Summer 2023

Regional Water Resources Plan – North West

Strategic Environmental Assessment

Appendix H: Study Area A – Environmental Review

Tionscadal Éireann Project Ireland 2040

6 CLEAN WATER AND SANITATION

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

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

Table of Contents

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 North West Region (referred to as the Regional Plan). The Regional Plan includes seven individual study area reviews (SAA-G) as appendices.

This Study Area A 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 A (SAA) within the North West Region for the options and approaches considered and as outlined in the Study Area A Technical Report (draft RWRP-NW Appendix 1). This Environmental Review applies the Strategic Environmental Assessment (SEA) objectives and environmental assessment methodology set out in the NWRP Framework Plan (Framework Plan).

Environmental Reviews have been undertaken for each study area and form appendices to the SEA Environmental Report for the Regional Plan as part of Phase 2 of the National Water Resources Plan (NWRP). Phase 1 in the development of the NWRP was the preparation of the Framework Plan, which was adopted in Spring 2021 following SEA, Appropriate Assessment (AA) and extensive public consultation. Two regional plans, the RWRP for the Eastern and Midlands region and the RWRP for the South West region have been taken through a consultation process and have been finalised and adopted. The RWRP for the North West region, which this Environmental Review supports as part of the SEA documentation, is expected to be adopted in Summer 2023. The RWRP for the South East is currently underway, is out for public consultation, and will be the final region for the Phase 2 NWRP. The Framework Plan, Regional Plans and supporting documentation are available at https://www.water.ie/projects/strategic-plans/national-water-resources/.

1.1 Options Assessment Methodology

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

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

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

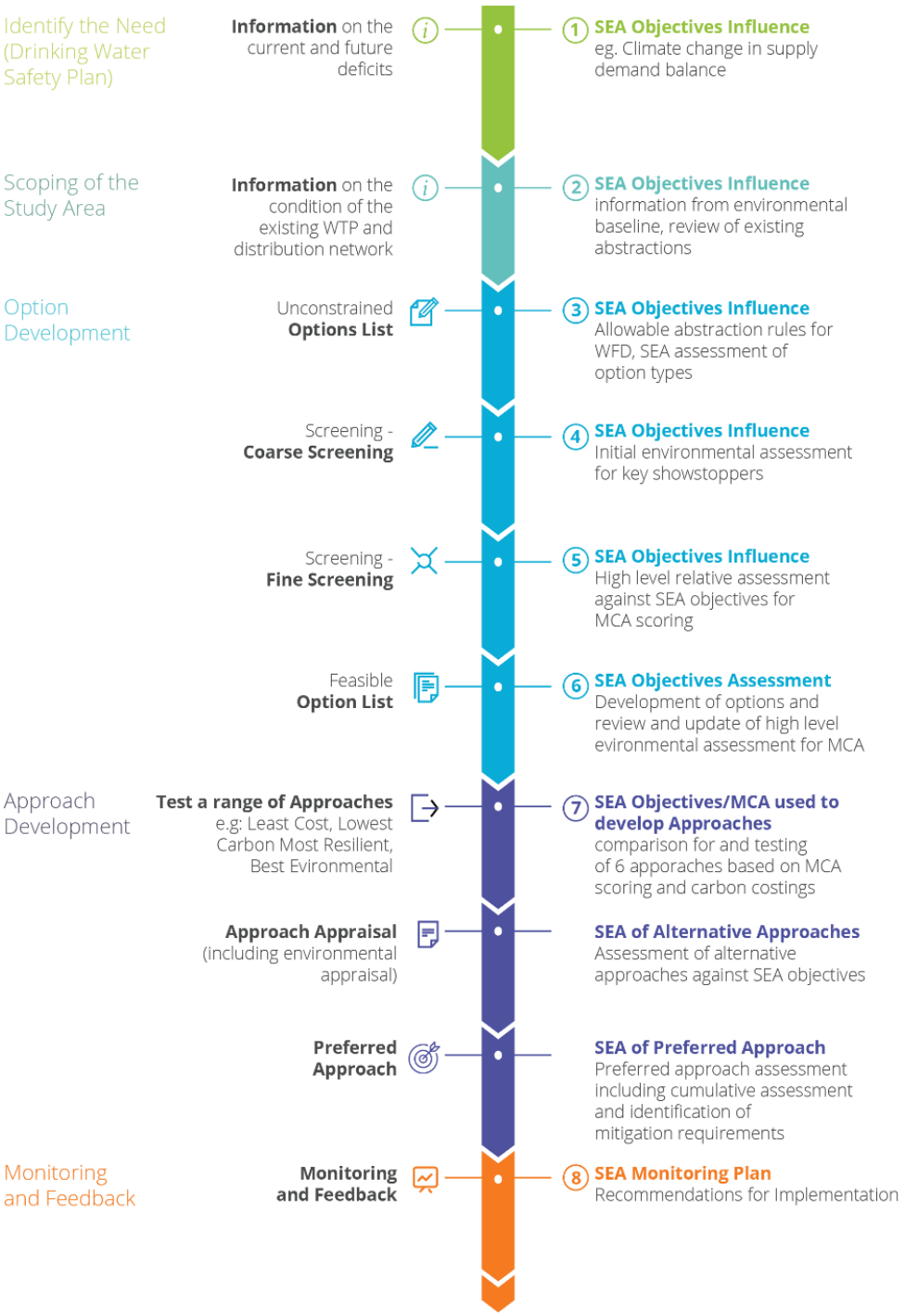

Figure 1.1 Option and Approach Development Process

1.2 Regional Plan Strategic Environmental Assessment

The four RWRPs, implementing Phase 2 of the NWRP, are each subject to a separate SEA process. The study area assessments 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. As indicated above, this consultation process has been completed for three of the regions and the South East Region, which is currently in consultation, is the final region in the Phase 2 NWRP.

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

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

1.3 Study Area: Strategic Environmental Assessment

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

Table 1.1 SEA Objectives

SEA Topic	SEA Objective
Population, economy, tourism and recreation, and human health	Protect and, where possible, contribute to enhancement of human health and wellbeing and to prevent restrictions to recreation and amenity facilities in providing water services.
Water environment	<u>Water quality and resources</u> Prevent deterioration of the WFD status of waterbodies with regard to both water quality and quantity due to Uisce Éireann's activities. Contribute towards the "no deterioration" WFD condition and, where possible, to the improvement of waterbody status for rivers, lakes, transitional and coastal waters, and groundwater to at least 'Good' status.
	<u>Flood risk</u> Protect and, where possible, reduce risk from ground water and surface water flooding as a result of Uisce Éireann's activities.
Biodiversity	Protect and, where possible, enhance terrestrial, aquatic and soil biodiversity; particularly regarding European sites and protected species in providing water services.

SEA Topic	SEA Objective
Material assets	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.
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 Uisce Éireann's activities.
	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 North West region were available. At that point, Uisce Éireann conducted an exercise as part of the development of the overall relevant Regional Plan to assess the cumulative and in-combination impacts of the Preferred Approaches identified for each study area within the North West region. The conclusions of that cumulative assessment are presented in the SEA Environmental Report for the North West region.

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

1.4 Study Area: Water Framework Directive

Requirements under the WFD to avoid deterioration in waterbody status or objectives has been incorporated into the allowable abstraction constraints for new option abstractions. WFD requirements

are also included in the SEA objectives for the assessment (see Table 1.1). Baseline data in relation to the WFD is presented in section 2.2.1 and a summary of the assessment for SAA is provided in chapter 8 of this review.

1.5 Study Area: Appropriate Assessment

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

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

1.6 Study Area A

The North West Region is subdivided into seven 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 SAA, the location of SAA in relation to the North West Region is shown in Figure 1.2.

Study Area A lies within the county of Donegal, including Arranmore Island, and its total area is approximately 4,650 km^2. There is one principal settlement (with a population of over 10,000) within SAA, namely Letterkenny (CSO, 2016a), as shown in Figure 1.3.

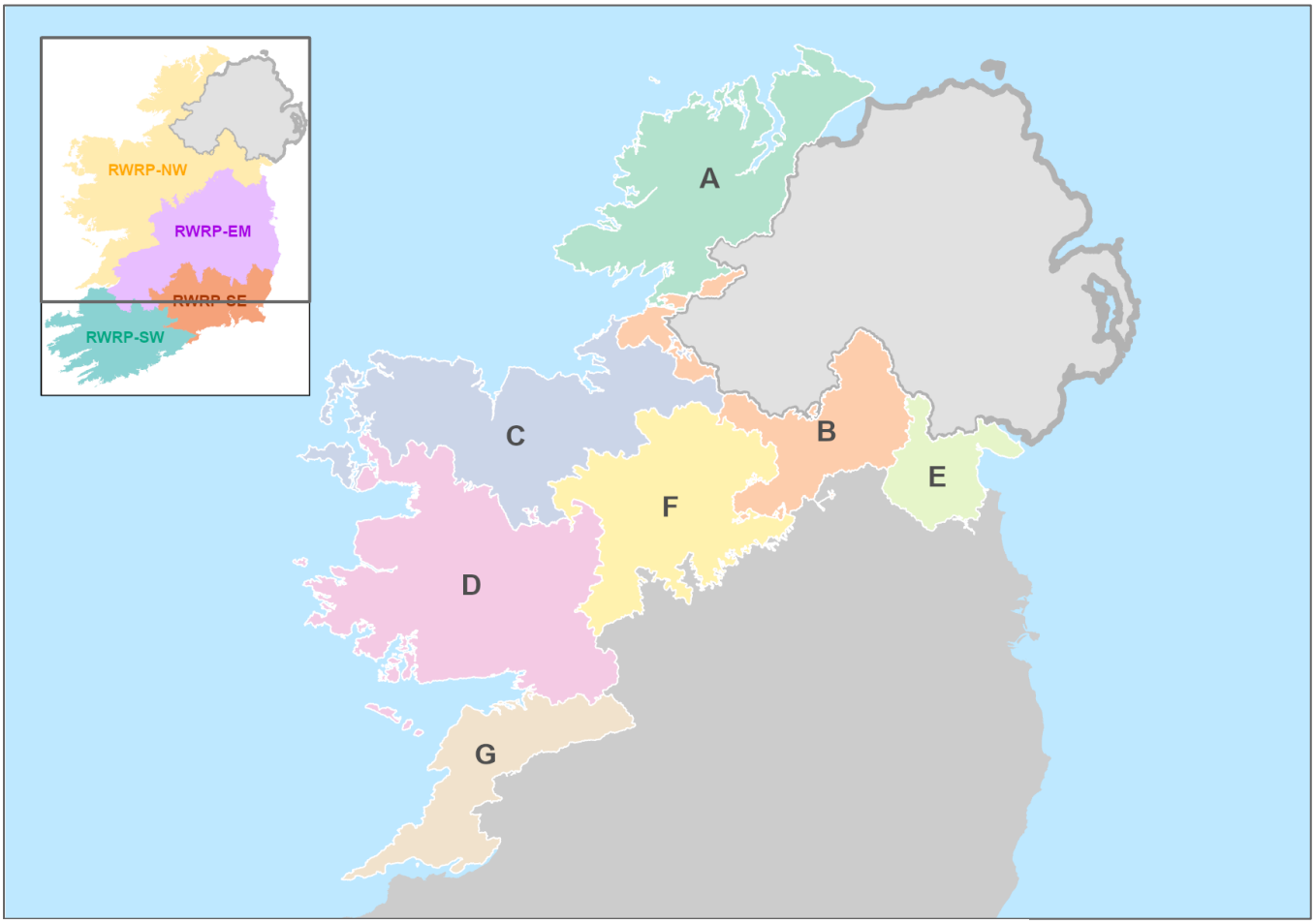

Figure 1.2 North West Region Study Areas

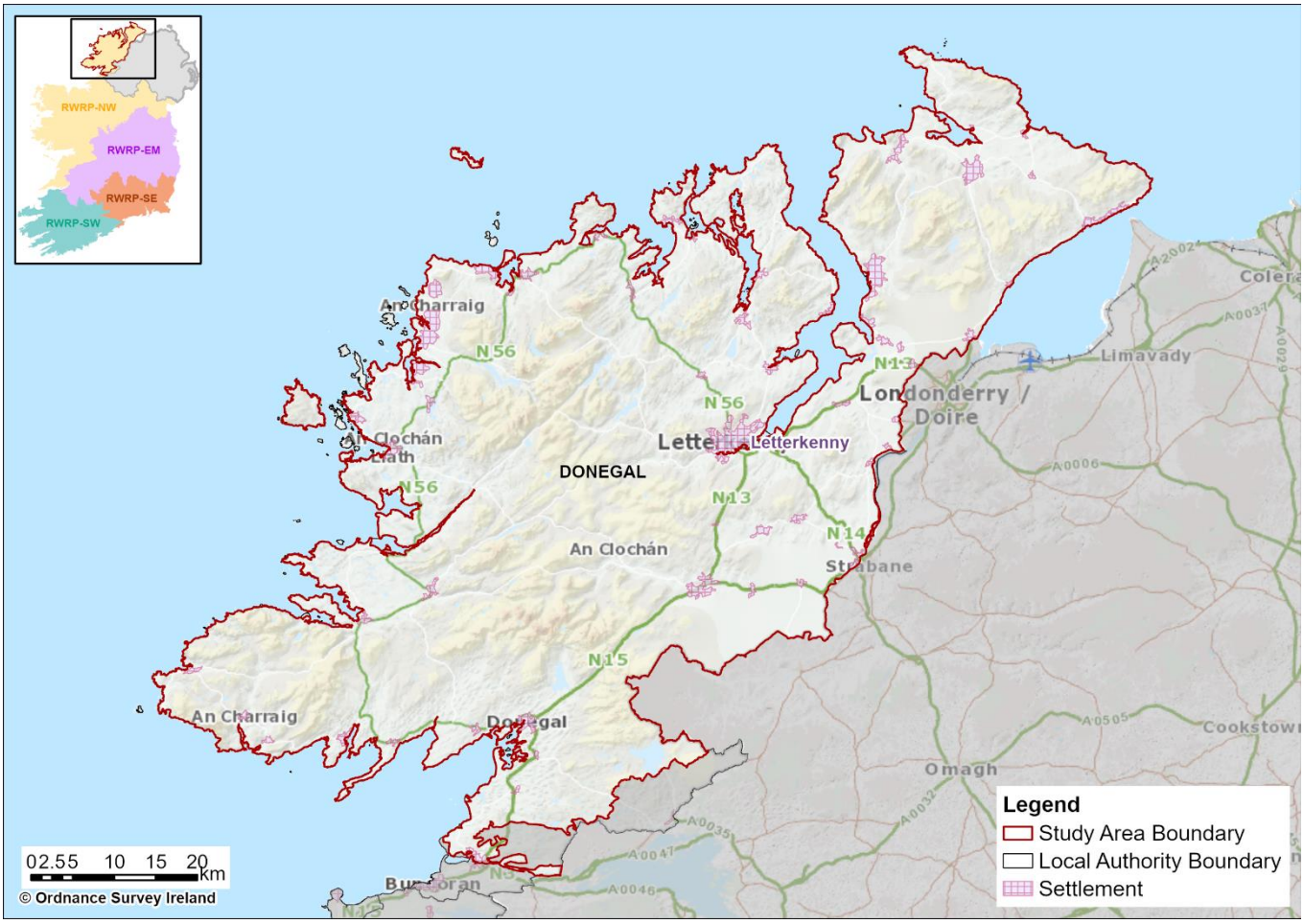

Figure 1.3 Study Area A

2

Study Area A Environmental Baseline Context

2 Study Area A Environmental Baseline Context

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

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

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

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

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

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

2.1.1 Population

Table 2.1 provides a general overview of the WRZ's population and the projected percentage change in population between 2019 and 2044. The estimated population currently living in each WRZ has been based on the 2016 Census data. The 2016 population was assigned to District Metering Areas (DMAs) by mapping the Central Statistics Office (CSO) data to DMA boundaries. Uisce Éireann have projected the 2016 population forward to 2019 using the growth projections in the National Planning Framework, updated information from the Regional Spatial and Economic Strategies, and Local Authority Planning sections (where available). The full 2022 Census data was not available at the time of the SDB analysis, however, Uisce Éireann will update the SDB with the 2022 census data when published. Updated data and information will be incorporated via the monitoring and feedback process as set out in section 8.3.8 of the Framework Plan.

Table 2.1 Overview of the Population within the WRZs of SAA

WRZ Reference Number and Name	Total Population Served (2019)*	% Population Change (2019-2044)*
0600SC0007– Arranmore Island	471	15.3
0600SC0030 – Ballyshannon & Bundoran	7,103	13.8
0600SC0045 – Buncrana	3,775	15.8
0600SC0043 – Carrigart-Downings & Cranford	2,346	15.3
0600SC0039 – Creeslough Dunfanaghy	3,065	15.3
0600SC0012 – Culdaff	1,068	15.3
0600SC0010 – Donegal (River Eske)	6,092	27.3
0600SC0047 – Fanad East	305	15.3
0600SC0046 – Fanad West	1,108	15.3
0600SC0036 – Frosses-Inver	4,425	15.3
0600SC0035 – Glenties-Ardara	3,602	15.3
0600SC0026 – Gortahork-Falcarragh	3,936	15.3
0600SC0001 – Inishowen West & Carndonagh & Culdaff	9,494	15.3
0600SC0009 – Killybegs	4,567	15.3
0600SC0029 – Letterkenny & Inishowen East & Pollan Dam	62,049	24.9
0600SC0038 – Lettermacaward	2,241	11.4
0600SC0028 – Lough Mourne	21,689	18.3
0600SC0013 – Owenteskiny	2,871	28.4
0600SC0006 – Rosses	9,390	16.3

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

2.1.2 Economy and Employment

SAA had a below average household disposable income per person in 2019 (CSO, 2022), and an unemployment rate of 4% in the Border region of the country (CSO, 2023a).

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 Q1 2023 was 339 for the Border region (CSO, 2023b).

2.1.3 Tourism and Recreation

Tourism in SAA 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 Donegal has been described as "*Ireland's wild side*", containing an abundance of Waymarked Trails, local walks, mountain paths, and hidden coves and beaches; emphasising outdoor recreation as a key asset for the area (Go Visit Donegal, 2022).

Additionally, the study area is located along Ireland's Wild Atlantic Way, which 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 SAA, the national park of note in SAA is Ireland's second biggest National Park, Glenveagh. 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 Border region within Ireland. Improvements in air quality, access to good quality drinking water and participation in recreational activities can all have a positive influence on human health and well-being.

Table 2.2 Well-Being Indicators for the Border 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, 2021)
Border	Male: 79.5 Female: 83.5	35%	Good

A key issue for public health is reliable access to good quality drinking water. Regulated water service providers have to ensure appropriate standards of supply and be able to cope with drought conditions, peak events, and maintenance of assets. This requires adequate reserve capacity in Uisce Éireann's supplies to provide a 1 in 50 Level of Service. At present, not all supplies within this study area provide the required levels of reserve capacity. Due to the limited historical monitoring of these supplies, particularly in relation to groundwater, this will need to be studied further. Table 2.3 lists the areas supplied by the Water Treatment Plants (WTPs) in SAA.

Table 2.3 Areas Supplied by the WTPs in SAA

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Arranmore Island WTP	0600SC0007 – Arranmore Island	Donegal
Ballymagroarty WTP, Ballyshannon (Parkhill) WTP and Bundoran (Lough Melvin) WTP	0600SC0030 – Ballyshannon & Bundoran	Donegal
Buncrana WTP	0600SC0045 – Buncrana	Donegal

Water Treatment Plants	Water Resource Zone	Local Authority Supplied
Carrigart – Downings WTP and Cranford WTP	0600SC0043 – Carrigart-Downings & Cranford	Donegal
Creeslough (Killdarragh) WTP	0600SC0039 – Creeslough Dunfanaghy	Donegal
Culdaff WTP	0600SC0012 – Culdaff	Donegal
Donegal (River Eske) WTP	0600SC0010 – Donegal (River Eske)	Donegal
Fanad East (Lough Shannagh) WTP	0600SC0047 – Fanad East	Donegal
Tullyconnel WTP	0600SC0046 – Fanad West	Donegal
Frosses – Inver (Drumbeagh) WTP	0600SC0036 – Frosses-Inver	Donegal
Glenties WTP	0600SC0035 – Glenties-Ardara	Donegal
Gortahork – Falcarragh WTP	0600SC0026 – Gortahork-Falcarragh	Donegal
Inishowen West WTP and Tiernaleague WTP	0600SC0001 – Inishowen West & Carndonagh & Culdaff	Donegal
Killybegs (Old) WTP and Killybegs WTP	0600SC0009 – Killybegs	Donegal
Ballymacool WTP, Illies WTP, Inishowen East (Redcastle) WTP, Letterkenny (Goldrum) WTP, Milford WTP and Rathmullen WTP	0600SC0029 – Letterkenny & Inishowen East & Pollan Dam	Donegal
Lettermacaward WTP	0600SC0038 – Lettermacaward	Donegal
Lough Mourne (Meencrumlin) WTP	0600SC0028 – Lough Mourne	Donegal
Owenteskna WTP	0600SC0013 – Owenteskiny	Donegal
Crolly WTP	0600SC0006 – Rosses	Donegal

Currently for day-to-day operations, 18 out of 21 of the WRZs in the area have a current and projected future SDB deficit (based on a 'Do Minimum' approach – see section 4.5 for further clarification). While sufficient on normal weather conditions, several would fail in drought. During recent drought periods, a number of sources in SAA had issues. In summer 2018, low water levels were experienced for surface water sources supplying Carrigart Downings and Lettermacaward, and instream pumping was required.

