Inland Fisheries Ireland (IFI) • Building on previous community and farmer engagement • One deteriorated waterbody • One potential 'quick win'
Awbeg (Buttevant) West	• Test case for drainage issues • Upper reaches of subcatchment, headwaters to At Risk waterbodies • Failing to meet protected area objectives for Crayfish • The IFI reported this is a good trout river • Two deteriorated waterbodies
Farahy	• Community groups in the area • Two deteriorated waterbodies • Tributaries to Funshion_050, a deteriorated High Ecological Status objective waterbody
Glenaboy	• Test case for diffuse urban issues • Building on existing work by IFI • Headwater tributary to the main channel of the Bridge (Blackwater) • One deteriorated waterbody
Licky	• 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
Ogeen	• Failing to meet protected area objectives for Freshwater Pearl Mussel (19 of 27 catchments of S.I. 296 2009) • Opportunity for Forest Service and Coillte to work together

Areas for Action	Key Reasons for Selection
	• Two deteriorated High Ecological Status objective waterbodies • Tributaries to main channel of the Awbeg, which is At Risk
Owentaraglin	• Opportunity to coordinate with IFI who are working in the area and have completed a stock assessment • Useful to help understand the High status deteriorated waterbodies in the tributaries to the Blackwater • One High Ecological Status objective deteriorated waterbody • One potential 'quick win'
Upper Deel	• Multi-agency approach between Cork and Limerick • Pilot project for the very poorly draining soils in Limerick • There is the potential for a rivers trust here • Community involvement, including active tidy towns group • The Deel is a good trout fishery • Two deteriorated waterbodies
Upper Funshion	• Building on proposed improvements at Mitchelstown WwTP • Two waterbodies are failing to meet protected area objectives for Freshwater Pearl Mussel (19 of 27 catchments of S.I. 296 2009) • Two deteriorated waterbodies

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 SAJ.

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 greenhouse gas emissions 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*".

Section 1 of the 2015 Act in turn defines 'climate neutral economy' as "*a sustainable economy and society where greenhouse gas emissions are balanced or exceeded by the removal of greenhouse gases*".

The amended Act requires public authorities, including Irish Water, 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 GW from onshore wind, 8 GW from solar, and at least 5 GW 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	• 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

Summary	
	• 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	• 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	• 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 • 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 proactive 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 SAJ

County	Key Risk Areas
Cork (Cork County Council, 2019)	• Flooding (Pluvial, Fluvial, Groundwater or Coastal or Marine) • Extreme Rainfall • Rising Sea Levels and Storm Surges • Storm Frequency and Intensity • Extreme Heat/Drought Conditions • Coastal Erosion • Wind Speeds
Kerry (Kerry County Council, 2019)	• Flooding (Pluvial, Fluvial, Groundwater or Coastal or Marine) • 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 • Coastal Erosion • Wind Speeds
Limerick (Limerick City and County Council, 2019)	• Flooding (Pluvial, Fluvial, Groundwater or Coastal or Marine) • Storm Frequency and Intensity • Extreme Cold/Heavy Snowfall and Ice • Extreme Heat/Drought Conditions • Coastal Erosion • Wind Speeds
Tipperary (Tipperary County Council, 2019)	• Flooding (Pluvial, Fluvial, Groundwater or Coastal or Marine) • Extreme Heat/Drought Conditions
Waterford (Waterford City and County Council, 2019)	• Flooding (Pluvial, Fluvial, Groundwater or Coastal or Marine) • Rising Sea Levels and Storm Surges • Extreme Cold/Heavy Snowfall and Ice • Extreme Heat/Drought Conditions • Wind Speeds

Climate change is expected to influence weather conditions, such as frequency of droughts and extreme events such as storms, and is likely to affect habitats and species, water availability for supply and water demand and water quality. For SAJ, not all supplies within the study area meet the required levels of

reserve capacity. As evidenced in the 2018 drought, 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 Irish Water's strategy is to 'Supply Smarter', by improving the quality, resilience and security of 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 SAJ there are a number of European, national and locally designated sites, including Special Protected Areas (SPAs), Special Areas of Conservation (SACs), National Parks, Nature Reserves, and proposed Natural Heritage Areas (see Table 2.10 and Figure 2.2). Proposed Marine Conservation Zones (MCZs) are currently undergoing consultation. The European sites (SPAs and SACs), and the potential impacts on them, are discussed in more detail in the NIS.

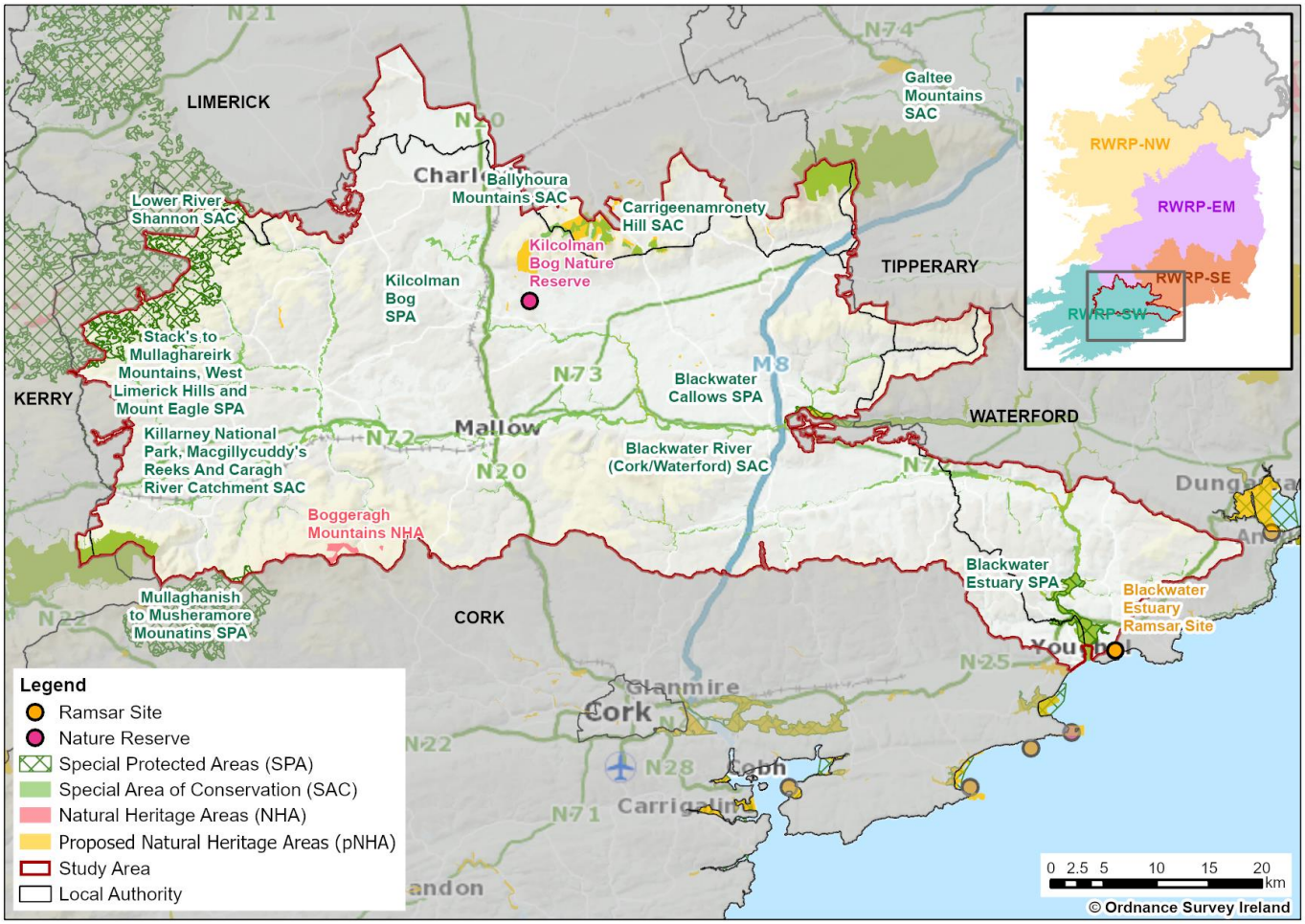

Figure 2.2 Designated Sites in SAJ

Table 2.10 Designated Sites within SAJ (NPWS, 2019a)

Receptor	Name	Total Number
	Blackwater Estuary SPA	5

Receptor	Name	Total Number
Special Protected Area (SPA)	Blackwater Callows SPA	
	Kilcolman Bog SPA	
	Mullaghanish to Musheramore Mountains SPA	
	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	
Special Area of Conservation (SAC)	Ballyhoura Mountains SAC	6
	Blackwater River (Cork/Waterford) SAC	
	Carrigeenamronety Hill SAC	
	Galtee Mountains SAC	
	Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC	
	Lower River Shannon SAC	
Ramsar Sites	Blackwater Estuary	1
Nature Reserves	Kilcolman Bog	1
National Parks	N/A	0
Natural Heritage Areas (NHAs)	Boggeragh Mountains NHA	1
Proposed Natural Heritage Areas (pNHAs)	See Figure 2.2	35

2.4.2 Habitats

Table 2.11 lists the percentage of the study area, and the number of hectares, covered by each habitat within SAJ; as reported in the Corine land use dataset[1].

Table 2.11 Habitat Areas for SAJ (EPA, 2018)

Habitat	Ha	% of Study Area
Agricultural Land		
Complex cultivation patterns	3,348	1.12%
Land principally occupied by agriculture, with significant areas of natural vegetation	8,604	2.87%
Non-irrigated arable land	16,517	5.51%
Pastures	215,876	72.01%
Natural Habitats		
Bare rocks	199	0.07%

[1] The EPA land use dataset will be used once this is available

Habitat	Ha	% of Study Area
Estuaries	505	0.17%
Inland marshes	95	0.03%
Moors and heathland	971	0.32%
Natural grasslands	737	0.25%
Peat bogs	7,330	2.45%
Salt Marshes	180	0.06%
Sparsely vegetated areas	6	0.00%
Water courses	182	0.06%
Forest		
Broad-leaved forest	1,679	0.56%
Coniferous forest	20,362	6.79%
Mixed forest	3,070	1.02%
Transitional woodland-shrub	16,782	5.60%
Urban		
Continuous urban fabric	74	0.02%
Discontinuous urban fabric	2,366	0.79%
Green urban areas	68	0.02%
Road and rail networks and associated land	70	0.02%
Sport and leisure facilities	340	0.11%
Industry		
Industrial or commercial units	184	0.06%
Mineral extraction sites	234	0.08%

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

- Oligotrophic waters containing very few minerals of sandy plains;
- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*;
- Bog habitats – Rhynchosporion depressions;
- Groundwater dependant terrestrial habitats, such as blanket bogs; and
- Northern Atlantic wet heaths with *Erica tetralix*.

2.4.3 Species

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

- Otter (*Lutra lutra*);
- Bat species – Lesser Horseshoe Bat (*Rhinolophus hipposideros*);
- Fish species – Atlantic Salmon (*Salmo salar*), Lamprey species;

- Fresh-water pearl mussel (*Margaritifera margaritifera*);
- Killarney Fern (*Trichomanes speciosum*);
- Kerry Slug (*Geomalacus maculosus*);
- White-clawed Crayfish (*Austropotamobius pallipes*);
- Marsh Fritillary (*Euphydryas aurinia*);
- Slender Naiad (*Najas flexilis*);
- Killarney Shad (*Alosa fallax killarnensis*);
- Waterbirds of 'qualifying interest' e.g. whooper swan (*Cygnus cygnus*), and winter migratory waders; and
- Other 'qualifying interest' bird species e.g. hen harrier (*Circus cyaneus*).

The key invasive plant and animal species to consider (National Biodiversity Data Centre, 2021) for developing options within SAJ are stated below.

Animals:

- American mink (*Neovison vison*);
- Dace (*Leuciscus leuciscus*);
- Grey squirrel (*Sciurus carolinensis*);
- Ruddy duck (*Oxyura jamaicensis*); and
- Wild boar (*Sus scrofa*).

Plants:

- American skunk-cabbage (*Lysichiton americanus*);
- Brazilian giant-rhubarb (*Gunnera manicata*);
- Fringed water-lily (*Nymphoides peltata*);
- Giant hogweed (*Heracleum mantegazzianum*);
- Himalayan/Indian balsam (*Impatiens glandulifera*);
- Himalayan knotweed (*Persicaria wallichii*);
- Japanese knotweed (*Fallopia japonica*);
- Rhododendron (*Rhododendron ponticum*);
- Salmonberry (*Rubus spectabilis*);
- Three-cornered leek (*Allium triquetrum*);
- Water fern (*Azolla filiculoides*); and
- Waterweeds (*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 SAJ are listed in Table 2.12, such as agricultural land 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.

Irish Water has seventy-eight WTPs in SAJ, meeting the demand of 50.0 Ml/d in 2019.

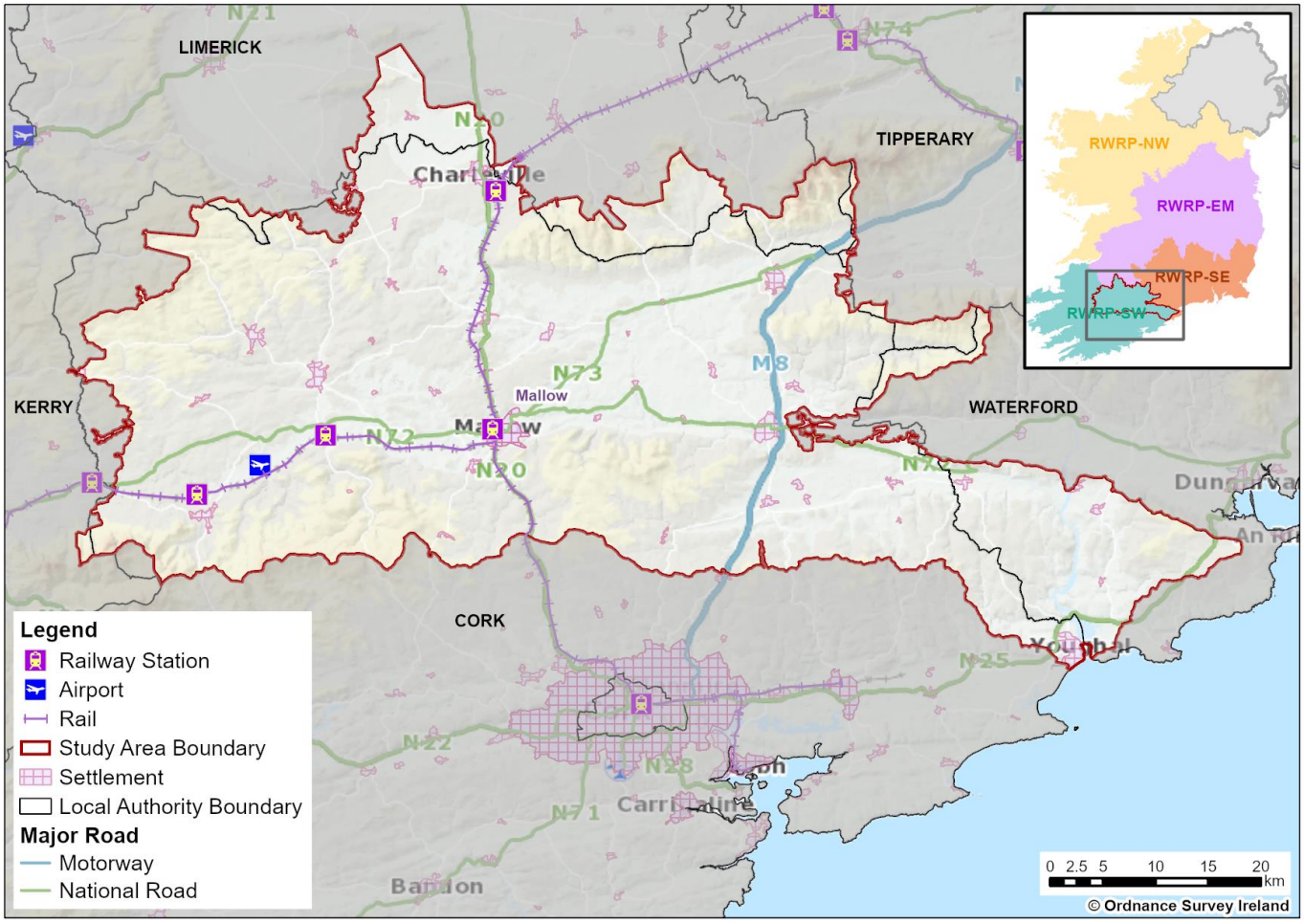

Figure 2.3 Transport Infrastructure in SAJ

There are no canals or ports of national or regional significance in SAJ. There is one local airport, the Rathcoole Aerodrome. Other significant transport infrastructure includes the main road network (particularly the N72, N20, N73, N25 and M8).

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

Table 2.12 Land Use within SAJ (EPA, 2018)[2]

Land use	Ha	% of Study Area	Comparison to Overall South West Region %
Agriculture	244,345	81.51%	66.37%
Urban	2,917	0.97%	1.57%
Natural Habitats	10,205	3.40%	20.73%
Forest	41,893	13.97%	10.97%
Industry	418	0.14%	0.29%
Other	0	0.0%	0.08%

[2] The EPA land use dataset will be used once it has been made available

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

Table 2.13 gives an overview of the project developments which are available from myProjectIreland (2021) for SAJ[3]. 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		
Ballydesmond	Ballydesmond Village Public Realm and Placemaking Enhancement Plan	Banteer Amenity Project
Cork Events Centre	Development of a Georgian Cultural/Heritage Quarter for Mitchelstown	Kanturk Regeneration – Phase 1
M20 Cork to Limerick	Mallow Town Regeneration and Mallow Town Regeneration 2	MY Greenway – Midleton to Youghal
N72/N73 Mallow Relief Road	Rathcormac Strategy for Development	Mallow Wastewater Treatment Plant

2.6 Landscape and Visual Amenity

2.6.1 Landscape and Visual

The National Landscape Strategy 2015-2025 is in the process of being implemented and will be Ireland's vehicle for complying with the EU Landscape Convention. Landscape assessment guidance is also available from the local authorities. This will be taken into account when identifying landscape character areas and protected areas at the project level in the future. Table 2.14 shows the sensitivity and value of the Landscape Character Areas (LCAs) within each of the counties listed within the study area[4]. There is no value or sensitivity information available from Limerick City and County (Limerick County Council, 2010).

The value of the landscape in SAJ 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.

[3] Note that the myProjectIreland dataset was taken at a fixed point in time to allow for assessment of cumulative effects. The date for SAJ being the 17/01/22.
[4] As with all the baseline information, the LCA information will be updated as part of regular reviews.

Table 2.14 Value and Sensitivity of Landscape Character Areas in the Counties of SAJ (Ordnance Survey Ireland. N.d.)

Landscape Character Area	Sensitivity	Value
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
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

Landscape Character Area	Sensitivity	Value
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: Kerry (Kerry County Council, 2021)		
Beal Hill and Ballybunion	-	High
The Shannon Estuary	-	Medium / High
Bunnaruddee Bog and Galey River	-	Low / Medium
Kerry Head and Ballyduff	-	Medium / High
Listowel and The Cashen River	-	Medium
Banna and Ardfert	-	Medium / High
Smearlagh River Valley	-	Low / Medium
River Feale Valley	-	Medium
Stack's and Glanaruddery Mountains	-	Low / Medium
Mount Eagle and Owveg River Valley	-	Low / Medium
Tralee and Castleisland	-	Medium
Blasket Islands, Smerwick Harbour and Mount Brandon	-	High
Ventry and Dingle Harbours	-	High
Brandon Bay	-	High
Garfinny and Owenalondrig River Valleys	-	Medium / High
Tralee Bay, The Maharees and Northern Slieve Mish Mountains	-	High
Annascaul, Inch and Southern Slieve Mish Mountains	-	Medium / High
Milltown and Castlemaine	-	Medium
Gweestin River Valley	-	Medium
Deenagh and Glanoragh River Valleys	-	Medium
The Brown Flesk River Valley	-	Medium
Quagmire and Owneyskeagh Rivers	-	Medium
River Blackwater and Rathmore	-	Medium
Rossbeigh and Cromane	-	Medium / High

Landscape Character Area	Sensitivity	Value
Killorglin and Beaufort	-	Medium / High
Lough Leane and Killarney National Park	-	High
Clydagh River, The Paps and the Derrynasaggart Mountains	-	Medium / High
Coomasaharan Lake and Mountain Stage	-	Medium / High
Glencar, Caragh Lake and The Bridia Valley	-	High
MacGillycuddy Reeks and The Black Valley	-	High
Cahersiveen	-	Medium / High
Valentia Island and Saint Finan's Bay	-	High
Lough Currane and Mástir Gaoithe	-	Medium / High
Derrynane and Castlecove	-	High
Sneem and Ardsheelhane River Valley	-	Medium / High
Blackwater and Ballaghbeama	-	Medium / High
Kenmare	-	Medium / High
Kilgarvan and Roughty River Valley	-	Medium / High
Healy Pass, Kilmakilloge Harbour and Lough Inchiquin	-	High
Bonane and Sheen River Valley	-	Medium / High
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
Littleton Farmland Mosaic and Marginal Peatland	-	Dominant Low with some Moderate and High

Landscape Character Area	Sensitivity	Value
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 Mounain 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)		

Landscape Character Area	Sensitivity	Value
Lower Waterford Estuary	-	Most Sensitive
Tramore Bay	-	Most Sensitive
Copper Coast East	-	Most Sensitive
Copper Coast West	-	Most Sensitive
Dungarvan	-	Most Sensitive
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
Rathgormack 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

2.6.2 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 one SCA in SAJ; the Atlantic Celtic Bays & Estuaries.

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 air quality index rating of the area within SAJ is rated as ‘good’.

In general, the water industry is not a major contributor to air quality issues, although there is potential for local pollution through Irish Water 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 Mallow, Fermoy, N20, N25 and M8.

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 SAJ, 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, 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.

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.

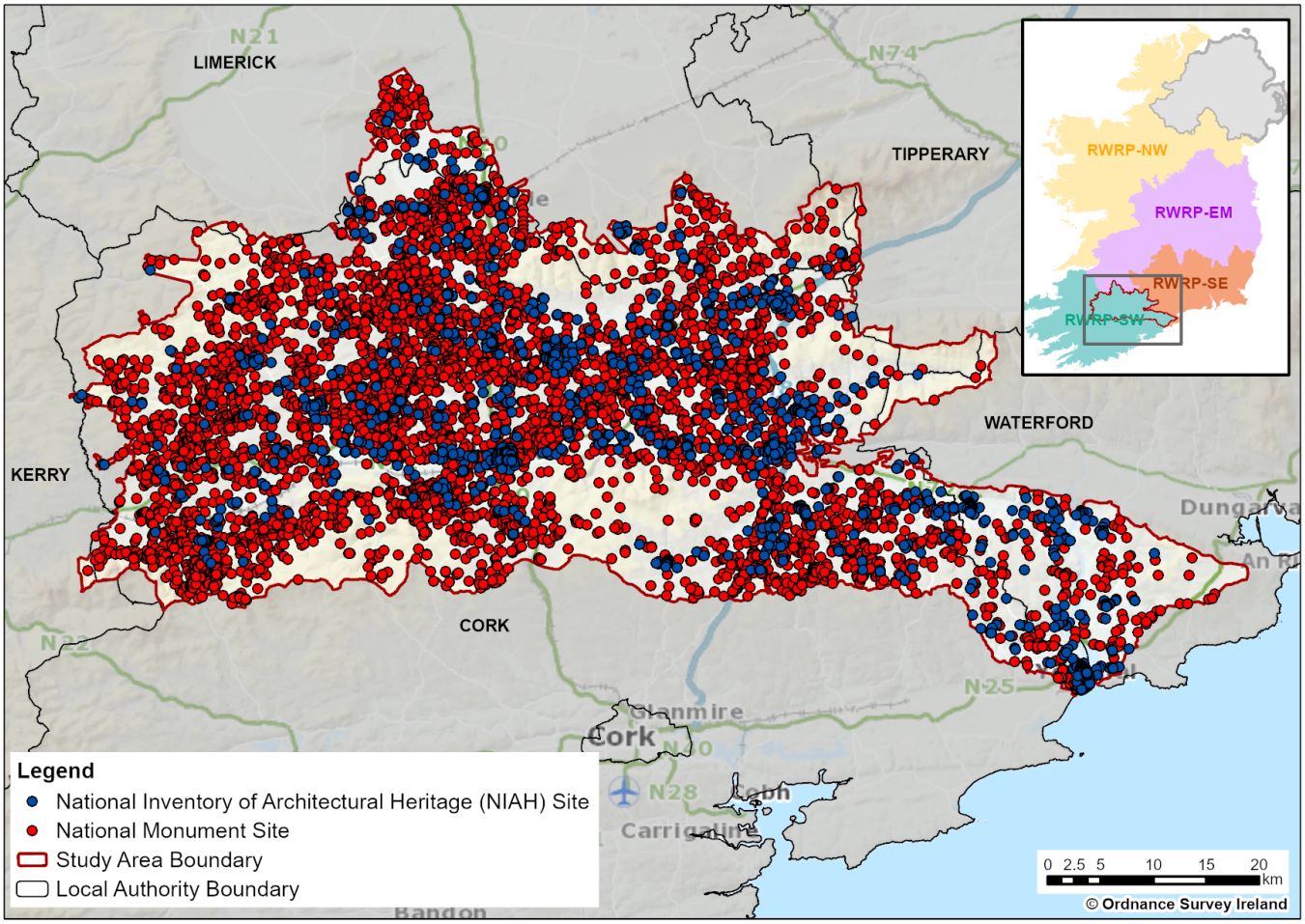

Figure 2.4 SAJ Cultural Heritage Assets

Table 2.15 Cultural Heritage Assets within SAJ

Assets	Total Number
National Monuments Service Sites	6,901
National Inventory of Architectural Heritage Sites	2,177
Sites and Monuments Record Zones	4,892

2.9 Geology and Soils

Table 2.12 lists the land uses within SAJ. SAJ predominantly has a loamy soil type (EPA, 2019a).