Poor water quality can be linked to risks to health. The Barrier Assessment identified 23 of the 29 WTPs within the study area are at high risk of failing to achieve Uisce Éireann's conservative Barrier Assessment standards. Particularly in relation to chlorine residuals in the networks (Barrier 2.1) (see Table 2.1 in the SAA Technical Report).

The "quality need" identified through the Barrier Assessment is not an indicator of compliance with the Drinking Water Regulations. It is an internal Uisce Éireann assessment of the need to invest in areas of

the Uisce Éireann asset base through resource planning, to ensure that potential risks or emerging risks to supplies are addressed. Currently, there are 3 WRZs on the EPA Remedial Action List within SAA, Glenties-Ardara, Letterkenny & Inishowen East & Pollan Dam, and Lettermacaward. Uisce Éireann is currently progressing immediate corrective action in relation to a number of supplies within SAA in advance of the NWRP. Details of these are included in the SAA Technical Report.

2.2 Water Environment

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

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

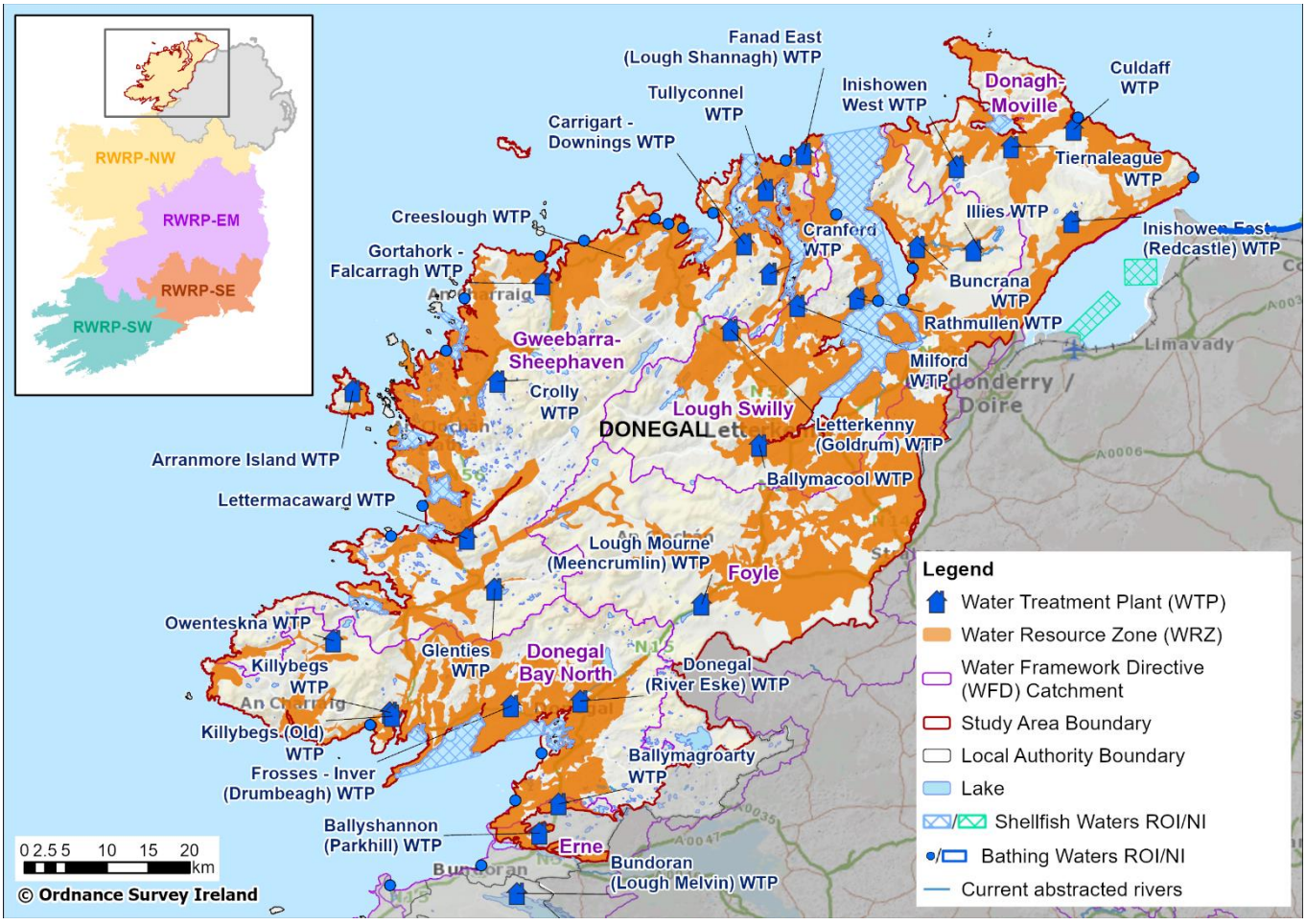

Figure 2.1 Water Environment of SAA

Table 2.4 Catchments within SAA (EPA, 2020)

WFD Catchments	Total Catchment Area (km²)	Catchment Area within SAA (km²)
Donagh-Moville	512	503
Donegal Bay North	805	803
Erne	3,441	32
Foyle	1,106	898
Gweebarra-Sheephaven	1,455	1,450

WFD Catchments	Total Catchment Area (km²)	Catchment Area within SAA (km²)
Lough Swilly	962	943

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

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

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

On an interim basis, Uisce Éireann has developed an initial desktop assessment based on available information (see SAA Technical Report). Over the coming years, Uisce Éireann 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 SAA supplies, Uisce Éireann has assessed its surface water abstraction for the 31 surface water abstractions in SAA (see section 2.4 of the SAA Technical Report). Based on this initial assessment, the volumes of water abstracted from 28 of Uisce Éireann's sources, namely Crana River Pollan Dam (Letterkenny & Inishowen East & Pollan Dam), Glencoagh Lough (Frosses-Inver), Gort lough (Letterkenny & Inishowen East & Pollan Dam), Lough Aderry Intake (Killybegs), Lough Agher (Creeslough Dunfanaghy), Lough Anna (Glenties-Ardara), Lough Columbkille (Letterkenny & Inishowen East & Pollan Dam), Lough Derkmore-Impoundment (Lettermacaward), Lough Doo (Buncrana), Lough Fad (Inishowen West & Carndonagh & Culdaff), Lough Fad (Letterkenny & Inishowen East & Pollan Dam), Lough Gorman (Ballyshannon &Bundoran), Lough Greenan (Letterkenny & Inishowen East & Pollan Dam), Lough Keel (Letterkenny & Inishowen East & Pollan Dam), Lough Keel Intake (Rosses), Lough Lagha (Gortahork-Falcarragh), Lough Mourne (Lough Mourne), Lough Nacreaght (Carrigart-Downings & Cranford), Lough Naglea (Fanad West), Lough Nalughraman (Owenteskiny), Lough Nambraddan (Carrigart-Downings & Cranford), Lough Nameeltoge (Carrigart-Downings & Cranford), Lough Salt (Letterkenny & Inishowen East & Pollan Dam), Lough Shore (Arranmore Island), Lough Unshin (Ballyshannon &Bundoran), Muckish (Creeslough

Dunfanaghy), River Eske (Donegal (River Eske)), Shannagh Lake (Fanad East), and St. Peters Lough 2 (Frosses-Inver) may not meet sustainability guidelines during dry weather flows. However, under the proposed regulatory regime, this will be adjudicated by the EPA.

The Letterkenny/Milford & Inishowen RWSS & Inishowen East WRZ could have the most significant impacts to the SDB based on the theoretical future abstraction at the Eddie Fullerton Pollan Dam reservoir source. However, it is assumed that the existing historical abstraction licence conditions will be preserved under the new regulatory regime. This would allow the current abstraction rates to be maintained and the potential; for the source to be developed to meet future projected deficits. This assumption is based on the appropriate enforcement of the compensation flow releases from the dam downstream, as detailed in the existing licence.

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

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

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

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

Waterbody Type	Water Catchments	Number of Waterbodies	Number of Waterbodies Rated Below Moderate
Rivers	Donagh-Moville	36	16
	Donegal Bay North	50	9
	Erne	3	0
	Foyle	41	7
	Gweebarra-Sheephaven	88	11
	Lough Swilly	51	12
Lakes	Donagh-Moville	1	0
	Donegal Bay North	12	0
	Erne	6	0
	Foyle	5	0
	Gweebarra-Sheephaven	83	0
	Lough Swilly	9	1
Transitional and Coastal	N/A	43	2
Groundwater	N/A	24	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:

- Donagh-Moville: Agriculture (75%), Domestic Wastewater (25%) and Other (abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species) (20%);
- Donegal Bay North: Agriculture (74%), Forestry (32%) and Other (abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species) (32%);
- Erne: Agriculture (84%) and Other (abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species) (20%);
- Foyle: Agriculture (77%), Forestry (43%) and Other (abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species) (20%);
- Gweebarra-Sheephaven: Other (25%), Agriculture (15%) and Domestic Wastewater (12%); and
- Lough Swilly: Agriculture (79%), Urban Wastewater (32%) and Domestic Wastewater (29%).

The Beg_010 river, Clonmany_010 river, Corconnelly Lake, Crana_020 river, Cullies_040 river, Erne_020 river, Fad Meendoran lake, Greencastle_010 river, Keel Crott, Kindrum lake, Leannan_020 river, Maggy's Burn_010 river, Mourne Kinny lake, Owennasop_010 river, Stragar_010, Tullaghobegly_010 river, and Veagh Lake waterbodies are at particular risk of abstraction in SAA.

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

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

Waterbody Type	Water Catchments	Number of Waterbodies Identified as 'At Risk'	Surface Waterbodies Status 'At Risk' Due to Abstraction Pressure*
Rivers	Donagh-Moville	19	2
	Donegal Bay North	18	
	Erne	1	
	Foyle	29	
	Gweebarra-Sheephaven	14	
	Lough Swilly	24	
Lakes	Donagh-Moville	1	26
	Donegal Bay North	0	
	Erne	2	
	Foyle	0	
	Gweebarra-Sheephaven	9	
	Lough Swilly	2	
Transitional and Coastal	N/A	7	0
Groundwater	N/A	2	N/A
Total		**128**	**28**

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

* Based on Uisce Éireann assessment of their current abstractions

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

Table 2.7 'Areas for Action' within SAA (catchments.ie, 2022)

Areas for Action	Key Reasons for Selection
Clonmany	• Water quality within the area has deteriorated • Waterbodies within the area have reported unsatisfactory water quality • The coastal area receiving water from the Clonmany River is part of the North Inishowen Coast, Special Area of Conservation (SAC), and therefore, must be protected • Help to streamline the approach taken to improve waterbodies outside the Area for Action
Donagh	• Drop in ecological status of Straid_101 waterbody • Straid_010 waterbody has a single river network with no additional waterbodies draining into it • Urban and rural pressures causing water quality deterioration of Donagh_030 waterbody
Donegal SW and Murlins	• Eight rivers have shown a deterioration in water quality • Pollution from insecticides is a common issue • Owenteskinny river is a Blue Dot site meaning it requires extra protection
Glen Lackagh	• A decline in water quality has been observed in Glen Lackagh_010 waterbody
Laghy Stream – Bridgetown	• The Bridgetown_010 waterbody is a Blue Dot Site meaning it requires extra protection
Lough Eske	• Drinking water is taken from the catchment to provide the Donegal Town area • The lough and its tributaries have shown a deteriorated in water quality • Corabber River is a Blue Dot site meaning it requires extra protection • Lough Eske is an oligotrophic lake, meaning that it is naturally low in nutrients. However, the lake's ecology is under threat from excess nutrients

Areas for Action	Key Reasons for Selection
	• Exceedances of the herbicide/pesticide has been detected in the raw water intake for the drinking water supply
Lough Nastackan	• Water quality in waterbodies has deteriorated despite both achieving High status in the past • Lough Nastackan stream_010 still has a High status objective and is part of the Blue Dot Programme meaning it requires extra protection • The waterbodies are somewhat isolated (with no inflowing waterbodies) and are both significantly pressured by agriculture
Malin	• The water quality has deteriorated, and two out of the three monitored waterbodies are currently at poor ecological status • The water quality status has remained poor since 2018, despite all sites presenting at least good if not high biological status in years prior • Help to streamline the approach taken to improve waterbodies outside the Area for Action
Roosky	• Cabry_101 waterbody has recently deteriorated while Roosky_010 waterbody has recently shown a slight improvement despite having similar pressures affecting them

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 SAA.

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

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

2.3 Climate Change

Ireland’s climate is heavily influenced by the Atlantic Ocean. Consequently, Ireland has a milder climate that has less extreme temperature variation compared with other countries at a similar latitude. The hills

and mountains, many of which are near the coasts, provide shelter from strong winds and from the direct oceanic influence. Winters tend to be cool and windy, while summers are generally mild and less windy (Met Éireann, 2019).

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

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

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

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

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

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

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

Summary	
Key Points	• Protecting and improving water quality and improving water services infrastructure are major challenges in Ireland • Climate change-induced threats will increase the scale of these challenges • Risks to water quality and water infrastructure arise from changing rainfall patterns and different annual temperature profiles. The frequency and intensity of storms and sea level rise are also considered
The challenges: Water services infrastructure	• Increased surface and sewer flooding leading to pollution, water and wastewater service interruptions • Reduced availability of water resources

Summary	
	• 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 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 SAA

County	Key Risk Areas
Donegal (Donegal City Council, 2019)	• Extreme rainfall and storms • Flooding • Increasing temperatures • Changes to natural ecosystem

County	Key Risk Areas
	• Ocean warming and acidification • Rising sea levels

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 SAA, not all supplies within the study area meet the required levels of reserve capacity. As evidenced in the 2018 and 2020 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 Uisce Éireann's strategy is to 'Supply Smarter', by improving the quality, resilience and security of their supply through infrastructural improvements. One of the high-level goals taken from the national level is building resilience, with water services being a key factor.

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

2.4 Biodiversity, Flora and Fauna

2.4.1 Designated Sites

Within SAA 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 – note that an index key for Figure 2.2 is provided in Appendix C). The European sites (SPAs and SACs), and the potential impacts on them, are discussed in more detail in the NIS.

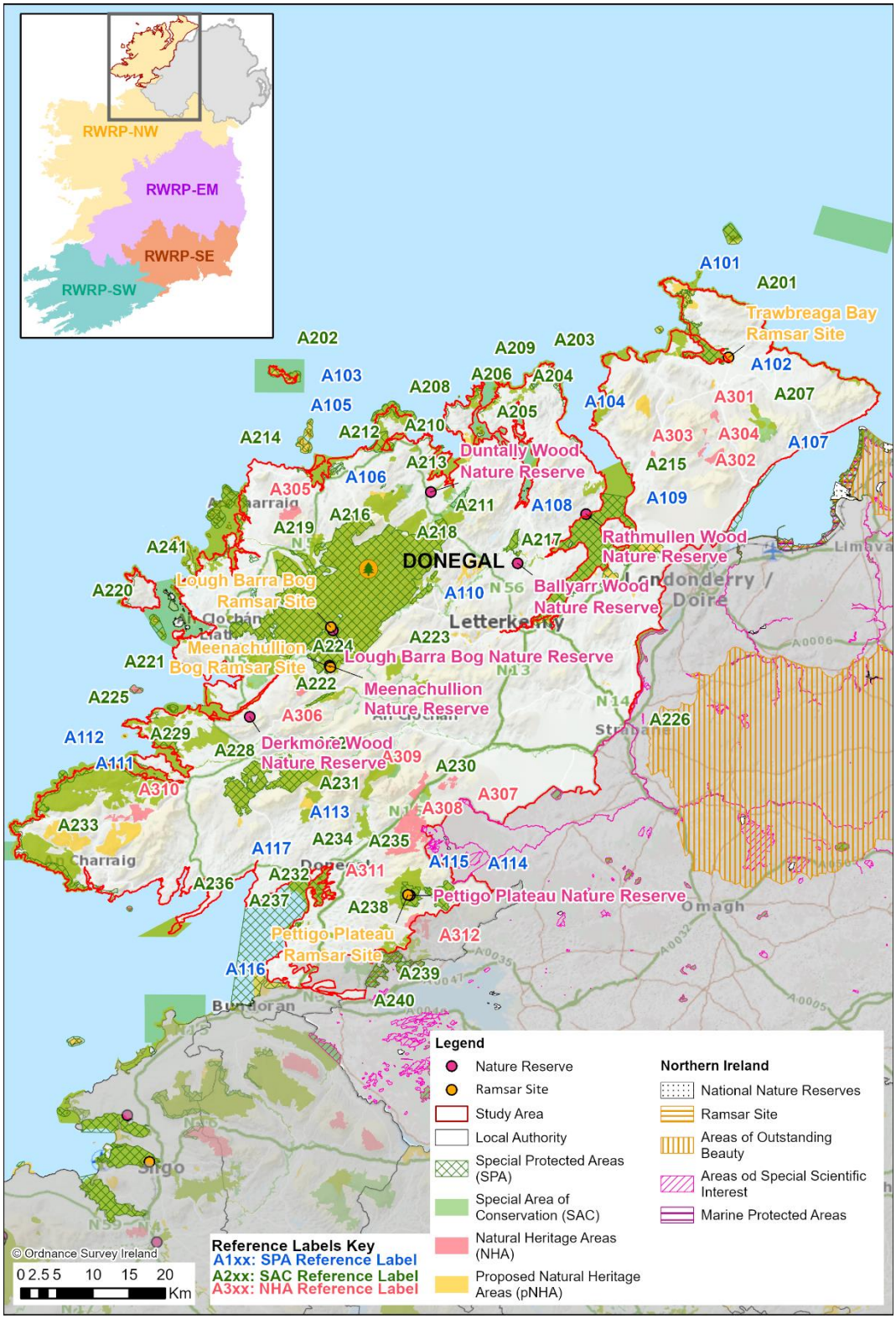

Figure 2.2 Designated Sites in SAA

Table 2.10 Designated Sites within SAA (NPWS, 2023)

Receptor	Name	Total Number
Special Protected Area (SPA)	Trawbreaga Bay SPA	17
	Derryveagh And Glendowan Mountains SPA	
	Lough Derg (Donegal) SPA	
	Lough Fern SPA	
	Tory Island SPA	
	Lough Swilly SPA	
	Lough Foyle SPA	
	Sheskinmore Lough SPA	
	Pettigo Plateau Nature Reserve SPA	
	Lough Nillan Bog SPA	
	Durnesh Lough SPA	
	Malin Head SPA	
	Fanad Head SPA	
	West Donegal Coast SPA	
	Donegal Bay SPA	
	Horn Head to Fanad Head SPA	
	Falcarragh to Meenlaragh SPA	
Special Area of Conservation (SAC)	Aran Island (Donegal) Cliffs SAC	41
	Croaghonagh Bog SAC	
	Fawnboy Bog/Lough Nacung SAC	
	Gannivegil Bog SAC	
	Horn Head and Rinclevan SAC	
	Lough Nagreany Dunes SAC	
	Lough Nillan Bog (Carrickatlieve) SAC	
	Magheradrumman Bog SAC	
	Meenaguse/Ardbane Bog SAC	
	Slieve League SAC	
	Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	
	Tranarossan And Melmore Lough SAC	
	Coolvoy Bog SAC	
	Dunragh Loughs/Pettigo Plateau SAC	

Receptor	Name	Total Number
	Gweedore Bay and Islands SAC	
	Kindrum Lough SAC	
	Muckish Mountain SAC	
	Sheephaven SAC	
	Meenaguse Scragh SAC	
	Ballyhoorisky Point to Fanad Head SAC	
	North Inishowen Coast SAC	
	Cloghernagore Bog and Glenveagh National Park SAC	
	Mulroy Bay SAC	
	Lough Golagh and Breesy Hill SAC	
	Rutland Island and Sound SAC	
	Tamur Bog SAC	
	Ballintra SAC	
	Ballyarr Wood SAC	
	Sessiagh Lough SAC	
	Leannan River SAC	
	St. John's Point SAC	
	Tory Island Coast SAC	
	Lough Eske and Ardnamona Wood SAC	
	Termon Strand SAC	
	Durnesh Lough SAC	
	Ballyness Bay SAC	
	Lough Swilly SAC	
	West Of Ardara/Maas Road SAC	
	River Finn SAC	
	Donegal Bay (Murvagh) SAC	
	Meentygrannagh Bog SAC	
Ramsar Sites	Lough Barra Bog	4
	Meenachullion Bog	
	Pettigo Plateau	
	Trawbreaga Bay	
Nature Reserves	Ardnamona Nature Reserve	10

Receptor	Name	Total Number
	Ballyarr Wood Nature Reserve	
	Derkmore Wood Nature Reserve	
	Duntally Wood Nature Reserve	
	Inch Levels Wildfowl Reserve	
	Lough Barra Bog Nature Reserve	
	Meenachullion Nature Reserve	
	Pettigo Plateau Nature Reserve	
	Rathmullen Wood Nature Reserve	
	Sheskinmore Nature Reserve	
National Parks	Glenveagh National Park	1
Natural Heritage Areas (NHAs)	Corveen Bog NHA	12
	Illies Hill Bog NHA	
	Lough Fad Bog NHA	
	Crocknamurrin Mountain Bog NHA	
	Slieve Snaght Bogs NHA	
	Barnesmore Bog NHA	
	Camowen River Bog NHA	
	Umrycam Bog NHA	
	Meenagarranroe Bog NHA	
	Lough Hill Bog NHA	
	Meenmore West Bog NHA	
	Cashelnavean Bog NHA	
Proposed Natural Heritage Areas (pNHAs)	See Figure 2.2	67

2.4.2 Habitats

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

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

Table 2.11 Habitat Areas for SAA (EPA, 2018)

Habitat	Ha	% of Study Area
Agricultural Land		
Pastures	128,324	27.61%
Land principally occupied by agriculture, with significant areas of natural vegetation	38,463	8.28%
Complex cultivation patterns	6,358	1.37%
Non-irrigated arable land	4,064	0.87%
Natural Habitats		
Peat bogs	178,120	38.32%
Moors and heathland	26,053	5.61%
Sparsely vegetated areas	10,542	2.27%
Water bodies	5,174	1.11%
Natural grasslands	5,216	1.12%
Beaches, dunes, sands	3,100	0.67%
Bare rocks	612	0.13%
Intertidal flats	413	0.09%
Inland marshes	337	0.07%
Sea and ocean	292	0.06%
Salt marshes	186	0.04%
Estuaries	63	0.01%
Water courses	20	0.00%
Forest		
Coniferous forest	25,259	5.46%
Transitional woodland-shrub	19,789	4.28%
Broad-leaved forest	3,165	0.68%
Mixed forest	1,733	0.37%

Particularly relevant habitats that depend on the water quality and/or quantity in SAA 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;*
- Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.;
- Bog habitats – Rhynchosporion depressions, transition mires and quaking bog habitats;
- Alkaline fens;

- Groundwater dependant terrestrial habitats, such as petrifying springs with tufa formation and blanket bogs;
- Northern Atlantic wet heaths with *Erica tetralix;*
- Coastal lagoons;
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*);
- Machairs; and
- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho–Batrachion* vegetation.

2.4.3 Species

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

- Otter (*Lutra lutra*);
- Fish species – Atlantic Salmon (*Salmo salar*);
- Fresh-water pearl mussel (*Margaritifera margaritifera*);
- Killarney Fern (*Trichomanes speciosum*);
- Marsh Fritillary (*Euphydryas aurinia*);
- Slender Naiad (*Najas flexilis*);
- Narrow-mouthed Whorl Snail (*Vertigo angustior*);
- Slender green feather-moss (*Hamatocaulis vernicosus*);
- Geyer's Whorl Snail (*Vertigo geyeri*);
- Petalwort (*Petalophyllum ralfsii*);
- 'Qualifying interest' bird species e.g. peregrine falcon (*Falco peregrinus*), merlin (*Falco columbarius*), chough (*Pyrrhocorax pyrrhocorax*) and corncrake (*Crex crex*); and
- Waterbirds of 'qualifying interest' e.g. Brent goose (*Branta bernicla*), whooper swan (*Cygnus cygnus*), Bewick's swan (*Cygnus columbianus bewickii*), Greenland white-fronted goose (*Anser albifrons flavirostris*), Greylag goose (*Anser anser*), and winter migratory waders.

The key invasive species to consider (National Biodiversity Data Centre, 2021) for developing options within SAA include:

Animals:

- American mink (*Mustela/Neovison vison*);
- Asian river clam (*Corbicula fluminea*);
- Brown hare (*Lepus europaeus*);
- Brown rat (*Rattus norvegicus*);
- Canada goose (*Branta canadensis*);
- Common toad (*Bufo bufo*);
- Grey squirrel (*Sciurus carolinensis*);
- Greylag goose (*Anser anser*);
- Muntac deer (*Muntiacus reevesi*);
- Roach (*Rutilus rutilus*);
- Ruddy duck (*Oxyura jamaicensis*);
- Stalked/leathery sea squirt (*Styela clava*); and
- Zebra mussel (*Dreissena polymorpha*).

Plants:

- American skunk-cabbage (*Lysichiton americanus*);

- Brazilian giant-rhubarb (*Gunnera manicata*);
- Cord-grasses (*Spartina* spp.);
- Curly waterweed (*Lagarosiphon major*);
- Dwarf eel-grass (*Zostera japonica*);
- Giant hogweed (*Heracleum mantegazzianum*);
- Giant knotweed (*Fallopia sachalinensis*);
- Giant-rhubarb (*Gunnera tinctoria*);
- Himalayan/Indian balsam (*Impatiens glandulifera*);
- Himalayan knotweed (*Persicaria wallichii*);
- Japanese knotweed (*Fallopia japonica*);
- Rhododendron (*Rhododendron ponticum*);
- Salmonberry (*Rubus spectabilis*);
- Sea-buckthorn (*Hippophae rhamnoides*);
- Spanish bluebell (*Hyacinthoides hispanica*);
- Three-cornered leek (*Allium triquetrum*);
- Waterweeds (*Elodea* spp.); and
- Wireweed (*Sargassum muticum*).

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 SAA 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.

Uisce Éireann has 29 WTPs in SAA, meeting the average demand of 71.4 Ml/d in 2019.

There are no canals or ports of national or regional significance in SAA. There are no airports of local significance. Other significant transport infrastructure includes the main road network (particularly the N13, N14, N15 and N56).

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

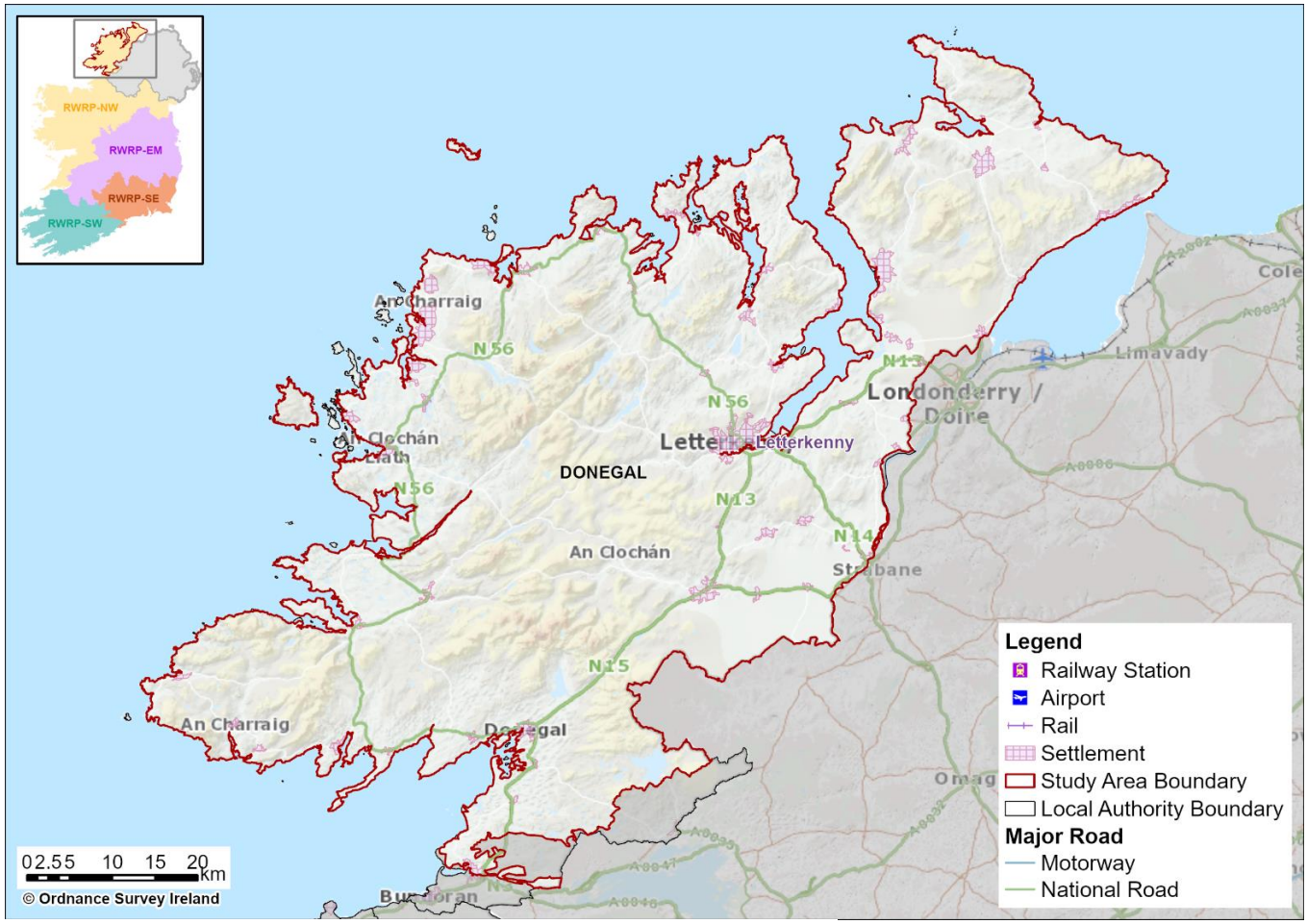

Figure 2.3 Transport Infrastructure in SAA

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

Land use	Ha	% of Study Area	Comparison to Overall North West Region %
Agriculture	177,209	38.13%	57.28%
Urban	6,794	1.46%	1.18%
Natural Habitats	230,126	49.51%	31.76%
Forest	49,945	10.75%	9.47%
Industry	225	0.05%	0.07%
Other	469	0.10%	0.24%

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

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

Table 2.13 gives an overview of the project developments which are available from myProjectIreland (2022) for SAA[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		
Admiran, Stranorlar	Gteic Gaoth Dobhair	N56 Mountcharles to Inver Road
Ailt an Chorráin (Burtonport)/ Oileán Árainn Mhór (Arranmore Island) – Harbour to Island Regeneration Phase 1&2	Inishowen – Buncrana – Carndonagh Greenway	National Parks – Location #2 of 8 – Glenveagh
Ballyshannon 2040 – Back to Ballyshannon	Inishowen – Muff Quigleys Point Greenway	Ocean Innovation Centre Ireland
Barnesmore Gap Greenway	Inishowen Greenway – Bridgend to Buncrana & Newtowncunningham	Ramelton Historic Town Centre – A Restorative and Transformational Public Realm Scheme
Buncrana Community Nursing Unit	Killybegs 2040 – Town Centre Regeneration Project	Ramelton, Community Nursing Unit
Burtonport to Letterkenny Greenway	Letterkenny 2040	Raphoe Flood Relief scheme
Carndonagh Community Hospital.	Letterkenny 2040 Phase 1	Repowering Buncrana A NW Place Standard Project
Carndonagh TUS NUA Regeneration Project	Letterkenny Community Nursing Unit	Shiel Hospital, Ballyshannon.
Carrigans to Castlefinn – Castlefin and Foyle Valley Greenway Link	Letterkenny Courthouse – PPP: Ongoing Unitary Charge Payments	St Joseph's, Stranorlar
Cill Ulta: Northwest Bioeconomy Hub	Libraries Capital Programme – Donegal Library	Swan Park
Convent Road, Carndonagh	Little Angels Association, Letterkenny, Co. Donegal – 19724A	The Seed Project – Strenghten, Engage, Enable, Deliver
DigiWest – Location #4 of 4 – Stranorlar	LYIT Library, IT and Education Building	Willowbrook, Glencar, Letterkenny
Dungloe Community Hospital.	Milford, Ramelton and Rathmullan WWTP	
Falcarragh Community Hospital	N56 Dungloe to Glenties	

[3] Note that the myProjectIreland dataset was taken at a fixed point in time to allow for assessment of cumulative effects. The date for SAA being the 15/04/22.

2.6 Landscape and Visual Amenity

The National Landscape Strategy 2015-2025 is in the process of being implemented and will be Ireland's vehicle for complying with the EU Landscape Convention. Landscape assessment guidance is also available from the local authorities. This will be taken into account when identifying landscape character areas and protected areas at the project level in the future. No Landscape Character Areas (LCAs) are provided for the counties listed within the study area[4].

The value of the landscape in SAA 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.

2.6.1 Seascape

The Regional Seascape Character Assessment for Ireland (2020) presents the Regional Seascape Character Areas (SCAs) for the entire Republic of Ireland. An SCA is defined as "*an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors*". The assessment identifies four SCAs in SAA; Border – Lough Foyle, the North Donegal Atlantic Headlands, Loughs and Beaches, the Northwest Atlantic Islands, Headlands and Beaches, and Sligo Bay.

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 SAA 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 Uisce Éireann vehicles, generator plants and drinking water residuals treatment facilities. There is a requirement to comply with air pollution regulations and also to identify potential opportunities for reducing emissions. Air quality will be a consideration at the project level, for example, through scheme construction management and scheme design and operation.

2.7.2 Noise

The main areas that experience noise pollution are likely to be areas along the main roads, particularly around the N13, N14, N15 and N56.

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.

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

2.8 Cultural Heritage

Within SAA, 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 2.14).

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.

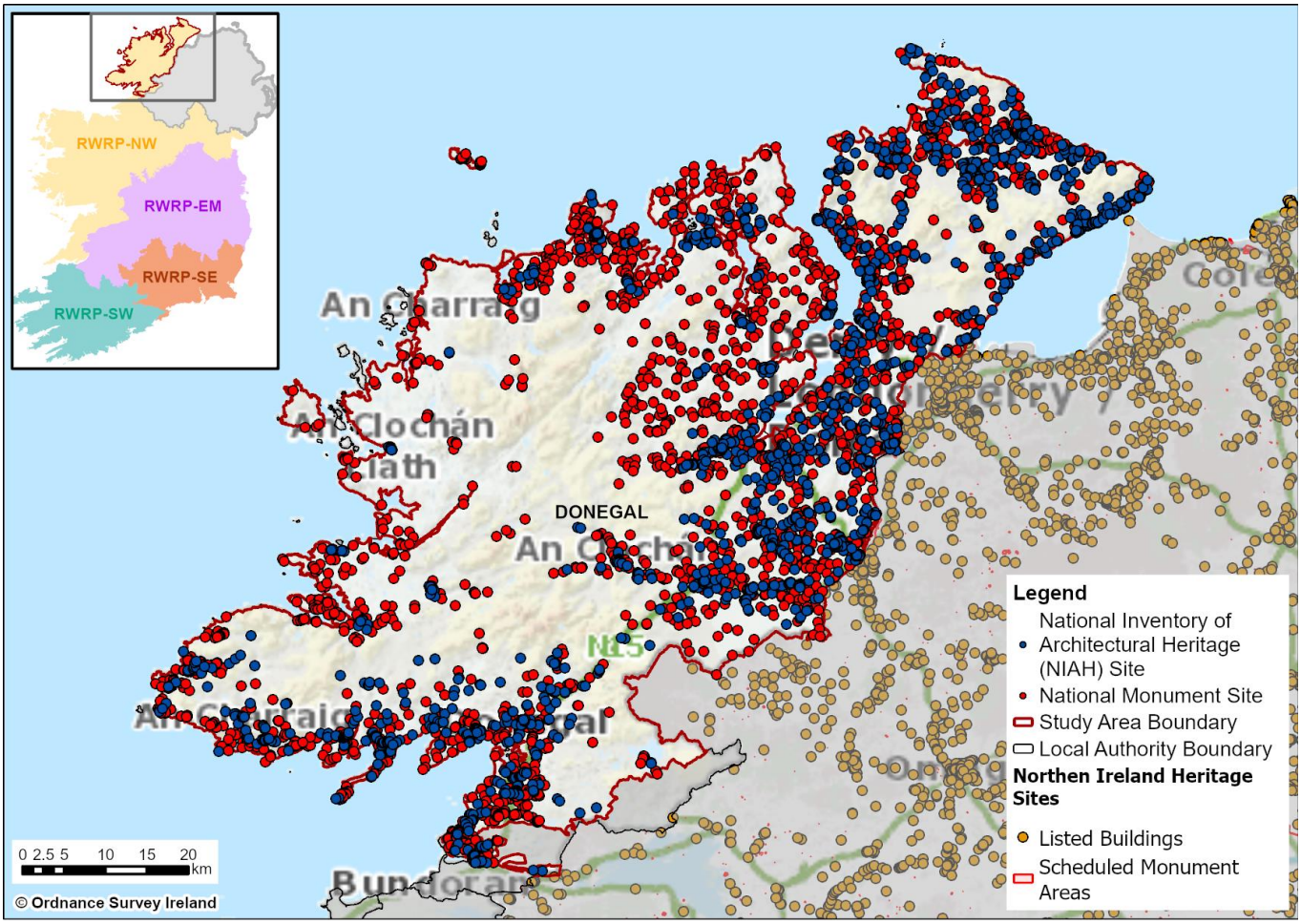

Figure 2.4 SAA Cultural Heritage Assets

Table 2.14 Cultural Heritage Assets within SAA

Assets	Total Number
National Monuments Service Sites	3,202
National Inventory of Architectural Heritage Sites	3,833
Sites and Monuments Record Zones	2,067

2.9 Geology and Soils

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

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

The geology of County Donegal most closely resembles that of County Mayo, with Dalradian age metamorphic rocks being dominant. These rocks were metamorphosed or altered into gneiss, schists and quartzites during the Grenvillian Orogeny (700 Ma) and gave rise to some of the areas more mountainous regions, including Errigal Mountain. Around 405 Ma, six granite masses were injected into the older rocks, with the main Donegal Granite being the largest. There are no Ordovician or Silurian rocks in Donegal and only a small patch of Devonian sandstones along the northern shore of Donegal Bay. The Precambrian rocks and Granites are characterised by the absence of an intergranular permeability and the presence of low fissure permeability. The marbles may contain some solutionally enhanced permeability zones which could provide a domestic or farm supply or small group scheme. Yields are lowest in the fine-grained schists (pelites) where wells may fail to provide even a domestic yield.

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, 94 of which have the potential to constrain water resource options in SAA.