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 SAJ are shown in Figure 2.5.

Due to the underlying sandstone geology and karst topography, groundwater supplies are the dominant source of supply for the region. These groundwater sources are replenished by winter rainfall to meet higher demand in the spring and summer. Regarding surface water availability, SAJ is almost entirely within the Blackwater (Munster) catchment, except for a small part in the far north of the Study Area

crossing into the Shannon Estuary South catchment. Approximately a quarter of the water supplies to SAJ come from 5 surface water sources within Blackwater catchment.

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, 28 of which have the potential to constrain water resource options in SAJ.

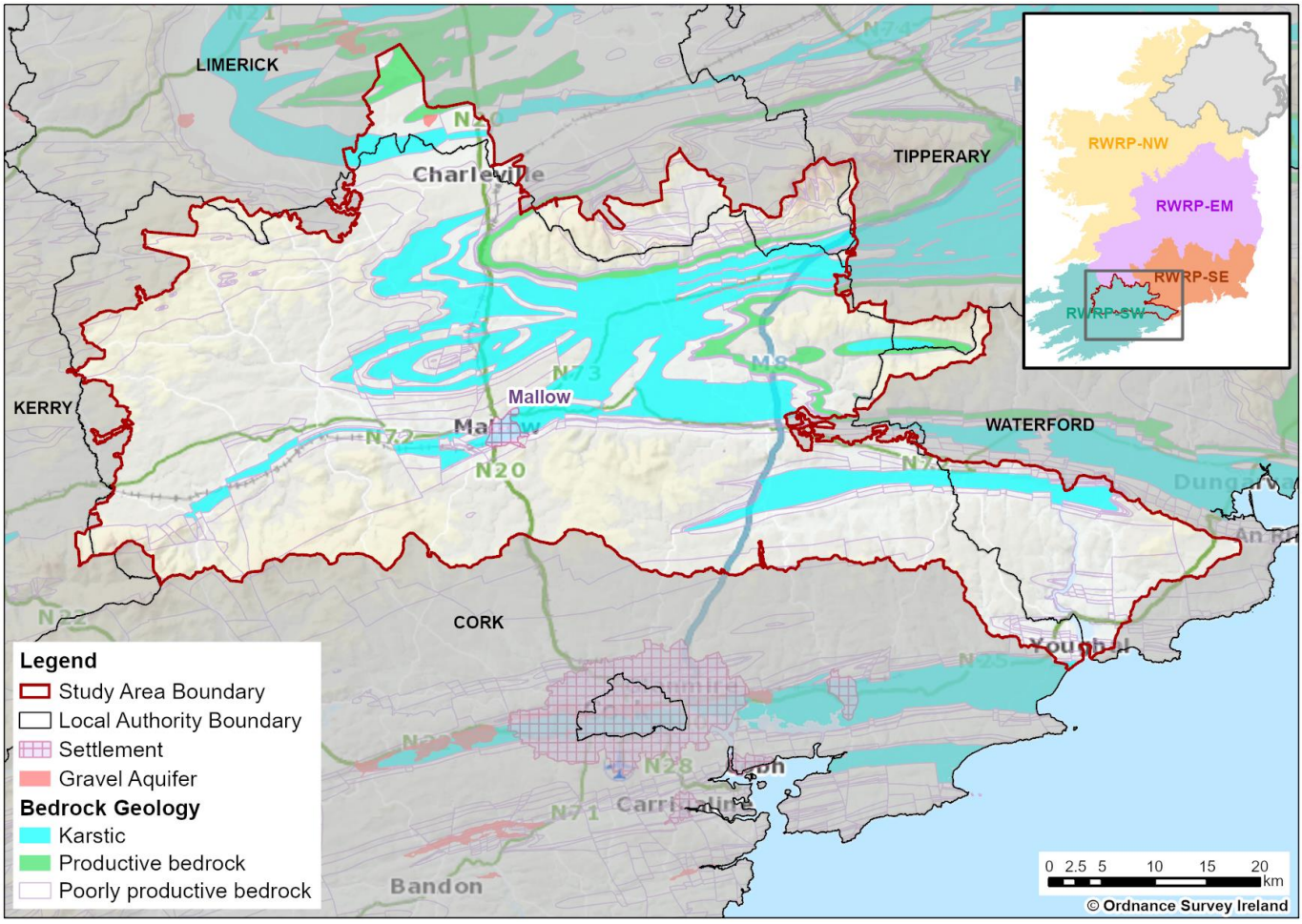

Figure 2.5 SAJ Hydrogeology

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 SAJ 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	**Issues:** Increasing population and the increased stress of climate change on water quality and water resources could affect health and well-being. **Opportunities:** Irish Water will put in place plans to assess water quality and measures to address risks as part of the Regional Plan	Climate change, biodiversity, water environment, material assets and landscape and visual amenity

SEA Topic	Issues and Opportunities	Interrelated Topics
	Irish Water has ongoing activities to improve the Supply Demand Balance in SAJ, including, leakage management and water conservation measures. Raising awareness of the importance of water conservation and efficiency measures, and the value of the environment for health and wellbeing, can play an important part in water planning. Valuing the importance of access to the environment for recreation.	
Water Environment	**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 SAJ, some of the existing abstractions may not meet sustainability guidelines in the medium term; specifically, during drought periods. On an interim basis, Irish Water has developed an initial conservative assessment based on available information (see SAJ Technical Report). This has been used to inform options identification and appraisal. Irish Water will update its sustainability analysis and impact on its baseline Supply Demand Balance (SDB) calculations when regulatory assessment for the new legislation is undertaken. **Opportunities:** To take account of identified pressure on the water environment in the selection of solutions for SAJ.	Biodiversity and climate change
Biodiversity, Flora and Fauna	**Issues:** For SAJ, the Blackwater (Munster) catchment is designated the Blackwater River (Cork/Waterford) SAC, with a large portion of this also designated as a Freshwater Pearl Mussel (*Margaritifera margaritifera)* SAC catchment. Therefore this is required to achieve high ecological status WFD objectives. 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	Water resources, water quality and climate change
Material Assets	**Issues:** WTP assets and network infrastructure requiring improvement or replacement **Opportunities**: Improvements to support reliability of access to good quality water.	Health and wellbeing

SEA Topic	Issues and Opportunities	Interrelated Topics
Landscape and Visual Amenity	**Issues**: Potential for climate change to affect land use and habitats and influencing landscape quality and amenity.	Biodiversity and geology and soils, climate change, health and wellbeing
Air Quality and Noise	No specific issues identified for the baseline for SAJ.	Health and wellbeing
Climate Change	**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. **Opportunities:** Additional management to minimise impact on supply and the environment, vulnerability to climate change and drought is required.	Biodiversity and water environment
Cultural Heritage	**Issues**: Known cultural heritage and archaeological assets and potential unknown archaeological assets.	Health and wellbeing
Geology and Soils	**Issues**: General need for good soil conservation and retention of nutrients and carbon in soil resources **Opportunities:** Potential benefits from soil conservation for biodiversity, water quality and water retention also.	Biodiversity, water quality, landscape and climate change
Additional interrelated aspects	**Issues**: Poor water quality requiring additional water treatment and affecting aquatic biodiversity. **Opportunities**: Potential for catchment management initiatives leading to habitat, water retention, water quality enhancement and soil quality have the potential to provide wider benefits for environmental resilience and water supply; although this has not been specifically studied in this study area.	

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

Irish Water applied its Options Assessment Methodology from the Framework Plan to identify potential solutions to meet the needs identified in the SAJ 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 SAJ 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 being developed there will be more detailed site specific information.

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

3.2.1 Existing Groundwater Abstractions

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

3.2.2 New Groundwater Abstractions

The Zone of Contribution (ZOC), the land area that contributes water to the well or spring, is defined and used to calculate a preliminary water balance for the source using the average abstraction rate and the annual average recharge rate as estimated from the Geological Survey Ireland (GSI) recharge maps. The water balance estimates the area needed to supply the yield and is then compared to the delineated ZOC. A WFD >20% 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 are not yet in place. Therefore, Irish Water 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 Irish Water 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, Irish Water developed an initial list of unconstrained options for new supplies, increases and upgrades to existing supplies. An unconstrained options review workshop was held with Irish Water'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 503 unconstrained options were identified for SAJ 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 9 of the SEA Environmental Report for the Framework Plan. 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 503 unconstrained options, 161 were rejected after being analysed against the coarse screening criteria of resilience, deliverability and environment.

Sustainability reasons for rejecting options were identified for 47 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 SAJ. The full rejection register, including both the coarse and fine screening (where applicable) is provided in the SAJ Technical Report – RWRP-SW Appendix 3.

Table 3.2 Coarse Screening Rejection Register

Option Reference	Option Description	Rejection Reasoning
SAJ-016	Interconnect Newmarket and Central Regional – Lough Guitane WRZs and supply deficit from Central Regional – Lough Guitane.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status. Therefore,

Option Reference	Option Description	Rejection Reasoning
SAJ-075	Interconnect Millstreet and Central Regional – Lough Guitane WRZ and supply deficit from Central Regional – Lough Guitane.	this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAJ-040	Increase existing SW abstraction/raw water storage from Fiddane Reservoir and upgrade existing Mallow WTP to supply deficit.	Any increase of abstraction (if possible) can only fulfil only a fraction of the large deficit at Mallow WRZ. There is also the possibility of over abstraction from this source. Therefore, this option did not meet the requirements for Deliverability, Resilience and Environmental and was rejected at coarse screening stage.
SAJ-033	Rationalise Charleville / Doneraile to Glenosheen/ Jamestown/ Kilmallock WRZ (Jamestown springs) WRZ. Develop additional wells at Jamestown Spring and new WTP.	Interconnection is a better option and additional yield of 14 MLD required from Jamestown springs. This option did not meet the Deliverability, Resilience and Environmental criteria and as a result, was not taken forward to the fine screening stage as rationalisation is not considered feasible.
SAJ-057	New SW abstraction from Funshion River and new WTP to supply deficit.	Option does not cover full deficit and requires significant amount of pipeline. Therefore, the option did not meet the requirements for Deliverability, Resilience and Environmental and was rejected at coarse screening stage.
SAJ-009	New SW abstraction from the Dalua River and new WTP to partly supply deficit.	The Duala River is a WFD high-status waterbody and the abstraction point is within the SAC region. The river could supply approximately one third of the deficit. Therefore, this option did not meet the requirements of Resilience, Deliverability and Environmental and was rejected at coarse screening.
SAJ-041	Increase existing SW abstraction from Clyda River Intake and upgrade existing Mallow WTP to supply deficit.	The estimated sustainable abstraction from this source can fulfil just above 50% of the deficit. There is also the possibility of over abstraction from this source. Therefore, this option did not meet the requirements for Deliverability, Resilience and Environmental and was rejected at coarse screening stage.
SAJ-117	Increase SW abstraction from River Allow and upgrade Freemount WTP.	The option does not address full deficit, as the estimated allowable abstraction is limited. Therefore, this option did not meet the requirements of Deliverability, Resilience and Environmental criteria and was rejected at coarse screening stage.
SAJ-121	New connection to NSS to feed Newmarket, Charleville/Doneraile,	The option requires a significant length of new and upgraded pipeline for a relatively small supply.

Option Reference	Option Description	Rejection Reasoning
	Mallow and Allow Regional WRZs via Newcastle West.	Transferring small quantities of water over long distances can affect the quality of water. Therefore, this option did not meet the requirements of Deliverability, Resilience and Environmental criteria and as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-020	New connection to NSS to feed Newmarket, Charleville / Doneraile, Mallow and Allow Regional WRZs via Newcastle West).	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, this option did not meet the Deliverability, Resilience and Environmental criteria and as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-030	New connection to NSS to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs via Newcastle West).	
SAJ-049	New connection to NSS to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs via Newcastle West).	
SAJ-327	New connection to NSS to feed Newmarket, Charleville/Doneraile, Mallow Allow Regional [full demand] and Cork City [deficit] WRZs.	
SAJ-328	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-329	New connection to Limerick City (NSS source) to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-330	New connection to NSS to feed Newmarket, Charleville/Doneraile, Mallow Allow Regional [full demand] and Cork City [deficit] WRZs.	
SAJ-331	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket,	

Option Reference	Option Description	Rejection Reasoning
	Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-332	New connection to Limerick City (NSS source) to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-333	New connection to NSS to feed Newmarket, Charleville/Doneraile, Mallow Allow Regional (full demand) and Cork City (deficit) WRZs.	
SAJ-334	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-335	New connection to Limerick City (NSS source) to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-336	New connection to NSS to feed Newmarket, Charleville/Doneraile, Mallow Allow Regional [full demand] and Cork City (deficit) WRZs.	
SAJ-337	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	
SAJ-338	New connection to Limerick City (NSS source) to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs.	
SAJ-280	Rationalise Mountain Barracks to Mitchelstown WRZ (Mitchelstown Galtee WTP).	There are issues around available yield and as a result, this option did not meet the Resilience, Deliverability and Environmental criteria and would not be taken forward to the fine screening stage.
SAJ-290	Rationalise Castletown Ballyagran to South West Regional WRZ (Castlemahon WTP).	
SAJ-072	Increase existing abstraction at Cockhill borehole and upgrade Cockhill WTP.	There is a great uncertainty around available yield and as a result, this option did not meet the requirements of

Option Reference	Option Description	Rejection Reasoning
SAJ-092	Increase GW abstraction at Kildorrery (Glenavuddig) BH and upgrade existing Kildorrery WTP to supply deficit.	Deliverability, Resilience and Environmental criteria and is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-096	Increase GW abstraction from Kildorrery (Ballyvisteen) spring and upgrade existing Ballyvisteen WTP to supply deficit.	
SAJ-097	Increase GW abstraction from existing Kilally (Kilworth) BH and upgrade Kilally WTP to supply deficit.	
SAJ-105	Increase GW abstraction from Johnstown (BH) and upgrade Ballykenley (Johnstown) WTP to supply deficit.	
SAJ-107	Increase GW abstraction from existing BH and upgrade Dunmahon WTP to supply deficit.	
SAJ-131	Increase GW abstraction from no. 2 BHs and upgrade Creggane WTP to supply deficit.	
SAJ-372	Increase existing GW abstraction and upgrade Tallow WTP.	
SAJ-056	New SW abstraction from Funshion River and new WTP to supply deficit.	This option cannot meet deficit and is within a Freshwater Pearl Mussel catchment. As the deficit is not met this option did not meet the requirements for Deliverability, Resilience and Environmental and was rejected at coarse screening stage.
SAJ-058	Increase existing abstraction from Behanagh River and upgrade Mitchelstown Galtee WTP to partly supply deficit.	This option included increasing the abstraction at Behanagh River to partly supply deficit. The Behanagh River is a WFD high status waterbody. The estimated sustainable abstraction is only approximately 10-15% of the deficit. As the option will not meet deficit and did not meet the requirements for Deliverability, Resilience and Environmental it was rejected at coarse screening.
SAJ-060	Increase existing abstraction from Behanagh River and upgrade Mitchelstown Galtee WTP to partly supply deficit.	This option included increasing the abstraction at Behanagh River to partly supply deficit. There are issues around available yield and as a result, this option did not meet the requirements for Deliverability, Resilience and Environmental and would not be taken forward to the fine screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-059	Increase existing abstraction from Behanagh River and upgrade Mitchelstown Galtee WTP to partly supply deficit.	This option included increasing the abstraction at Behanagh River to partly supply deficit. There are yield issues associated with this option and an increase in SW abstraction is not possible, therefore, this option did not meet the requirements for Deliverability, Resilience and Environmental and was rejected at coarse screening.
SAJ-147	New SW abstraction from Clyda River and new WTP to supply deficit.	This option included increasing the abstraction at River Clyde to partly supply deficit. There was insufficient yield to supply the full deficit. The option did not meet the requirements of the Deliverability, Resilience and Environmental criteria. As the option will not meet deficit it was rejected at coarse screening.
SAJ-343	New SW abstraction from Knockananig Reservoir and treat water at Coolrue WTP (full treatment needed for SW source). This source was historically used to supply Fermoy.	This option proposes a new SW abstraction to meet 1,251m^3/d deficit. However there is only approximately 54m^3/d is available. This option did not meet the Deliverability, Resilience and Environmental criteria and would not be taken forward to the fine screening stage.
SAJ-130	Increase GW abstraction no. 2 BHs and upgrade Creggane WTP to supply deficit.	This option proposes an increase GW abstraction to supply deficit. This option was deemed not feasible due to high turbidity. This option did not meet the requirements of Deliverability, Resilience and Environmental criteria.
SAJ-264	Interconnect Knockeragh and South West Regional WRZs and supply deficit from South West Regional (Tobergal springs).	This option proposes to supply deficit from South West Regional (Tobergal springs). There is not enough yield at this abstraction. This option did not meet the Deliverability, Resilience and Environmental criteria and therefore, this option is not taken forward to the fine screening stage.
SAJ-316	New SW abstraction from Kilmaloo Lake and new WTP to supply deficit.	This option recommends a new SW abstraction from Kilmaloo Lake. This is categorised not as a lake but as a wetland. Therefore, this option did not meet the Deliverability, Resilience and Environmental criteria and is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-308	New SW abstraction from Knockmeelmore River and new WTP to supply deficit.	This option recommends a new SW abstraction from Knockmeelmore River. There are issues with yield at this abstraction point. Therefore, this option did not meet the Deliverability, Resilience and Environmental criteria and would not be taken forward to the fine screening stage.
SAJ-198	Interconnect Monabricka with South West Regional Scheme WRZ and supply deficit (Castlemahon WTP).	This option recommends interconnecting Monabricka with South West Regional Scheme WRZ. There are issues around available yield and an increase in SW abstraction is not possible. As a result, this option did not meet the Deliverability, Resilience and Environmental criteria and is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-255	Rationalise Labbamollogga to Mitchelstown WRZ (Mitchelstown Galtee WTP).	This option recommends rationalising Labbamollogga to Mitchelstown WRZ. There are issues around available yield and an increase in SW abstraction is not possible. As a result, this option did not meet the Deliverability, Resilience and Environmental criteria and is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-165	Rationalise Lombardstown Glantane to Banteer WRZ (Creggane WTP).	This option recommends rationalising Lombardstown Glantane to Banteer WRZ but there are existing issues with yield. Therefore, this option did not meet the Resilience, Deliverability and Environmental criteria and as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.

3.4 Stage 5: Fine Screening

A total of 342 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.

A further two options were rejected at fine screening in SAJ.

3.5 Stage 6: Feasible Options List

A total of 340 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 SAJ Technical Report (RWRP-SW Appendix 3).

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, Irish Water 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-SW:

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 options[4] 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

[4] 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).

project specific mitigation applied as these can be addressed with general/standard mitigation measures. Scores of -3 equates to LSEs that may be difficult to mitigate or where uncertainty remains.

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.

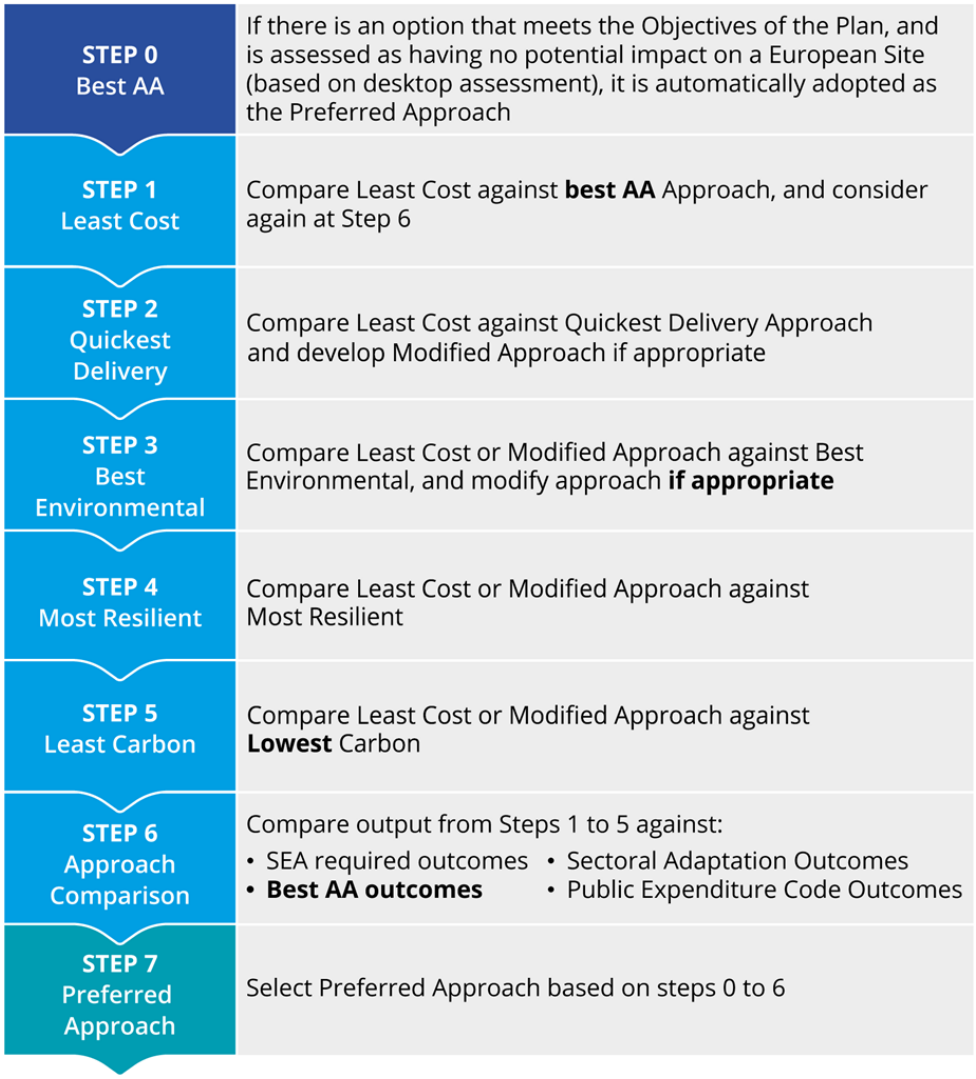

Figure 4.1 The 7 Step Process

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 Irish Water 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.

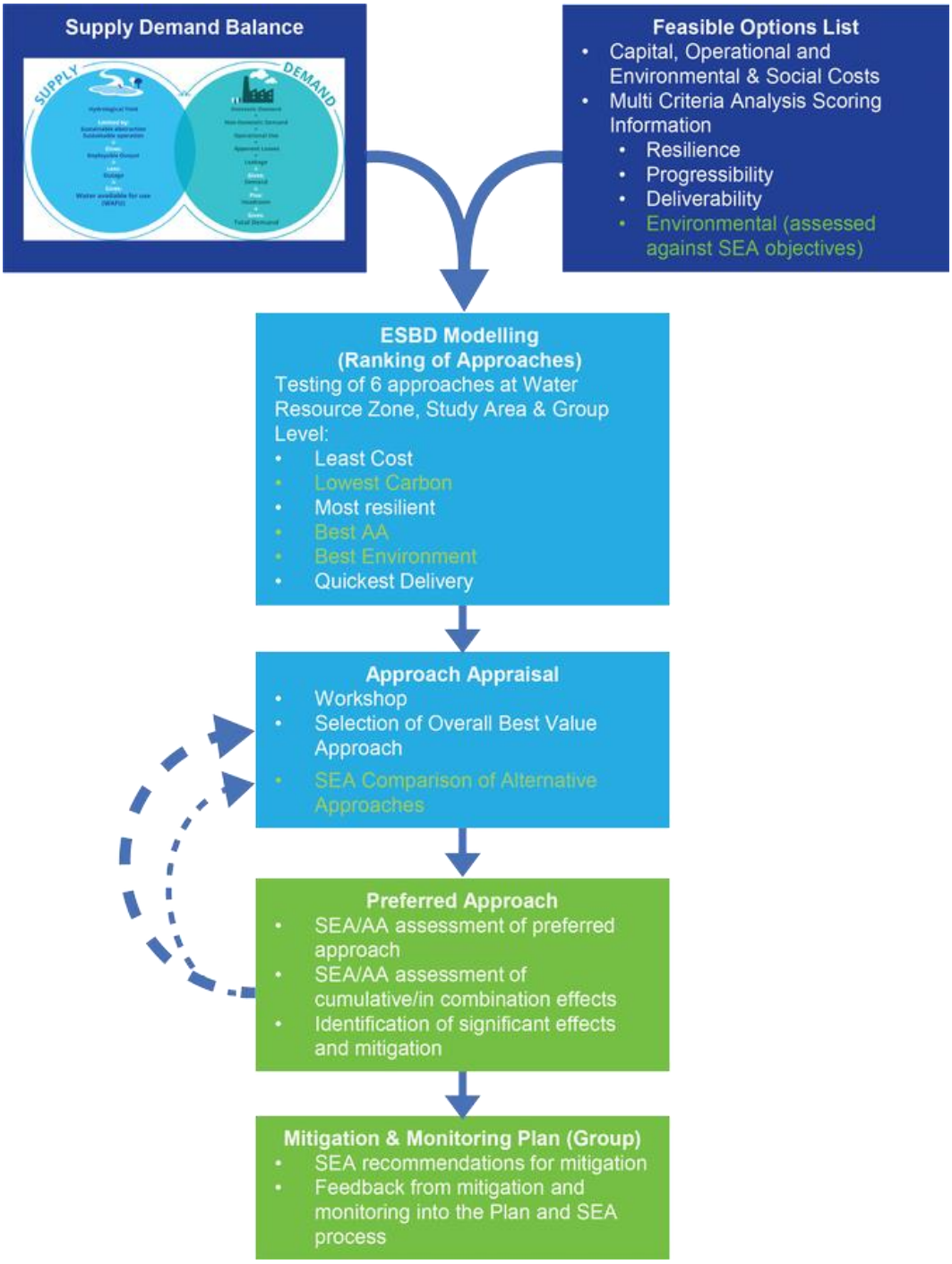

Figure 4.2 Approach Development Process

4.3 SAJ 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 SAJ there are 104 WRZ options and these are listed in Table 5.2 in the SAJ Technical Report (RWRP-SW Appendix 3), 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 SAJ, a total of 14 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 SAJ Summary of SA Combination of Performance against Approach Category

Category	WRZ Level Approach	SA Combination 1	SA Combination 2	SA Combination 3	SA Combination 4	SA Combination 5	SA Combination 6	SA Combination 7	SA Combination 8	SA Combination 9	SA Combination 10	SA Combination 11	SA Combination 12	SA Combination 13
Least Cost	Worst												Best	
Quickest Delivery													Worst	Best
Number of -3 Biodiversity Scores	Three -3 Scores	One -3 Score	Two -3 Scores	Two -3 Scores	Two -3 Scores	Two -3 Scores	Three -3 Scores	Two -3 Scores	Two -3 Scores	Two -3 Scores	Three -3 Scores	Three -3 Scores	Two -3 Scores	Three -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–- RWRP-SW Appendix 3); these aligned as four approaches (see Table 4.3).

Table 4.3 Study Area Approach Categories

Category	SA Approach 1 (SA Combination 1) (SA Option 1, 15, 20, 25, 26, 33, 38, 47)	SA Approach 2 (SA Combination 10) (SA Option 15, 20, 25, 26, 33, 38, 78, 79a)	SA Approach 3 (SA Combination 12) (SA Option 20, 31, 95, 97, 100, 101, 109, 111,113, 114, 116, 117, 127, 128, 129, 130, 131)	SA Approach 4 (SA Combination 13) (SA Option 52)
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 (SA Approach 3) (SA combination 12)	Best Appropriate Assessment (SA Approach 1) (SA combination 1)	Quickest Delivery (SA Approach 4) (SA Combination 13)	Best Environmental (SA Approach 3) (SA combination 12)	Most Resilient (SA Approach 2) (SA combination 10)	Lowest Carbon (SA Approach 1) (SA Combination 1)
SA options (Group options)	No options	**SA option 20:** 154 & 155, 278 **SA option 31:** 260, 325	**SA option 1:** 011, 119 **SA option 15:** 82, 241	**SA option 52:** 311, 322	**SA option 20:** 154 & 155, 278 **SA option 31:** 260, 325	**SA option 15:** 82, 241 **SA option 20:** 154 & 155, 278	**SA option 1:** 011, 119 **SA option 15:** 82, 241

Options included	Do Minimum	Least Cost (SA Approach 3) (SA combination 12)	Best Appropriate Assessment (SA Approach 1) (SA combination 1)	Quickest Delivery (SA Approach 4) (SA Combination 13)	Best Environmental (SA Approach 3) (SA combination 12)	Most Resilient (SA Approach 2) (SA combination 10)	Lowest Carbon (SA Approach 1) (SA Combination 1)
		SA option 95: 396, 397, 398, 399, 400, 401 **SA option 97:** 406, 407, 408, 409, 411, 412, 413, 414, 415 **SA option 100:** 423, 424 **SA option 101:** 425, 426 **SA option 109:** 449, 450, 451 **SA option 111:** 455, 457, 458 **SA option 113:** 461 **SA option 114:** 462 **SA option 116:**	**SA option 20:** 154 & 155, 278 **SA option 25:** 99, 127 **SA option 26:** 23, 267 **SA option 33:** 44, 153 **SA option 38:** 55, 253 **SA option 47:** 134, 177		**SA option 95:** 396, 397, 398, 399, 400, 401 **SA option 97:** 406, 407, 408, 409, 411, 412, 413, 414, 415 **SA option 100:** 423, 424 **SA option 101:** 425, 426 **SA option 109:** 449, 450, 451 **SA option 111:** 455, 457, 458 **SA option 113:** 461 **SA option 114:** 462 **SA option 116:**	**SA option 25:** 99, 127 **SA option 26:** 23, 267 **SA option 33:** 44, 153 **SA option 38:** 55, 253 **SA option 78:** 350, 352 **SA Option 79a:** 352, 354, 355, 356	**SA option 20:** 154 & 155, 278 **SA option 25:** 99, 127 **SA option 26:** 23, 267 **SA option 33:** 44, 153 **SA option 38:** 55, 253 **SA option 47:** 134, 177

Options included	Do Minimum	Least Cost (SA Approach 3) (SA combination 12)	Best Appropriate Assessment (SA Approach 1) (SA combination 1)	Quickest Delivery (SA Approach 4) (SA Combination 13)	Best Environmental (SA Approach 3) (SA combination 12)	Most Resilient (SA Approach 2) (SA combination 10)	Lowest Carbon (SA Approach 1) (SA Combination 1)
		466 **SA option 117:** 467, 468 **SA option 127:** 511 & 512, 513 **SA option 128:** 514 **SA option 129:** 515, 516, 517 **SA option 130:** 518, 519 **SA option 131:** 521, 522, 523, 525, 526 & 527, 528			466 **SA option 117:** 467, 468 **SA option 127:** 511 & 512, 513 **SA option 128:** 514 **SA option 129:** 515, 516, 517 **SA option 130:** 518, 519 **SA option 131:** 521, 522, 523, 525, 526 & 527, 528		
WRZ options	No options	128 141 162 167 188 223 262 272 281	034 068 110 141 142 162 167 171 178	034 051 068 093 110 118 128 132 141	128 141 162 167 188 223 262 272 281	034 068 110 118 142 162 167 171 175	034 068 110 141 142 162 167 171 178

Options included	Do Minimum	Least Cost (SA Approach 3) (SA combination 12)	Best Appropriate Assessment (SA Approach 1) (SA combination 1)	Quickest Delivery (SA Approach 4) (SA Combination 13)	Best Environmental (SA Approach 3) (SA combination 12)	Most Resilient (SA Approach 2) (SA combination 10)	Lowest Carbon (SA Approach 1) (SA Combination 1)
		287	188	142	287	188	188
		291	189	149	291	189	189
		294	194	157	294	194	194
		295	201	162	295	201	201
		304	207	167	304	208	207
			208	171		209	208
			209	175		212	209
			212	178		221	212
			215	188		223	215
			221	189		225	221
			223	194		226	223
			225	201		229	225
			226	207		236	226
			229	208		259	229
			236	209		262	236
			259	212		265	259
			262	215		269	262
			265	221		270	265
			269	223		272	269
			270	225		274	270
			272	226		281	272
			274	229		284	274
			281	236		286	281
			284	238		287	284
			286	250		291	286
			287	259		294	287
			291	262		295	291
			294	265		297	294
			295	266		304	295
			297	269		305	297
			304	270		310	304

Options included	Do Minimum	Least Cost (SA Approach 3) (SA combination 12)	Best Appropriate Assessment (SA Approach 1) (SA combination 1)	Quickest Delivery (SA Approach 4) (SA Combination 13)	Best Environmental (SA Approach 3) (SA combination 12)	Most Resilient (SA Approach 2) (SA combination 10)	Lowest Carbon (SA Approach 1) (SA Combination 1)
			305	272		313	305
			310	274		323	310
			313	276		326	313
			323	281		340	323
			326	284		379	326
			340	286			340
			379	287			379
				291			
				294			
				295			
				297			
				304			
				305			
				313			
				323			
				326			
				342			
				379			
				507a			
				605			

* For the option references–- all options are part of SAJ e.g. SAJ-128 is shown as 128 above

For the purposes of the Approach Development Process as set out in the SA Technical Report (RWRP-SW Appendix 3) and for the purpose of the SEA comparison as set out in this Environmental Review, Irish Water 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 SAJ Technical Report (RWRP-SW Appendix 3).

Within SAJ, this resulted in four approaches being selected from the fourteen SA combinations presented 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 four 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 Table

4.2. 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. Although both SA approach 1 and SA approach 3 both have the same number of -3 biodiversity scores in Table 4.5 SA approach 3 was selected as the best AA approach after further comparison of the other biodiversity scores.

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 Summary of the MCA Scoring Costing for the SA Approaches

Category Criteria	SA Approach 1 (LC, BA) (SA Combination 1)	SA Approach 2 (MR) (SA Combination 10)	SA Approach 3 (ICo, BE) (SA Combination 12)	SA Approach 4 (QD) (SA Combination 13)
Least Cost Score			Best	Worst
Quickest Delivery Score			Worst	Best
Best AA Score	One -3 Biodiversity Score	Three -3 Biodiversity Scores	Two -3 Biodiversity Scores	Three -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 four selected approaches			
Worst			Best

4.4 Comparison of SAJ Approaches

An overall summary of the infrastructure components and abstractions for each of the SA approaches identified for SAJ 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 (LC, BA) (SA Combination 1)	SA Approach 2 (MR) (SA Combination 10)	SA Approach 3 (ICo, BE) (SA Combination 12)	SA Approach 4 (QD) (SA Combination 13)
New pipeline network (km)	0	74	142	202	102
New WTPs	0	4	6	4	2
Upgrade WTPs (Quality)	0	47	45	24	47
Upgrade WTPs (Quantity)	0	25	24	15	31
New abstractions	0	4	6	6	4
Increased abstractions	0	25	24	13	30
WTPs decommissioned	0	7	10	40	1
Abstractions abandoned	0	7	10	39	2
Raw Water Storage	0	0	0	0	1
Treated Water Storage	0	14	24	24	13

A comparative assessment of the four 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 (LC, BA) (SA Combination 1)	SA Approach 2 (MR) (SA Combination 10)	SA Approach 3 (LCo, BE,) (SA Combination 12)	SA Approach 4 (QD) (SA Combination 13)	Range (Difference between Lowest and Highest Score)
Population, health, economy and recreation	-3 scores	Worst	Worst		Best	2
	MCA score			Best	Worst	93
Water Environment: quality and resources	-3 scores			Best	Worst	10
	MCA score			Best	Worst	49
Biodiversity, Flora and Fauna	-3 scores	Best	Worst		Worst	2
	MCA score			Best	Worst	131
Material Assets	-3 scores	Worst	Worst	Best	Worst	1
	MCA score			Best	Worst	41
Landscape and Visual	-3 scores	No Difference				0
	MCA score			Best	Worst	21
Climate Change	-3 scores	No Difference				0
	MCA Score			Best	Worst	35
Culture, Heritage and Archaeology	-3 scores	No Difference				0
	MCA Score			Best	Worst	21
Geology and Soils	-3 scores	No Difference				0

Topic	Total No. of	SA Approach 1 (LC, BA) (SA Combination 1)	SA Approach 2 (MR) (SA Combination 10)	SA Approach 3 (LCo, BE,) (SA Combination 12)	SA Approach 4 (QD) (SA Combination 13)	Range (Difference between Lowest and Highest Score)
	MCA Score			Best	Worst	15

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

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

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

4.4.1 SA Approach 1 (SA Combination 1) (LC, BA)

SA approach 1, key comparison points:

- Identified as the lowest carbon and best AA approach;
- Option types included:
  - SA options (group options): 2 groundwater abstraction and rationalisation options and 6 groundwater abstraction options;
  - WRZ options: 20 groundwater abstraction options, 1 surface water abstraction option and 26 WTP upgrade options;
- One -3 biodiversity score for SAJ-068 which has the potential to impact groundwater dependent habitats in the Blackwater River (Cork/Waterford) SAC; and
- SA approach 1's key differences in terms of infrastructure development are the:
  - Shortest length of pipeline;
  - Highest number of WTP quality upgrades (same number as SA approach 4); and
  - Lowest number of new abstractions (same number as SA approach 4).

4.4.2 SA Approach 2 (SA Combination 10) (MR)

SA approach 2, key comparison points:

- Identified as the most resilient approach for supply;
- Option types included:
  - SA options (group options): 1 groundwater abstraction and rationalisation option, 1 surface water abstraction option, and 6 groundwater abstraction options;
  - WRZ options: 20 groundwater abstraction options, 1 surface water abstraction option and 24 WTP upgrade options;

- Three -3 biodiversity scores associated with options:
    - SAJ-068 has the potential to impact groundwater dependent habitats in the Blackwater River (Cork/Waterford) SAC;
    - SA option 78 has the potential to impact the Blackwater River (Cork/Waterford) SAC;
    - SA option 79a has the potential to impact the Blackwater River (Cork/Waterford) SAC;
- SA approach 2's key differences in terms of infrastructure development are the:
    - Highest number of new WTPs;
    - Highest number of new abstractions (same number as SA approach 3); and
    - Highest number of treated water storage facilities (same number as SA approach 3).

4.4.3 SA Approach 3 (SA Combination 12) (LCo, BE)

SA approach 3, key comparison points:

- Identified as the best in the least cost and best environmental categories;
- Option types included:
    - SA options (group options): 1 surface water abstraction and rationalisation option, 7 groundwater abstraction and rationalisation options, and 9 groundwater abstraction options;
    - WRZ options: 3 groundwater abstraction options, 1 conjunctive use option, and 10 WTP upgrade options;
- Two -3 biodiversity scores associated with options:
    - SA option 129 has the potential to impact River Blackwater SAC and qualifying interests in the surrounding rivers;
    - SA option 131 has the potential to impact River Blackwater SAC and qualifying interests in the surrounding rivers;
- SA approach 3's key differences in terms of infrastructure development are the:
    - Longest length of pipeline;
    - Lowest number of WTP upgrades (quality and quantity);
    - Highest number of new abstractions (same number as SA approach 2);
    - Lowest number of increased abstractions;
    - Approximately four times the number of decommissioned WTPs and abstractions abandoned compared with the other approaches, and therefore potential benefits reducing pressure on the water environment and biodiversity from existing abstractions; and
    - Highest number of treated water storage facilities (same number as SA approach 2).

4.4.4 SA Approach 4 (SA Combination 13) (QD)

SA approach 4, key comparison points:

- Identified as the best in the quickest delivery category;
- Option types included:
    - SA option (group option): 1 groundwater abstraction and rationalisation option;
    - WRZ options: 1 conjunctive use option, 30 groundwater abstraction options, 1 surface water abstraction option and 28 WTP upgrade options;
- Three -3 biodiversity scores associated with options:

- SAJ-068 which has the potential to impact groundwater dependent habitats in the Blackwater River (Cork/Waterford) SAC;
- SAJ-436 which has the potential to impact the Blackwater River (Cork/Waterford) SAC. Further investigation is required to determine the impact of the abstraction on groundwater dependent habitats;
- SAJ-507a which has the potential to impact the Blackwater River (Cork/Waterford) SAC;

- Compared with the other approaches, in terms of infrastructure development, SA approach 4 requires the:
  - Lowest number of new WTPs;
  - Highest number of WTP upgrades (quality and quantity);
  - Lowest number of new abstractions (same number as SA approach 1);
  - Highest number of increased abstractions;
  - Lowest number of abstractions abandoned and WTPs decommissioned;
  - New raw water storage;
  - Lowest number of treated water storage facilities.

4.5 SAJ 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 -20,860 m^3/d in 2019, to a projected maximum of -24,040 m^3/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 SAJ.

Table 4.8 Supply Demand Balance for SAJ

WRZ Name	WRZ Code	Population	Maximum Deficit m^3/day*	
			2019	2044
Clashmore/White Well Laurentum	3100SC0084	681	-104	-124
Ballymoate Upper	3100SC0121	98	-12	-16
Kilmore-Kilbeg	3100SC0106	23	No Deficit	No Deficit
Aglish Cul Rua	3100SC0082	239	No Deficit	No Deficit
Ballyheaphy	3100SC0052	40	No Deficit	No Deficit
Tallow	3100SC0020	1,045	-109	-141
Camphire	3100SC0017	22	No Deficit	No Deficit
Villierstown	3100SC0016	304	No Deficit	No Deficit
Strancally	3100SC0010	38	No Deficit	No Deficit

WRZ Name	WRZ Code	Population	Maximum Deficit m^3/day*	
			2019	2044
Tiknock\Tinnabina	3100SC0008	93	-11	-14
Grallagh	3100SC0007	56	-35	-40
CastletownBallyagran Water Supply	1900SC0018	1,233	-948	-999
Rahan	0500SC0186	270	No Deficit	No Deficit
Ballyclough & Mount North	0500SC0185	2,041	No Deficit	No Deficit
Gortnagreige	0500SC0182	814	-34	-70
Fermoy	0500SC0176	7,522	-1,004	-1,251
Glanworth /Ballykenley/Johnstown	0500SC0175	2,051	-1,036	-1,130
Knoppogue	0500SC0166	39	No Deficit	No Deficit
Strawhall	0500SC0165	10	No Deficit	No Deficit
Kilbrin Garran an Darra	0500SC0144	101	No Deficit	No Deficit
Newmarket	0500SC0143	9,059	-5,139	-5,546
Toureen _Derry	0500SC0139	32	-93	-96
Millstreet	0500SC0138	3,822	-1,587	-1,617
Banteer	0500SC0136	1,637	-369	-421
Mallow	0500SC0131	13,301	-2,205	-3,084
Lombardstown Glantane	0500SC0130	712	-12	-46
Killavullen	0500SC0128	824	-52	-81
Dromahane/Kilcolman/Cois Tobair	0500SC0126	1,168	No Deficit	No Deficit
Castletownroche	0500SC0124	1,106	-437	-487
Ballyvadonna	0500SC0122	18	-3	-4
Castlecooke/Macroney	0500SC0121	135	-10	-14
Ballyhooly	0500SC0118	4,170	-1,021	-1,179
Charleville/Doneraile	0500SC0114	10,572	-4,076	-4,604
Allow Regional	0500SC0113	3,329	-761	-885
Castlewrixon	0500SC0110	24	No Deficit	No Deficit
Stagmount	0500SC0109	5	No Deficit	No Deficit
Rockchapel	0500SC0108	75	No Deficit	No Deficit
Monabricka	0500SC0107	12	-38	-39

WRZ Name	WRZ Code	Population	Maximum Deficit m^3/day*	
			2019	2044
Labbamollogga	0500SC0106	46	No Deficit	-1
Knockeragh	0500SC0105	55	No Deficit	No Deficit
Skahanagh	0500SC0104	66	-13	-15
Knockanevin	0500SC0103	12	-3	-4
Gortnaskehy	0500SC0102	45	No Deficit	No Deficit
Mountain Barracks	0500SC0101	14	No Deficit	No Deficit
Mitchelstown	0500SC0100	5,496	-1,409	-1,732
Glenduff	0500SC0099	26	No Deficit	No Deficit
Boherascrub	0500SC0096	18	No Deficit	No Deficit
Kilmurry (Mitchelstown)	0500SC0092	55	-10	-11
Kilmagnier	0500SC0090	308	-29	-36
Coolagown	0500SC0089	195	-6	-11
Knockdrumaclough	0500SC0088	83	No Deficit	No Deficit
Glenleigh	0500SC0076	13	No Deficit	No Deficit
Kilcorney	0500SC0075	117	No Deficit	No Deficit
Lyre	0500SC0066	359	-97	-109
Ballinamona	0500SC0065	17	No Deficit	No Deficit
Monee & Knockabrack	0500SC0064	163	No Deficit	No Deficit
Monaparson	0500SC0062	33	No Deficit	No Deficit
Carrigcleena	0500SC0061	48	No Deficit	No Deficit
Bweeng	0500SC0056	640	-204	-231
Bottlehill	0500SC0006	97	No Deficit	-3
Ballynoe	0500SC0004	309	No Deficit	No Deficit
Conna Regional	0500SC0002	4,451	No Deficit	No Deficit

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

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

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

SEA Objectives	Phase (Construction (C) / Operation (O))	Do Minimum	SA Approach 1 (LC, BA) (SA Combination 1)	SA Approach 2 (MR) (SA Combination 10)	SA Approach 3 (LCo, BE) (SA Combination 12)	SA Approach 4 (QD) (SA Combination 13)
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
	O	--	--	--	-	--
8. Avoid flood risk	C	0	-	-	-	-
	O	0	-	-	-	-
9. Protect and where appropriate, enhance cultural heritage assets	C	0	--	--	--	--
	O	0	0	0	0	0
10. Protect quality and function of soils	C	0	--	--	--	--
	O	0	0	0	0	0

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

The overall assessment of the approaches against the SEA objectives indicates that SA approach 1 will have less of an impact on biodiversity during construction as it has less infrastructure required within designated sites. SA approach 4 involved decommissioning only one WTP and requires two new WTPs which could result in an adverse impact for landscape and visual amenity. SA approach 3 (identified as the Preferred Approach) does not require land that has strategic land use potential, but has potentially greater construction risks for archaeological interests given the length of pipeline. SA approach 3 could provide benefits for the water environment given large number of existing abstractions that would be abandoned and while high level assessment of some of the new or increased groundwater sources identified potential risks to sustainable abstraction this reflects the precautionary desk based method applied further assessment indicates there are potentially sustainable in terms of WFD quantitative status but this and water quality aspects will need to be confirmed through more detailed site investigations.

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 ‘Do Minimum’.

4.5.1 Selection of the SA Preferred Approach

SA approach 3 has been selected through the 7 step process as the best performing approach overall across the different categories.

The SA Preferred Approach includes two -3 Biodiversity score options. Therefore, there are two higher risk options for effects on European Sites that are included in the Preferred Approach. For options identified as having some level of risk for LSEs, mitigation measures to address these are set out in the NIS and no AESI are identified.

5

SAJ Preferred Approach: Strategic Environmental Assessment

5 SAJ Preferred Approach Strategic Environmental Assessment

5.1 SAJ 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 fourteen of the sixty-two WRZs in the study area. This reflects the small scale of the supplies and difficulties in transporting small volumes of water over long distances. The Preferred Approach will result in a reduction of WRZs from sixty-two to thirty due to the rationalisation and interconnection of WRZs. Thirty-nine of the existing eighty abstractions in SAJ are proposed to be decommissioned. One of these abstractions has been identified as having the potential to not meet sustainability guidelines during dry weather flows (Allow Regional), therefore, decommissioning this source could provide significant environmental benefits.