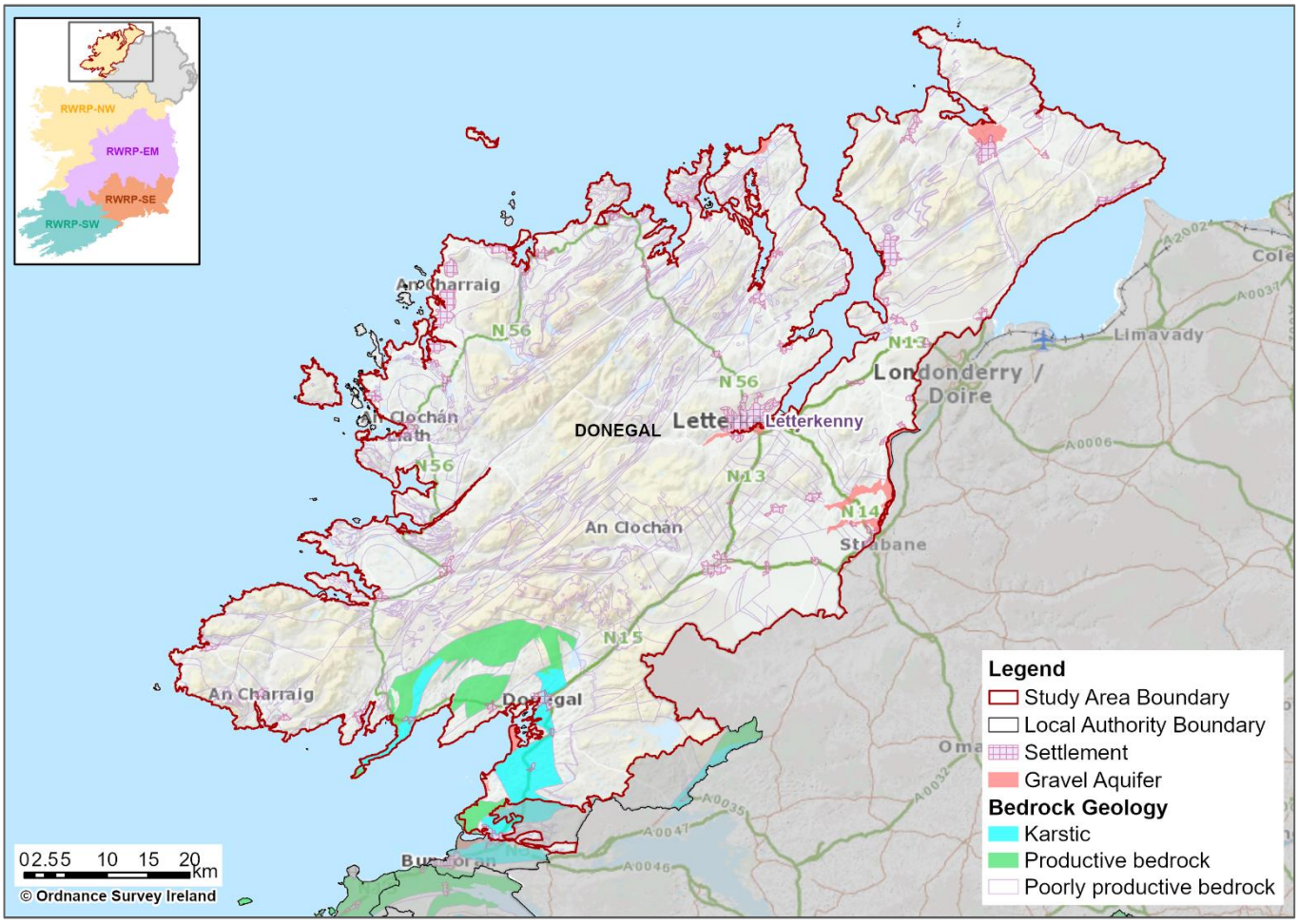

Figure 2.5 SAA Hydrogeology

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 SAA are listed in Table 2.15.

Table 2.15 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**: Uisce Éireann will put in place plans to assess water quality and measures to address risks as part of the Regional Plan Uisce Éireann has ongoing activities to improve the Supply Demand Balance in SAA, 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	Climate change, biodiversity, water environment, material assets and landscape and visual amenity

SEA Topic	Issues and Opportunities	Interrelated Topics
	important part in water planning. Valuing access to 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 SAA, some of the existing abstractions may not meet sustainability guidelines in the medium term; specifically, during drought periods. On an interim basis, Uisce Éireann has developed an initial conservative assessment based on available information (see SAA Technical Report). This has been used to inform options identification and appraisal. Uisce Éireann will update its sustainability analysis and impact on their baseline Supply Demand Balance (SDB) calculations when regulatory assessment for the new legislation is undertaken. **Opportunities:** To take account of identified pressure on the water environment in the selection of solutions for SAA.	Biodiversity and climate change
Biodiversity, Flora and Fauna	**Issues:** SAA has an expansive network of designated areas including Ireland's second biggest National Park (Glenveagh). Furthermore, SAA has several waterbodies with High Status Objectives, including six *Margaritifera* (Freshwater Pearl Mussel) SAC catchments designated for the protection of the species by the National Parks and Wildlife Service. 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
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 SAA.	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	Biodiversity and water environment

SEA Topic	Issues and Opportunities	Interrelated Topics
	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.	
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

Uisce Éireann applied its Options Assessment Methodology from the Framework Plan to identify potential solutions to meet the needs identified in the SAA 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 SAA are Stages 3-6:

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

3.2 Stage 3: Unconstrained Options

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

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

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

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

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

3.2.1 Existing Groundwater Abstractions

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

3.2.2 New Groundwater Abstractions

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

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

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

3.2.3 Sustainable Abstraction in Options Assessment

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

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

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

3.3 Stage 4: Coarse Screening

A total of 350 unconstrained options were identified for SAA and subjected to coarse screening. The coarse screening process assessed the options against the criteria outlined in Table 3.1. This process is summarised in chapter 6 of the SEA Environmental Report for the RWRP-NW. 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 350 unconstrained options, 159 were rejected after being analysed against the coarse screening criteria of resilience, deliverability and environment.

Sustainability reasons for rejecting options were identified for 138 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 SAA. The full rejection register, including those options rejected for other reasons, in both the coarse and fine screening (where applicable) is provided in Annex B of the SAA Technical Report.

Table 3.2 Coarse Screening Rejection Register

Option Reference	Option Description	Rejection Reasoning
SAA-107	Rationalise Creeslough Dunfanaghy to Rossess WRZ – new WTP at Dunlewy Lough.	This option did not meet the requirements of the Environmental, Resilience or Deliverability criteria. A better alternative to this option is to abstract from larger Lough Nacung directly downstream
SAA-113	Rationalise Gortahork-Falcarragh to Rossess WRZ – new WTP at Dunlewy Lough.	
SAA-120a	New WTP on ESB impoundment at Dunlewy Lough.	

Option Reference	Option Description	Rejection Reasoning
SAA-120b	New WTP on ESB impoundment at Dunlewy Lough.	
SAA-148	Rationalise Arranmore Island to mainland – Rosses WRZ (Dunlewy Lough)	
SAA-002a	Rationalise Culdaff WRZ to Illies WTP (Letterkenny 25 year plan)	Abstracting the volume of water required is considered unfeasible. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria
SAA-006a	Rationalise Inishowen West WSZ to Illies WTP.	
SAA-007	Rationalise Inishowen West WSZ to Lough Mourne WRZ (Letterkenny 25 year plan)	
SAA-010a	Rationalise Carndonagh WSZ to Illies WTP (Letterkenny 25 year plan)	
SAA-011	Rationalise Carndonagh WSZ to Lough Mourne WRZ (Letterkenny 25 year plan)	
SAA-015a	Rationalise Slavery WTP to Illies WTP.	
SAA-016	Rationalise Slavery WTP to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-017a	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.	
SAA-017c	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.	
SAA-019a	Rationalise Inishowen East to Illies WTP.	
SAA-020	Rationalise Inishowen East to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-021b	Increase existing SW abstraction from Lough Mourne. It would require significant increase to impoundment.	
SAA-027	Rationalise Lough Mourne WRZ to Illies WTP supply.	
SAA-033	New GW abstraction (poorly productive bedrock) at Meeneragh/ Cronalaghey.	
SAA-037	Rationalise Fanad East to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-067c	Increase GW abstraction from existing BHs to partly supply Letterkenny, Inishowen East & Pollan Dam deficit. Recent work has shown potential to get 1-3MLD more from this supply.	
SAA-067d	Increase GW abstraction from existing BHs to partly supply Letterkenny, Inishowen East & Pollan Dam	

Option Reference	Option Description	Rejection Reasoning
	WRZ deficit. Recent work has shown potential to get 1-3MLD more from this supply.	
SAA-069	Rationalise Letterkenny Mixed to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-079	Rationalise Carrigart-Downings to Ballymacool WTP	
SAA-080	Rationalise Carrigart-Downings to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-088	Rationalise Cranford to Ballymacool WTP	
SAA-089	Rationalise Cranford WSZs to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-101	Rationalise Creeslough Dunfanaghy WRZ to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-115	Rationalise Gortahork-Falcarragh WRZ to Lough Mourne WRZ.	
SAA-118b	New SW abstraction from Loch an Luir and new WTP.	
SAA-122	Rationalise Rosses WRZ to Lough Mourne WRZ.	
SAA-123	Rationalise Roysses to Killyhbegs and decommission existing source.	
SAA-124	Interconnect Rosses with Glenties-Ardara WRZ (rationalise Lettermacaward WRZ to Glenties-Ardara WRZ) and supply deficit from new WTP at Lough Finn.	
SAA-130	Rationalise Lettermacaward WRZ to Lough Mourne WRZ.	
SAA-132	Rationalise Lettermacaward to Killybegs and decommission existing source.	
SAA-133	Rationalise Lettermacaward to Glenties-Ardara WRZ (new WTP at Lough Finn) and decommission existing source.	
SAA-135b	New SW abstraction from Lough Finn and new WTP. Supply Glenties-Ardara and Lettermacaward WRZs. Supply deficit to Rosses WRZ.	
SAA-137	Rationalise Glenties-Ardara WRZ to Lough Mourne WRZ.	
SAA-140	Rationalise Glenties-Ardara to Killybegs and decommission existing source.	

Option Reference	Option Description	Rejection Reasoning
SAA-147	Rationalise Arranmore Island to mainland – Rosses WRZ (Lough Anure)	
SAA-154	Increase existing SW abstraction from Lough Aderry. Rationalise Lettermacaward, Rosses and Glenties-Ardara WRZs (decommission existing sources) to Killybegs and create a single WRZ.	
SAA-184	Rationalise Fanad West WSZs to Lough Mourne WRZ (Letterkenny 25 year plan).	
SAA-017e	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.	
SAA-216	New SW abstraction from Lough Altan and new WTP	
SAA-114	Rationalise Gortahork-Falcarragh to Rossess WRZ – new WTP at Lough Nacung.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving high WFD status. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAA-119a	New WTP on ESB impoundment at Lough Nacung.	
SAA-119b	New WTP on ESB impoundment at Lough Nacung.	
SAA-119c	New WTP on ESB impoundment at Lough Nacung.	
SAA-149	Rationalise Arranmore Island to mainland – Rosses WRZ (Lough Nacung).	
SAA-211	New WTP on ESB impoundment at Lough Nacung.	
SAA-212	Interconnect Lettermacaward WRZ to Rosses WRZ – new WTP at Lough Nacung	
SAA-213	Interconnect Glenties-Ardara WRZ to Rosses WRZ – new WTP at Lough Nacung	
SAA-219	New WTP on ESB impoundment at Lough Nacung.	
SAA-275	Rationalise Gortahork-Falcarragh to Rossess WRZ – new WTP at Lough Nacung.	
SAA-276	New WTP on ESB impoundment at Lough Nacung.	
SAA-003	Rationalise Culdaff WRZ to Inishowen East	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAA-004	Increase existing SW abstraction from Lough Fad.	
SAA-005	New SW source to supply deficit at Inishowen West/Carndonagh/ Culdaff WRZ – source TBC	
SAA-012	Increase SW abstraction from Lough Doo.	
SAA-018a	Increase existing SW abstraction from Lough Fad.	
SAA-018b	Increase existing SW abstraction from Lough Fad.	

Option Reference	Option Description	Rejection Reasoning
SAA-034	Increase existing SW abstraction from Lough Naglea.	
SAA-040	Rationalise Fanad to Cranford.	
SAA-043a	Increase existing SW abstraction from Lough Salt and increase capacity of new Letterkenny WTP.	
SAA-043b	Increase existing SW abstraction from Lough Salt and increase capacity of new Letterkenny WTP.	
SAA-043c	Increase existing SW abstraction from Lough Salt and increase capacity of new Letterkenny WTP.	
SAA-043d	Increase existing SW abstraction from Lough Salt and increase capacity of new Letterkenny WTP.	
SAA-043e	Increase existing SW abstraction from Lough Salt and increase capacity of new Letterkenny WTP.	
SAA-045a	Increase existing SW abstraction from Lough Greenan and increase capacity of new Letterkenny WTP.	
SAA-045b	Increase existing SW abstraction from Lough Greenan and increase capacity of new Letterkenny WTP.	
SAA-045c	Increase existing SW abstraction from Lough Greenan and increase capacity of new Letterkenny WTP.	
SAA-045d	Increase existing SW abstraction from Lough Greenan and increase capacity of new Letterkenny WTP.	
SAA-045e	Increase existing SW abstraction from Lough Greenan and increase capacity of new Letterkenny WTP.	
SAA-046	Increase existing SW abstraction from Lough Keel for new Letterkenny WTP and increase capacity of new Letterkenny WTP.	
SAA-048a	New SW abstraction from Lough Reelan to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.	
SAA-048b	New SW abstraction from Lough Reelan to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.	

Option Reference	Option Description	Rejection Reasoning
SAA-051	Increase existing SW abstraction from Lough Columbkille.	
SAA-053	Rationalise Milford to Goldrum Letterkenny WTP	
SAA-054	Rationalise Milford to Cranford.	
SAA-055	Increase existing SW abstraction from Gort Lough.	
SAA-057	Rationalise Milford to new Letterkenny WTP. New SW abstraction from Lough Reelan to supplement new Letterkeny WTP.	
SAA-061	Rationalise Rathmullen to Goldrum Letterkenny WTP	
SAA-063	Rationalise Rathmullen to new Letterkenny WTP. New SW abstraction from Lough Reelan to supplement new Letterkeny WTP.	
SAA-070	Increase existing SW abstraction from Lough Nambraddan.	
SAA-071	Increase existing SW abstraction from Lough Nameeltoge.	
SAA-074	Rationalise Carrigart-Downings to Goldrum Letterkenny WTP	
SAA-076	Rationalise Carrigart-Downings to new Letterkenny WTP. New SW abstraction from Lough Reelan to supplement new Letterkeny WTP.	
SAA-081a	Increase existing SW abstraction from Lough Nacreaght.	
SAA-081b	Increase existing SW abstraction from Lough Nacreaght.	
SAA-081c	Increase existing SW abstraction from Lough Nacreaght.	
SAA-083	Rationalise Cranford to Goldrum Letterkenny WTP	
SAA-085	Rationalise Cranford to new Letterkenny WTP. New SW abstraction from Lough Reelan to supplement new Letterkeny WTP.	
SAA-094b	New SW abstraction and WTP on Lough Veagh and supplement Letterkenny & Inishowen RWSS.	
SAA-096	Increase existing SW abstraction from stream from Muckish Mountain.	
SAA-097	Increase existing SW abstraction from Lough Agher.	

Option Reference	Option Description	Rejection Reasoning
SAA-103	Rationalise Creeslough Dunfanaghy WRZ to Letterkenny WRZ – Lough Veagh source	
SAA-109	Increase existing SW abstraction from Lough Lagha.	
SAA-116a	Increase existing SW abstraction from Lough Keel.	
SAA-116b	Increase existing SW abstraction from Lough Keel.	
SAA-117	Increase existing SW abstraction from river leaving Lough Keel.	
SAA-129	Interconnect Lettermacaward WRZ and Glenties WRZ and supply deficit from Glenties.	
SAA-134a	Increase existing impoundment at Lough Anna and increase existing SW abstraction.	
SAA-134b	Increase existing impoundment at Lough Anna and increase existing SW abstraction.	
SAA-146	Rationalise Arranmore Island to mainland – Rosses WRZ (Lough Keel)	
SAA-150	Increase existing SW abstraction from Lough Nalughraman.	
SAA-156	Increase existing SW abstraction from St. Peters Lough.	
SAA-157	Increase existing SW abstraction from Glencoagh Lough.	
SAA-163	Interconnect Frosses-Inver and Donegal (River Eske source) supply deficit from Donegal (River Eske) WRZ.	
SAA-164	Interconnect Frosses-Inver and Donegal (River Eske & Lough Eske source) supply deficit from Donegal (River Eske) WRZ.	
SAA-167a	Increase existing SW abstraction from River Eske.	
SAA-167b	Increase existing SW abstraction from River Eske.	
SAA-167c	Increase existing SW abstraction from River Eske.	
SAA-167d	Increase existing SW abstraction from River Eske.	
SAA-167e	Increase existing SW abstraction from River Eske.	
SAA-167f	Increase existing SW abstraction from River Eske.	
SAA-168a	New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two	

Option Reference	Option Description	Rejection Reasoning
	sources conjunctively, applying compensation flow release requirements from lake to river.	
SAA-168b	New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying compensation flow release requirements from lake to river.	
SAA-168c	New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying compensation flow release requirements from lake to river.	
SAA-173	Increase existing SW abstraction from Lough Gorman.	
SAA-179	Rationalise Ballyshannon/ Ballymagroarty to Donegal (River Eske) WRZ.	
SAA-180	Rationalise Ballyshannon/ Ballymagroarty to Donegal (River Eske& Lough Eske source) WRZ.	
SAA-210	Increase existing SW abstraction from Lough Unshin	
SAA-108	Rationalise Creeslough Dunfanaghy to Rossess WRZ – new WTP at Lough Nacung.	
SAA-112	New SW abstraction from Lough Nacung.	
SAA-094a	New SW abstraction and WTP on Lough Veagh and supplement Letterkenny/ Milford	The desktop assessments undertaken indicate that there is no scope to increase the abstraction. The Lake is upstream of Glen Lough with a small contributing catchment. High status Freshwater Pearl Mussel area so applying 5% Q50 allowable abstraction equal to 3,700m^3/d could only supply approximately 25% deficit. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAA-024	New SW abstraction from Lough Finn and new WTP.	The option also requires a significant length of pipeline. Transferring small quantities of water over long distances can affect the quality of water. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.

Option Reference	Option Description	Rejection Reasoning
SAA-050a	New SW abstraction from Lough Fern to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.	The overall WFD status of the ground waterbody in this location is classified as poor status and the lake is 'at risk'. There are problems associated with urban wastewater, a nearby landfill site, geomorph issues with shallowness and bank stability issues. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAA-050b	New SW abstraction from Lough Fern to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.	
SAA-052	New SW abstraction and new WTP at Lough Fern and abandon Milford WTP.	
SAA-059	Rationalise Milford to new Letterkenny WTP. New SW abstraction from Lough Fern to supplement new Letterkeny WTP.	
SAA-065	Rationalise Rathmullen to new Letterkenny WTP. New SW abstraction from Lough Fern to supplement new Letterkeny WTP.	
SAA-078	Rationalise Carrigart-Downings to new Letterkenny WTP. New SW abstraction from Lough Fern to supplement new Letterkeny WTP.	
SAA-174	New SW abstraction from lake (source TBC) and new WTP in Ballyshannon & Bundoran WRZ	There are no other suitable new lake sources associated with this option. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAA-087	Rationalise Cranford to new Letterkenny WTP. New SW abstraction from Lough Fern to supplement new Letterkeny WTP.	This option is associated with a large contributing source but the overall WFD status of the ground waterbody in this location is classified as poor status and the lake is 'at risk'. There are problems associated with urban wastewater, a nearby landfill site, geomorph issues with shallowness and bank stability issues. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.
SAA-013a	Interconnect Buncrana and Cardonagh and supply deficit from Carndonagh.	Upgrades are to be considered for Inishowen West/Carndonagh/ Culdaff only, not as part of larger regional group as this option is unlikely to be able cover deficit based on allowable abstraction limits. Therefore, this option did not meet
SAA-013b	Interconnect Buncrana and Cardonagh and supply deficit from Carndonagh.	
SAA-014a	Rationalise Buncrana to Cardonagh.	
SAA-014b	Rationalise Buncrana to Cardonagh.	

Option Reference	Option Description	Rejection Reasoning
		the requirements of the Environmental, Resilience or Deliverability criteria.

3.4 Stage 5: Fine Screening

A total of 191 options passed the coarse screening stage; these options were subjected to further consideration as part of a multi-criteria assessment (MCA) at the fine screening stage.

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

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

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

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

No further options were rejected at fine screening in SAA.

3.5 Stage 6: Feasible Options List

A total of 191 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 SAA Technical Report.

4

Environmental Assessment – Approach Development

4 Environmental Assessment – Approach Development

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

4.1 Introduction to Approach Development

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

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

Table 4.1 The Six SA Approaches

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

SA Approaches Tested	Description	Policy Driver
Most Resilient (MR)	This is the option or combination of options with the highest total score against the resilience criteria. (Link to SEA Objective for climate change adaptation for environment)	National Adaptation Plan
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-NW:

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[5] 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

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

being identified. Scores of -1 to -2 are LSEs that will not result in AESI with standard best practice project specific mitigation applied as these can be addressed with general/standard mitigation measures. Scores of -3 equates to LSEs that may be difficult to mitigate, but it is understood at plan level that mitigation would be achievable, noting that further project level assessments are required to confirm this.