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

Table 5.1 Preferred Approach Breakdown

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
SAJ-128 0500SC0124 Castletownroche	**Conjunctive use of existing spring and trial well and upgrade existing Castletownroche WTP** • Castletownroche WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Existing GW source (Mitchelstown groundwater body (GWB)) WFD status 2016-2021 – Good	1,477 m^3/d
SAJ-141 0500SC0002 Conna Regional	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Conna Regional WRZ in projected surplus • Existing GW and SW abstractions maintained • Existing SW source (River Bride surface waterbody (SWB)) WFD status 2016-2021 – Good • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	N/A
SAJ-162 0500SC0130 Lombardstown Glantane	**Increase GW abstraction from Kilgobnet (Spring) and upgrade Laharan Abbeys Well WTP to supply deficit** • Lombardstown Glantane WRZ in deficit • Increase existing GW abstraction and WTP upgrade to meet WRZ future deficit • Existing GW abstraction maintained	486 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
	• Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	
SAJ-167 0500SC0066 Lyre	**Increase GW abstraction from Lyre spring and upgrade Lyre WTP to supply deficit** • Lyre WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	210 m^3/d
SAJ-188 0500SC0126 Dromahane / Kilcolman / Cois Tobair	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Dromahane / Kilcolman / Cois Tobair WRZ in projected surplus • WTPs upgrade works only • Existing GW abstractions maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	N/A
SAJ-223 0500SC0004 Ballynoe	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Ballynoe WRZ not in deficit. WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	N/A
SAJ-262 0500SC0105 Knockeragh	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Knockeragh WRZ in project surplus so WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Rathmore West GWB) WFD status 2016-2021 – Good	N/A
SAJ-272 0500SC0061 Carrigcleena	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Carrigcleena WRZ in projected surplus. WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	N/A

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
SAJ-281 0500SC0101 Mountain Barracks	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Mountain Barracks WRZ in projected surplus so WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Knockmealdown GWB) WFD status 2016-2021 – Good	N/A
SAJ-287 1900SC0018 Castletown/Ballyagran Water Supply	**Increase GW abstraction at Ballyagran BH and upgrade Ballyagran Pump Station WTP to supply deficit** • Castletown Ballyagran WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Existing GW source (Bruree GWB) WFD status 2016-2021 – Good	1,189 m^3/d
SAJ-291 3100SC0082 Aglish Cul Rua	**Upgrade existing WTP for water quality improvements** • Carrigcleena WRZ in projected surplus. WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	N/A
SAJ-294 3100SC0016 Villierstown	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Villierstown WRZ in projected so WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Tallow GWB) WFD status 2016-2021 – Good	N/A
SAJ-295 3100SC0017 Camphire	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Camphire WRZ in projected surplus. WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Tallow GWB) WFD status 2016-2021 – Good	N/A
SAJ-304 3100SC0010	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit**	N/A

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
Strancally	• Strancally WRZ in project surplus so WTP upgrade works only • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	
SA Option 20	**Increase GW abstraction from Mount North and Ballyclough (spring) and upgrade Mount North (spring) WTP. Rationalise Boherascrub to Ballyclough & Mount North WRZ**	**Demand per WRZ provided below**
SAJ-154 0500SC0185 Ballyclough & Mount North	**SA Option 20** • Ballyclough & Mount North WRZ in projected surplus • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	2,014 m^3/d
SAJ-155 0500SC0185 Ballyclough & Mount North	**SA Option 20** • Ballyclough & Mount North WRZ in projected surplus • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	2,014 m^3/d
SAJ-278 0500SC0096 Boherascrub	**SA Option 20** • Boherascrub WRZ is not in deficit but would be rationalised to Mount North • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	N/A
SA Option 31	**Rationalise Gortnaskehy to Ballyheaphy WRZ. Increase GW abstraction from Ballyheaphy BH and upgrade Ballyheaphy WTP**	**Demand per WRZ provided below**
SAJ-260 0500SC0102 Gortnaskehy	**SA Option 31** • Gortnaskehy WRZ in projected surplus but is to be rationalised to Ballyheaphy WRZ • Existing GW source (Araglin GWB) WFD status 2016-2021 – Good	25 m^3/d
SAJ-325 3100SC0052 Ballyheaphy	**SA Option 31** • Ballyheaphy WRZ in projected surplus • Existing GW sources (Knockmealdown GWB) WFD status 2016-2021 – Good	35 m^3/d
SA Option 95	**Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is provided when the infiltration gallery floods. Rationalise**	**Demand per WRZ provided below**

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
	Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	
SAJ-396 0500SC0176 Fermoy	**SA Option 95** • Fermoy WRZ in deficit • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	5,101 m^3/d
SAJ-397 0500SC0122 Ballyvadonna	**SA Option 95** • Ballyvadonna WRZ in deficit and is to be rationalised to Fermoy WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	13 m^3/d
SAJ-398 0500SC0165 Strawhall	**SA Option 95** • Knockdrumaclough WRZ in project surplus but is to be rationalised to Fermoy WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	9 m^3/d
SAJ-399 0500SC0088 Knockdrumaclough	**SA Option 95** • Knockdrumaclough WRZ in project surplus but is to be rationalised to Fermoy WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	33 m^3/d
SAJ-400 0500SC0089 Coolagown	**SA Option 95** • Coolagown WRZ in deficit but is to be rationalised to Fermoy WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	52 m^3/d
SAJ-401 0500SC0090 Kilmagnier	**SA Option 95** • Kilmagnier WRZ in deficit and is to be rationalised to Fermoy WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	36 m^3/d
SA Option 97	**Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit. Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow**	**Demand per WRZ provided below**
SAJ-406 0500SC0131	**SA Option 97** • Mallow WRZ in deficit	10,418 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
Mallow	• Existing GW sources (Glenville GWB) WFD status 2016-2021 – Good and (Mitchelstown GWB) WFD status 2016-2021 – Good	
SAJ-407 0500SC0182 Gortnagreige	**SA Option 97** • Ballinanoma WRZ not in deficit but is to be rationalised to Mallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	272 m^3/d
SAJ-408 0500SC0065 Ballinamona	**SA Option 97** • Ballinanoma WRZ not in deficit but is to be rationalised to Mallow WRZ • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	6 m^3/d
SAJ-409 0500SC0062 Monaparson	**SA Option 97** • Monaparson WRZ in projected surplus but is to be rationalised to Mallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	8 m^3/d
SAJ-411 0500SC0006 Bottlehill	**SA Option 97** • Ballinanoma WRZ not in deficit but is to be rationalised to Mallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	41 m^3/d
SAJ-412 0500SC0128 Killavullen	**SA Option 97** • Killavullen WRZ in deficit and is to be rationalised to Mallow WRZ • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	722 m^3/d
SAJ-413 0500SC0166 Knoppogue	**SA Option 97** • Knoppogue WRZ in project surplus but is to be rationalised to Mallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	13 m^3/d
SAJ-414 0500SC0064 Monee & Knockabrack	**SA Option 97** • Monee & Knockabrack WRZ in projected surplus but is to be rationalised to Mallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	94 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
SAJ-415 0500SC0186 Rahan	**SA Option 97** • Rahan WRZ in projected surplus but is to be rationalised to Mallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	133 m^3/d
SA Option 100	**Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Supply spare capacity**	**Demand per WRZ provided below**
SAJ-423 0500SC0109 Stagmount	**SA Option 100** • Stagmount WRZ in projected surplus but is to be rationalised to Rockchapel WRZ • Existing GW source (Abbeyfeale GWB) WFD status 2016-2021 – Good	5 m^3/d
SAJ-424 0500SC0108 Rockchapel	**SA Option 100** • Rockchapel WRZ in projected surplus • Existing GW source (Abbeyfeale GWB) WFD status 2016-2021 – Good	55 m^3/d
SA Option 101	**Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs. Rationalise Glenduff to Mitchelstown (planned for 2022)**	**Demand per WRZ provided below**
SAJ-425 0500SC0100 Mitchelstown	**SA Option 101** • Mitchelstown WRZ in deficit • Existing GW sources (Ballyhoura GWB) WFD status 2016-2021 – Good and (Knockmealdown GWB) WFD status 2016-2021 – Good	4,392 m^3/d
SAJ-426 0500SC0099 Glenduff	**SA Option 101** • Glenduff WRZ in project surplus but is to be rationalised to Mitchelstown WRZ • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	8 m^3/d
SA Option 109	**New GW abstraction in karstic region and new WTP to supply deficit. Rationalise Kilmore-Kilbeg to Tallow WRZ. Rationalise Ballymoate Upper to Tallow WRZ**	**Demand per WRZ provided below**
SAJ-449	**SA Option 109**	416 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
3100SC0020 Tallow	• Tallow WRZ in deficit • New GW source (Tallow GWB) WFD status 2016-2021 – Good)	
SAJ-450 3100SC0106 Kilmore-Kilbeg	**SA Option 109** • Kilmore-Kilbeg WRZ is in projected surplus but is to be rationalised to Tallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	15 m^3/d
SAJ-451 3100SC0121 Ballymoate Upper	**SA Option 109** • Ballymoate Upper WRZ in deficit and is to be rationalised to Tallow WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	50 m^3/d
SA Option 111	**Increase GW at Grallagh and rationalise Tiknock/Tinnabina, Ballycurrane and Clashmore/Whitewell WRZs**	**Demand per WRZ provided below**
SAJ-455 3100SC0007 Grallagh	**SA Option 111** • Grallagh WRZ in deficit • Existing GW source (Glenville SWB) WFD status 2016-2021 – Good	108 m^3/d
SAJ-457 3100SC0084 Clashmore / Whitewell	**SA Option 111** • Clashmore/Whitewell WRZ in deficit and is to be rationalised to Grallagh WRZ • Existing GW source (Glenville SWB) WFD status 2016-2021 – Good	299 m^3/d
SAJ-458 3100SC0008 Tinkock/Tinnabinna	**SA Option 111** • Tiknock/Tinnabina WRZ in deficit and is to be rationalised to Grallagh WRZ • Existing GW source (Glenville SWB) WFD status 2016-2021 – Good	37 m^3/d
SA Option 113	**Rationalise Labbamollogga to Ballylanders WRZs**	**Demand per WRZ provided below**
SAJ-461 0500SC0106 Labbamollogga	**SA Option 113** • Kilmurry (Mitchelstown) WRZ in deficit and is to be rationalised to Inchinleamy WRZ • Existing GW source (Ballyhoura GWB) WFD status 2016-2021 – Good	16 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
SA Option 114	**Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SAK Waterford) WRZ. This WRZ is not in deficit and spare capacity can cover the demand in Kilmurry (Mitchelstown)**	**Demand per WRZ provided below**
SAJ-462 0500SC0092 Kilmurry (Mitchelstown)	**SA Option 114** • Kilmurry (Mitchelstown) WRZ in deficit and is to be rationalised to Inchinleamy WRZ • Existing GW source (KnockmealdownGWB) WFD status 2016-2021 – Good	37 m^3/d
SA Option 116	**Rationalise Bweeng to Donoughmore WRZ**	**Demand per WRZ provided below**
SAJ-466 0500SC0056 Bweeng	**SA Option 116** • Bweeng WRZ in deficit and is to be rationalised to Donoughmore WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	373 m^3/d
SA Option 117	**New GW and new WTP for Glanworth/Ballykenley/ Johnstown & rationalise Knockanevin**	**Demand per WRZ provided below**
SAJ-467 0500SC0175 Glanworth / Ballykenley/Johnstown	**SA Option 117** • Glanworth / Ballykenley / Johnstown WRZ in deficit • New GW source (Cappoquin Kiltorcan GWB) WFD status 2016-2021 – Good	3,421 m^3/d
SAJ-468 0500SC0103 Knockanevin	**SA Option 117** • Knockanevin WRZ in deficit and is to be rationalised to Glanworth / Ballykenley / Johnstown WRZ • Existing GW source (Ballyhoura GWB) WFD status 2016-2021 – Good	22 m^3/d
SA Option 127	**Increase GW abstraction at Downing Bridge BH and upgrade existing Dowing. Increase GW abstraction from existing Spring and upgrade Castletownroche. Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)**	**Demand per WRZ provided below**
SAJ-511 0500SC0118 Ballyhooly	**SA Option 127** • Ballyhooly WRZ in deficit. Increase GW abstraction to meet WRZ future deficit • Existing GW sources (Mitchelstown GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good	4,067 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
SAJ-512 0500SC0118 Ballyhooly	**SA Option 127** • Ballyhooly WRZ in deficit. Increase GW abstraction to meet WRZ future deficit • Existing GW sources (Mitchelstown GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good	4,067 m^3/d
SAJ-513 0500SC0121 Macroney	**SA Option 127** • Castlecooke/Macroney WRZ in deficit and is to be rationalise to Ballyhooly WRZ • Existing GW source (Cappoquin Kiltorcan GWB) WFD status 2016-2021 – Good	96 m^3/d
SA Option 128	**Rationalise Monabricka to South West Regional Scheme WRZ**	**Demand per WRZ provided below**
SAJ-514 0500SC0107 Monabricka	**SA Option 128** • Monabricka WRZ in deficit and is to be rationalised to South West Regional Scheme WRZ • Existing GW abstraction and WTP to be decommissioned	69 m^3/d
SA Option 129	**Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ, new GW abstraction and upgrade Charleville WRZ to supply deficit**	**Demand per WRZ provided below**
SAJ-515 0500SC0114 Charleville / Doneraile	**SA Option 129** • Charleville/Doneraile WRZ in deficit. New GW abstraction to meet WRZ future deficit • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	13,923 m^3/d
SAJ-516 0500SC0110 Castlewrixon	**SA Option 129** • Castlewrixon WRZ in projected surplus but is to be rationalised to Charlevile/Doneraile WRZ • Existing GW source (Ballyhoura GWB) WFD status 2016-2021 – Good	6 m^3/d
SAJ-517 0500SC0104 Skahanagh	**SA Option 129** • Skahanagh WRZ in deficit and is to be rationalised to Charleville/Doneraile WRZ • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	38 m^3/d
SA Option 130	**New GW abstraction (karstic) and new WTP to supply full deficit. Decommission Freemount WTP.**	**Demand per WRZ provided below**

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
	Rationalise Kilbrin Garran an Darra to Allow regional WRZ	
SAJ-518 0500SC0113 Allow Regional	**SA Option 130** • New GW abstraction to meet WRZ future deficit • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good	3,268 m^3/d
SAJ-519 0500SC0144 Kilbrin Garran an Darra	**SA Option 130** • Kilbrin Garran an Darra WRZ is in projected surplus but is to be rationalised to Newmarket WRZ • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Rathmore West GWB) WFD status 2016-2021 – Good	26 m^3/d
SA Option 131	**Interconnect Banteer with Newmakret for increased resilience and supply deficit. Rationalise Creggane WTP. Rationalise Glenleigh and Kilcorney to Millstreet WRZ. Interconnect Millstreet with Newmakret for increased resilience and supply deficit. Rationalise Cockhill WTP and Caherbarnagh WTP. Rationalise Toureen Derry to Banteer WRZ.**	**Demand per WRZ provided below**
SAJ-521 0500SC0136 Banteer	**SA Option 131** • Banteer WRZ in deficit and to be interconnected with Newmarket WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	1,151 m^3/d
SAJ-522 0500SC0076 Glenleigh	**SA Option 131** • Glenleigh WRZ is in projected surplus but is to be rationalised to Millstreet WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	5 m^3/d
SAJ-523 0500SC0075 Kilcorney	**SA Option 131** • Kilcorney WRZ in projected surplus but is to be rationalised to Millstreet WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	66 m^3/d
SAJ-525 0500SC0138 Millstreet	**SA Option 131** • Millstreet WRZ in deficit but is to be interconnected to Newmarket WRZ	3,795 m^3/d

WRZ Name and Option Reference*	Option Description	Demand (DYCP 2044)
	• Existing GW sources (Glenville GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good	
SAJ-526 0500SC0143 Newmarket	**SA Option 131** • Newmarket WRZ in deficit. New GW abstractions to meet the WRZ future deficit • New GW sources (Mitchelstown GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good	3,795 m3/d
SAJ-527 0500SC0143 Newmarket	**SA Option 131** • Newmarket WRZ in deficit. New GW abstractions to meet the WRZ future deficit • New GW sources (Mitchelstown GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good	3,795 m^3/d
SAJ-528 0500SC0139 Toureen _Derry	**SA Option 131** • Toureen_Derry WRZ in deficit and is to be rationalised to Banteer WRZ • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good	165 m^3/d

*SA Options are the same as Group Options

The SA Preferred Approach options are shown in Figure 5.1, in relation to key environmental designations. Note that SA options in Figure 5.1 below are labelled as the following: SA option 31 (SAJ-531), SA option 20 (SAJ-520), SA option 109 (SAJ-609), SA option 95 (SAJ-595), SA option 97 (SAJ-597), SA option 100 (SAJ-600), SA option 101 (SAJ-601), SA option 111 (SAJ-611), SA option 113 (SAJ-613), SA option 114 (SAJ-614), SA option 116 (SAJ-616), SA option 117 (SAJ-617), SA option 127 (SAJ-627), SA option 128 (SAJ-628), SA option 129 (SAJ-629), SA option 130 (SAJ-630) and SA option 131 (SAJ-631).

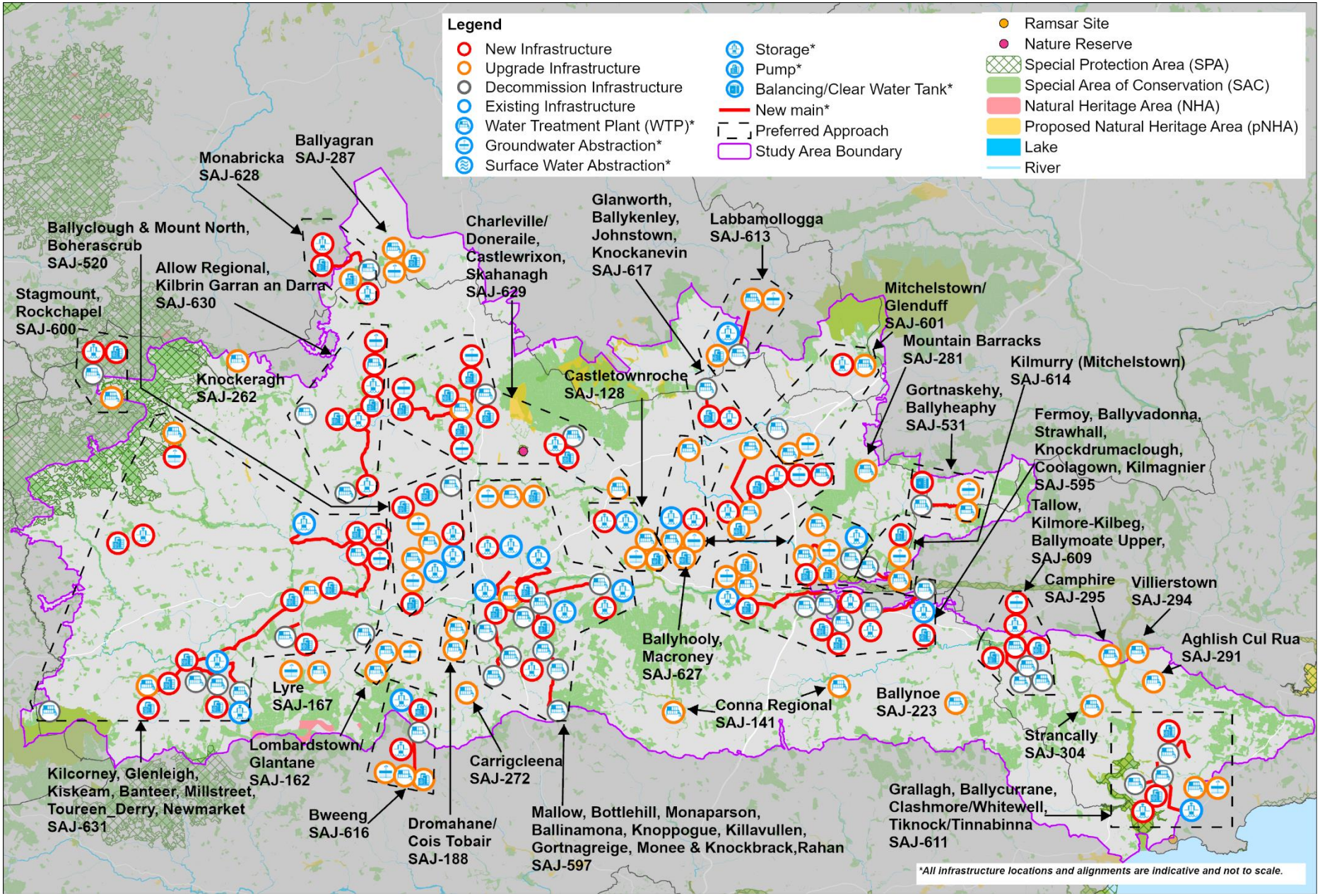

Figure 5.1 SA Preferred Approach and Key Environmental Designations

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

Table 5.2 Component Table

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs (Quality)	Upgrade WTPs (Quantity)	WTPs Decommissioned	New Abstractions	Increased Abstractions	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SAJ-128	-	-	-	✓	-	-	✓	-	-	✓
SAJ-141	-	-	✓	-	-	-	-	-	-	-
SAJ-162	-	-	✓	✓	-	-	✓	-	-	-
SAJ-167	-	-	-	✓	-	-	✓	-	-	-
SAJ-188	-	-	✓	-	-	-	-	-	-	-
SAJ-223	-	-	✓	-	-	-	-	-	-	-
SAJ-262	-	-	✓	-	-	-	-	-	-	-
SAJ-272	-	-	✓	-	-	-	-	-	-	-
SAJ-281	-	-	✓	-	-	-	-	-	-	-
SAJ-287	-	-	-	✓	-	-	✓	-	-	-
SAJ-291	-	-	✓	-	-	-	-	-	-	-
SAJ-294	-	-	✓	-	-	-	-	-	-	-
SAJ-295	-	-	✓	-	-	-	-	-	-	-
SAJ-304	-	-	✓	-	-	-	-	-	-	-
SA option 20 (SAJ-154 & 155, 278)	✓	-	-	✓	✓	-	✓	✓	-	✓
SA option 31 (SAJ-260, 325)	✓	-	-	✓	✓	-	✓	✓	-	✓

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs (Quality)	Upgrade WTPs (Quantity)	WTPs Decommissioned	New Abstractions	Increased Abstractions	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SA option 95 (SAJ-396, 397, 398, 399, 400, 401)	✓	-	-	✓	✓	-	✓	✓	-	✓
SA option 97 (SAJ-406, 407, 408, 409, 411, 412, 413, 414, 415)	✓	-	✓	✓	✓	-	✓	✓	-	✓
SA option 100 (SAJ-423, 424)	✓	-	✓	-	✓	-	-	✓	-	✓
SA option 101 (SAJ-425, 426)	-	-	✓	✓	✓	-	✓	✓	-	✓
SA option 109 (SAJ-449, 450, 451)	✓	✓	-	-	✓	✓	-	✓	-	✓
SA option 111 (SAJ-455, 457, 458)	✓	-	-	✓	✓	-	✓	✓	-	✓
SA option 113 (SAJ-461)	✓	-	-	-	✓	-	-	✓	-	-
SA option 114 (SAJ-462)	✓	-	-	-	✓	-	-	✓	-	-

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs (Quality)	Upgrade WTPs (Quantity)	WTPs Decommissioned	New Abstractions	Increased Abstractions	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SA option 116 (SAJ-466)	✓	-	-	-	✓	-	-	✓	-	-
SA option 117 (SAJ-467, 468)	✓	✓	✓	-	✓	✓	-	✓	-	✓
SA option 127 (SAJ-511 & 512, 513)	✓	-	✓	✓	✓	-	✓	✓	-	✓
SA option 128 (SAJ-514)	✓	-	-	-	✓	-	-	✓	-	✓
SA option 129 (SAJ-515, 516, 517)	✓	-	✓	✓	✓	✓	-	✓	-	✓
SA option 130 (SAJ-518, 519)	✓	✓	-	-	✓	✓	-	✓	-	✓
SA option 131 (SAJ-521, 522, 523, 525, 526 & 527, 528)	✓	✓	✓	✓	✓	✓	-	✓	-	-

*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 20 (SAJ-154 & 155, 278)	Increase GW abstraction from Mount North and Ballyclough (spring) and upgrade Mount North (spring) WTP. Rationalise Boherascrub to Ballyclough & Mount North WRZ	Construction	-	-	-	-	--	--	0	-	-	-
		Operation	+	0	+	0	--	--	---	0	0	0
SA option 31 (SAJ-260, 325)	Rationalise Gortnaskehy to Ballyheaphy WRZ.	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)
	Increase GW abstraction from Ballyheaphy borehole and upgrade Ballyheaphy WTP	Operation	+	-	+	0	-	--	---	0	0	0
SA option 95 (SAJ-396, 397, 398, 399, 400, 401)	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is	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)
	provided when the infiltration gallery floods. Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ.	Operation	+	-	+	0	-	--	---	0	0	0
SA option 97 (SAJ-406, 407, 408, 409, 411, 412,	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit. Rationalise	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)
413, 414, 415)	Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow.	Operation	++	-	++	0	---	--	---	0	0	0
SA option 100 (SAJ-423, 424)	Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Supply spare capacity.	Construction	-	--	-	-	-	0	0	0	-	-
		Operation	+	-	+	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)
SA option 101 (SAJ-425, 426)	Increase existing GW abstraction from Ballybeg boreholes and new GW from treatment works upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South water supply zones. Rationalise Glenduff to Mitchelstown (planned for 2022)	Construction	-	-	-	-	--	--	0	0	0	0
		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 109 (SAJ-449, 450, 451)	New GW abstraction in karstic region and new WTP to supply deficit. Rationalise Kilmore-Kilbeg to Tallow WRZ. Rationalise Ballymoate Upper to Tallow WRZ.	Construction	-	--	-	-	-	-	0	0	-	-
		Operation	-	-	+	-	-	-	-	0	0	0
SA option 111 (SAJ-455, 457, 458)	Increase GW at Grallagh and rationalise Tiknock/Tinnabina, Ballycurrane and Clashmore/Whitewell WRZs	Construction	-	--	-	-	-	--	0	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)
SA option 113 (SAJ-461)	Rationalise Labbamollogga to Ballylanders WRZs	Construction	-	-	-	-	0	--	0	-	-	-
		Operation	+	0	+	0	0	--	---	0	0	0
SA option 114 (SAJ-462)	Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SAK Waterford) WRZ.	Construction	-	-	-	-	0	--	0	0	-	-
		Operation	+	--	+	0	0	--	---	0	0	0
SA option 116 (SAJ-466)	Rationalise Bweeng to Donoughmore WRZ (SAI) (SAI-212)	Construction	-	-	-	-	0	--	0	0	-	-
		Operation	0	0	+	0	0	--	---	0	0	0
	New GW abstraction at Ballynacagheragh	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)
SA option 117 (SAJ-467, 468)	and new WTP to supply deficit. New Storage at Dunmahon.	Operation	++	-	+	0	---	-	-	0	0	0
SA option 127 (SAJ-511 & 512, 513)	Increase GW abstraction at Downing Bridge borehole and upgrade existing Downing. Increase GW abstraction from	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)
	existing Spring and upgrade Castletownroche. Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP).	Operation	++	-	+	0	---	--	---	0	0	0
SA option 128 (SAJ-514)	Rationalise Monabricka to South West Regional Scheme WRZ.	Construction	-	-	-	-	-	0	0	0	-	-
		Operation	+	0	+	0	-	0	0	0	0	0
SA option 129 (SAJ-	Rationalise Castlewrixon and Skahanagh WRZs 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)
515, 516, 517)	Charleville/Doneraile WRZ, new GW abstraction and upgrade Charleville WRZ to supply deficit.	Operation	+	---	+	0	-	--	---	0	0	0
SA option 130 (SAJ-518, 519)	New GW abstraction (karstic) and new WTP to supply full deficit. Decommission Freemount WTP. Rationalise Kilbrin Garran an Darra to Allow regional WRZ.	Construction	-	-	-	-	---	--	0	-	-	-
		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 131 (SAJ-521, 522, 523, 525, 526 & 527, 528)	Interconnect Banteer with Newmakret for increased resilience and supply deficit. Rationalise Creggane WTP. Rationalise Glenleigh and Kilcorney to Millstreet	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)
	WRZ. Interconnect Millstreet with Newmakret for increased resilience and supply deficit. Rationalise Cockhill WTP and Caherbarnagh WTP. Rationalise Toureen Derry to Banteer WRZ.	Operation	++	---	+	-	---	--	---	0	0	0
SAJ-291	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	-	-	-
		Operation	+	0	0	0	0	0	0	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (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)
SAJ-223	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	-	0	0	0	-	-
		Operation	+	0	0	0	-	0	0	0	0	0
SAJ-295	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	-	-	-
		Operation	+	0	0	0	0	0	0	0	0	0
SAJ-272	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	0	-	-
		Operation	+	0	0	0	0	0	0	0	0	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)
SAJ-287	Increase GW abstraction at Ballyagran borehole and upgrade Ballyagran Pump Station WTP to supply deficit.	Construction	-	-	-	0	-	--	0	-	0	0
		Operation	0	0	0	0	-	--	---	0	0	0
SAJ-128	Conjunctive use of existing spring and trial well and upgrade existing Castletownroche WTP.	Construction	-	-	-	-	--	--	0	0	0	0
		Operation	0	--	0	0	--	--	---	0	0	0
SAJ-141		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	0	0
SAJ-188	Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	-	0	0	-	-	-
		Operation	++	0	0	0	-	0	0	0	0	0
SAJ-262	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	-	-	0
		Operation	+	0	0	0	0	0	0	0	0	0
SAJ-162	Increase GW abstraction and	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 Laharan Abbeys Well WTP to supply deficit.	Operation	+	0	0	0	-	--	---	0	0	0
SAJ-167	Increase GW abstraction from Lyre spring and upgrade Lyre WTP to supply deficit.	Construction	-	-	-	0	0	--	0	0	0	0
		Operation	0	0	0	0	0	--	---	0	0	0
SAJ-281	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	0	-	-
		Operation	+	0	0	0	0	0	0	0	0	0
SAJ-304		Construction	-	-	0	0	-	0	0	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (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
SAJ-294	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	Construction	-	-	0	0	0	0	0	-	-	-
		Operation	+	0	0	0	0	0	0	0	0	0

*SA Options are the same as Group Options

**Total lifetime tCO_2e categories: minor beneficial = -ve negligible/neutral = <1000 minor = 1000 to <10,000, Moderate = 10,000 to <50,000, Major = 50,000+

5.2 Additional Measures

In addition to the SA Preferred Approach supply options, Irish Water is already implementing measures across the three pillars of Lose Less, Use Less and Supply Smarter to improve the level of service to its customers in this study area. These are described in the SAJ Technical Report (RWRP-SW Appendix 3) 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 Irish Water assesses 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 WRZs: Charlesville/Doneraile, Millstreet and Newmarket.

5.2.2 Water Conservation

At present, Irish Water 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 water supplies and reduce pressure on the natural environment during this period. Irish Water 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, Irish Water has not applied reductions to the SDB for unquantifiable water conservation gains. However, Irish Water does assume that any gain will offset consumer usage growth factors.

5.3 Interim Solutions

The SAJ Technical Report (RWRP-SW Appendix 3) 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 Irish Water have undertaken for the SAJ Preferred Approach is provided in the SAJ Technical Report (RWRP-SW Appendix 3). A high-level assessment of what this could mean for the SEA is shown in Table 5.4.

Table 5.4 SAJ 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 Irish Water's	+6,400 m^3/d	The impact of sustainability reductions would reduce the volumes that can be abstracted from Irish Water's existing

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)		sources, therefore, increasing the SDB deficit. There are several surface water sources in SAJ that would be impacted through sustainability reductions. However, the Preferred Approach is designed to relieve pressure on these sources by supplementing from more resilient surface water and groundwater sources. Groundwater sustainability is more difficult to assess at desktop level, however, as the abstractions in SAJ are small in scale they do not appear to be problematic.
			The SA Preferred Approach addresses reduction and Irish Water have decommissioned the abstraction for Allow Regional that was at risk of not meeting sustainability guidelines. However, additional sustainability reductions for other WRZs could increase pressure for additional supply from outside the study area.
Climate Change	High (international climate change targets have not been met)	+1,900 m^3/d	Higher climate change scenarios would impact Irish Water'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 Irish Water's operations on a more environmentally sustainable basis across the range of supplies. Within SAJ, the abstraction at Allow Regional would be vulnerable to increased climate change impacts scenarios. However, this source is to be decommissioned as part of the Preferred Approach. 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.
			Although the Preferred Approach provides more operational flexibility to use less sensitive water sources, this could still result in more pressure on sources.
Demand Growth		-21,558 m^3/d	The impact of lower than expected growth would reduce the SDB deficit and the overall need requirement. The SDB deficit is currently spread across thirty-one out of sixty-two

Uncertainty	Likelihood	Increase/ Decrease in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
	Low/Moderate (growth has been based on policy)		of the WRZs in the area and is projected to spread across thirty-three. This is driven by quality as well as quantity issues. In this rural area, growth is relatively low.
			This could allow lower than expected energy and carbon costs and lower increased abstraction requirements
Leakage Targets	Low (Irish Water is focused on sustainability and aggressive leakage reduction)	+369 m^3/d	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 Irish Water's networks, Irish Water could potentially fail to achieve target leakage reductions within the timeframes set out. However, as Irish Water 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.
			This could increase carbon and the effects of abstraction pressure on the environment.
	Moderate/High (Irish Water is focused on sustainability and aggressive leakage reduction)	-19,197 m^3/d	Increased leakage savings beyond SELL would reduce the SDB deficit and the overall need requirement. The need drivers span across the WRZs in SAJ and are driven by quality as well as availability issues.
			This could allow lower than expected energy and carbon emissions and lower increased abstraction requirements.

6

SEA Cumulative Effects for SAJ Preferred Approach

6 SEA Cumulative Effects for SAJ Preferred Approach

Secondary, cumulative and the synergistic nature of the effects of the SAJ 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 West 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 SAJ

The potential 'within plan' cumulative effects for SAJ 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 Irish Water 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 West Region level: Considering combined effects from proposals in the three study areas (see the SEA Environmental Report of the Regional Plan).

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

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

- Biodiversity – for example, a cumulative loss of habitats or changes to a habitat's quality through changes in water quality or groundwater levels;
- Water environment (surface water and groundwater WFD status) – for example, changes to water flow due to combined abstraction pressure;
- People and health – for example, disruption due to multiple construction works taking place at the same time;
- Landscape and visual – for example, if there are a number of options located close together that could alter the landscape character or views;
- Cultural heritage – for example if the same cultural heritage features are affected by above ground infrastructure in close proximity or the combined effect of loss to undesignated archaeological assets or from combined impacts resulting in additional changes to water levels affecting archaeological resources; and
- Climate change – combined carbon emissions for the approach as a whole have been considered through the approach selection process and are also reported here to identify

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

6.1.1 Cumulative Effects during Construction

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

There could be cumulative effects associated with construction in terms of traffic, noise and dust for the options located along the N72 road (indicated by 'N72' 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 disruption. With these standard good practice measures in place, there are unlikely to be significant cumulative effects.

If construction of SAJ-128,162, 167, 188, 223, 262, 272, 281 and 291, and SA options 20, 31, 95, 97, 101, 109, 111, 113, 114, 116, 117, 127, 129, 130 and 131 are concurrent, there could be cumulative effects from habitat loss (SAJ-128 and SA options 31, 95, 97, 111, 127, 129 and 131 only), mortality and disturbance (SAJ-128 and SA options 31, 95, 97, 109, 111, 114, 127, 129 and 131 only), spread of invasive non-native species (SAJ-128 and SA options 31, 95, 97, 109, 111, 114, 127, 129, 130 and 131 only) and pollution (all options) on Blackwater River (Cork/Waterford) SAC (identified as 'BR' in Table 6.1). There could be cumulative effects from pollution impacts on Blackwater Estuary SPA and Lower River Shannon SAC if construction of options SAJ-128, 223 and 291 and SA options 109 and 111, and SA options 100 and 128 are concurrent (see 'BE' and 'SH' in Table 6.1). If construction of SAJ-281 and SA options 31, 95, 97, 101, 113, 114, 117 and 127 are concurrent, there could be cumulative effects from disturbance (SA options 95, 114 and 127 only) and pollution (all options) on Blackwater Callows SPA (identified as 'BC' in Table 6.1). Cumulative effects to European designated sites during construction could be mitigated with good practice mitigations, such as having buffers along the edge of the river and having an emergency plan in place during construction. The impacts on the European designations are provided in the NIS and also summarised in chapter 9 of this review

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

Preferred Approach	SAJ-128	SAJ-141	SAJ-162	SAJ-167	SAJ-188	SAJ-223	SAJ-262	SAJ-272	SAJ-281	SAJ-287	SAJ-291	SAJ-294	SAJ-295	SAJ-304	SA option 20	SA option 31	SA option 95	SA option 97	SA option 100	SA option 101	SA option 109	SA option 111	SA option 113	SA option 114	SA option 116	SA option 117	SA option 127	SA option 128	SA option 129	SA option 130
SAJ-141																													
SAJ-162	BR																												
SAJ-167	BR		BR																										
SAJ-188	BR		BR	BR																									
SAJ-223	BR BE		BR	BR	BR																								
SAJ-262	BR		BR	BR	BR	BR																							
SAJ-272	BR		BR	BR	BR	BR	BR																						
SAJ-281	BR		BR	BR	BR	BR	BR	BR																					
SAJ-287																													
SAJ-291	BR BE		BR	BR	BR	BR BE	BR	BR	BR																				
SAJ-294																													
SAJ-295																													
SAJ-304																													
SA option 20	BR		BR	BR	BR	BR	BR	BR	BR		BR																		
SA option 31	BR		BR	BR	BR	BR	BR	BR	BR BC		BR																		
SA option 95	BR		BR	BR	BR	BR	BR	BR	BR BC		BR																		
SA option 97	BR		BR	BR	BR	BR	BR	BR	BR BC		BR																		
SA option 100																													
SA option 101	BR		BR	BR	BR	BR	BR	BR	BR BC		BR					BR BC	BR BC	BR BC											
SA option 109	BE					BE					BE																		
SA option 111	BR BE		BR	BR	BR	BR BE	BR	BR	BR		BR BE				BR	BR	BR	BR		BR	BE								
SA option 113	BR		BR	BR	BR	BR	BR	BR	BR BC		BR				BR	BR BC	BR BC	BR BC		BR BC		BR							
SA option 114	BR		BR	BR	BR	BR	BR	BR	BR BC		BR				BR	BR BC	BR BC	BR BC		BR BC		BR	BR BC						
SA option 116	BR		BR	BR	BR	BR	BR	BR	BR		BR				BR	BR	BR	BR		BR		BR	BR	BR					
SA option 117	BR		BR	BR	BR	BR	BR	BR	BR BC		BR				BR	BR BC	BR BC	BR BC		BR		BR	BR BC	BR BC	BR				
SA option 127	BR		BR	BR	BR	BR	BR	BR	BR BC		BR				BR	BR BC	BR BC	BR BC		BR BC		BR	BR BC	BR BC	BR	BR BC			
SA option 128	BR		BR	BR	BR	BR	BR	BR	BR		BR				BR	BR	BR	BR	SH	BR		BR	BR	BR	BR	BR	BR			
SA option 129	BR		BR	BR	BR	BR	BR	BR	BR		BR				BR	BR	BR	BR		BR		BR	BR	BR	BR	BR	BR	BR		
SA option 130	BR		BR	BR	BR	BR	BR	BR	BR		BR				BR	BR	BR	BR		BR		BR	BR	BR	BR	BR	BR	BR	BR	
SA option 131	BR		BR	BR	BR	BR	BR	BR	BR		BR				BR	BR	BR	BR		BR		BR	BR	BR	BR	BR	BR	BR	BR	BR

Key	
Construction Phase	
Operation Phase	
Construction and Operation	
Lower River Suir SAC	SU
Lower River Shannon SAC	SH
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	S
Blackwater River (Cork/Waterford) SAC	BR
Blackwater Estuary SPA	BE
Blackwater Callows SPA	BC
N72	N72

6.1.2 Cumulative Effects during Operation

The SEA has identified that, at a plan level, there is potential for cumulative effects during the operational phase of the SA Preferred Approach on Blackwater River (Cork/Waterford) SAC given that SAJ-128 and SA options 31, 95, 97, 127, 129 and 131 all have potential for hydrological changes and water table impacts to the site. Option SAJ-128 and SA option 129 and 131 includes a new groundwater abstraction from an aquifer that is within and hydrologically linked to the SAC. SA options 95, 97 and 127 include an increase in groundwater abstraction from aquifers that are hydrologically linked to the SAC. See Figure 6.1 for the Preferred Approach abstractions in SAJ. All of these abstractions could potentially lead to changes in water table/availability and hydrological changes during operation that could impact QI species and habitats. The impacts on the European designations are provided in the NIS and also summarised in chapter 9 of this review. The NIS concluded that with general mitigation measures and hydrogeological modelling, there will no adverse cumulative effects on the integrity of Blackwater River (Cork/Waterford) SAC.

The potential for cumulative effects on groundwater bodies has been considered in a hydrogeological assessment of the groundwater abstractions commissioned by Irish Water (Irish Water, 2022). This hydrogeological assessment considers the abstraction quantities and proximities and concludes that all of the WFD groundwater bodies (Bruree, Cappoquin Kiltorcan, Glenville, Knockaskallen, Knockmealdown, Mitchelstown and Tallow) affected cumulatively by the proposed and existing abstractions have a good quantitative status, therefore, the likelihood of affecting their WFD objectives is low. According to Irish Water's hydrogeological assessment, Bruree, Cappoquin Kiltorcan and Mitchelstown groundwater bodies are hydrologically linked to surface waters that are not meeting water quality objectives where it is considered likely that groundwater is a contributing source of phosphates; these groundwater bodies are currently 'at risk' of failing the WFD objectives. .

The potential for cumulative effects on European designated sites has been considered in the NIS. The NIS concluded that there will be no operational cumulative effects to the sites.

There could also be cumulative effects in terms of carbon emissions 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, increases in carbon emissions can be considered a significant effect, as these increases add cumulatively across all developments and contribute to carbon emissions at a national level. 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 SAJ this averages as 405.49 tCO_2e/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.

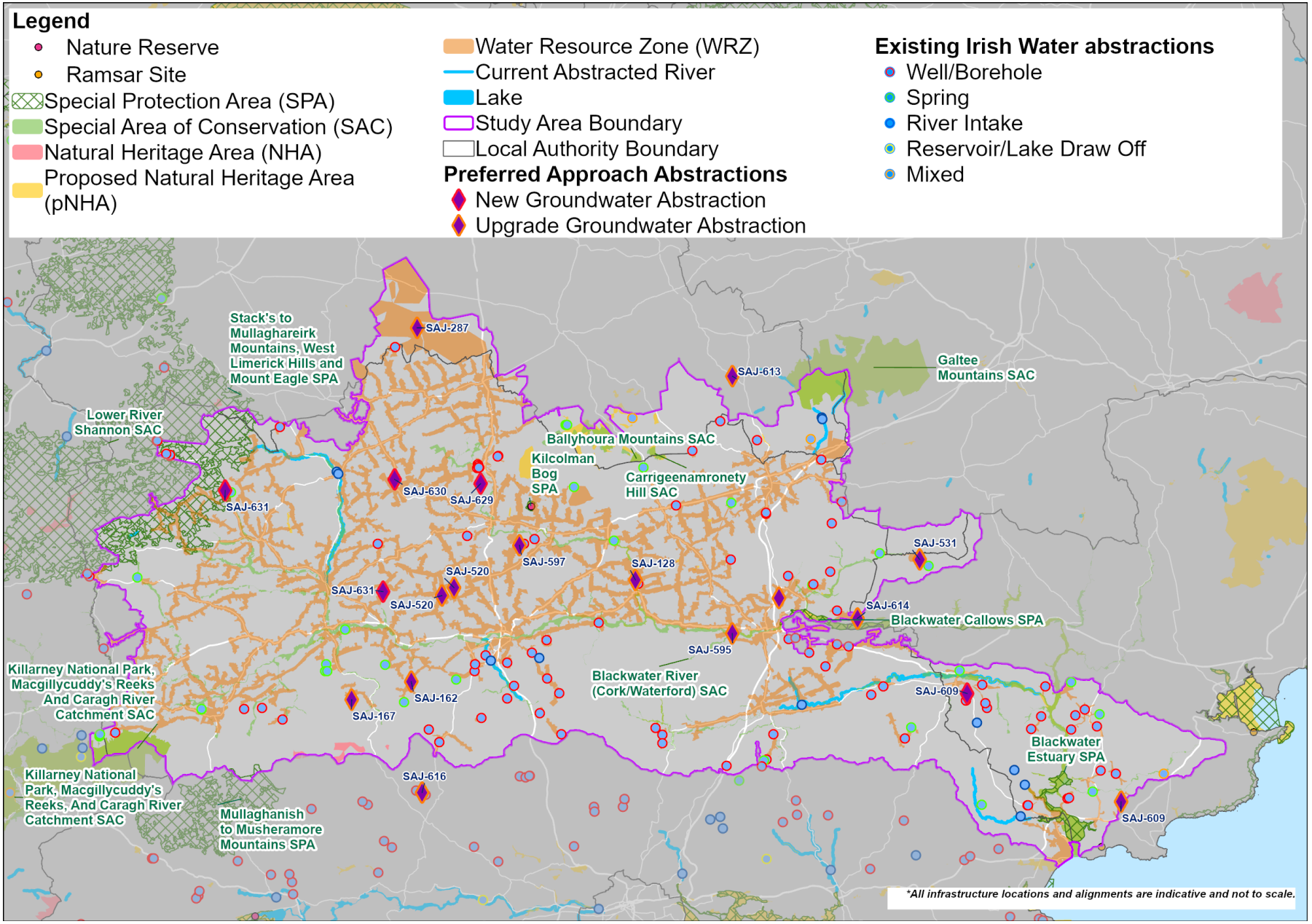

Figure 6.1 SA Preferred Approach Abstractions in SAJ

6.2 Cumulative Effects with Other Developments

The SAJ Preferred Approach has been assessed alongside other developments that could occur within the plan area. Proposals for other strategic developments within SAH are primarily identified from the National Planning Framework and from myProjectIreland, where any relevant projects for the study area are included (other local developments may also be included that are not listed in myProjectIreland if they are considered to be of an appropriate scale). Small scale housing and business development are not considered for this plan level assessment. 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 SAJ there are a number of regeneration and construction projects in and near Mallow and along M20 route. In addition to these, there is a regeneration project in Ballydesmond. Other developments that were not considered further due to the scale and nature of the developments, meaning they are unlikely to have interaction with the SA Preferred Approach, are the Cork Line Level Crossings, Cois Abhainn, Greencloyne, Youghal, Youghal Community Hospital (St Raphael's), Youghal Public Library, St Joseph's Community Hospital, Millstreet and Kanturk Community Hospital.

6.2.1 Cumulative Effects during Construction

The projects near or in Mallow and Kanturk and along N20 and N72 roads 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 ‘M’, ‘K’, ‘N20’ and ‘N72’, respectively). Potential effects could include increased traffic and noise to the residential and commercial properties in Mallow and Kanturk or along the two roads. 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. 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.

There is potential for cumulative effects from pollution impacts on Blackwater River (Cork/Waterford) SAC if the construction phase of M20 Cork to Limerick Road Improvement Scheme, N72/N73 Mallow Relief Road, Mallow Town Regeneration, Mallow Wastewater Treatment Plant, Ballydesmond Village Public Realm and Placemaking Enhancement works are concurrent with the SA Preferred Approach (identified in Table 6.2 as ‘BR’). If construction of Ballydesmond Village Public Realm and Placemaking Enhancement Plan is concurrent with the SA Preferred Approach, there is potential for cumulative effects from habitat loss and disturbance impacts on Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (see ‘S’ in Table 6.2). With the implementation of mitigation measures as outlined in section 6.3.3 of the NIS, there will be no adverse cumulative effects on the integrity of any of the SACs or SPAs mentioned.

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

Preferred Approach	Ballydesmond	Ballydesmond Village Public Realm and Placemaking Enhancement Plan	Banteer Amenity Project	Cork Events Centre	Development of a Georgian Cultural/ Heritage Quarter for Mitchelstown	Kanturk Regeneration – Phase 1	M20 Cork to Limerick	Mallow Town Regeneration and Mallow Town Regeneration 2	MY Greenway – Midleton to Youghal	N72/N73 Mallow Relief Road	Rathcormac Strategy for Development	Mallow Wastewater Treatment Plant
SAJ-128		BR					BR	BR		BR		BR
SAJ-141												
SAJ-162		BR					BR	BR		BR		BR
SAJ-167		BR					BR	BR		BR		BR
SAJ-188		BR					BR	BR		BR		BR
SAJ-223		BR					BR	BR		BR		BR
SAJ-262		BR					BR	BR		BR		BR
SAJ-272		BR					BR	BR		BR		BR
SAJ-281		BR					BR	BR		BR		BR
SAJ-287												
SAJ-291		BR					BR	BR		BR		BR
SAJ-294												
SAJ-295												
SAJ-304												
SA option 20		BR					BR	BR		BR		BR
SA option 31		BR					BR	BR		BR		BR
SA option 95		BR					BR	BR		BR N72		BR
SA option 97		BR					BR	BR M		BR N72 M		BR M
SA option 100		S										
SA option 101		BR					BR	BR		BR		BR
SA option 109		BR					BR	BR		BR		BR
SA option 111		BR					BR	BR		BR		BR
SA option 113		BR					BR	BR		BR		BR
SA option 114		BR					BR	BR		BR		BR
SA option 116		BR					BR	BR		BR		BR

Preferred Approach	Ballydesmond	Ballydesmond Village Public Realm and Placemaking Enhancement Plan	Banteer Amenity Project	Cork Events Centre	Development of a Georgian Cultural/ Heritage Quarter for Mitchelstown	Kanturk Regeneration – Phase 1	M20 Cork to Limerick	Mallow Town Regeneration and Mallow Town Regeneration 2	MY Greenway – Midleton to Youghal	N72/N73 Mallow Relief Road	Rathcormac Strategy for Development	Mallow Wastewater Treatment Plant
SA option 117		BR					BR	BR		BR		BR
SA option 127		BR					BR	BR		BR		BR
SA option 128												
SA option 129		BR					BR N20	BR		BR		BR
SA option 130		BR					BR	BR		BR		BR
SA option 131		BR				K	BR	BR		BR		BR

Key	
Construction Phase	
Operation Phase	
Construction and Operation	
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	S
Blackwater River (Cork/Waterford) SAC	BR
N20	N20
N72	N72
Mallow	M
Kanturk	K

6.2.2 Cumulative Effects during Operation

There could be cumulative effects on Blackwater River (Cork/Waterford) SAC from habitat degradation and water table impacts if operation of the SAJ Preferred Approach is concurrent with Ballydesmond Village Public Realm and Placemaking Enhancement Plan, M20 Cork to Limerick, Mallow Town Regeneration and Mallow Town Regeneration 2, N72/N73 Mallow Relief Road and Mallow Wastewater Treatment Plant (identified as 'BR' in Table 6.2). However, with the implementation of standard good practice measures there will be no adverse effects on the integrity of these 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 increases add cumulatively across all developments and contribute to carbon emissions at a national level. The same mitigation measures suggested for the SAJ 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 SAJ 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 all options associated with increasing resilience and the quality of water supply for local communities; and the subsequent benefits of this for public health. There are also moderate long-term beneficial impacts associated with the decommissioning of WTPs for landscape and visual amenity.

Key potential adverse impacts identified at plan level include:

- Moderate adverse effects during construction for SA option 95, SA option 97 and SA option 127 due to potential short-term adverse impacts to public health and/or quality of life from dust, noise and/traffic in the urban and rural areas. There would also be temporary amenity area loss/loss of access to amenity area during construction for SA option 95 and SA option 97;
- Major adverse effects during operation against biodiversity for SA option 131 and SA option 129. These require new abstractions from Ketragh and Ballinatona springs which support habitats of the Awbeg River and the upper reaches of the Blackwater River within Blackwater River SAC. The abstraction pressures on surface flows are unknown at this stage and require further site investigation.
- Moderate adverse effects during construction for SA options 95, 97 and 131 due to the potential for short-term impacts to the local landscape and visual amenity of the area during construction of the new assets, upgrades and decommissioning of WTPs;
- Major adverse effects during construction against material assets for SA option 131 associated with the requirement for a new groundwater abstraction, new WTP, upgrade of WTP and new pumps, storages and over 50km of new network. However, these are necessary to make use of the existing assets;
- Moderate adverse effects to environmental climate change resilience and major adverse effects to the water environment for options SAJ-128, 162, 167, 287, and SA options 20, 31, 95, 97, 101, 111,113, 114, 116 and 127 due to the level of increase in their existing groundwater abstractions. SA options 129, 130 and 131 also have the potential for moderate effects due to the level of abstraction required for their new groundwater abstractions;
- Moderate adverse effects during construction of SA options 127 and 131 associated with cultural heritage as the option requires new above ground assets within a boundary of National Inventory of Architectural Heritage/Sites and Monuments Record. There is potential for moderate short-term impacts regarding the setting of the site and a large amount of archaeological input will be required; and
- Moderate adverse effects during construction for geology and soils associated with SA option 131 which has new above ground assets within the boundary of a geological heritage site.