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

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

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

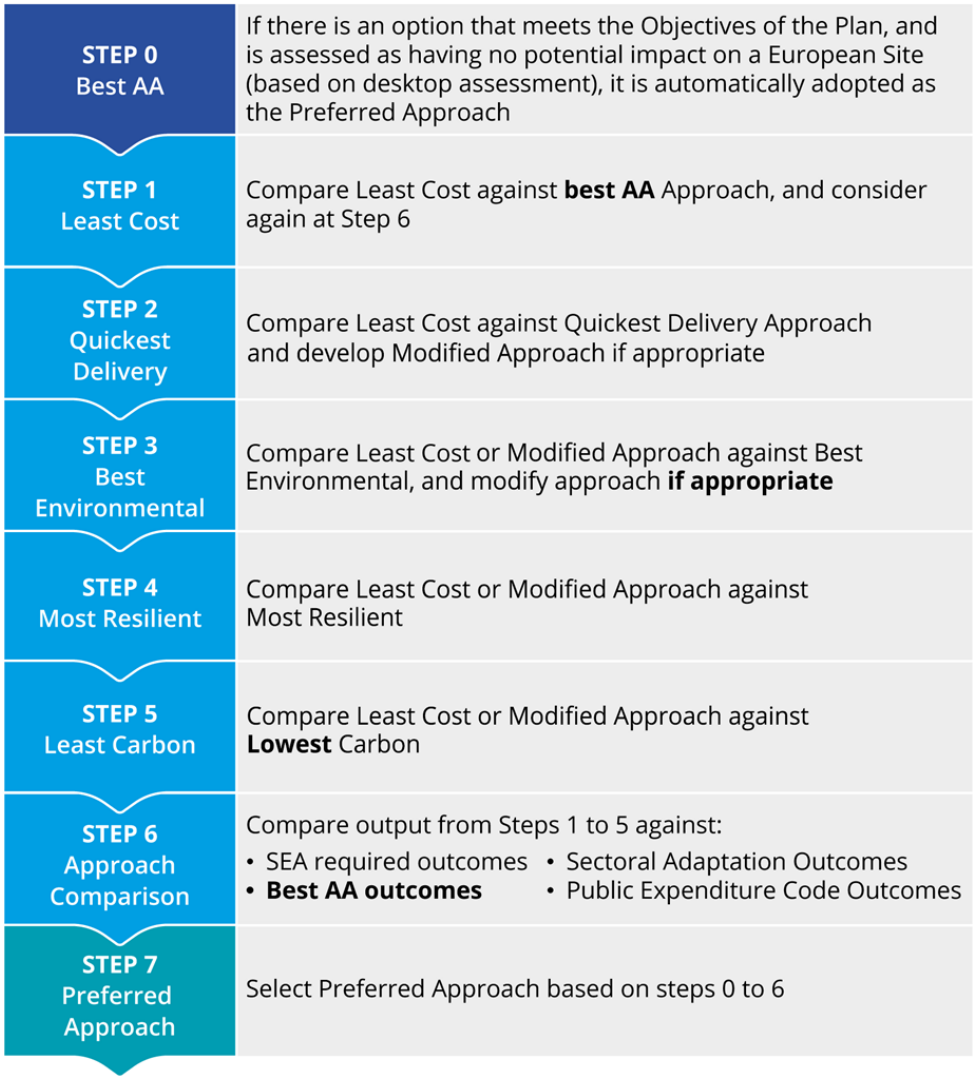

Figure 4.1 The 7 Step Process

4.2.1 Environmental Assessment in the Approach Development process

Combinations of feasible options are identified to balance the water demand and predicted baseline supply and address the remaining deficit over the plan period. The Approach Development process

allows Uisce Éireann to compare and optimise the options against different elements to create a range of approaches capable of meeting the deficit.

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

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

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

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

Carbon emissions (tCO_2e) and carbon costs are calculated alongside construction and operational costs. As part of the environmental assessment carbon efficiency has also been calculated to identify carbon emissions per ML of water supply.

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

Carbon emissions (tCO_2e) were initially assessed through qualitative assessment for fine screening as this preceded option costing, however in the approach development process the carbon emissions as total Net Present Value (NPV) costs have been used to inform the Approach Development Process. Total life- time carbon emissions and carbon efficiency per ML have been used to inform the SEA assessment.

The general process is illustrated in Figure 4.2 below.

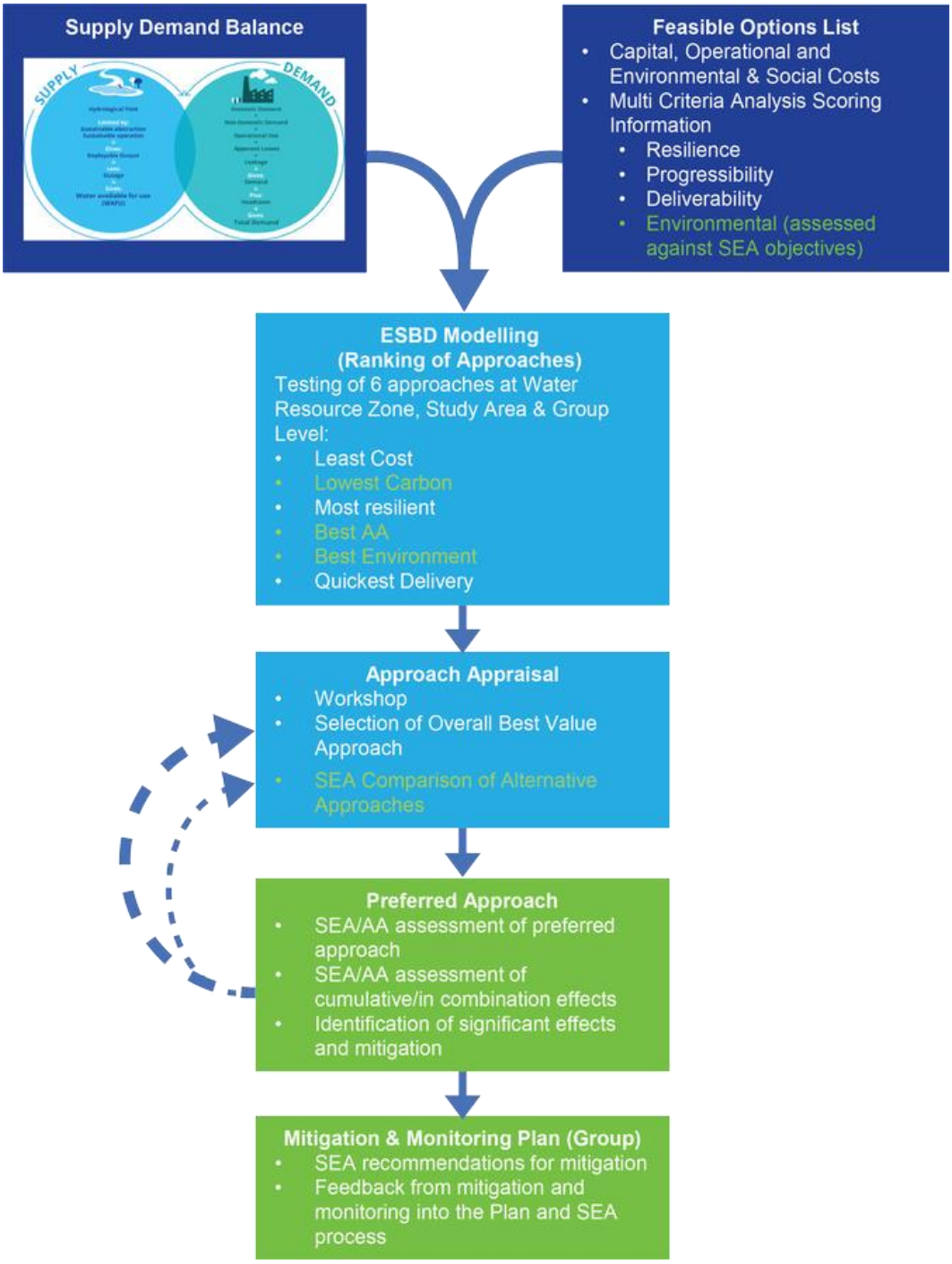

Figure 4.2 Approach Development Process

4.3 SAA 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 SAA there are 41 WRZ options and these are listed in Table 5.2 in the SAA Technical Report, providing option reference numbers and the relevant WRZ. These options were taken through the 7 step process to identify the preferred WRZ approach.

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

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

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

For SAA, a total of 13 combinations were compared and presented in Table 4.2. The WRZ level preferred approach cannot meet the deficit for the study area as a whole, therefore, it has not been assessed and assigned a score in Table 4.2 for the purposes of determining the best performing alternative within each approach category. Note that the Preferred Approach selected at the end of the process has been outlined in red throughout this section.

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

Category	WRZ Level Approach (Cannot meet the deficit)	SA Combination 1 (SA Option 2, 12 and 58)	SA Combination 2 (SA Option 2, 12, 36 and 58)	SA Combination 3 (SA Option 2, 12, 37 and 58)	SA Combination 4 (SA Option 2, 12, 40 and 58)	SA Combination 5 (SA Option 2, 12, 41 and 58)	SA Combination 6 (SA Option 2, 12, 42 and 58)	SA Combination 7 (SA Option 12, 63 and 67)	SA Combination 8 (SA Option 12, 64 and 67)	SA Combination 9 (SA Option 65 and 67)	SA Combination 10 (SA Option 66 and 67)	SA Combination 11 (SA Option 58 and 66)	SA Combination 12 (SA Option 42, 66 and 67)	SA Combination 13 (SA Option 42, 66 and 70)
Least Cost						Best**								Worst
Quickest Delivery		Best											Worst	
Number of -3 Biodiversity Scores		One -3 Score	Two -3 Scores	Two -3 Scores	Two -3 Scores	One -3 Score	One -3 Score	Three -3 Scores	Three -3 Scores	Two -3 Scores	Two -3 Scores	One -3 Score	One -3 Score	Two -3 Scores
Lowest Carbon				Best							Worst			
Most Resilient				Worst						Best				
Best Environmental		Worst											Best	

Key													
Ranked order (best to worst)	Best												Worst

*SA options are also known as SA grouped options

**Overall combination 5 is within 5% of the other lowest cost combination and performs better against other categories. Hence, it has been identified as the least cost approach. Further explanation can be found in section 5.2.3 of the Technical Report.

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

Table 4.3 Study Area Approach Categories

Category	SA Approach 1 (QD) (SA combination 1)	SA Approach 2 (LC) (SA combination 3)	SA Approach 3 (Lco) (SA combination 5)	SA Approach 4 (MR) (SA combination 9)	SA Approach 5 (BE, BA) (SA combination 12)
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 A of this report.

Table 4.4 Study Area Approaches

Options included	Do Minimum	Least Cost Approach (SA combination 5)	Best AA Approach (SA combination 12)	Quickest Delivery Approach (SA combination 1)	Best Environmental Approach (SA combination 12)	Most Resilient Approach (SA combination 9)	Lowest Carbon Approach (SA combination 3)
SA options (Group options)	No options	**SA option 2:** 02b, 06b, 10b, 15b, 17b, 19b, 102, 197, 198, 199, 200, 201, 202	**SA option 42:** 26a, 191, 192, 193 **SA option 66:** 261, 262, 263, 264, 265, 266,	**SA option 2:** 02b, 06b, 10b, 15b, 17b, 19b, 102, 197, 198, 199, 200, 201, 202	**SA option 42:** 26a, 191, 192, 193 **SA option 66:** 261, 262, 263, 264, 265, 266,	**SA option 65:** 252, 253, 254, 255, 256, 257 258, 259, 260 **SA option 67:**	**SA option 2:** 02b, 06b, 10b, 15b, 17b, 19b, 102, 197, 198, 199, 200, 201, 202

Options included	Do Minimum	Least Cost Approach (SA combination 5)	Best AA Approach (SA combination 12)	Quickest Delivery Approach (SA combination 1)	Best Environmental Approach (SA combination 12)	Most Resilient Approach (SA combination 9)	Lowest Carbon Approach (SA combination 3)
		SA option 12: 035, 36b **SA option 41:** 160, 171, 182 **SA option 58:** 214, 215	267, 268, 269, 270 **SA option 67:** 271, 272, 273, 274	**SA option 12:** 035, 36b **SA option 58:** 214, 215	267, 268, 269, 270 **SA option 67:** 271, 272, 273, 274	271, 272, 273, 274	**SA option 12:** 035, 36b **SA option 37:** 21f, 166, 172 **SA option 58:** 214, 215
WRZ options	No options	023 111a 118a 126a 135a 141 217 218	111a 118a 141 217 218	023 111a 118a 126a 135a 141 159 169a 209 217 218	111a 118a 141 217 218	023 099 111a 118a 141 159 169a 209 217 218	111a 118a 126a 135a 141 209 217 218

* For the option references – all options are part of SAA e.g. SAA-023 is shown as 023 above

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

Within SAA, this resulted in six approaches being selected from the thirteen SA combinations identified in Table 4.3, 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 six identified approaches against each other (representing the Stage 3 analysis for the selection of the Preferred Approach used in the workshop – see Table 4.5), their relative performance against categories they were not identified as "best" in in Table 4.2 may be different. This is because Table 4.2 compares all of the combinations to give a wider ranking, whereas Table 4.5 only

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

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

The three stages identified above were applied through a final workshop with all of the background MCA and option costing information available for each option and the ranking from the Economic Balance of Supply and Demand (EBSD) tool. Table 4.5 suggests that SA approaches 1, 3 and 5 are the best AA because they have the same number of -3 biodiversity scores. After comparing the number of -2 and -1 biodiversity scores SA Approach 5 was selected as the best AA approach in Table 4.3.

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

Category Criteria	SA Approach 1 (QD) (SA Combination 1)	SA Approach 2 (LC) (SA Combination 3)	SA Approach 3 (Lco) (SA Combination 5)	SA Approach 4 (MR) (SA Combination 9)	SA Approach 5 (BE, BA) (SA Combination 12)
Least Cost Score			Best*		Worst
Quickest Delivery Score	Best				Worst
Best AA Score	One -3 Biodiversity Score	Two -3 Biodiversity Scores	One -3 Biodiversity Score	Two -3 Biodiversity Scores	One -3 Biodiversity Score
Lowest Carbon Score		Best		Worst	
Most Resilient Score		Worst		Best	
Best Environmental Score	Worst				Best

Key
Ranked order (best to worst) within the five selected approaches
*Overall combination 5 is within 5% of the other lowest cost combination and performs better against other categories. Hence, it has been identified as the least cost approach.

Worst				Best

4.4 Comparison of SAA Approaches

An overall summary of the infrastructure components and abstractions for each of the SA approaches identified for SAA 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 (QD) (SA Combination 1)	SA Approach 2 (LC) (SA Combination 3)	SA Approach 3 (Lco) (SA Combination 5)	SA Approach 4 (MR) (SA Combination 9)	SA Approach 5 (BE, BA) (SA Combination 12)
New pipeline network (km)	0	190	200	213	217	278
New WTPs	0	6	4	5	5	3
Upgrade WTPs	0	24	24	24	20	21
New / upgraded abstractions	0	18	16	16	14	9
WTPs decommissioned	0	5	5	5	9	8
Abstractions abandoned	0	6	5	6	11	10
Raw Water Storage	0	0	0	0	0	4
Treated Water Storage	0	21	18	19	26	21

A comparative assessment of the six 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 (QD)	SA Approach 2 (LC)	SA Approach 3 (Lco)	SA Approach 4 (MR)	SA Approach 5 (BE)	Range (Difference between Lowest and Highest Score)
Population, health, economy and recreation	-3 scores	No Difference					0
	MCA score				Worst	Best	7
Water Environment: quality and resources	-3 scores		Worst		Best	Best	3
	MCA score	Worst	Worst			Best	9
Biodiversity, Flora and Fauna	-3 scores	Best	Worst	Best	Best	Best	1
	MCA score	Worst				Best	33
Material Assets	-3 scores	Worst	Worst	Worst	Best	Worst	1
	MCA score	Worst				Best	10
Landscape and Visual	-3 scores		Best	Best	Worst		3
	MCA score				Worst	Best	7
Climate Change	-3 scores	No Difference					0
	MCA Score	Worst				Best	5
Culture, Heritage and Archaeology	-3 scores	No Difference					0
	MCA Score		Best		Worst		5
Geology and Soils	-3 scores	No Difference					0
	MCA Score	Worst				Best	4

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

Key

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

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

4.4.1 SA Approach 1 (SA Combination 1) (QD)

SA approach 1, key comparison points:

- Identified as the best in the Quickest Delivery category;
- Option types included:
    - SA option (group option): 1 surface water abstraction option, 1 surface water abstraction and interconnection option, and 1 surface water abstraction rationalisation option;
    - WRZ options: 2 rationalisation options and 9 surface water abstraction options;
- One -3 biodiversity score associated with the SA option 12 abstraction which has the potential to impact Shannagh Lake, which forms part of Ballyhoorisky point to Fanad head SAC. This area is sensitive to environmental changes; therefore, further assessment is required; and
- SA approach 1, 2, and 3 are similar in terms of infrastructure development. The difference being a result of one different SA option used in each of the SA approaches. The key differences are that SA approach 1 requires:
    - The shortest length of pipeline;
    - The highest number of new WTPs;
    - The highest number of new/upgraded abstractions;
    - The highest number of abstractions abandoned (same number as SA approach 3); and
    - The highest number of treated water storages.

4.4.2 SA Approach 2 (SA Combination 3) (LC)

SA approach 2, key comparison points:

- Identified as the best in the Lowest Carbon category;
- Option types included:
    - SA option (group option): 2 surface water abstraction options, 1 surface water rationalisation option, and 1 surface water interconnection option;
    - WRZ options: 6 surface water abstraction options and 2 rationalisation options;
- Two -3 biodiversity scores associated with the options;
    - SA option 12: The abstraction has the potential to impact Shannagh Lake, which forms part of the Ballyhoorisky point to Fanad head SAC. This area is sensitive to environmental changes; therefore, further assessment is required; and
    - SA option 37: The abstraction has the potential to impact Croaghonagh Bog SAC. This may result in parts of the bog being submerged, causing habitat loss; therefore, further assessment is required.

- SA approach 2 is similar to SA approaches 1 and 3 in terms of infrastructure development. The key differences between SA approach 2 and SA approaches 1, 3 and 4 are that SA approach 2 requires:
    - The lowest number of new WTPs;
    - The lowest number of new/upgraded abstractions (same as SA approach 3);
    - The lowest number of abstractions abandoned; and
    - The lowest number of treated water storage facilities.

4.4.3 SA Approach 3 (SA Combination 5) (LCo)

SA approach 3, key comparison points:

- Identified as the best in the Least Cost category,
- Option types included:
    - SA option (group option): 3 surface water abstraction and interconnections, and 1 surface water abstraction and rationalisation;
    - WRZ options: 6 surface water abstraction options and 2 rationalisation options;
- One -3 biodiversity score associated with the SA option 12 abstraction which has the potential to impact Shannagh Lake, which forms part of Ballyhoorisky point to Fanad head SAC. This area is sensitive to environmental changes; therefore, further assessment is required;
- SA approach 3 is similar to SA approaches 1 and 2 in terms of infrastructure development. The key differences between SA approach 3 and SA approaches 1 and 2 are that SA approach 3 requires:
    - The longest length of pipeline;
    - The lowest number of new/upgraded abstractions (same number as SA approach 2); and
    - The highest number of abstractions abandoned (same number as SA approach 1).

4.4.4 SA Approach 4 (SA Combination 9) (MR)

SA approach 4, key comparison points:

- Identified as the best in the most resilient category;
- Option types included:
    - SA option (group option): 2 surface water abstraction options;
    - WRZ options: 2 rationalisation options and 8 surface water abstraction options;
- One -3 biodiversity score associated with SA option 65. The increase in the existing abstraction from River Crana and the new abstractions from Glen and Gartan Loughs have the potential to impact Cloghernagore Bog and Glenveagh National Park SAC, and Leannan River SAC. New infrastructure also includes a proposed WTP within Cloghermore Bog and Glenveagh National Park SAC which has the potential for habitat loss, degradation and disturbance. This would require further assessment at project level. The proposed pipeline route also has hydrological links to other European sites downstream;
- In terms of infrastructure development, the key differences for SA approach 4 are that it requires:
    - The lowest number of upgraded WTPs;
    - The highest number of WTPs decommissioned and abstractions abandoned; and
    - The highest number of treated water storage facilities.

4.4.5 SA Approach 5 (SA Combination 12) (BE, BA)

SA approach 5, key comparison points:

- Identified as the best in the Best Environmental category;
- Option types included:
    - SA option (group option): 2 surface water abstraction options and 1 surface water and interconnection options;
    - WRZ options: 2 rationalisation options, 3 surface water abstraction options;
- One -3 biodiversity score associated with SA option 66 due to the increase in existing abstraction from River Crana and the new abstractions from Glen and Gartan Loughs. These have the potential to impact Cloghernagore Bog and Glenveagh National Park SAC, and Leannan River SAC. New infrastructure also includes a proposed WTP within Cloghermore Bog and Glenveagh National Park SAC which could result in habitat loss, degradation and disturbance and would require further assessment at project level. The proposed pipeline route also has hydrological links to other European sites downstream; and
- In terms of infrastructure development, the key differences for SA approach 5 are that it requires:
    - The longest length of pipeline;
    - The lowest number of new WTPs;
    - The lowest number of new/upgraded abstractions; and
    - Four raw water storage facilities.

4.5 SAA 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 -40,455 m^3/d in 2019, to a projected maximum of -47,522 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 SAA.