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 SAJ but does provide a complete picture as it does not fully take account of efficiencies from replacement of failing infrastructure, treatment technology or potential for mitigation, such as use of renewable energy

sources in relation to the whole network. Insufficient information is available for the cumulative effects assessment to consider how total study area carbon emissions will change overall and per ML of water.

SEA mitigation identified to address the key adverse impacts identified above includes further hydrological or hydrogeological modelling (as appropriate) to further inform understanding of potential impacts on the European and national designated sites identified as potentially affected by increased abstractions from existing surface and groundwater sources (see the NIS of the Framework Plan for further information). Other mitigation identified includes development of construction environmental management plans, public consultation with local residents on disruption during construction and consideration of the waste hierarchy in design. Measures to address the cumulative impact for carbon emissions include sourcing the energy supply from renewable sources. All developments will aim to achieve as far as possible requirements for no net loss in biodiversity or enhancement, as set out in the Biodiversity Action Plan (Irish Water, 2021). There may be potential to also provide opportunities for carbon sequestration with biodiversity enhancement. In addition, there are opportunities to reduce water demand (which in turn would reduce energy and carbon) by raising awareness of water issues, promoting water efficient devices and through leakage reduction.

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

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

Table 7.1 SEA Summary

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
SA Preferred Approach with interim measures as required and a programme of leakage reduction and water conservation measures, taking an adaptive approach to address uncertainty				
1. Protect public health and promote wellbeing	C Neutral to Moderate Adverse O Moderate Beneficial to Neutral 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.	Standard good construction practice and consultation 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.	• 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	• 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 amenities are impeded
2. Protect and enhance biodiversity and contribute to	C **Minor Adverse to Moderate Adverse** O Neutral to Major Adverse Impacts from construction works for pipelines and service reservoirs on biodiversity. These can be	Routing/siting to avoid impacts. Standard good construction practice and specific measures as identified in the NIS of the Framework Plan.	• Temporary and permanent habitats lost vs habitats created/enhanced • Site condition and population data for QI of European and National designated sites.	• Monitor construction activities to ensure compliance

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
resilient ecosystems	minimised through careful routing and siting. Potential for construction and operational impacts on European and National designated sites.	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.		
3. To protect landscapes, townscapes and visual amenity	C Neutral to Moderate Adverse O Moderate Beneficial to Neutral 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.	• Total working area of pipelines in sensitive landscapes • Land use/landscape features re-established for schemes over appropriate period – areas/km successfully restored to meet requirements	• Duration of construction works • Number of complaints received regarding visual impact of construction works

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
4. Protect and where appropriate enhance, built and natural assets and reduce waste	C Neutral to Moderate Adverse O Neutral to Minor Adverse New resources required for construction works, including extensive lengths of pipeline, service reservoirs and new/upgraded WTPs. Ongoing maintenance requirements.	Materials management to be integrated into design to optimise use of existing resources and minimise waste from construction and operation.	• 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	• 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.	• 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)	• Carbon footprint (total tonnes) during construction • Operational Carbon Intensity kgsCO_2equic/ML

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
6. Contribute to environmental climate change resilience	C Neutral to Moderate Adverse O Neutral to Moderate Adverse 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. WRZ options SAJ-128, SAJ-162, SAJ-167 and SAJ-287, require further assessment to understand their sustainability in the longer term.	Consider how operation can further reduce climate change pressure on at risk sources and associated designations, particularly for SAJ-128, SAJ-162, SAJ-167 and SAJ-287. Sustainability review of sources taking account of groundwater and surface water interconnections.	• WFD waterbody status objectives at risk and designated site condition status • Frequency of drought orders requiring change to normal abstractions/ compensation releases	• None identified
7. Protect and improve surface water and groundwater status	C Neutral O Neutral to Major Adverse Generally, new/increased abstractions are limited to allowable limits and have a low risk of adverse effect on WFD waterbody status objectives.	Further investigation to consider effects on groundwater abstraction on the surface water environment.	• WFD waterbody status objectives at risk	• Pollution incidents during construction

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
8. Avoid flood risk	C Neutral to Moderate Adverse O Neutral Potential loss of flood plain increasing flood risk from construction and location of above ground structures for SAJ-188, SAJ-262, SAJ-287, SAJ-291, SAJ-294, SAJ-295 and SA option 95, 130 and 113.	Siting and design of schemes to take account of flood risk and design for flood risk resilience.	• Number of options at risk of flooding at each AEP level	• Lost time to flooding • Lost time to power supply interruptions
9. Protect and where appropriate, enhance cultural heritage assets	C Neutral to Minor Adverse O Neutral to Moderate Adverse Potential construction impacts on unknown archaeological interest. Impacts on known interests are expected to be avoided.	Standard good practice approaches to minimise potential impacts.	• Number of archaeological assets adversely affected by water resource options • Number of options that are rerouted to avoid cultural heritage impacts • Number of schemes including improvements to access recording of archaeological assets or communication/ interpretation of interest features	• Number of archaeological finds recorded during construction

SEA Objectives	SA Preferred Approach (PA) (SA Approach 1) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
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.	• Soil Management Plans implemented • Volume of contaminated land restored, or soils removed	• 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 SAJ 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 SAJ abstractions have good quantitative status (Irish Water, 2022), therefore, the likelihood of affecting their WFD objectives in terms of quantitative status is low. It should be noted there are three groundwater bodies (Bruree, Cappoquin Kiltorcan and Mitchelstown) that are currently ‘at risk’ of failing their WFD objectives. These GWB are hydrologically linked to ‘At Risk’ surface waters that are not meeting water quality objectives and it is considered likely that groundwater is a contributing source of phosphorus. Additionally, Mitchelstown GWB has a poor chemical status due to nitrate concentrations exceeding the drinking water threshold value. Hence, impacts, including cumulative effects with non Irish Water abstractions, will need to be considered in further detail as part of project level consenting to demonstrate both sustainability for any connected surface waterbodies and groundwater dependent habitats and protected areas.

9 Appropriate Assessment Summary

9 Appropriate Assessment Summary

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

Potential in-combination effects with other projects and plans were identified for the preferred options on several designated sites. The potential effects include:

- Pollution impacts on Blackwater Estuary SPA;
- Habitat loss and disturbance impacts on Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA; and
- Habitat loss, habitat degradation, mortality, disturbance, spread of invasive non-native species, pollution and water table/availability impacts on Blackwater River (Cork/Waterford) SAC.

The assessment concluded that with the mitigation identified there will be no adverse effects on the integrity of the European sites in-combination with other plans or projects.

Potential in-combination effects between preferred options were identified for several designated sites. The potential impacts include:

- Habitat loss, mortality, spread of invasive non-native species, disturbance and habitat degradation impacts on Blackwater River (Cork/Waterford) SAC;
- Habitat degradation impacts on Blackwater Estuary SPA;
- Disturbance and habitat degradation impacts on Blackwater Callows SPA; and
- Habitat degradation impacts on Lower River Shannon SAC.

With the implementation of mitigation as detailed in Appendix E of the NIS, there will be no adverse effects on the integrity of European sites.

10 Recommendations for Implementation

10 Recommendations for Implementation

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

- SEA Environmental Report of the Framework Plan – this includes general proposals and standard mitigation requirements (also see SEA Environmental Report Appendix); and
- SEA Environmental Report of the Regional Plan - this includes specific mitigation and monitoring requirements for the South West 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 Groundwater Options in SAJ

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
SAJ-003	Increase existing GW abstraction from Ballinatona Springs, upgrade existing Ballinatona WTP and supply deficit									2	0	-18
SAJ-004	Increase existing GW abstraction from Ballinatona Springs, upgrade existing Ballinatona WTP and supply deficit									2	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
SAJ-007	New GW abstraction and from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-21
SAJ-008	New GW abstractionand from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-20
SAJ-022	Increase GW abstraction from Charleville BHs and upgrade Charleville WTP to partly supply deficit									2	0	-20
SAJ-023	Increase GW abstraction from Charleville BHs and upgrade Charleville WTP to supply deficit									1	0	-14
SAJ-024	Increase GW abstraction from Charleville BHs and upgrade Charleville 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
SAJ-025	Increase GW abstraction from Clogher Spring and upgrade Doneraile Shanballymore WTP									2	0	-17
SAJ-119	New GW abstraction (karstic) and new WTP to supply full deficit. Decomission Freemount WTP									2	0	-25
SAJ-034	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit									1	0	-15
SAJ-038	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit									1	0	-17
SAJ-039	Increase GW abstraction at Box Cross and									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
	upgrade Box Cross WTP to supply deficit											
SAJ-044	Increase existing GW abstraction from Lavally BH and upgrade existing Rahan WTP									1	0	-13
SAJ-045	New GW abstraction (karstic) and new WTP to partly supply deficit									0	0	-15
SAJ-046	Recommission old GW sources (2 BHs) for Mallow at Oliver's Cross (disused due to hydrocarbon contamination, but potential to reuse if contamination issue can be resolved) and supply deficit									1	0	-18
SAJ-050	GW abstraction from BH near Glantane School									1	0	-25

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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
	and new WTP to supply deficit											
SAJ-051	Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs									1	0	-10
SAJ-052	Increase existing GW abstraction from Ballybeg BHs and upgrade Mitchelstown South WTP to supply deficit									1	0	-12
SAJ-053	Increase existing GW abstraction from Ballybeg BHs and upgrade									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
	Mitchelstown South WTP to supply deficit											
SAJ-055	New GW abstraction (karstic location) and new WTP to supply deficit									0	0	-14
SAJ-063	New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2 MLD) and new WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs									0	0	-16
SAJ-065	Increase GW abstraction at Caherbarnagh and upgrade Caherbarnagh WTP									2	0	-12
SAJ-066	Increase GW abstraction at Caherbarnagh and									2	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
	upgrade Caherbarnagh WTP											
SAJ-067	Increase GW abstraction at Caherbarnagh and upgrade Caherbarnagh WTP									2	0	-17
SAJ-068	Increase GW abstraction from Tubrid Spring and Millstreet BH and upgrade existing Millstreet WTP									2	0	-13
SAJ-069	Increase GW abstraction from Tubrid Spring and Millstreet BH and upgrade existing Millstreet WTP									2	0	-19
SAJ-070	Increase GW abstraction from Tubrid Spring and Millstreet BH and upgrade existing Millstreet WTP									2	0	-17

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-071	New GW abstraction at Milstreet BH (karstic Region) and upgrade Millstreet WTP									2	0	-18
SAJ-082	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP									1	0	-16
SAJ-083	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP									1	0	-18
SAJ-086	Increase existing GW abstraction from infiltration gallery alongside Blackwater									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
	River and upgrade Coolrue WTP											
SAJ-087	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP									1	0	-23
SAJ-089	New GW abstraction (karstic) and new WTP to supply deficit									1	0	-21
SAJ-093	Increase GW abstraction at Downing Bridge BH and upgrade existing Dowing Bridge WTP to supply deficit									1	0	-13
SAJ-094	Increase GW abstraction at Downing Bridge BH and upgrade existing Dowing Bridge WTP to supply deficit									1	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
SAJ-095	Increase GW abstraction from Downing Bridge BH and upgrade existing Dowing Bridge WTP to supply deficit									1	0	-19
SAJ-098	Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit									0	0	-11
SAJ-099	Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit									0	0	-18
SAJ-100	New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2									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
	MLD) and new WTP to supply deficit											
SAJ-106	Increase GW abstraction from Johnstown (BH) and upgrade Ballykenley (Johnstown) WTP to supply deficit									1	0	-11
SAJ-108	New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2 MLD) and new WTP to supply deficit. New Storage at Dunmahon									0	0	-16
SAJ-109	New GW abstraction (karstic) and new WTP to supply deficit									1	0	-20
SAJ-118	New GW abstraction (karstic) and new WTP to supply full deficit. Decommission Freemount 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
SAJ-124	Increase GW abstraction from Spring and upgrade Castletownroche WTP									0	0	-13
SAJ-125	New GW abstraction and new WTP to supply deficit									0	0	-18
SAJ-132	Increase GW abstraction from Poulgorm springs and upgrade Poulgrom WTP to supply deficit									1	0	-11
SAJ-133	Increase GW abstraction from Poulgorm springs and upgrade Poulgrom WTP to supply deficit									1	0	-16
SAJ-134	Increase GW abstraction from Poulgorm springs and upgrade Poulgrom WTP to supply deficit									1	0	-12
SAJ-142	Increase GW abstraction from existing BH and									1	0	-9

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	upgrade Bweeng WTP to supply deficit											
SAJ-144	New GW abstraction and new WTP to supply deficit									1	0	-15
SAJ-149	Increase GW abstraction and upgrade Killavullen WTP to supply deficit									1	0	-12
SAJ-154	Increase GW abstraction from Mount North (spring) and upgrade Mountnorth WTP to supply spare capacity to neighboring WRZ									1	0	-9
SAJ-155	Increase GW abstraction from Mountnorth & Ballyclough (spring) and upgrade Ballyclough WTP to supply spare capacity to neighboring WRZ									1	0	-9

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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
SAJ-156	Increase GW abstraction from Mountnorth & Ballyclough (spring) and upgrade Ballyclough WTP to supply spare capacity to neighboring WRZ									1	0	-19
SAJ-162	Increase GW abstraction and upgrade Laharan Abbeys Well WTP to supply deficit									1	0	-9
SAJ-163	Increase GW abstraction from Laharan Cross Spring and upgrade Laharan Cross WTP to supply deficit									1	0	-8
SAJ-164	New GW abstraction in karstic region and new 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
SAJ-166	New GW abstraction (wells) and new WTP to supply deficit									2	0	-19
SAJ-167	Increase GW abstraction from Lyre spring and upgrade Lyre WTP to supply deficit									1	0	-9
SAJ-171	Increase GW abstraction from Gortnagraige BH and upgrade Gortnagraige WTP to supply deficit									1	0	-20
SAJ-172	New GW abstraction (karstic) and new WTP to supply deficit									2	0	-27
SAJ-175	Increase GW abstraction from springs (no. 3 springs) and upgrade Derry 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
SAJ-178	Increase GW abstraction from existing no. 2 boreholes and upgrade Kilmaginer WTP to supply deficit									1	0	-21
SAJ-179	New GW abstraction in the karstic region north of Kilmaginer and new WTP to supply deficit									0	0	-23
SAJ-184	Increase GW abstraction from Drommahane BH and upgrade Hammond Place WTP. Supply spare capacity to neighboring scheme in deficit									1	0	-12
SAJ-185	Increase GW abstraction from Drommahane BH and upgrade Hammond Place WTP. Supply spare capacity to neighboring scheme in deficit									1	0	-12

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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
SAJ-186	Increase GW abstraction from Cois Tobair BH and upgrade Cois Tobair WTP. Supply spare capacity to neighboring scheme in deficit									1	0	-12
SAJ-187	Increase GW abstraction from Cois Tobair BH and upgrade Cois Tobair WTP. Supply spare capacity to neighboring scheme in deficit									1	0	-12
SAJ-194	Increase GW abstraction from existing BH and upgrade Monabricka WTP to supply deficit									2	0	-19
SAJ-195	New GW abstraction (karstic) and new WTP to supply deficit									3	0	-24
SAJ-339	Increase GW abstraction at Box Cross and									2	0	-17

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	upgrade Box Cross WTP to supply deficit											
SAJ-209	Increase GW abstraction from Macroney spring and upgrade Macroney WTP to supply deficit									0	0	-20
SAJ-210	New GW abstraction (karstic) and new WTP to supply deficit									1	0	-22
SAJ-212	Increase GW abstraction from springs and upgrade Skahanagh WTP to supply deficit									0	0	-14
SAJ-213	New GW abstraction (karstic) and new WTP to supply deficit									0	0	-17
SAJ-026	Increase GW abstraction from Clogher Spring and upgrade Doneraile Shanballymore WTP									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
SAJ-215	Increase GW abstraction from existing BH and upgrade Coolagown WTP to supply deficit									1	0	-16
SAJ-216	New GW abstraction and new WTP to supply deficit									1	0	-22
SAJ-221	Increase GW abstraction from Kilmurry BH and upgrade Kilmurray WTP to supply deficit									1	0	-20
SAJ-226	Increase GW abstraction from Bottlehill BH and upgrade Bottlehill WTP to supply deficit									1	0	-18
SAJ-227	New GW abstraction and new WTP to supply deficit									1	0	-21
SAJ-229	Increase GW abstraction from Knockanevin BH									0	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
	and upgrade existing Knockanevin WTP to supply deficit											
SAJ-238	Increase GW abstraction from Ballyvadonna BH and upgrade Ballyvadonna WTP to supply deficit									0	0	-21
SAJ-239	New GW abstraction (poorly productive bedrock) and new WTP to supply deficit									1	0	-26
SAJ-250	Increase GW abstraction from Labbamollogga BH and upgrade Labbamollogga WTP to supply deficit									0	0	-17
SAJ-287	Increase GW abstraction at Ballyagran BH and upgrade Ballyagran									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
	Pump Station WTP to supply deficit											
SAJ-288	New GW abstraction (karstic) and new WTP to supply deficit									1	0	-20
SAJ-289	New GW abstraction from Ballingarry groundwater body (productive fissured bedrock) and new WTP									0	0	-18
SAJ-297	Increase GW abstraction from Balinamultina BH and upgrade Coolboa WTP to supply deficit									1	0	-12
SAJ-298	Increase GW abstraction from Laurentum spring and upgrade Clashmore White Well (Laurentum) 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
SAJ-299	New GW abstraction in karstic region and new WTP to supply deficit									0	0	-16
SAJ-305	Increase GW abstraction from Grallagh BH and upgrade Grallagh WTP to supply deficit									1	0	-10
SAJ-306	Increase GW abstraction from Grallagh BH and upgrade Grallagh WTP to supply deficit									0	0	-14
SAJ-307	New GW abstraction from karstic region and upgrade WTP									0	0	-18
SAJ-313	Increase GW abstraction from Tinnabinna BHs and upgrade Tinnabinna WTP to supply deficit									1	0	-9
SAJ-449	New GW abstraction in karstic region and new									1	0	-24

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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 to supply full demand											
SAJ-315	New GW abstraction in karstic region and new WTP									0	0	-19
SAJ-323	Increase GW abstraction from Ballyhamlet BH and upgrade Ballymoate Upper WTP									1	0	-11
SAJ-324	Increase GW abstraction from Ballyhamlet BH and upgrade Ballymoate Upper WTP									1	0	-12
SAJ-325	Increase GW abstraction from Ballyheaphy BH and upgrade Ballyheaphy WTP to supply spare capacity to neighboring scheme									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
SAJ-340	New GW abstraction in karstic region and new WTP to supply deficit									1	0	-18
SAJ-342	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Flood defense required at project level									1	0	-20
SAJ-344	Increase GW abstraction from Clogher Spring and upgrade Doneraile Shanballymore WTP									2	0	-19
SAJ-345	Interconnect Castletownroche with Doneraile Shanballymore WTP and supply deficit from Charleville WRZ									2	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
SAJ-348	Increase GW abstraction at Ballyagran BH and upgrade Ballyagran Pump Station WTP to supply deficit									1	0	-12
SAJ-351	Increase existing GW abstraction from Ballinatona Springs, upgrade existing Ballinatona WTP and supply deficit									2	0	-20
SAJ-352	New GW abstractionand from Ketragh Springs and new WTP to supply deficit									3	0	-24
SAJ-363	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit									1	0	-16
SAJ-365	Increase GW abstraction at Box Cross and									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
	upgrade Box Cross WTP to supply deficit											
SAJ-369	New GW abstraction and new WTP to supply deficit									1	0	-20
SAJ-388	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit									2	0	-26
SAJ-391	New GW abstraction at Milstreet BH (karstic Region) and upgrade Millstreet WTP									2	0	-23
SAJ-392	Increase GW abstraction from Mount North (spring) and upgrade Mountnorth WTP to supply spare capacity to neighboring WRZ									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
SAJ-396	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is provided when the infiltration gallery floods									1	0	-21
SAJ-402	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is provided when the infiltration gallery floods									1	0	-16
SAJ-406	Increase GW abstraction at Box Cross and									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
	upgrade Box Cross WTP to supply deficit											
SAJ-417	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit									1	0	-15
SAJ-429	Increase GW abstraction at Box Cross, upgrade WTP and interconnect to Charleville/ Doneraile to supply deficit									3	0	-28
SAJ-424	Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Supply spare capacity									0	2	-11
SAJ-425	Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve									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
	interconnectivity between Mitchelstown North and Mitchelstown South WSZs											
SAJ-432	Increase GW abstraction at Box Cross, upgrade WTP and interconnect to Charleville/ Doneraile to supply deficit									3	0	-27
SAJ-436	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit									2	0	-24
SAJ-437	New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-24
SAJ-438	New GW abstraction and upgrade existing									2	0	-25

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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
	Charleville WTP to supply deficit											
SAJ-439	New GW abstraction and upgrade existing Charleville WTP to supply deficit									2	0	-25
SAJ-443	Increase GW abstraction at Box Cross, upgrade WTP and interconnect to Charleville/ Doneraile to supply deficit									2	0	-25
SAJ-448	Increase GW abstraction at Box Cross, upgrade WTP and interconnect to Charleville/ Doneraile to supply deficit									2	0	-25
SAJ-455	Increase GW abstraction from Grallagh BH and upgrade Grallagh 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
SAJ-460	Increase GW abstraction from Laurentum spring and upgrade Clashmore White Well (Laurentum) WTP to supply deficit									1	0	-15
SAJ-464	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit									2	0	-23
SAJ-465	New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-23
SAJ-467	"New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2 MLD) and new WTP to supply deficit. New Storage at Dunmahon									0	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
SAJ-469	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit									2	0	-31
SAJ-470	New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-31
SAJ-480	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit									2	0	-29
SAJ-481	New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-29
SAJ-490	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing									2	0	-22

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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
	Ballinatona WTP and supply deficit											
SAJ-491	New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-22
SAJ-502	New GW and upgrade Charleville WRZ to supply deficit									2	0	-19
SAJ-314	Bring back Tiknock BH to production, upgrade Tiknock WTP and supply deficit									1	0	-13
SAJ-507a	New GW and upgrade Charleville WRZ to supply deficit									2	0	-19
SAJ-509	Increase GW abstraction at Downing Bridge BH and upgrade existing									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
	Dowing Bridge WTP to supply deficit											
SAJ-510	Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit									1	0	-19
SAJ-511	Increase GW abstraction at Downing Bridge BH and upgrade existing Dowing Bridge WTP to supply deficit									1	0	-20
SAJ-512	Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit									1	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
SAJ-515	New GW and upgrade Charleville WRZ to supply deficit.									2	0	-20
SAJ-518	New GW abstraction (karstic) and new WTP to supply full deficit. Decomission Freemount WTP									1	0	-17
SAJ-526	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit									2	0	-22
SAJ-527	New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)									2	0	-21

Table A.2 Fine Screening Summary of Groundwater and Interconnection Options in SAJ

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
SAJ-011	Interconnect Newmarket with Allow Regional and supply deficit from Allow Regional									1	1	-13
SAJ-014	Interconnect Newmarket with Rathmore WRZ (Kerry) and supply deficit from Rathmore									2	0	-18
SAJ-021	Interconnect Newmarket and Millstreet WRZs and partly supply deficit from Millstreet									2	0	-19
SAJ-061	Improve interconnectivity of Mitchelstown North (Michelstown Galtee WTP) and Mitchelstown South (Mitchelstown South WTP)									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
	and supply deficit from Mitchelstown South WTP											
SAJ-062	Interconnect Mitchelstown and Burncourt Ballylooby WRZs and supply deficit from Ballylooby Springs WTP									2	0	-19
SAJ-123	Interconnect Allow Regional with Newmarket and supply deficit from Newmarket									1	0	-20
SAJ-127	Interconnect Castletownroche with Ballyhooly WRZ and supply deficit									0	0	-18
SAJ-145	Interconnect Bweeng and Dromahane/Kilcolman/Cois Tobair WRZs and supply deficit from Dromahane/Kilcolman/Cois Tobair									1	0	-12