Table 4.8 Supply Demand Balance for SAA

WRZ Name	WRZ Code	Population	Maximum Deficit m^3/day*	
			2019	2044
Fanad East	0600SC0047	305	-895	-926
Fanad West	0600SC0046	1,108	-566	-606
Buncrana	0600SC0045	3,775	-1,364	-1,493
Carrigart-Downings & Cranford	0600SC0043	2,346	-295	-467

WRZ Name	WRZ Code	Population	Maximum Deficit m³/day*	
			2019	2044
Creeslough Dunfanaghy	0600SC0039	3,065	-1,903	-2,084
Lettermacaward	0600SC0038	2,241	-1,380	-1,482
Frosses-Inver	0600SC0036	4,425	-1,183	-1,380
Glenties-Ardara	0600SC0035	3,602	-1,144	-1,273
Ballyshannon &Bundoran	0600SC0030	7,103	-1,688	-1,820
Letterkenny & Inishowen East & Eddie Fullerton Pollan Dam	0600SC0029	62,049	-13,982	-17,393
Lough Mourne	0600SC0028	21,689	-4,751	-5,616
Gortahork-Falcarragh	0600SC0026	3,936	-580	-746
Owenteskiny	0600SC0013	2,871	-2,197	-2,469
Culdaff	0600SC0012	1,068	-488	-535
Donegal (River Eske)	0600SC0010	6,092	-2,024	-2,288
Killybegs	0600SC0009	4,567	No Deficit	No Deficit
Arranmore Island	0600SC0007	471	-206	-252
Rosses	0600SC0006	9,390	-3,026	-3,484
Inishowen West & Carndonagh & Culdaff	0600SC0001	9,494	-2,785	-3,207
Alt Raws	0600PRI3077	No Data**	No Data**	No Data**
Meeneragh/ Cronalaghey	0600PRI3078	No Data**	No Data**	No Data**

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

** Note that these WRZs receive supply from Northern Ireland, therefore, Uisce Éireann do not have access to this data

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 (QD)	SA Approach 2 (LC)	SA Approach 3 (LCo)	SA Approach 4 (MR)	SA Approach 5 (BE, BA)
1. Protect public health and promote wellbeing	C	0	-	-	-	-	-
	O	---	++	++	++	++	++

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

Key			
Major beneficial	+++	Minor adverse	-

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

The overall assessment of the approaches against the SEA objectives indicates that SA approach 2 is likely to have a more adverse biodiversity impact during construction due to it including more development located within designated sites. SA approach 5 is likely to have less adverse biodiversity impacts during construction as it erequires less development within designated sites. SA approaches 1 and 4 are likely to have a more adverse landscape impact during construction due to the development of new significant above ground assets in landscape amenity areas. SA approaches 4 and 5 are likely to have a more beneficial landscape impact during operation due them including more WTP decommissions. SA approaches 1, 3 and 4 are likely to have more adverse resilience impacts due to them requiring abstraction from new sources. SA approaches 4 and 5 are likely to have less adverse impacts to water during operation as they have fewer abstractions that have the potential to affect WFD Status. SA approaches 1, 3, 4 and 5 are likely to have more adverse flood risk impacts during construction due to the requirement of above ground assets adjacent to/on flood plains. SA options 4 and 5 are likely to have a more adverse cultural heritage impact during construction due to the requirement of more above ground assets impacting heritage sites. SA approach 1 is likely to have a more adverse geology and soils impact during construction due to more new above ground assets on heritage sites.

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

4.5.1 Selection of the SA Preferred Approach

SA approach 5 has been selected through the 7 step process as the best performing approach overall across the different categories.

The SA Preferred Approach does not include any -3 Biodiversity score options. Therefore, no higher risk options for effects on European Sites 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

SAA Preferred Approach: Strategic Environmental Assessment

5 SAA Preferred Approach Strategic Environmental Assessment

5.1 SAA 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 five of the WRZs in the study area, the other WRZs utilise SA options 42, 66 and 67. SA option 42 involves a new surface water abstraction and WTP on the River Knaddar, and interconnections to Donegal, Lough Mourne and Frosses-Inver WRZs. SA option 66 rationalises Culdaff, Inishowen West/Carndonagh/Culdaff, Buncrana, Carrigart-Downings & Cranford, Fanad West, Fanad East, and Creeslough Dunfanaghy, and interconnects Inishowen West/Carndonagh/Culdaff to new sources developed near Letterkenny. SA option 67 proposes to increase the existing surface water abstraction from Lough Derkmore. The other WRZ options include new surface water abstractions, increased surface water abstractions and rationalisation.

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

Table 5.1 Preferred Approach Breakdown

WRZ Name and Option Reference*	Option Description	Abstraction / Demand
SAA-111a 0600SC0026 Gortahork-Falcarragh	New SW abstraction from Lough Altan and new WTP • Gortahork-Falcarragh WRZ in deficit so new SW abstraction to meet WRZ future deficit • Existing source (Lagha lake waterbody (LWB)) WFD status 2016-2021 – Good • New source (Altan LWB) WFD status 2016-2021 – High	2,836 m^3/d
SAA-118a 0600SC0006 Rosses	New SW abstraction from Loch Anure and New WTP • Rosses WRZ in deficit so new SW abstraction to meet WRZ future defici • Existing source (Keel Crotty LWB) WFD status 2016-2021 – Moderate • New source (Anure) WFD status 2016-2021 – Good	6,825 m^3/d
SAA-141 0600SC0007 Arranmore Island	Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume • Arranmore Island WRZ in deficit so increase existing SW abstraction to meet WRZ future deficit • Existing source (Shore LWB) WFD status 2016-2021 – Unassigned	608 m^3/d
SAA-217 0600PRI3077	Rationalise Alt Raws to Lough Mourne WRZ • Alt Raws is to be rationalised to Lough Mourne WRZ	170 m^3/d

WRZ Name and Option Reference*	Option Description	Abstraction / Demand
Alt Raws	• New SW source (Assaroe LWB) WFD status 2016-2021 – Good	
SAA-218 0600PRI3078 Meeneragh/ Cronalaghey	Rationalise Meeneragh to Lough Mourne WRZ • Meeneragh is to be rationalised to Lough Mourne WRZ • Existing import from Northern Ireland to be abandoned • New SW source (Assaroe LWB) WFD status 2016-2021 – Good	20 m^3/d
SAA-542 (SA Option 42) 0600SC0010 Donegal (River Eske)	Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit • SA option 42 - Donegal (River Eske) WRZ in deficit so interconnect with Ballyshannon & Bundoran WRZ to meet WRZ future deficit • Existing SW abstraction maintained. Existing source (Eske river waterbody (RWB)) WFD status 2016-2021 – Good • New SW source (Assaroe LWB) WFD status 2016-2021 – Good	4,899 m^3/d
SAA-542 (SA Option 42) 0600SC0028 Lough Mourne	Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit • SA option 42 - Lough Mourne WRZ in deficit so interconnect with Ballyshannon & Bundoran WRZ to meet WRZ future deficit • Existing source (Mourne LWB WFD status 2016-2021 – Good • New SW source (Assaroe Highly Modified Waterbody) WFD status 2016-2021 – Good	12,191 m^3/d
SAA-542 (SA Option 42) 0600SC0030 Ballyshannon & Bundoran	New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit • SA option 42 - Ballyshannon & Bundoran WRZ so new abstraction to meet WRZ future deficit • Existing sources: (Gorman LWB) WFD status 2016-2021 – Good, (Ballyshannon groundwater body (GWB)) WFD status 2016-2021 – Good, (Unshin LWB) WFD status 2016-2021 – Good, (Melvin LWB) WFD status 2016-2021 – Moderate • New source (Assaroe Highly Modified Waterbody) WFD status 2016-2021 – Good	7,121 m^3/d

WRZ Name and Option Reference*	Option Description	Abstraction / Demand
SAA-542 (SA Option 42) 0600SC0036 Frosses-Inver	Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit • SA option 42 - Frosses-Inver WRZ in deficit so interconnect with Ballyshannon & Bundoran WRZ to meet WRZ future deficit • Existing sources: (Glencoagh LWB) WFD status 2016-2021 – Good and (St Peter's LWB) WFD status 2016-2021 – Good • New SW source (Assaroe LWB) WFD status 2016-2021 – Good	1,550 m^3/d
SAA-566 (SA Option 66) 0600SC0001 Inishowen West/Carndonagh/ Culdaff	Interconnect Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny • SA option 66 - Inishowen West/Carndonagh/ Culdaff WRZ in deficit so interconnect to Letterkenny, Inishown East & Pollan Dam WRZ • Existing sources: (Lough Fad Meendoran LWB) WFD status 2016-2021 – Good, (East Inishowen GWB) WFD status 2016-2021 – Good • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	5,890 m^3/d
SAA-566 (SA Option 66) 0600SC0012 Culdaff	Rationalise Culdaff to new sources developed near Letterkenny • SA option 66 - Culdaff WRZ in deficit so rationalise to Letterkenny, Inishown East & Pollan Dam WRZ to meet WRZ future full demand • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	994 m^3/d
SAA-566 (SA Option 66) 0600SC0029 Letterkenny & Inishowen East & Pollan Dam	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs • SA option 66 - Letterkenny & Inishowen East & Pollan Dam WRZ in deficit so increase existing SW abstraction and new SW abstractions to meet WRZ future deficit • Existing sources: (Pollan Dam) WFD status 2016-2021 – Unassigned, (Fad Meendoran LWB) WFD status 2016-2021 – Good, (Lough Columbkille LWB) WFD status 2016-2021 –Unassigned, (Gort Lough LWB)	36,742 m^3/d

WRZ Name and Option Reference*	Option Description	Abstraction / Demand
	WFD status 2016-2021 – Good, (Lough Greenan LWB) WFD status 2016-2021 – Good, (Lough Keel LWB) - WFD status 2016-2021 – Good, (Lough Salt LWB) - WFD status 2016-2021 –Good, (Lough Swilly GWB) – WFD status 2016-2021 – Good • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	
SAA-566 (SA Option 66) 0600SC0039 Creeslough Dunfanaghy	Rationalise Creeslough Dunfanaghy to new sources developed near Letterkenny • SA option 66 - Creeslough Dunfanaghy WRZ in deficit so rationalise to Letterkenny, Inishown East & Pollan Dam WRZ to meet WRZ future full demand • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	2,973 m^3/d
SAA-566 (SA Option 66) 0600SC0043 Carrigart-Downings & Cranford	Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny • SA option 66 - Carrigart-Downings & Cranford WRZ in deficit so rationalise to Letterkenny, Inishown East & Pollan Dam WRZ to meet WRZ future full demand • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	1,818 m^3/d
SAA-566 (SA Option 66) 0600SC0045 Buncrana	Rationalise Buncrana to new sources developed near Letterkenny • SA option 66 - Buncrana WRZ in deficit so rationalise to Letterkenny, Inishown East & Pollan Dam WRZ to meet WRZ future full demand • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	1,749 m^3/d
SAA-566 (SA Option 66) 0600SC0046 Fanad West	Rationalise Fanad West to new sources developed near Letterkenny • SA option 66 - Fanad West WRZ in deficit so rationalise to Letterkenny, Inishown East & Pollan Dam WRZ to meet WRZ future full demand • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	857 m^3/d

WRZ Name and Option Reference*	Option Description	Abstraction / Demand
SAA-566 (SA Option 66) 0600SC0047 Fanad East	Rationalise Fanad East to new sources developed near Letterkenny • SA option 66 - Fanad West WRZ in deficit so rationalise to Letterkenny, Inishown East & Pollan Dam WRZ to meet WRZ future full demand • New sources: (Glen LWB) WFD status 2016-2021 – Moderate, (Gartan LWB) WFD status 2016-2021 – Good	1,121 m^3/d
SAA-567 (SA Option 67) 0600SC0009 Killybegs	Increase existing SW abstraction from Lough Derkmore impoundment. Involves significant project to raise dam. Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source. Increase existing SW abstraction from Lough Aderry. Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry • SA option 67 - Killybegs WRZ in projected surplus so WTP upgrade works only • Existing sources: (Aderry Reservoir) WFD status 2016-2021 – Unassigned and (Dirkmore Lough) WFD status 2016-2021 – Unassigned	N/A
SAA-567 (SA Option 67) 0600SC0013 Owenteskiny	Increase existing SW abstraction from Lough Derkmore impoundment. Involves significant project to raise dam. Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source. Increase existing SW abstraction from Lough Aderry. Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry • SA option 67 - Owenteskiny WRZ in deficit so interconnect Owenteskiny WRZ to Killybegs WRZ • Existing sources: (Aderry Reservoir) WFD status 2016-2021 – Unassigned and (Dirkmore Lough) WFD status 2016-2021 – Unassigned	3,878 m^3/d
SAA-567 (SA Option 67) 0600SC0035 Glenties-Ardara	Increase existing SW abstraction from Lough Derkmore impoundment. Involves significant project to raise dam. Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source. Increase existing SW abstraction from Lough Aderry. Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry	2,557 m^3/d

WRZ Name and Option Reference*	Option Description	Abstraction / Demand
	• SA option 67 - Glenties-Ardara WRZ in deficit so split WRZ and supply part of Glenties-Ardara WRZ from Killybegs and Lettermacaward WRZs • Existing sources: (Aderry Reservoir) WFD status 2016-2021 – Unassigned and (Dirkmore Lough) WFD status 2016-2021 – Unassigned	
SAA-567 (SA Option 67) 0600SC0038 Lettermacaward	Increase existing SW abstraction from Lough Derkmore impoundment. Involves significant project to raise dam. Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source. Increase existing SW abstraction from Lough Aderry. Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry • SA option 67 - Lettermacaward WRZ in deficit so increase existing SW abstraction to meet WRZ future deficit • Existing sources: (Aderry Reservoir) WFD status 2016-2021 – Unassigned and (Dirkmore Lough) WFD status 2016-2021 – Unassigned	2,612 m^3/d

*SA Options are the same as Group Options

The SA Preferred Approach options are shown in Figure 5.1, in relation to key environmental designations. Note that SA option 42, 66 and 67 are labelled as SAA-542, 566 and 567 respectively.

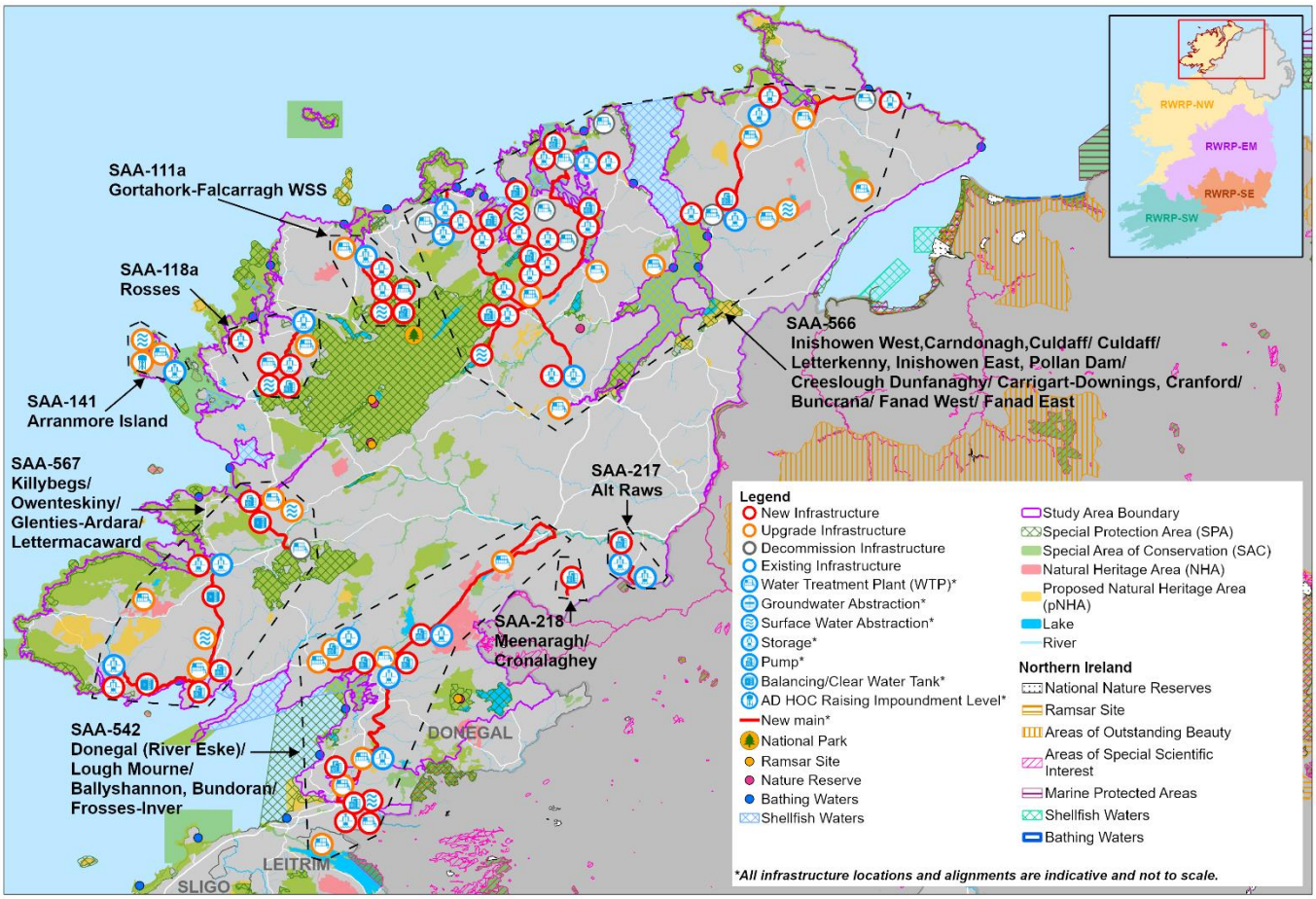

Figure 5.1 SA Preferred Approach and Key Environmental Designations

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

Table 5.2 Component Table

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs	New / Upgraded Abstractions	WTPs Decommissioned	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SAA-111a	✓	✓	✓	✓	-	-	-	✓
SAA-118a	✓	✓	✓	✓	-	-	-	✓

Option Reference*	New / Refurbished Pipeline	New WTP	Upgrade WTPs	New / Upgraded Abstractions	WTPs Decommissioned	Abstractions Abandoned	Raw Water Storage	Treated Water Storage
SAA-141	✓	-	✓	✓	-	-	-	-
SAA-217	✓	-	-	-	-	-	-	-
SAA-218	✓	-	-	-	-	-	-	-
SA Option 42 (SAA-026a, 191, 192 & 193)	✓	✓	✓	✓	-	-	-	✓
SA Option 66 (SAA-261, 262, 263, 264, 265, 266, 267, 268, 269 & 270)	✓	-	✓	✓	✓	✓	✓	✓
SA Option 67 (SAA-271, 272, 273 & 274)	✓	-	✓	✓	✓	✓	-	✓

*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 66 (SAA-262, 261, 264, 265, 268, 267, 263, 269 and 270)	Rationalise Culdaff, Inishowen West/ Carndonagh/Culdaff, Buncrana, Carrigart-Downings & Cranford, Fanad West, Fanad East, and Creeslough Dunfanaghy to new sources developed near Letterkenny. Develop Pollan Dam,	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)
	Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs. Interconnect Inishowen West/ Carndonagh/Culdaff to new sources developed near Letterkenny.	Operation	++	--	++	--	---	--	---	0	0	0
SAA-118a	New SW abstraction from Loch an Luir and new WTP	Construction	-	--	-	-	-	--	0	0	-	-
		Operation	+	-	-	-	-	--	--	0	0	0

Option Reference*	Option Description	Phase	Protect Public Health and Promote Wellbeing (P1, P2, P3)	Protect and Enhance Biodiversity and Contribute to Resilient Ecosystems (B1, B2, B3, B4, B5)	To Protect Landscapes, Townscapes and Visual Amenity (L1)	Protect and Where Appropriate Enhance, Built and Natural Assets and Reduce Waste (M1, M2)	Reduce Greenhouse Gas Emissions (C1)	Contribute to Environmental Climate Change Resilience (R1, R2, R5)	Protect and Improve Surface Water and Groundwater Status (W1, W2, W3)	Avoid Flood Risk (W5)	Protect and Where Appropriate, Enhance Cultural Heritage Assets (CH1)	Protect Quality and Function of Soils (G1)
SA option 42 (SAA-193, 26a,191 and 192)	New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit. Interconnect Donegal (River Eske), Lough Mourne and Frosses-Inver WRZs with new Ballyshannon WTP.	Construction	--	--	--	---	--	-	0	0	--	--
		Operation	++	-	-	-	--	-	-	0	0	-
SAA-141	Increase existing SW abstraction from Lough Shore. Involves	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)
	rebuilding dam structure to increase operational lake storage volume	Operation	0	--	0	0	-	--	---	+	0	0
SAA-111a	New SW abstraction from Lough Altan and new WTP	Construction	-	--	-	-	-	-	0	0	-	-
		Operation	+	--	-	--	-	-	-	0	0	0
SAA-217	Rationalise Alt Raws to Lough Mourne WRZ	Construction	-	-	-	-	0	0	0	0	-	-
		Operation	0	0	-	0	0	0	0	0	0	0
SAA-218	Rationalise Meeneragh to Lough Mourne WRZ	Construction	-	-	-	-	0	0	0	0	-	-
		Operation	0	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)
SA option 67 (SAA-273, 274, 272 and 271)	Increase existing SW abstraction from Lough Derkmore impoundment. Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermacaward and decommission the existing source. Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry.	Construction	-	--	--	--	--	--	0	0	--	-
		Operation	+	--	+	-	--	--	---	+	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 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, Uisce Éireann is already implementing measures across the three pillars of Lose Less, Use Less and Supply Smarter to improve the level of service to their customers in this study area. These are described in the SAA Technical Report and include leakage reduction and water conservation.

5.2.1 Leakage Reduction

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

- Ongoing leakage management including active leakage control, pressure management, and find and fix activities to offset Natural Rate of Leakage Rise;
- Further net leakage reductions, to move towards achieving the national SELL target by 2034, in the WRZs: Inishowen West & Carndonagh & Culdaff, Rosses, Arranmore Island, Killybegs, Donegal (River Eske), Owenteskiny, Gortahork-Falcarragh, Lough Mourne, Letterkenny & Inishowen East & Eddie Fullerton Pollan Dam, Ballyshannon & Bundoran, Glenties-Ardara, Frosses-Inver, Lettermacaward, and Creeslough Dunfanaghy.

5.2.2 Water Conservation

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

5.3 Interim Solutions

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

5.4 Approach Uncertainty and Adaptability

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

Table 5.4 SAA Sensitivity Analysis and Environmental Impacts

Uncertainty	Likelihood	Increase (+)/ Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
Sustainability	Moderate/High (as Uisce Éireann's current abstractions are large compared to the waterbodies from which they abstract)	+38,000 m^3/d	The impact of sustainability reductions would reduce the volumes that can be abstracted from Uisce Éireann's existing sources, therefore, increasing the SDB deficit. There are some surface water sources in SAA that could be impacted by sustainability reductions. However, the Preferred Approach is designed to relieve pressure on these sources by supplying from new, larger and more resilient lake sources, including Glen Lough, Gartan Lough, Lough Altan and the River Erne/ESB Dam-Kathleen Falls. Nine lake sources that have been noted as being potentially unsustainable long term have also been decommissioned as part of the Preferred Approach. Groundwater sustainability is more difficult to assess at desktop level, however, as the abstractions in SAA are small in scale any impacts are likely to be minimal.
			The SA Preferred Approach addresses reductions and decommissions several abstractions that have the potential to be unsustainable. However, additional sustainability reductions could increase pressure for additional supply from outside the study area.
Climate Change	High (international climate change targets have not been met)	+2,000 m^3/d	Higher climate change scenarios would impact Uisce Éireann's existing supplies and result in decreased water availability at certain times of year. Although the likelihood of this scenario is high based on climate change adaptation to date, potential impacts may be mitigated against by optimising Uisce Éireann's operations on a more environmentally sustainable basis across the range of supplies.
			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	Low/Moderate (growth has been based on policy)	-40,455 m^3/d	The impact of lower than expected growth would reduce the SDB deficit and the overall need requirement. The SDB deficit is spread across eighteen of the twenty-one WRZs. This is driven by quality as well as quantity issues. In this rural area, growth is relatively low.

Uncertainty	Likelihood	Increase (+)/ Decrease (-) in Deficit	Environmental Impacts Relative to Assessment of Preferred Approach Key: Green - Positive Amber - Negative
			This could allow lower than expected energy and carbon costs and lower increased abstraction requirements
Leakage Targets	Low (Uisce Éireann is focused on sustainability and aggressive leakage reduction)	+634 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 Uisce Éireann's networks, Uisce Éireann could potentially fail to achieve target leakage reductions within the timeframes set out. However, as Uisce Éireann is committed to achieving leakage reductions, the likely scenario would be an extension in the period of time taken to achieve leakage targets as opposed to accepting lower targets.
			This could increase carbon and the effects of abstraction pressure on the environment.
	Moderate/High (Uisce Éireann is focused on sustainability and aggressive leakage reduction)	-20,605 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 SAA 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 SAA Preferred Approach

6 SEA Cumulative Effects for SAA Preferred Approach

Secondary, cumulative and the synergistic nature of the effects of the SAA 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 seven study areas within the North 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 SAA

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

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

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

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

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

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

6.1.1 Cumulative Effects during Construction

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

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

Preferred Approach Option References	SAA-118a	SAA-141	SAA-111a	SAA-217	SAA-218	SA Option 42	SA Option 66
SA Option 67	DGM N56		DGM N56	RF	RF	RF	DGM N56
SA Option 66	DGM N56		DGM CBG N56				
SA Option 42				RF RFT	RF RFT		
SAA-218				RF RFT			
SAA-217							
SAA-111a	DGM N56						
SAA-141							

Key	
Construction Phase	
Operation Phase	
Construction and Operation	
Cloghernagore Bog and Glenveagh National Park SAC	CBG
Derryveagh and Glendowan Mountains SPA	DGM
River Finn SAC	RF

There could be cumulative effects associated with construction in terms of traffic, noise and dust for the options located along the N56 road (indicated by N56 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.

There is potential for cumulative effects from habitat loss, mortality, disturbance, and pollution on Cloghernagore Bog and Glenveagh National Park SAC, and Derryveagh and Glendowan Mountains SPA if construction of options SAA-111a and SA option 66, and SAA-111a, SAA-118a and SA options 66 and 67 are concurrent, respectively. These are shown as 'CBG' and 'DGM' in Table 6.1. There is potential for cumulative effects from disturbance and pollution impacts on River Foyle and Tributaries SAC if construction of options SAA-217, SAA-218 and SA option 42 are concurrent (represented in Table 6.1 as 'RFT'). There could also be cumulative effects during construction of the SAA Preferred Approach on the River Finn SAC (indicated by RF in Table 6.1) from spread of invasive non-native species (SA options 42 and 67), disturbance (SAA-217, SAA-218 and SA option 42) and pollution (all options) impacts. 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 an emergency plan in place during construction. The impacts on the European designated sites are provided in the NIS and are also summarised in chapter 9 of this review. Any option specific mitigation measures are included in section 6.3.4 of the NIS.

6.1.2 Cumulative Effects during Operation

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 Cloghernagore Bog and Glenveagh National Park SAC and Derryveagh and Glendowan Mountains SPA given that SAA-111a and SA option 66 and SAA-111a and SA options 66 have the potential for hydrological changes and water table impacts to the sites, respectively. All of the options include increase or new surface water abstraction (see Figure 6.1). 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 be no adverse cumulative effects on the integrity of Cloghernagore Bog and Glenveagh National Park SAC and Derryveagh and Glendowan Mountains SPA.

The potential for cumulative effects on groundwater bodies have been considered in a hydrogeological assessment of the groundwater abstractions commissioned by Uisce Éireann (Irish Water, 2022). However, there are no groundwater abstractions proposed in SAA and therefore no potential cumulative effect.

The potential for operational 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 across the SA Preferred Approach. The whole life carbon estimate (including construction and operation) for the SA Preferred Approach indicates increased contribution to carbon emissions related to carbon embodied in materials used for construction and through operational energy use and water treatment. Generally, in terms of carbon emissions, increase in carbon emissions can be considered a significant effect, as these add cumulatively across all developments and contribute to the national target for carbon. However, consideration also needs to be given to the additional water supply provided from the options and therefore the overall carbon efficiency in terms of carbon emissions per ML of supply is an appropriate metric and for SAA this averages as 0.48 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.

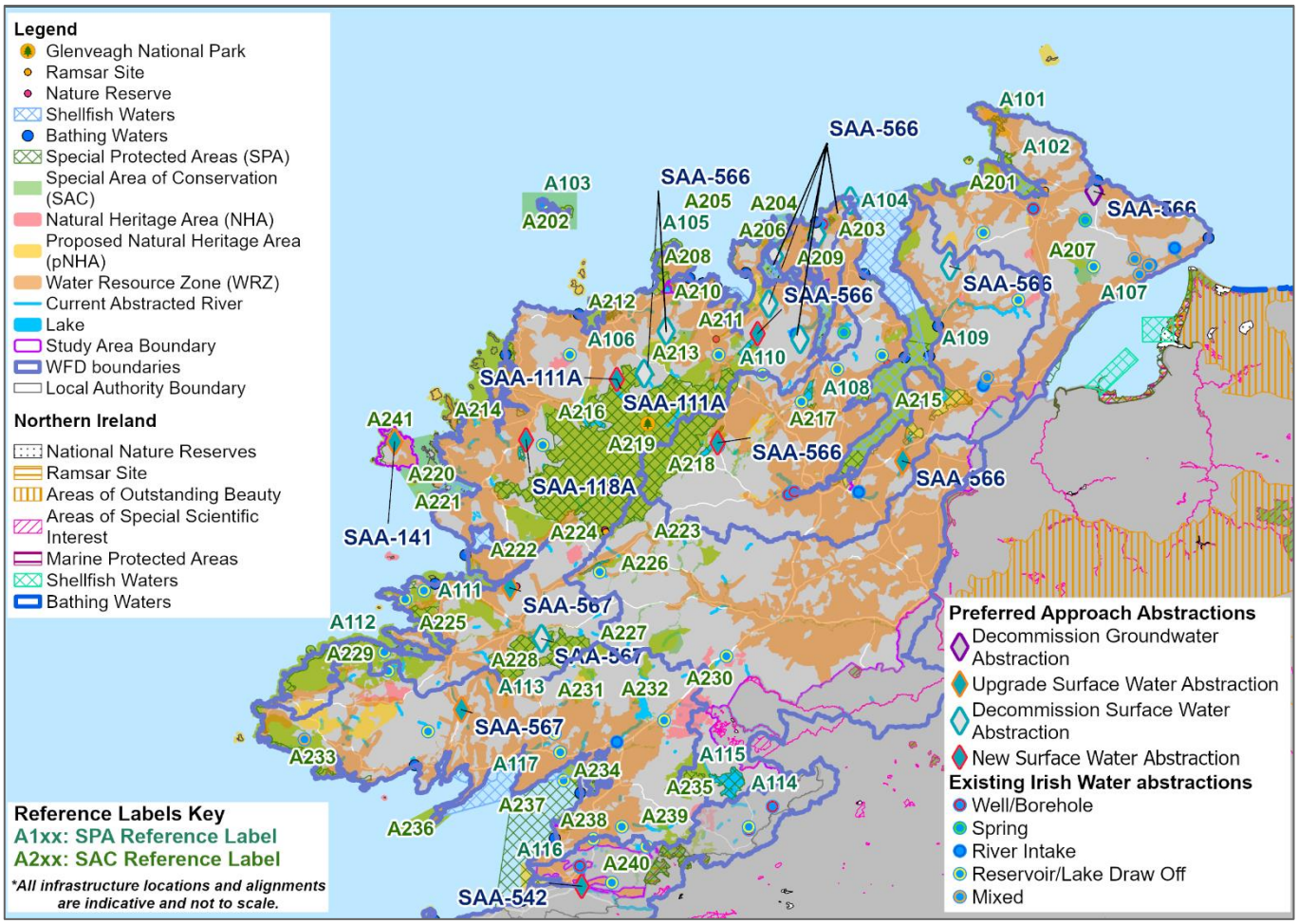

Figure 6.1 SA Preferred Approach Abstractions in SAA

6.2 Cumulative Effects with Other Developments

The SAA Preferred Approach has been assessed alongside other developments that could occur within the plan area. Potential cumulative effects could include increased traffic and noise. These could be mitigated by standard mitigation measures, such as planning of construction traffic routes and informing local residents about the works. With these standard good practice measures in place, there are unlikely to be significant cumulative effects.

Table 6.2 shows that within SAA there are a number of projects near or in Letterkenny and along the N56 route.

6.2.1 Cumulative Effects during Construction

The projects near or in Letterkenny and along N56 road could result in cumulative effects with the SAA Preferred Approach if they were to be constructed at the same time (represented in Table 6.2 as ‘L’ and ‘N56’ respectively). Projects near or in Letterkenny include Letterkenny 2040; Letterkenny IT Library, IT and Education Building; Willowbrook, Glencar social housing; and Letterkenny Community Nursing Unit. Potential effects could include increased traffic and noise to the residential and commercial properties

near or in Letterkenny and along the N56 road. These could be mitigated by standard mitigation measures, such as planning 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 habitat loss, pollution, mortality and disturbance on the Cloghernagore Bog and Glenveagh National Park SAC if the construction phase of N56 Dungloe to Glenties and Dungloe Community Hospital works (only for disturbance impacts) are concurrent with the SAA Preferred Approach (identified as 'CBG' in Table 6.2). If construction of the SAA Preferred Approach is concurrent with Ailt an Chorráin (Burtonport)/ Oileán Árainn Mhór (Arranmore Island) Harbour to Island Regeneration, Dungloe and Falcarragh community hospitals, N56 Dungloe to Glenties and Milford, Ramelton and Rathmullan Wastewater Treatment Plant works, there is potential for habitat loss (only for N56 Dungloe to Glenties), mortality (only for N56 Dungloe to Glenties), pollution (for N56 Dungloe to Glenties and Milford, Ramelton and Rathmullan Wastewater Treatment Plant works), and disturbance (all projects) impacts on Derryveagh and Glendowan Mountains SPA. This is represented in Table 6.2 as 'DGM'.

There is potential for habitat loss, pollution, mortality, spread of invasive species and disturbance impacts on the West of Ardara/Maas Road SAC if Ailt an Chorráin (Burtonport)/ Oileán Árainn Mhór (Arranmore Island) Harbour to Island Regeneration, N56 Dungloe to Glenties (only for disturbance impacts) and the SAA Preferred Approach are constructed at the same time (shown in Table 6.2 as 'W/M'). There is potential for cumulative effects from pollution, spread of invasive species and disturbance impacts on the Donegal Bay (Murvagh) SAC and Lough Eske and Ardnamona Wood SAC if the construction phase of the Donegal Library works is concurrent with the SAA Preferred Approach (these are shown as 'DBM' and 'LEAW' in Table 6.2).

There is potential for cumulative effects from pollution and disturbance impacts on the Donegal Bay SPA and Lough Swilly SAC and SPA if the construction phase of the Ballyshannon 2040 regeneration project, Shiel Hospital, N56 Mountcharles to Inver Road and Donegal Library works, and the projects near or in Letterkenny, Buncrana Community Nursing Unit, Swan Park, Milford, and Ramelton and Rathmullan Wastewater Treatment Plant works are concurrent with the SAA Preferred Approach respectively (these are represented in Table 6.2 as 'DB' and 'LS'). Similarly if construction of Convent Road, Carndonagh social housing scheme occurred at the same time as the SAA Preferred Approach, there is potential for cumulative effects from pollution and disturbance on the Trawbreaga bay SPA ('TB' in Table 6.2).

There is potential for cumulative effects from disturbance impacts on the Horn Head to Fanad Head SPA, Lough Nillan Bog SPA and West Donegal Coast SPA if the construction phase of the Falcarragh Community Hospital and Milford, Ramelton and Rathmullan Wastewater Treatment Plant works; N56 Dungloe to Glenties and N56 Mountcharles to Inver Road works; and Convent Road, Carndonagh social housing are concurrent with the SAA Preferred Approach, respectively (these are represented in Table 6.2 as 'HHFH', 'LNB' and 'WDC' respectively).

There is potential for cumulative effects from pollution impacts on the Leannan River SAC and Lough Fern SPA if the construction phase of the Milford, Ramelton and Rathmullan Wastewater Treatment Plant scheme is concurrent with the SAA Preferred Approach (these are represented in Table 6.2 as 'LR'

and ‘LF’ respectively). Similarly, if construction of Milford, Ramelton and Rathmullan Wastewater Treatment Plant and Convent Road, Carndonagh social housing and Admiran, Stranorlar social housing and Raphoe Flood Relief scheme works are concurrent with the SAA Preferred Approach, there is potential for pollution impacts to North Inishowen Coast SAC, and River Finn SAC and River Foyle and Tributaries SAC, respectively (see Table 6.2 as ‘NIC’ and ‘RF’ respectively).

The SAA Preferred Approach are either within, adjacent or hydrologically linked to these European designated sites. 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 SAA

Preferred Approach Options								
Project Developments	**SAA-118a**	**SAA-141**	**SAA-111a**	**SAA-217**	**SAA-218**	**SA Option 42**	**SA Option 66**	**SA Option 66**
Admiran, Stranorlar social housing				RF	RF	RF		
The Seed Project, Ballybofey, Stranolar								
Ailt an Chorráin (Burtonport)/ Oileán Árainn Mhór (Arranmore Island) - Harbour to Island Regeneration Phase 1&2	DGM	WDC	DGM				DGM	W/M DGM
Ballyshannon 2040 - Back to Ballyshannon						DB		
Buncrana Community Nursing Unit							LS	
Swan Park, Buncranna							LS	
Carndonagh TUS NUA Regeneration Project								
Convent Road, Carndonagh social housing							NIC TB	
Dungloe Community Hospital	DGM		CBG DGM				CBG DGM	DGM
Falcarragh Community Hospital	DGM		DGM				HHFH DGM	DGM

Preferred Approach Options								
Project Developments	**SAA-118a**	**SAA-141**	**SAA-111a**	**SAA-217**	**SAA-218**	**SA Option 42**	**SA Option 66**	**SA Option 66**
Killybegs 2040 - Town Centre Regeneration Project								
Ocean Innovation Centre Ireland, Killybegs								
Letterkenny 2040							L	
Letterkenny IT Library, IT and Education Building							L LS	
Willowbrook, Glencar, Letterkenny							L LS	
Letterkenny Community Nursing Unit							L LS	
Libraries Capital Programme - Donegal Library						LEAW DBM DB		
Milford, Ramelton and Rathmullan WWTP	DGM		DGM				HHFH DGM NIC LR LS LF	DGM
N56 Dungloe to Glenties	DGM N56		DGM CBG N56				DGM CBG N56	DGM W/M LNB N56
N56 Mountcharles to Inver Road	N56		N56			DB	N56	LNB N56
Ramelton Historic Town Centre - A Restorative and								

Preferred Approach Options								
Project Developments	**SAA-118a**	**SAA-141**	**SAA-111a**	**SAA-217**	**SAA-218**	**SA Option 42**	**SA Option 66**	**SA Option 66**
Transformational Public Realm Scheme								
Raphoe Flood Relief scheme				RF	RF	RF		
Shiel Hospital, Ballyshannon.						DB		

Key	
Construction Phase	
Operation Phase	
Construction and Operation	
Cloghernagore Bog and Glenveagh National Park SAC	CBG
Derryveagh and Glendowan Mountains SPA	DGM
Donegal Bay SPA	DB
Donegal Bay (Murvagh) SAC	DBM
Horn Head to Fanad Head SPA	HHFH
Letterkenny	L
Leannan River SAC	LR
Lough Eske and Ardnamona Wood SAC	LEAW
Lough Fern SPA	LF
Lough Nillan Bog SPA	LNB
Lough Swilly SAC and SPA	LS
N56 road	N56
North Inishowen Coast SAC	NIC
River Finn SAC and River Foyle and Tributaries SAC	RF
Trawbreaga Bay SPA	TB
West Donegal Coast SPA	WDC
West of Ardara/Maas Road SAC	W/M

6.2.2 Cumulative Effects during Operation

There could be cumulative effects from habitat degradation and a reduction in flow and water availability on the Cloghernagore Bog and Glenveagh National Park SAC, and Derryveagh and Glendowan Mountains SPA with operation of the SAA Preferred Approach and the N56 Dungloe to Glenties and

Dungloe Community Hospital schemes. Similarly, there could be cumulative effects from habitat degradation and a reduction in flow and water availability on the West of Ardara/Maas Road SAC with operation of the Ailt an Chorráin (Burtonport)/ Oileán Árainn Mhór (Arranmore Island) Harbour to Island Regeneration works, N56 Dungloe to Glenties works and the SAA Preferred Approach. Other developments mentioned above, and the SAA Preferred Approach are all hydrologically linked to the SACs and SPA. 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 add cumulatively across all developments and contribute to the national target for carbon. The same mitigation measures suggested for the SAA 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 SAA and a range of options and SA approaches have been considered and assessed, including a 'Do Minimum' approach.

Key beneficial impacts assessed include moderate beneficial impacts for SA options 42 and 66, and minor beneficial impacts for SA option 67, and options SAA-111a and 118a associated with improving the quality of water supply for local communities; and the subsequent benefits of this for public health. There are minor beneficial impacts for SA option 67 and moderate beneficial impacts for SA option 66 associated with the decommissioning of WTPs reducing landscape and visual disruption in the localised area. There are also minor beneficial impacts associated with SA option 67 and option SAA-141 as these options provide additional flood storage and/or promote the retention of water in the upper catchment.