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-243	Interconnect Ballyvadonna and Fermoy and supply deficit from increased GW abstraction at Fermoy									1	0	-18
SAJ-256	Inerconnect Labbamollogga and Ballylanders WRZs and supply deficit from Ballylanders (study area K)									1	0	-12
SAJ-197	Interconnect Monabricka with South West Regional Scheme WRZ and supply deficit (Tobergal WTP)									1	2	-10
SAJ-349	Interconnect Banteer and Newmarket and supply deficit from Newmarket (Ballinatona WTP)									2	0	-20
SAJ-350	Interconnect Banteer and Newmarket and supply									2	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
	deficit from Newmarket (Ketragh Springs)											
SAJ-366	Interconnect Charleville / Doneraile and Mallow and supply deficit from Box Cross WTP									1	1	-13
SAJ-368	Interconnect Banteer and Lombardstown WRZs (new regional scheme) and supply deficit from Lombardstown									1	0	-20
SAJ-430	Interconnect Charleville / Doneraile and Mallow and supply deficit from Box Cross WTP									3	0	-28
SAJ-433	Interconnect Charleville / Doneraile and Mallow and supply deficit from Box Cross WTP									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
SAJ-440	New GW abstraction and upgrade existing Charleville WTP. Interconnect with Box Cross to supply deficit									1	0	-23
SAJ-441	New GW abstraction and upgrade existing Charleville WTP. Interconnect with Box Cross to supply deficit									1	0	-23
SAJ-463	Interconnect Allow Regional with Newmarket and supply deficit from Newmarket									2	0	-23
SAJ-473	Interconnect Banteer with Newmarket for increased resilience and supply deficit. Rationalise Creggane WTP - rationalisation within WRZ									2	0	-31

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
SAJ-475	Interconnect Millstreet with Newmarket for increased resilience and supply deficit. Rationalise Cockhill WTP and Caherbarnagh WTP - rationalisation within WRZ									2	0	-31
SAJ-479	Interconnect Allow Regional with Newmarket for increased resilience and supply deficit									2	0	-31
SAJ-484	Interconnect Banteer with Newmarket for increased resilience and supply deficit. Rationalise Creggane WTP - rationalisation within WRZ									2	0	-29
SAJ-486	Interconnect Millstreet with Newmarket for increased resilience and supply deficit. Rationalise Cockhill									2	0	-29

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
	WTP and Caherbarnagh WTP - rationalisation within WRZ											
SAJ-497	New GW abstraction and upgrade Charleville WTP. Interconnect with Mount Russel BH (1.6 MLD) (Glenosheen / Jamestown / Kilmallock WRZ - SA 8)									1	0	-18
SAJ-498	New GW abstraction and upgrade Charleville WTP. Interconnect with Mount Russel BH (1.6 MLD) (Glenosheen / Jamestown / Kilmallock WRZ - SA 8)									1	0	-17
SAJ-508	Interconnect Kilmurry (Mitchelstown) and Inchinleamy (SA K Waterford) WRZs									0	0	-13
SAJ-521	Interconnect Banteer with Newmarket for increased									2	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
	resilience and supply deficit. Rationalise Creggane WTP - rationalisation within WRZ											
SAJ-525	Interconnect Millstreet with Newmarket for increased resilience and supply deficit. Rationalise Cockhill WTP and Caherbarnagh WTP - rationalisation within WRZ									2	0	-21

Table A.3 Fine Screening Summary of Groundwater and Rationalisation Options in SAJ

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
SAJ-228	Rationalise Bottlehill to Mallow WRZ (Box Cross WTP)									1	0	-17
SAJ-073	Rationalise Caherbarnagh WTP and Cockhill WTP to Milstreet WTP. Rationalisation within WRZ									2	3	-14
SAJ-146	Rationalise Bweeng to Dromahane/Kilcolman/Cois Tobair WRZ									1	0	-12
SAJ-153	Rationalise Kilavullen to Mallow WRZ (Lavally WTP)									1	0	-13
SAJ-169	Rationalise Lyre to Banteer WRZ (Poulgrom WTP)									1	0	-16
SAJ-173	Rationalise Gortnagreige to Mallow WRZ									1	0	-22
SAJ-177	Rationalise Toureen Derry to Banteer WRZ (approved)									1	0	-12

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-183	Rationalise Kilmagnier to Fermoy WRZ (increase existing GW abstraction)									1	0	-23
SAJ-196	Rationalise Monabricka to Charleville/Doneraile WRZ (Charleville WTP)									1	0	-13
SAJ-200	Rationalisation approved to connect to Ballyclough & Mount North WRZ									1	0	-19
SAJ-205	Rationalisation approved to connect to Fermoy WRZ (Coolrue WTP)									1	0	-16
SAJ-206	Rationalisation approved to connect to Fermoy WRZ (Coolrue WTP)									1	0	-23
SAJ-211	Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)									1	0	-19
SAJ-219	Rationalise Coolagown to Fermoy WRZ (increase GW									1	0	-23

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	abstraction from existing infiltration gallery)											
SAJ-222	Rationalise Kilmurry (Mitchelstown) to Ballyhooly WRZ (Downing Bridge WTP)									1	0	-20
SAJ-214	Rationalise Skahanagh to Charleville/Doneraile WRZ (Doneraile Shanballymore WTP)									1	0	-16
SAJ-232	Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)									1	0	-11
SAJ-235	Rationalise Kilcorney to Millstreet WRZ for increased resilience and long term OPEX savings									2	0	-17
SAJ-241	Rationalise Ballyvadonna to Fermoy WRZ (increase existing GW abstraction)									1	0	-16
SAJ-252	Rationalise Labbamollogga to Mitchelstown WRZ (Mitchelstown South WTP)									1	0	-11

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-253	Rationalise Labbamollogga to Mitchelstown WRZ (new GW & new WTP)									0	0	-14
SAJ-260	Rationalise Gortnaskehy to Ballyheaphy WRZ									1	0	-15
SAJ-263	Rationalise Knockeragh to Newmarket WRZ									2	0	-19
SAJ-267	Rationalise Castlewrixon to Charleville for increased resilience and long term OPEX savings									1	0	-14
SAJ-268	Rationalise Ballinamona to Mallow WRZ for increased resilience and long term OPEX savings									1	0	-22
SAJ-278	Rationalise Boherascrub to Ballyclough & Mount North WRZ									1	0	-9
SAJ-285	Rationalise Monaparson to Mallow WRZ for increased									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
	resilience and long term OPEX savings											
SAJ-303	Rationalise Clashmore/Whitewell to Grallagh WRZ									0	0	-14
SAJ-311	Rationalise Kilmore-Kilbeg to Tallow WRZ									1	0	-10
SAJ-312	Rationalise Kilmore-Kilbeg to Ballymoate Upper WRZ									1	0	-12
SAJ-341	Rationalise Villierstown to LCB Cappoquin WTP (SA K)									1	3	-14
SAJ-347	Rationalise Monabricka to Castletown Ballyagran WRZ									1	0	-12
SAJ-364	Rationalise Rahan to Box's Cross WTP									1	0	-16
SAJ-370	Rationalise Ballymoate Upper to Tallow WRZ									1	0	-16
SAJ-377	Rationalise Castletown Ballyagran to Rathkeale WRZ									1	2	-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
	(SA 8 - preferred approach option TG4-SA8-145)											
SAJ-378	Rationalise Castletown Ballyagran to Bruree WRZ (SA 8 - preferred approach option TG4-SA8-68)									1	2	-12
SAJ-385	Rationalise Bottlehill, Monaparson and Ballinamona WRZs to Mallow WRZ									1	0	-25
SAJ-386	Rationalise Bottlehill, Monaparson and Ballinamona WRZs to Mallow WRZ									1	0	-25
SAJ-387	Rationalise Bottlehill, Monaparson and Ballinamona WRZs to Mallow WRZ									1	0	-25
SAJ-389	Rationalise Kilcorney and Glenleigh to Millstreet WRZ for increased resilience and long term OPEX savings									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
SAJ-390	Rationalise Kilcorney and Glenleigh to Millstreet WRZ for increased resilience and long term OPEX savings									2	0	-23
SAJ-393	Rationalise Boherascrub and Kilbrin Garran an Darra to Ballyclough & Mount North WRZ									0	0	-15
SAJ-394	Rationalise Boherascrub and Kilbrin Garran an Darra to Ballyclough & Mount North WRZ									0	0	-15
SAJ-397	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ									1	0	-21
SAJ-398	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ									1	0	-21
SAJ-399	Rationalise Ballyvadonna, Strawhall, Knockdrumalough,									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
	Coolagown and Kilmagnier to Fermoy WRZ											
SAJ-400	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ									1	0	-21
SAJ-401	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ									1	0	-21
SAJ-403	Rationalise Ballyvadonna, Strawhall and Knockdrumalough to Fermoy WRZ (approved for 2021)									1	0	-16
SAJ-404	Rationalise Ballyvadonna, Strawhall and Knockdrumalough to Fermoy WRZ (approved for 2021)									1	0	-16
SAJ-405	Rationalise Ballyvadonna, Strawhall and Knockdrumalough									1	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
	to Fermoy WRZ (approved for 2021)											
SAJ-407	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow									1	0	-16
SAJ-408	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow									1	0	-16
SAJ-409	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow									1	0	-16
SAJ-411	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,									1	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
	Monee & Knockabrack and Rahan to Mallow											
SAJ-412	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow									1	0	-16
SAJ-413	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow									1	0	-16
SAJ-414	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow									1	0	-16
SAJ-415	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,									1	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
	Monee & Knockabrack and Rahan to Mallow											
SAJ-416	Rationalise Knoppogue to Mallow (planned for 2022)									1	0	-15
SAJ-423	Rationalise Stagmount to Rockchapel WRZ (planned for 2022)									0	2	-11
SAJ-426	Rationalise Glenduff to Mitchelstown (planned for 2022)									1	0	-14
SAJ-434	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									2	0	-27
SAJ-435	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									2	0	-27
SAJ-444	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									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
SAJ-446	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									2	0	-25
SAJ-445	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									1	0	-23
SAJ-447	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									1	0	-23
SAJ-450	Rationalise Kilmore-Kilbeg to Tallow WRZ									1	0	-23
SAJ-451	Rationalise Ballymoate Upper to Tallow WRZ									1	0	-23
SAJ-457	Rationalise Clashmore/Whitewell to Grallagh WRZ									1	0	-19
SAJ-458	Rationalise Tiknock/Tinnabina to Grallagh WRZ									1	0	-19
SAJ-459	Rationalise Tiknock/Tinnabina to Clashmore/Whitewell WRZ									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
SAJ-461	Rationalise Labbamollogga to Ballylanders WRZs (study area K)									1	0	-10
SAJ-462	Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SA K Waterford) WRZ									1	0	-14
SAJ-466	Rationalise Bweeng to Donoughmore WRZ (SA I) (TG2-SAI-212)									1	0	-11
SAJ-468	Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)									0	0	-17
SAJ-474	Rationalise Toureen Derry to Banteer WRZ (approved)									2	0	-31
SAJ-476	Rationalise Glenleigh and Kilcorney to Millstreet WRZ									2	0	-31
SAJ-477	Rationalise Glenleigh and Kilcorney to Millstreet WRZ									2	0	-31

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
SAJ-478	Rationalise Kilbrin Garran an Darra to Newmarket WRZ									2	0	-31
SAJ-485	Rationalise Toureen Derry to Banteer WRZ (approved)									2	0	-29
SAJ-487	Rationalise Glenleigh and Kilcorney to Millstreet WRZ									2	0	-29
SAJ-488	Rationalise Glenleigh and Kilcorney to Millstreet WRZ									2	0	-29
SAJ-489	Rationalise Kilbrin Garran an Darra to Newmarket WRZ									2	0	-29
SAJ-492	Rationalise Kilbrin Garran an Darra to Newmarket WRZ									2	0	-22
SAJ-499	Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ									2	0	-18
SAJ-500	Rationalise Castlewrixon, Monabricka and Skahanagh									2	0	-18

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	WRZs to Charleville/Doneraile WRZ											
SAJ-501	Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ									2	0	-18
SAJ-503	Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ									2	0	-19
SAJ-504	Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ									2	0	-19
SAJ-505	Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ									2	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
SAJ-513	Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)									1	0	-20
SAJ-516	Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ									2	0	-20
SAJ-517	Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ									2	0	-20
SAJ-519	Rationalise Kilbrin Garran an Darra to Allow regional WRZ									1	0	-17
SAJ-522	Rationalise Glenleigh and Kilcorney to Millstreet WRZ									2	0	-18
SAJ-523	Rationalise Glenleigh and Kilcorney to Millstreet WRZ									2	0	-20
SAJ-528	Rationalise Toureen Derry to Banteer WRZ (approved)									2	0	-18

Table A.4 Fine Screening Summary of Surface Water Options in SAJ

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
SAJ-028	New SW abstraction from Awbeg River and new WTP to supply deficit									1	0	-18
SAJ-047	New SW abstraction from Blackwater River and new WTP to supply deficit									1	0	-23
SAJ-076	New SW abstraction from Blackwater River and new WTP to supply deficit									1	0	-25
SAJ-077	New SW abstraction from Blackwater River and new WTP to supply deficit									1	0	-24
SAJ-078	New SW abstraction from Blackwater River and new WTP to supply deficit									1	0	-24
SAJ-101	New SW abstraction from Funshion River and new WTP to supply deficit									0	0	-21

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-110	New SW abstraction from Funshion River and new WTP to supply deficit									0	0	-16
SAJ-042	Increase existing SW abstraction from Clyda River (Mallow WTP)									2	0	-17
SAJ-137	Increase SW abstraction from River Bride and upgrade Conna Regional WTP. Supply spare capacity to neighboring WRZ in deficit									0	0	-14
SAJ-320	Bring back Kilbeg stream (currently not in use) to production and upgrade Tallow WTP to supply deficit									1	0	-19
SAJ-322	Bring back Kilbeg stream (currently not in use) to production and upgrade Tallow WTP to supply deficit									1	0	-10
SAJ-353	Increase SW abstraction from River Bride and upgrade Conna									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
	Regional WTP. Supply spare capacity to neighboring WRZ in deficit											
SAJ-357	New SW abstraction from Blackwater River and new WTP to supply deficit									2	0	-25
SAJ-360	New SW abstraction from River Blackwater and new WTP to supply deficit (Banteer WRZ)									2	0	-23
SAJ-371	Bring back Kilbeg stream (currently not in use) to production and upgrade Tallow WTP to supply deficit									1	0	-16
SAJ-428	New SW abstraction from River Blackwater u/s of Mallow Town and treat at existing Mallow WTP (upgrade) to supply Mallow full demand. Abandoning existing SW sources Fiddane Reservoir and Clyda River. Therefore, allowing to offset Box Cross									3	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
	WTP (increased GW) to supply Charleville/ Doneraile											
SAJ-427	New SW from River Blackwater, new WTP and new network to supply Clareville/ Doneraile deficit									2	0	-24
SAJ-418	New SW from River Blackwater, new WTP and new network to supply Clareville/ Doneraile deficit									2	0	-24
SAJ-431	New SW abstraction from River Blackwater u/s of Mallow Town and treat at existing Mallow WTP (upgrade) to supply Mallow full demand. Abandoning existing SW sources Fiddane Reservoir and Clyda River. Therefore, allowing to offset Box Cross WTP (increased GW) to supply Charleville/ Doneraile									2	0	-24

Table A.5 Screening Summary of Surface Water and Interconnection Options in SAJ

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
SAJ-016	Interconnect Newmarket and Central Regional - Lough Guitane WRZs and supply deficit from Central Regional - Lough Guitane									1	0	-15
SAJ-075	Interconnect Millstreet and Central Regional - Lough Guitane WRZ and supply deficit from Central Regional - Lough Guitane									1	0	-19
SAJ-090	Interconnect Fermoy and Conna Regional and supply deficit from Conna Regional									0	0	-14
SAJ-242	Interconnect Ballyvadonna and Fermoy and supply deficit from new SW abstraction from River Blackwater at Fermoy									1	0	-24
SAJ-361	Interconnect Banteer and Newmarket WRZs and supply									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
	deficit from Banteer (new SW abstraction from River Blackwater)											

Table A.6 Fine Screening Summary of Surface Water and Rationalisation Options in SAJ

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
SAJ-174	Rationalise Gortnagreige to Mallow WRZ									2	0	-17
SAJ-240	Rationalise Ballyvadonna to Fermoy WRZ (new SW abstraction from Blackwater River)									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
SAJ-354	Rationalise Coolagown to Conna Regional (River Bride)									1	0	-13
SAJ-355	Rationalise Knockdrumaclough to Conna Regional (River Bride)									1	0	-13
SAJ-356	Rationalise Kilmagnier to Conna Regional (River Bride)									1	0	-13
SAJ-358	Interconnect Ballyhooly and Castletownroche with Fermoy (new SW abstraction from Blackwater River) and supply deficit									2	0	-25
SAJ-359	Interconnect Ballyhooly and Castletownroche with Fermoy (new SW abstraction from Blackwater River) and supply deficit									2	0	-25
SAJ-419	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									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
SAJ-420	Rationalise Monabricka and Castlewrixon to Charleville (planned for 2022)									2	0	-22
SAJ-514	Rationalise Monabricka to South West Regional Scheme WRZ									0	1	-10

Table A.7 Fine Screening Summary of WTP Upgrade Options in SAJ

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
SAJ-141	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-5

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-157	Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit									0	0	-6
SAJ-188	Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit									0	0	-17
SAJ-189	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-17
SAJ-201	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-15
SAJ-207	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. Rationalisation approved									0	1	-15
SAJ-208	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-15

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-223	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-14
SAJ-225	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-17
SAJ-236	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-14
SAJ-259	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	1	-17
SAJ-262	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-15
SAJ-265	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-15

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-266	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-15
SAJ-269	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-14
SAJ-270	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-15
SAJ-272	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									1	0	-15
SAJ-274	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-9
SAJ-276	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									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
SAJ-281	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-13
SAJ-284	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-8
SAJ-286	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-9
SAJ-291	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-14
SAJ-294	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-12
SAJ-295	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-12

Option Reference	Name	Environmental								Total -3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAJ-304	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-8
SAJ-310	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-13
SAJ-326	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	0	-7
SAJ-379	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit									0	2	-8

Table A.8 Fine Screening Summary of Conjunctive Use Options in SAJ

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
SAJ-128	Conjunctive use of existing spring and trial well and upgrade existing Castletownroche WTP									1	0	-16

Appendix B SA Approaches for SAJ

Note: SA Options are also referred to as Group Options

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0082: Aglish Cul Rua	SAJ-291 Upgrade existing WTP	-	SAJ-291 Upgrade existing WTP	-	SAJ-291 Upgrade existing WTP	-
0500SC0113: Allow Regional	SAJ-518 New GW abstraction and new WTP	130	SAJ-518 New GW abstraction and new WTP	130	SAJ-518 New GW abstraction and new WTP	130
0500SC0065: Ballinamona	SAJ-408 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-408 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-408 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0185: Ballyclough & Mount North	SAJ-154 & SAJ-155 Increase GW abstraction and upgrade WTP	20	SAJ-154 & SAJ-155 Increase GW abstraction and upgrade WTP	20	SAJ-154 & SAJ-155 Increase GW abstraction and upgrade WTP	20
3100SC0084: Clashmore / Whitewell	SAJ-457 Rationalise Clashmore/Whitewell to Grallagh WRZ	111	SAJ-457 Rationalise Clashmore/Whitewell to Grallagh WRZ	111	SAJ-457 Rationalise Clashmore/Whitewell to Grallagh WRZ	111
3100SC0052: Ballyheaphy	SAJ-325 Increase GW abstraction and upgrade WTP	31	SAJ-325 Increase GW abstraction and upgrade WTP	31	SAJ-325 Increase GW abstraction and upgrade WTP	31

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0118: Ballyhooly	SAJ-511 & SAJ-512 Increase GW abstraction and upgrade WTP	127	SAJ-511 & SAJ-512 Increase GW abstraction and upgrade WTP	127	SAJ-511 & SAJ-512 Increase GW abstraction and upgrade WTP	127
3100SC0121: Ballymoate Upper	SAJ-451 Rationalise Ballymoate Upper to Tallow WRZ	109	SAJ-451 Rationalise Ballymoate Upper to Tallow WRZ	109	SAJ-451 Rationalise Ballymoate Upper to Tallow WRZ	109
0500SC0004: Ballynoe	SAJ-223 Upgrade WTP	-	SAJ-223 Upgrade WTP	-	SAJ-223 Upgrade WTP	-
0500SC0122: Ballyvadonna	SAJ-397 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95	SAJ-397 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95	SAJ-397 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
0500SC0136: Banteer	SAJ-521 Interconnect Banteer with Newmarket. Rationalise Creggane WTP	131	SAJ-521 Interconnect Banteer with Newmarket. Rationalise Creggane WTP	131	SAJ-521 Interconnect Banteer with Newmarket. Rationalise Creggane WTP	131
0500SC0096: Boherascrub	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20
0500SC0006: Bottlehill	SAJ-411 Rationalise Gortnagreige, Ballinamona, Monaparson,	97	SAJ-411 Rationalise Gortnagreige, Ballinamona, Monaparson,	97	SAJ-411 Rationalise Gortnagreige, Ballinamona, Monaparson,	97

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow		Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow		Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	
0500SC0056: Bweeng	SAJ-466 Rationalise Bweeng to Donoughmore WRZ	116	SAJ-466 Rationalise Bweeng to Donoughmore WRZ	116	SAJ-466 Rationalise Bweeng to Donoughmore WRZ	116
3100SC0017: Camphire	SAJ-295 Upgrade existing WTP	-	SAJ-295 Upgrade existing WTP	-	SAJ-295 Upgrade existing WTP	-
0500SC0061: Carrigcleena	SAJ-272 Upgrade existing WTP	-	SAJ-272 Upgrade existing WTP	-	SAJ-272 Upgrade existing WTP	-
1900SC0018: Castletown Ballyagran Water Supply	SAJ-287 Increase GW abstraction and upgrade WTP	-	SAJ-287 Increase GW abstraction and upgrade WTP	-	SAJ-287 Increase GW abstraction and upgrade WTP	-
0500SC0124: Castletownroche	SAJ-128 Conjunctive use of existing spring and trial well and upgrade WTP	-	SAJ-128 Conjunctive use of existing spring and trial well and upgrade WTP	-	SAJ-128 Conjunctive use of existing spring and trial well and upgrade WTP	-
0500SC0110: Castlewrixon	SAJ-516 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129	SAJ-516 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129	SAJ-516 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0114: Charleville / Doneraile	SAJ-515 New GW and upgrade Charleville WRZ to supply deficit	129	SAJ-515 New GW and upgrade Charleville WRZ to supply deficit	129	SAJ-515 New GW and upgrade Charleville WRZ to supply deficit	129
0500SC0002: Conna Regional	SAJ-141 Upgrade WTP	-	SAJ-141 Upgrade WTP	-	SAJ-141 Upgrade WTP	-
0500SC0089: Coolagown	SAJ-400 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ.	95	SAJ-400 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ.	95	SAJ-400 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ.	95
0500SC0126: Dromahane / Kilcolman / Cois Tobair	SAJ-188 Upgrade existing WTP	-	SAJ-188 Upgrade existing WTP	-	SAJ-188 Upgrade existing WTP	-
0500SC0176: Fermoy	SAJ-396 Increase existing GW abstraction and upgrade WTP	95	SAJ-396 Increase existing GW abstraction and upgrade WTP	95	SAJ-396 Increase existing GW abstraction and upgrade WTP	95
0500SC0175: Glanworth / Ballykenley/Johnstown	SAJ-467 New GW abstraction and new WTP	117	SAJ-467 New GW abstraction and new WTP	117	SAJ-467 New GW abstraction and new WTP	117
0500SC0099: Glenduff	SAJ-426 Rationalise Glenduff to Mitchelstown	101	SAJ-426 Rationalise Glenduff to Mitchelstown	101	SAJ-426 Rationalise Glenduff to Mitchelstown	101

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0076: Glenleigh	SAJ-522 Rationalise Glenleigh and Kilcorney to Millstreet WRZ	131	SAJ-522 Rationalise Glenleigh and Kilcorney to Millstreet WRZ	131	SAJ-522 Rationalise Glenleigh and Kilcorney to Millstreet WRZ	131
0500SC0182: Gortnagreige	SAJ-407 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-407 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-407 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0102: Gortnaskehy	SAJ-260 Rationalise Gortnaskehy to Ballyheaphy WRZ	31	SAJ-260 Rationalise Gortnaskehy to Ballyheaphy WRZ	31	SAJ-260 Rationalise Gortnaskehy to Ballyheaphy WRZ	31
3100SC0007: Grallagh	SAJ-455 Increase GW abstraction and upgrade WTP	111	SAJ-455 Increase GW abstraction and upgrade WTP	111	SAJ-455 Increase GW abstraction and upgrade WTP	111
0500SC0144: Kilbrin Garran an Darra	SAJ-519 Rationalise Kilbrin Garran an Darra to Allow regional WRZ	130	SAJ-519 Rationalise Kilbrin Garran an Darra to Allow regional WRZ	130	SAJ-519 Rationalise Kilbrin Garran an Darra to Allow regional WRZ	130
0500SC0075: Kilcorney	SAJ-523 Rationalise Glenleigh and Kilcorney to Millstreet WTZ	131	SAJ-523 Rationalise Glenleigh and Kilcorney to Millstreet WTZ	131	SAJ-523 Rationalise Glenleigh and Kilcorney to Millstreet WTZ	131
0500SC0128: Killavullen	SAJ-412 Rationalise Gortnagreige,	97	SAJ-412 Rationalise Gortnagreige,	97	SAJ-412 Rationalise Gortnagreige,	97

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow		Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow		Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	
0500SC0090: Kilmagnier	SAJ-401 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95	SAJ-401 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95	SAJ-401 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
3100SC0106: Kilmore-Kilbeg	SAJ-450 Rationalise Kilmore-Kilbeg to Tallow WRZ	109	SAJ-450 Rationalise Kilmore-Kilbeg to Tallow WRZ	109	SAJ-450 Rationalise Kilmore-Kilbeg to Tallow WRZ	109
0500SC0092: Kilmurry (Mitchelstown)	SAJ-462 Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SA K Waterford) WRZ	114	SAJ-462 Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SA K Waterford) WRZ	114	SAJ-462 Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SA K Waterford) WRZ	114
0500SC0103: Knockanevin	SAJ-468 Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)	117	SAJ-468 Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)	117	SAJ-468 Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)	117
0500SC0088: Knockdrumaclough	SAJ-399 Rationalise Ballyvadonna, Strawhall, Knockdrumalough,	95	SAJ-399 Rationalise Ballyvadonna, Strawhall, Knockdrumalough,	95	SAJ-399 Rationalise Ballyvadonna, Strawhall, Knockdrumalough,	95

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Coolagown and Kilmagnier to Fermoy WRZ		Coolagown and Kilmagnier to Fermoy WRZ		Coolagown and Kilmagnier to Fermoy WRZ	
0500SC0105: Knockeragh	SAJ-262 Upgrade WTP	-	SAJ-262 Upgrade WTP	-	SAJ-262 Upgrade WTP	-
0500SC0166: Knoppogue	SAJ-413 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-413 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-413 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0106: Labbamollogga	SAJ-461 Rationalise Labbamollogga to Ballylanders WRZs	113	SAJ-461 Rationalise Labbamollogga to Ballylanders WRZs	113	SAJ-461 Rationalise Labbamollogga to Ballylanders WRZs	113
0500SC0130: Lombardstown Glantane	SAJ-162 Increase GW abstraction and upgrade WTP	-	SAJ-162 Increase GW abstraction and upgrade WTP	-	SAJ-162 Increase GW abstraction and upgrade WTP	-
0500SC0066: Lyre	SAJ-167 Increase GW abstraction and upgrade WTP	-	SAJ-167 Increase GW abstraction and upgrade WTP	-	SAJ-167 Increase GW abstraction and upgrade WTP	-
0500SC0121: Macroney	SAJ-513 Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)	127	SAJ-513 Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)	127	SAJ-513 Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)	127

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0131: Mallow	SAJ-406 Increase GW abstraction and upgrade WTP	97	SAJ-406 Increase GW abstraction and upgrade WTP	97	SAJ-406 Increase GW abstraction and upgrade WTP	97
0500SC0138: Millstreet	SAJ-525 Interconnect Millstreet with Newmarket. Rationalise Cockhill WTP and Caherbarnagh WTP	131	SAJ-525 Interconnect Millstreet with Newmarket. Rationalise Cockhill WTP and Caherbarnagh WTP	131	SAJ-525 Interconnect Millstreet with Newmarket. Rationalise Cockhill WTP and Caherbarnagh WTP	131
0500SC0100: Mitchelstown	SAJ-425 Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs.	101	SAJ-425 Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs.	101	SAJ-425 Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs.	101
0500SC0107: Monabricka	SAJ-514 Rationalise Monabricka to South West Regional Scheme WRZ	128	SAJ-514 Rationalise Monabricka to South West Regional Scheme WRZ	128	SAJ-514 Rationalise Monabricka to South West Regional Scheme WRZ	128
0500SC0062: Monaparson	SAJ-409 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,	97	SAJ-409 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,	97	SAJ-409 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,	97

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Monee & Knockabrack and Rahan to Mallow		Monee & Knockabrack and Rahan to Mallow		Monee & Knockabrack and Rahan to Mallow	
0500SC0064: Monee & Knockabrack	SAJ-414 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-414 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97	SAJ-414 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0101: Mountain Barracks	SAJ-281 Upgrade existing WTP	-	SAJ-281 Upgrade existing WTP	-	SAJ-281 Upgrade existing WTP	-
0500SC0143: Newmarket	SAJ-527 New GW abstraction and new WTP	131	SAJ-527 New GW abstraction and new WTP	131	SAJ-527 New GW abstraction and new WTP	131
0500SC0108: Rockchapel	SAJ-424 Rationalise Stagmount to Rockchapel WRZ	100	SAJ-424 Rationalise Stagmount to Rockchapel WRZ	100	SAJ-424 Rationalise Stagmount to Rockchapel WRZ	100
0500SC0104: Skahanagh	SAJ-517 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129	SAJ-517 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129	SAJ-517 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129
0500SC0109: Stagmount	SAJ-423 Rationalise Stagmount to Rockchapel WRZ	100	SAJ-423 Rationalise Stagmount to Rockchapel WRZ	100	SAJ-423 Rationalise Stagmount to Rockchapel WRZ	100

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0010: Strancally	SAJ-304 Upgrade existing WTP	-	SAJ-304 Upgrade existing WTP	-	SAJ-304 Upgrade existing WTP	-
0500SC0165: Strawhall	SAJ-398 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95	SAJ-398 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95	SAJ-398 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
3100SC0020: Tallow	SAJ-449 New GW abstraction and new TWP	109	SAJ-449 New GW abstraction and new TWP	109	SAJ-449 New GW abstraction and new TWP	109
3100SC0008: Tinkock\Tinnabinna	SAJ-458 Rationalise Tiknock/Tinnabina to Grallagh WRZ	111	SAJ-458 Rationalise Tiknock/Tinnabina to Grallagh WRZ	111	SAJ-458 Rationalise Tiknock/Tinnabina to Grallagh WRZ	111
0500SC0139: Toureen _Derry	SAJ-528 Rationalise Toureen Derry to Banteer WRZ	131	SAJ-528 Rationalise Toureen Derry to Banteer WRZ	131	SAJ-528 Rationalise Toureen Derry to Banteer WRZ	131
3100SC0016: Villierstown	SAJ-294 Upgrade existing WTP	-	SAJ-294 Upgrade existing WTP	-	SAJ-294 Upgrade existing WTP	-
0500SC0186: Rahan	SAJ-415 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,	97	SAJ-415 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,	97	SAJ-415 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue,	97

WRZ	Preferred Approach - SA Approach 3		Least Cost - SA Approach 3		Best Environmental - SA Approach 3	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Monee & Knockabrack and Rahan to Mallow		Monee & Knockabrack and Rahan to Mallow		Monee & Knockabrack and Rahan to Mallow	

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0082: Aglish Cul Rua	SAJ-291 Upgrade existing WTP	-	SAJ-291 Upgrade existing WTP	-	SAJ-291 Upgrade existing WTP	-
0500SC0113: Allow Regional	SAJ-118 New GW abstraction and new WTP	-	SAJ-118 New GW abstraction and new WTP	-	SAJ-119 New GW abstraction and new WTP	1
0500SC0065: Ballinamona	SAJ-269 Upgrade existing WTP	-	SAJ-269 Upgrade existing WTP	-	SAJ-269 Upgrade existing WTP	-
0500SC0185: Ballyclough & Mount North	SAJ-157 Upgrade existing WTPs	-	SAJ-154 & SAJ-155 Increase GW abstraction and upgrade WTP	20	SAJ-154 & SAJ-155 Increase GW abstraction and upgrade WTP	20
3100SC0084: Clashmore / Whitewell	SAJ-297 Increase GW abstraction and upgrade WTP	-	SAJ-297 Increase GW abstraction and upgrade WTP	-	SAJ-297 Increase GW abstraction and upgrade WTP	-
3100SC0052: Ballyheaphy	SAJ-326 Upgrade existing WTP	-	SAJ-326 Upgrade existing WTP	-	SAJ-326 Upgrade existing WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0118: Ballyhooly	SAJ-093 Increase GW abstraction and upgrade existing WTP	-	SAJ-099 Increase GW abstraction and upgrade WTP	25	SAJ-099 Increase GW abstraction and upgrade WTP	25
3100SC0121: Ballymoate Upper	SAJ-323 Increase GW abstraction and upgrade WTP	-	SAJ-323 Increase GW abstraction and upgrade WTP	-	SAJ-323 Increase GW abstraction and upgrade WTP	-
0500SC0004: Ballynoe	SAJ-223 Upgrade WTP	-	SAJ-223 Upgrade WTP	-	SAJ-223 Upgrade WTP	-
0500SC0122: Ballyvadonna	SAJ-238 Increase GW abstraction and upgrade WTP	-	SAJ-241 Rationalise Ballyvadonna to Fermoy WRZ (increase existing GW abstraction)	15	SAJ-241 Rationalise Ballyvadonna to Fermoy WRZ (increase existing GW abstraction)	15
0500SC0136: Banteer	SAJ-132 Increase GW abstraction and upgrade WTP	-	SAJ-350 Interconnect Banteer and Newmarket	78	SAJ-134 Increase GW abstraction and upgrade WTP	47
0500SC0096: Boherascrub	SAJ-276 Upgrade existing WTP	-	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20
0500SC0006: Bottlehill	SAJ-226 Increase GW abstraction and upgrade WTP	-	SAJ-226 Increase GW abstraction and upgrade WTP	-	SAJ-226 Increase GW abstraction and upgrade WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0056: Bweeng	SAJ-142 Increase GW abstraction and upgrade WTP	-	SAJ-142 Increase GW abstraction and upgrade WTP	-	SAJ-142 Increase GW abstraction and upgrade WTP	-
3100SC0017: Camphire	SAJ-295 Upgrade existing WTP	-	SAJ-295 Upgrade existing WTP	-	SAJ-295 Upgrade existing WTP	-
0500SC0061: Carrigcleena	SAJ-272 Upgrade existing WTP	-	SAJ-272 Upgrade existing WTP	-	SAJ-272 Upgrade existing WTP	-
1900SC0018: Castletown Ballyagran Water Supply	SAJ-287 Increase GW abstraction and upgrade WTP	-	SAJ-287 Increase GW abstraction and upgrade WTP	-	SAJ-287 Increase GW abstraction and upgrade WTP	-
0500SC0124: Castletownroche	SAJ-128 Conjunctive use of existing spring and trial well and upgrade WTP	-	SAJ-127 Interconnect Castletownroche with Ballyhooly WRZ	25	SAJ-127 Interconnect Castletownroche with Ballyhooly WRZ	25
0500SC0110: Castlewrixon	SAJ-266 Upgrade existing WTP	-	SAJ-267 Rationalise Castlwrixon to Charleville	26	SAJ-267 Rationalise Castlwrixon to Charleville	26
0500SC0114: Charleville / Doneraile	SAJ-507a New GW and upgrade Charleville WRZ to supply deficit	-	SAJ-023 Increase GW abstraction and upgrade WTP	26	SAJ-023 Increase GW abstraction and upgrade WTP	26
0500SC0002: Conna Regional	SAJ-141 Upgrade WTP	-	SAJ-353 Increase SW abstraction and upgrade WTP	79a	SAJ-141 Upgrade WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0089: Coolagown	SAJ-215 Increase GW abstraction and upgrade WTP	-	SAJ-354 Rationalise Coolagown to Conna Regional	79a	SAJ-215 Increase GW abstraction and upgrade WTP	-
0500SC0126: Dromahane / Kilcolman / Cois Tobair	SAJ-188 Upgrade existing WTP	-	SAJ-188 Upgrade existing WTP	-	SAJ-188 Upgrade existing WTP	-
0500SC0176: Fermoy	SAJ-342 Increase existing GW abstraction and upgrade WTP. Flood defence required at project level	-	SAJ-082 Increase existing GW abstraction and upgrade WTP	15	SAJ-082 Increase existing GW abstraction and upgrade WTP	15
0500SC0175: Glanworth / Ballykenley/Johnstown	SAJ-110 New SW abstraction and new WTP	-	SAJ-110 New SW abstraction and new WTP	-	SAJ-110 New SW abstraction and new WTP	-
0500SC0099: Glenduff	SAJ-286 Upgrade existing WTP	-	SAJ-286 Upgrade existing WTP	-	SAJ-286 Upgrade existing WTP	-
0500SC0076: Glenleigh	SAJ-270 Upgrade existing WTP	-	SAJ-270 Upgrade existing WTP	-	SAJ-270 Upgrade existing WTP	-
0500SC0182: Gortnagreige	SAJ-171 Increase GW abstraction and upgrade WTP	-	SAJ-171 Increase GW abstraction and upgrade WTP	-	SAJ-171 Increase GW abstraction and upgrade WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0102: Gortnaskehy	SAJ-259 Upgrade existing WTP	-	SAJ-259 Upgrade existing WTP	-	SAJ-259 Upgrade existing WTP	-
3100SC0007: Grallagh	SAJ-305 Increase GW abstraction and upgrade WTP	-	SAJ-305 Increase GW abstraction and upgrade WTP	-	SAJ-305 Increase GW abstraction and upgrade WTP	-
0500SC0144: Kilbrin Garran an Darra	SAJ-201 Upgrade existing WTP	-	SAJ-201 Upgrade existing WTP	-	SAJ-201 Upgrade existing WTP	-
0500SC0075: Kilcorney	SAJ-236 Upgrade existing WTP	-	SAJ-236 Upgrade existing WTP	-	SAJ-236 Upgrade existing WTP	-
0500SC0128: Killavullen	SAJ-149 Increase GW abstraction and upgrade WTP	-	SAJ-153 Rationalise Kilavullen to Mallow WRZ (Lavally WTP)	33	SAJ-153 Rationalise Kilavullen to Mallow WRZ (Lavally WTP)	33
0500SC0090: Kilmagnier	SAJ-178 Increase GW abstraction and upgrade WTP	-	SAJ-356 Rationalise Kilmagnier to Conna Regional	79a	SAJ-178 Increase GW abstraction and upgrade WTP	-
3100SC0106: Kilmore-Kilbeg	SAJ-311 Rationalise Kilmore-Kilbeg to Tallow WRZ	52	SAJ-310 Upgrade existing WTP	-	SAJ-310 Upgrade existing WTP	-
0500SC0092: Kilmurry (Mitchelstown)	SAJ-221 Increase GW abstraction and upgrade WTP	-	SAJ-221 Increase GW abstraction and upgrade WTP	-	SAJ-221 Increase GW abstraction and upgrade WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0103: Knockanevin	SAJ-229 Increase GW abstraction and upgrade existing WTP	-	SAJ-229 Increase GW abstraction and upgrade existing WTP	-	SAJ-229 Increase GW abstraction and upgrade existing WTP	-
0500SC0088: Knockdrumaclough	SAJ-207 Upgrade existing WTP	-	SAJ-355 Rationalise Knockdrumaclough to Conna Regional	79a	SAJ-207 Upgrade existing WTP	-
0500SC0105: Knockeragh	SAJ-262 Upgrade WTP	-	SAJ-262 Upgrade WTP	-	SAJ-262 Upgrade WTP	-
0500SC0166: Knoppogue	SAJ-208 Upgrade existing WTP	-	SAJ-208 Upgrade existing WTP	-	SAJ-208 Upgrade existing WTP	-
0500SC0106: Labbamollogga	SAJ-250 Increase GW abstraction and upgrade WTP	-	SAJ-253 Rationalise Labbamollogga to Mitchelstown WRZ (new GW & new WTP)	38	SAJ-253 Rationalise Labbamollogga to Mitchelstown WRZ (new GW & new WTP)	38
0500SC0130: Lombardstown Glantane	SAJ-162 Increase GW abstraction and upgrade WTP	-	SAJ-162 Increase GW abstraction and upgrade WTP	-	SAJ-162 Increase GW abstraction and upgrade WTP	-
0500SC0066: Lyre	SAJ-167 Increase GW abstraction and upgrade WTP	-	SAJ-167 Increase GW abstraction and upgrade WTP	-	SAJ-167 Increase GW abstraction and upgrade WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0121: Macroney	SAJ-209 Increase GW abstraction and upgrade WTP	-	SAJ-209 Increase GW abstraction and upgrade WTP	-	SAJ-209 Increase GW abstraction and upgrade WTP	-
0500SC0131: Mallow	SAJ-034 Increase GW abstraction and upgrade WTP	-	SAJ-034 Increase GW abstraction and upgrade WTP	-	SAJ-034 Increase GW abstraction and upgrade WTP	-
0500SC0138: Millstreet	SAJ-068 Increase GW abstraction and upgrade WTP	-	SAJ-068 Increase GW abstraction and upgrade WTP	-	SAJ-068 Increase GW abstraction and upgrade WTP	-
0500SC0100: Mitchelstown	SAJ-051 Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs	-	SAJ-055 New GW abstraction and new WTP	38	SAJ-055 New GW abstraction and new WTP	38
0500SC0107: Monabricka	SAJ-194 Increase GW abstraction and upgrade WTP	-	SAJ-194 Increase GW abstraction and upgrade WTP	-	SAJ-194 Increase GW abstraction and upgrade WTP	-
0500SC0062: Monaparson	SAJ-284 Upgrade existing WTP	-	SAJ-284 Upgrade existing WTP	-	SAJ-284 Upgrade existing WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0500SC0064: Monee & Knockabrack	SAJ-265 Upgrade WTP	-	SAJ-265 Upgrade WTP	-	SAJ-265 Upgrade WTP	-
0500SC0101: Mountain Barracks	SAJ-281 Upgrade existing WTP	-	SAJ-281 Upgrade existing WTP	-	SAJ-281 Upgrade existing WTP	-
0500SC0143: Newmarket	SAJ-605 New GW abstractions, upgrade WTP and new WTP	-	SAJ-352 New GW abstraction and new WTP	78	SAJ-011 Interconnect Newmarket with Allow Regional	1
0500SC0108: Rockchapel	SAJ-189 Upgrade existing WTP	-	SAJ-189 Upgrade existing WTP	-	SAJ-189 Upgrade existing WTP	-
0500SC0104: Skahanagh	SAJ-212 Increase GW abstraction and upgrade WTP	-	SAJ-212 Increase GW abstraction and upgrade WTP	-	SAJ-212 Increase GW abstraction and upgrade WTP	-
0500SC0109: Stagmount	SAJ-274 Upgrade existing WTP	-	SAJ-274 Upgrade existing WTP	-	SAJ-274 Upgrade existing WTP	-
3100SC0010: Strancally	SAJ-304 Upgrade existing WTP	-	SAJ-304 Upgrade existing WTP	-	SAJ-304 Upgrade existing WTP	-
0500SC0165: Strawhall	SAJ-225 Upgrade existing WTP	-	SAJ-225 Upgrade existing WTP	-	SAJ-225 Upgrade existing WTP	-
3100SC0020: Tallow	SAJ-322 Bring back Kilbeg stream (currently not in use) to production and upgrade WTP	52	SAJ-340 New GW abstraction and new WTP	-	SAJ-340 New GW abstraction and new WTP	-

WRZ	Quickest Delivery - SA Approach 4		Most Resilient - SA Approach 2		Lowest Carbon - SA Approach 1	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
3100SC0008: Tinkock\Tinnabinna	SAJ-313 Increase GW abstraction and upgrade WTP	-	SAJ-313 Increase GW abstraction and upgrade WTP	-	SAJ-313 Increase GW abstraction and upgrade WTP	-
0500SC0139: Toureen _Derry	SAJ-175 Increase GW abstraction and upgrade WTP	-	SAJ-175 Increase GW abstraction and upgrade WTP	-	SAJ-177 Rationalise Toureen Derry to Banteer WRZ (approved)	47
3100SC0016: Villierstown	SAJ-294 Upgrade existing WTP	-	SAJ-294 Upgrade existing WTP	-	SAJ-294 Upgrade existing WTP	-
0500SC0186: Rahan	SAJ-379 Upgrade existing WTP	-	SAJ-379 Upgrade existing WTP	-	SAJ-379 Upgrade existing WTP	-

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
3100SC0082: Aglish Cul Rua	SAJ-291 Upgrade existing WTP	-
0500SC0113: Allow Regional	SAJ-119 New GW abstraction and new WTP	1
0500SC0065: Ballinamona	SAJ-269 Upgrade existing WTP	-

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
0500SC0185: Ballyclough & Mount North	SAJ-154 & SAJ-155 Increase GW abstraction and upgrade WTP	20
3100SC0084: Clashmore / Whitewell	SAJ-297 Increase GW abstraction and upgrade WTP	-
3100SC0052: Ballyheaphy	SAJ-326 Upgrade existing WTP	-
0500SC0118: Ballyhooly	SAJ-099 Increase GW abstraction and upgrade WTP	25
3100SC0121: Ballymoate Upper	SAJ-323 Increase GW abstraction and upgrade WTP	-
0500SC0004: Ballynoe	SAJ-223 Upgrade WTP	-
0500SC0122: Ballyvadonna	SAJ-241 Rationalise Ballyvadonna to Fermoy WRZ (increase existing GW abstraction)	15
0500SC0136: Banteer	SAJ-134 Increase GW abstraction and upgrade WTP	47
0500SC0096: Boherascrub	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20
0500SC0006: Bottlehill	SAJ-226 Increase GW abstraction and upgrade WTP	-

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
0500SC0056: Bweeng	SAJ-142 Increase GW abstraction and upgrade WTP	-
3100SC0017: Camphire	SAJ-295 Upgrade existing WTP	-
0500SC0061: Carrigcleena	SAJ-272 Upgrade existing WTP	-
1900SC0018: Castletown Ballyagran Water Supply	SAJ-287 Increase GW abstraction and upgrade WTP	-
0500SC0124: Castletownroche	SAJ-127 Interconnect Castletownroche with Ballyhooly WRZ	25
0500SC0110: Castlewrixon	SAJ-267 Rationalise Castlwrixon to Charleville	26
0500SC0114: Charleville / Doneraile	SAJ-023 Increase GW abstraction and upgrade WTP	26
0500SC0002: Conna Regional	SAJ-141 Upgrade WTP	-
0500SC0089: Coolagown	SAJ-215 Increase GW abstraction and upgrade WTP	-
0500SC0126: Dromahane / Kilcolman / Cois Tobair	SAJ-188 Upgrade existing WTP	-

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
0500SC0176: Fermoy	SAJ-082 Increase existing GW abstraction and upgrade WTP	15
0500SC0175: Glanworth / Ballykenley/Johnstown	SAJ-110 New SW abstraction and new WTP	-
0500SC0099: Glenduff	SAJ-286 Upgrade existing WTP	-
0500SC0076: Glenleigh	SAJ-270 Upgrade existing WTP	-
0500SC0182: Gortnagreige	SAJ-171 Increase GW abstraction and upgrade WTP	-
0500SC0102: Gortnaskehy	SAJ-259 Upgrade existing WTP	-
3100SC0007: Grallagh	SAJ-305 Increase GW abstraction and upgrade WTP	-
0500SC0144: Kilbrin Garran an Darra	SAJ-201 Upgrade existing WTP	-
0500SC0075: Kilcorney	SAJ-236 Upgrade existing WTP	-
0500SC0128: Killavullen	SAJ-153 Rationalise Kilavullen to Mallow WRZ (Lavally WTP)	33

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
0500SC0090: Kilmagnier	SAJ-178 Increase GW abstraction and upgrade WTP	-
3100SC0106: Kilmore-Kilbeg	SAJ-310 Upgrade existing WTP	-
0500SC0092: Kilmurry (Mitchelstown)	SAJ-221 Increase GW abstraction and upgrade WTP	-
0500SC0103: Knockanevin	SAJ-229 Increase GW abstraction and upgrade existing WTP	-
0500SC0088: Knockdrumaclough	SAJ-207 Upgrade existing WTP	-
0500SC0105: Knockeragh	SAJ-262 Upgrade WTP	-
0500SC0166: Knoppogue	SAJ-208 Upgrade existing WTP	-
0500SC0106: Labbamollogga	SAJ-253 Rationalise Labbamollogga to Mitchelstown WRZ (new GW & new WTP)	38
0500SC0130: Lombardstown Glantane	SAJ-162 Increase GW abstraction and upgrade WTP	-
0500SC0066: Lyre	SAJ-167 Increase GW abstraction and upgrade WTP	-

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
0500SC0121: Macroney	SAJ-209 Increase GW abstraction and upgrade WTP	-
0500SC0131: Mallow	SAJ-034 Increase GW abstraction and upgrade WTP	-
0500SC0138: Millstreet	SAJ-068 Increase GW abstraction and upgrade WTP	-
0500SC0100: Mitchelstown	SAJ-055 New GW abstraction and new WTP	38
0500SC0107: Monabricka	SAJ-194 Increase GW abstraction and upgrade WTP	-
0500SC0062: Monaparson	SAJ-284 Upgrade existing WTP	-
0500SC0064: Monee & Knockabrack	SAJ-265 Upgrade WTP	-
0500SC0101: Mountain Barracks	SAJ-281 Upgrade existing WTP	-
0500SC0143: Newmarket	SAJ-011 Interconnect Newmarket with Allow Regional	1
0500SC0108: Rockchapel	SAJ-189 Upgrade existing WTP	-

WRZ	Best Appropriate Assessment - SA Approach 1	
	Option Description	SA Option
0500SC0104: Skahanagh	SAJ-212 Increase GW abstraction and upgrade WTP	-
0500SC0109: Stagmount	SAJ-274 Upgrade existing WTP	-
3100SC0010: Strancally	SAJ-304 Upgrade existing WTP	-
0500SC0165: Strawhall	SAJ-225 Upgrade existing WTP	-
3100SC0020: Tallow	SAJ-340 New GW abstraction and new WTP	-
3100SC0008: Tinkock\Tinnabinna	SAJ-313 Increase GW abstraction and upgrade WTP	-
0500SC0139: Toureen _Derry	SAJ-177 Rationalise Toureen Derry to Banteer WRZ (approved)	47
3100SC0016: Villierstown	SAJ-294 Upgrade existing WTP	-
0500SC0186: Rahan	SAJ-379 Upgrade existing WTP	-