Key potential adverse impacts identified at plan level include:

- Moderate adverse effects during construction for SA option 42 and 66 regarding public health and/or quality of life from dust, noise and/traffic in urban/rural areas, and temporary amenity area loss/loss of access to amenity area during construction;
- Major adverse effects during construction of SA option 66 associated with the potential for impacts on numerous European designated sites. The option is within the Cloghernagore Bog and Glenveagh National Park SAC, Leannan River SAC, Magheradrumman Bog SAC and Derryveagh and Glendowan Mountains SPA. It is also hydrologically linked to North Inishowen Coast SAC, Horn Head and Rinclevan SAC, Mulroy Bay SAC, Kindrum Lough SAC, Sheephaven SAC, Lough Swilly SAC, Trawbreaga Bay SPA, Horn Head to Fanad Head SPA, Greers Isle SPA, Lough Fern SPA and Lough Swilly SPA;
- Major adverse effects during construction of SA option 66 associated with the potential for impacts to the local landscape and visual amenity of the area;
- Moderate adverse effects to environmental climate change resilience for options SA options 66 and 67, and options SAA-118a and 141 due to the level of increase or new abstraction required from their associated surface water sources;
- Major adverse effects for greenhouse gas emissions for SA option 66 due to the emissions associated with abstracting and pumping water;
- Potential for major adverse effects during operation for SA option 66, 67 and option SAA-141 due to the level of abstraction required from their associated surface water abstraction sources. Further studies are required to understand the impacts and develop mitigation;
- Moderate adverse impacts for SA options 42, 66 and 67 during construction associated with cultural heritage. These options are located at known archaeological sites. Further cultural heritage and archaeological assessment will be required to aid option alignment; and
- Moderate adverse impacts for SA option 42 during construction associated with geology and soils as it is located within a known 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 SAA 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 6) 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 Minor Adverse to Moderate Adverse O Neutral to Moderate Beneficial 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 are impeded
2. Protect and enhance biodiversity and contribute to	C Minor Adverse to Major Adverse O Neutral to Moderate 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	• Monitor construction activities to ensure compliance

SEA Objectives	SA Preferred Approach (PA) (SA Approach 6) 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.	• Site condition and population data for QI of European and National designated sites.	
3. To protect landscapes, townscapes and visual amenity	C Minor Adverse to Major Adverse O Minor Adverse to Moderate Beneficial Construction landscape impacts and long term impacts from above ground structures, such as new WTPs.	Routing and siting to reduce tree loss and appropriate location and design of above ground structures with landscape planting. Reinstatement of land use and vegetation.	• Total working area of pipelines non-designated landscapes • Land use/landscape features re-established for schemes over appropriate period – areas/km successfully restored to meet requirements	• Duration of construction works • Number of complaints received regarding visual impact of construction works
4. Protect and where appropriate enhance, built	C Minor Adverse to Major Adverse O Neutral to Moderate Adverse New resources required for construction works, including	Materials management to be integrated into design to optimise use of existing resources and	• Loss of greenfield land, including agricultural, forestry or other land uses	• Construction wastes sent to landfill

SEA Objectives	SA Preferred Approach (PA) (SA Approach 6) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
and natural assets and reduce waste	extensive lengths of pipeline, service reservoirs and new/upgraded WTPs. Ongoing maintenance requirements.	minimise waste from construction and operation.	• Disruptions to strategic infrastructure/services • Use of waste management plans • Volume of drinking water treatment residuals 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
6. Contribute to environmental climate	C Neutral to Moderate Adverse O Neutral to Moderate Adverse Abstractions generally reduce environmental resilience but	Consider how operation can further reduce climate change pressure on at risk sources and associated designations,	• WFD waterbody status objectives at risk and designated site condition status	• None identified

SEA Objectives	SA Preferred Approach (PA) (SA Approach 6) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
change resilience	overall improved flexibility for operation using regional schemes has the potential to reduce pressure on at risk local resources. SA options 66 and 67, and options SAA-118a and 141 in particular require further assessment to understand their sustainability in the longer term.	particularly for SA options 66 and 67, and options SAA-118a and 141. Sustainability review of sources taking account of groundwater and surface water interconnections.	• Frequency of drought orders requiring change to normal abstractions/ compensation releases	
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
8. Avoid flood risk	C Neutral to Minor Adverse O Neutral to Minor Beneficial Potential loss of flood plain increasing flood risk from construction and location of above ground structures for SA option	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

SEA Objectives	SA Preferred Approach (PA) (SA Approach 6) Residual Effects Including Mitigation C – Construction (Short Term) O – Operational (Long Term)	Mitigation	Monitoring	
			Study Area Level	Scheme Level
	66. Also, flood risk impacts on operations with effect on meeting supply.			
9. Protect and where appropriate, enhance cultural heritage assets	C Minor Adverse to Moderate Adverse O Neutral Potential construction impacts on unknown archaeological interest. Impacts on known interests are expected to be avoided.	Standard good practice approaches to minimise potential impacts.	• 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
10. Protect quality and function of soils	C Minor Adverse to Moderate Adverse O Neutral to Minor Adverse 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 SAA 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.

There are no groundwater abstractions proposed in SAA (Irish Water, 2022). However, impacts, including cumulative effects with non Uisce Éireann abstractions, will need to be considered in further detail as part of project level consenting to demonstrate both sustainability for any connected surface waterbodies and groundwater dependent habitats and protected areas.

9 Appropriate Assessment Summary

9 Appropriate Assessment Summary

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

Potential in-combination effects with other projects and plans were identified for the preferred options on the Derryveagh and Glendowan Mountains SPA, Cloghernagore Bog and Glenveagh National Park SAC, West Donegal Coast SPA, River Finn SAC, River Foyle and Tributaries SAC, Donegal Bay SPA, Lough Eske and Ardnamona Wood SAC, Donegal Bay (Murvagh) SAC, Lough Swilly SAC, Lough Swilly SPA, North Inishowen Coast SAC, Trawbreaga Bay SPA, Horn Head to Fanad Head SPA, Lough Fern SPA, West of Ardara/Maas Road SAC, and Lough Nillan Bog SPA. The potential effects include habitat degradation, water table/availability, habitat loss, pollution, mortality, disturbance and spread of invasive species. The assessment concluded that with the mitigation identified there will be no adverse effects on the integrity of the European site in-combination with other plans or projects.

Potential in-combination effects between preferred options were identified for Cloghernagore Bog and Glenveagh National Park SAC, Derryveagh and Glendowan Mountains SPA, River Finn SAC, and River Foyle and Tributaries SAC. The potential impacts include habitat loss, mortality, spread of invasive non-native species, disturbance and pollution impacts. 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 draft 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 North West Region options and cumulative effects.

References

Catchments.ie. 2021a. *3rd Cycle Draft Donagh-Moville Catchment Repor*t. [Online]. [Accessed: 25/05/2022]. Available from: https://catchments.ie/wp-content/files/catchmentassessments/40%20Donagh-Moville%20Catchment%20Summary%20WFD%20Cycle%203.pdf

Catchments.ie. 2021b. *3rd Cycle Draft Lough Swilly Catchment Repor*t. [Online]. [Accessed: 25/05/2022]. Available from: https://catchments.ie/wp-content/files/catchmentassessments/39%20Lough%20Swilly%20Catchment%20Summary%20WFD%20Cycle%203.pdf

Catchments.ie. 2021c. *3rd Cycle Draft Foyle Catchment Repor*t. [Online]. [Accessed: 25/05/2022]. Available from: https://catchments.ie/wp-content/files/catchmentassessments/01%20Foyle%20Catchment%20Summary%20WFD%20Cycle%203.pdf

Catchments.ie. 2021d. *3rd Cycle Draft Gweebarra-Sheephaven Catchment Repor*t. [Online]. [Accessed: 25/05/2022]. Available from: https://catchments.ie/wp-content/files/catchmentassessments/38%20Gweebarra-Sheephaven%20Catchment%20Summary%20WFD%20Cycle%203.pdf

Catchments.ie. 2021e. *3rd Cycle Draft Donegal Bay North Catchment Repor*t. [Online]. [Accessed: 25/05/2022]. Available from: https://catchments.ie/wp-content/files/catchmentassessments/37%20Donegal%20Bay%20North%20Catchment%20Summary%20WFD%20Cycle%203.pdf

Catchments.ie. 2021f. *3rd Cycle Draft Erne Catchment Repor*t. [Online]. [Accessed: 25/05/2022]. Available from: https://catchments.ie/wp-content/files/catchmentassessments/36%20Erne%20Catchment%20Summary%20WFD%20Cycle%203.pdf

Catchments.ie. 2022. *Areas for Action (2022-2027) DRAFT*. [Online]. [Accessed: 26/05/2022]. Available from: https://www.catchments.ie/data/#/areaforaction?_k=taa8b6

Central Statistics Office (CSO). 2016a. *E2014: Population Density and Area Size 2016 by Towns by Size, Census Year and Statistic.* [Online]. [Accessed: 06/01/20]. Available from: https://www.cso.ie/en/releasesandpublications/ep/p-cp2tc/cp2pdm/pd/

Central Statistics Office (CSO). 2020a. *Period Life Expectancy*. [Online]. [Accessed: 21/04/22]. Available from: https://data.cso.ie/table/VSA31

Central Statistics Office (CSO). 2020b. *Physical activity of persons aged 15 years and over*. [Online]. [Accessed: 21/12/20]. Available from: https://data.cso.ie/table/IH292

Central Statistics Office (CSO). 2022. *County Incomes and Regional GDP 2019*. [Online]. [Accessed: 06/05/22]. Available from: https://www.cso.ie/en/releasesandpublications/er/cirgdp/countyincomesandregionalgdp2019/

Central Statistics Office (CSO). 2023a. Labour Force Survey Quarter 1 2023. [Online]. [Accessed: 01/07/23]. Available from: https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter12023/labourforce/

Central Statistics Office (CSO). 2023b. *New Dwelling Completions: Quarter 1 2023*. [Online]. [Accessed: 01/07/23]. Available from: https://www.cso.ie/en/releasesandpublications/ep/p-ndc/newdwellingcompletionsq12023/

Council Directive 2000/60/EC of 23rd October 2000 on the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. [Online]. [Accessed: 21/12/20]. Available from: https://ec.europa.eu/environment/water/water-framework/index_en.html

Department of Culture, Heritage and the Gaeltacht. 2020. *Historic Environment Viewer.* [Online]. [Accessed: 06/01/20]. Available from: http://webgis.archaeology.ie/historicenvironment/

Department of Environment, Community and Local Government, GSI and EPA.1999. *Groundwater Protection Schemes.* [Online]. [Accessed: 05/11/21]. Available from: https://www.gsi.ie/en-ie/publications/Pages/Groundwater-Protection-Schemes.aspx

Department of Housing, Planning and Local Government. 2019a. *Public Consultation on the Significant Water Management Issues for the third cycle River Basin Management Plan for Ireland 2022-2027*. [Online]. [Accessed: 06/01/20]. Available from: https://www.housing.gov.ie/water/water-quality/water-framework-directive/public-consultation-significant-water-management

Department of Housing, Planning and Local Government. 2019b. *Water Quality and Water Services Infrastructure: Climate Change Sectoral Adaptation Plan*. [Online]. [Accessed: 06/01/20]. Available from: https://www.dccae.gov.ie/documents/Water_Quality_and_Water_Services_Infrastructure_Climate_Adaptation_Plan.pdf

Department of the Environment, Climate and Communications. 2018. *Local Authority Adaptation Strategy Development Guidelines*. [Online]. [Accessed: 06/01/20]. Available from: https://www.dccae.gov.ie/documents/LA%20Adaptation%20Guidelines.pdf

Department of the Environment, Climate and Communications. 2023. *Climate Action Plan*. [Online]. [Accessed: 26/01/23]. Available from: https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023

Department of Transport, Tourism and Sport. 2019. *People, Place and Policy - Growing Tourism to 2025.* [Online]. [Accessed: 06/01/20]. Available from: https://assets.gov.ie/15792/8b462712683748e7bcec6c7d5c7ecd2a.pdf

Donegal City Council, 2019. *Climate Adaptation Strategy*. [Online]. [Accessed: 16/05/22]. Available from: https://www.donegalcoco.ie/media/donegalcountyc/environment/FINAL_Climate%20Change%20Adaptation%20Strategy%202019%20-2024.pdf

Environmental Protection Agency (EPA). 2018. *Corine Landcover - EPA Geoportal.* [Online]. [Accessed: 06/01/20]. Available from: http://gis.epa.ie/GetData/Download

Environmental Protection Agency (EPA). 2019. *Teagasc Soils Map*. [Online]. [Accessed: 06/01/20]. Available from: http://gis.teagasc.ie/soils/map.php

Environmental Protection Agency (EPA). 2020. *Water Framework Directive Water Catchments*. [Online]. [Accessed: 29/01/21]. Available from: https://gis.epa.ie/geonetwork/srv/eng/catalog.search#/metadata/78b8def6-16fd-4934-bc2a-1d52380a2b34

Environmental Protection Agency (EPA). 2021. *Air Quality in Ireland Report 2021*. [Online]. [Accessed: 31/10/22]. Available from: https://indd.adobe.com/view/67188a5f-37ff-44bd-b335-5d168fdcf113

Environmental Protection Agency (EPA). 2023a. *WFD Status Tables (excel) (All Waterbodies) 2016-*

2021. [Online]. [Accessed: 31/05/23]. Available at: https://gis.epa.ie/GetData/Download

Environmental Protection Agency (EPA). 2023b. *WFD Risk Data Excel (Online)*. [Online]. [Accessed: 31/05/23]. Available at: https://gis.epa.ie/GetData/Download

European Communities (Birds and Natural Habitats) Regulations 2011 (SI. 477)

Fáilte Ireland. 2020. *The Wild Atlantic Way*. [Online]. [Accessed 10/05/22]. Available from: https://www.failteireland.ie/Wild-Atlantic-Way.aspx

Go Visit Donegal. 2022. *Go Visit Donegal*. [Online]. [Accessed: 10/05/22]. Available from: https://www.govisitdonegal.com/

Government of Ireland. 2022. *Project Ireland 2040: National Planning Framework*. [Online]. [Accessed: 15/04/22]. Available from: http://npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf

Government of Ireland. 2022. *myProjectIreland: Project Ireland 2040*. [Online]. [Accessed: 15/04/22]. Available from: https://geohive.maps.arcgis.com/apps/MapSeries/index.html?appid=f05a07c5a0324b1a887cd9d5d7103e22

Irish Water. 2021. *Uisce Éireann's Biodiversity Action Plan: Embedding Biodiversity into Water Services*. [Online]. [Accessed: 25/06/21]. Available from: https://www.water.ie/docs/21668_Ervia_IrishWaterBiodiversityActionPlan_v7.pdf

Irish Water. 2022. Technical Note: Groundwater Summary Report – Potential impacts on GW Bodies due to Uisce Éireann Groundwater Abstraction Scheme. July 2022.

Met Éireann. 2019. *Climate of Ireland*. [Online]. [Accessed: 06/01/20]. Available from: https://www.met.ie/climate/climate-of-ireland

National Biodiversity Data Centre. 2021. National Invasive Species Database. [Online]. [Accessed 13/12/21]. Available from: https://maps.biodiversityireland.ie/Dataset/66

National Parks and Wildlife Service (NPWS). 2011. *Red Lists*. [Online]. [Accessed: 06/01/20]. Available from: https://www.npws.ie/research-projects/animal-species/invertebrates/red-lists

National Parks and Wildlife Service (NPWS). 2023. *Protected Sites in Ireland*. [Online]. [Accessed: 16/05/23]. Available from: https://www.npws.ie/protected-sites

National Parks and Wildlife Service (NPWS). 2019. *Article 17 Reports 2019*. [Online]. [Accessed: 06/01/20]. Available from: https://www.npws.ie/publications/article-17-reports/article-17-reports-2019

National Tourism Development Authority. 2016. *Tourism Development & Innovation: A strategy for investment 2016-2022*. [Online]. [Accessed: 06/01/20]. Available from: https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/Irelands%20Ancient%20East/FI-Tourism-Investment-Strategy-Final-07-06-16.pdf

Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. 2019. *Checklists of protected and threatened species in Ireland*. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland. [Online]. [Accessed: 06/12/21]. Available from: https://www.npws.ie/sites/default/files/publications/pdf/IWM%20116%20Checklists%20Protected%20and%20Threatened%20Species%202019.pdf

Office of Public Works. 2009. *The Planning System and Flood Risk Management Guidelines for Planning Authorities*. [Online]. [Accessed: 06/01/20]. Available from: https://www.opr.ie/wp-content/uploads/2019/08/2009-Planning-System-Flood-Risk-Mgmt-1.pdf

Office of Public Works. 2018. C*atchment Flood Risk Assessment and Management Programme*. [Online]. [Accessed: 06/01/20]. Available from: https://www.floodinfo.ie/map/floodplans/

Ordnance Survey Ireland. n.d. *GeoHive Environmental Sensitivity Mapping.* [Online]. [Accessed: 03/08/21]. Available from: https://airomaps.geohive.ie/ESM/

UKTAG. 2013. *UK Technical Advisory Group on the Water Framework Directive Final recommendations on new and updated biological standards.* [Online]. [Accessed: 06/01/20]. Available from: http://www.wfduk.org/sites/default/files/Media/UKTAG%20Final%20recommendations%20on%20biological%20stds_20131030.PDF

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 Desalinisation Options in SAA

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
SAA-145	Desalination plant to supply full deficit.									1	0	-19

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

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
SAA-001	Increase existing GW abstraction from Culdaff borehole.									1	0	-11
SAA-008a	Increase GW abstraction from existing BHs to partly supply deficit.									1	0	-10
SAA-009a	New GW (Carndonagh Gravels GWB) abstraction/wellfield to supply deficit at Inishowen West/Carndonagh/ Culdaff WRZ									0	0	-17
SAA-022	New GW abstraction/wellfield to partly supply deficit at Lough Mourne WRZ									0	0	-14

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-200	Increase GW abstraction from existing BHs to partly supply deficit. Recent work has shown potential to get 1-3Ml/d more from this supply.									2	0	-22
SAA-201	New GW abstraction/wellfield to partly supply deficit. Including upgrade of Ballymacool WTP for treatment.									2	0	-22
SAA-202	New GW abstraction/wellfield to partly supply deficit at Letterkenny & Inishowen East & Pollan Dam WRZ. Including new WTP on site.									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
SAA-203	Increase GW abstraction from existing BHs to partly supply deficit. Recent work has shown potential to get 1-3Ml/d more from this supply.									1	0	-19
SAA-067a	Increase GW abstraction from existing BHs to partly supply deficit. Recent work has shown potential to get 1-3Ml/d more from this supply.									1	0	-12
SAA-068	New GW abstraction/wellfield to partly supply deficit at Letterkenny & Inishowen East & Pollan Dam WRZ.									1	0	-12
SAA-100	New GW abstraction (poorly productive bedrock)to partly supply									0	0	-14

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	deficit at Creeslough Dunfanaghy WRZ.											
SAA-110	New GW abstraction (Northwest Donegal GWB) to partly supply deficit at Gortahork-Falcarragh WRZ.									0	0	-14
SAA-121	New GW abstraction (Northwest Donegal GWB) to partly supply deficit at Rosses WRZ									0	0	-18
SAA-128	New GW abstraction to partly supply deficit at Lettermacaward WRZ.									1	0	-17
SAA-136	New GW abstraction (Northwest Donegal GWB poorly productive bedrock) to partly supply deficit at Glenties-Ardara WRZ									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
SAA-143	New GW abstraction (Arainn Mhor GWB (poorly productive bedrock) to supply deficit at Arranmore Island WRZ.									0	0	-15
SAA-158	New GW abstraction to partly supply deficit at existing Frosses - Inver WTP site.									1	0	-20
SAA-170	New GW abstraction (Donegal-Ballintra GWB (karstic)to partly supply deficit at Donegal (River Eske) WRZ									1	0	-21
SAA-175	New GW abstraction (Donegal-Ballintra GWB (karstic)) to supply deficit at Ballyshannon & Bundoran WRZ									0	0	-16

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-176	New GW abstraction (Ballyshannon GWB (karstic)) to supply deficit at Ballyshannon & Bundoran WRZ									0	0	-14
SAA-177	New GW abstraction (Kildoney North GWB (productive fissured bedrock)) to supply deficit at Ballyshannon & Bundoran WRZ									1	0	-18
SAA-188	New GW abstraction/wellfield to partly supply deficit at Letterkenny & Inishowen East & Pollan Dam WRZ. Including new WTP.									0	0	-16
SAA-067b	Increase GW abstraction from existing BHs to partly supply deficit.									1	1	-12

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Recent work has shown potential to get 1-3Ml/d more from this supply.											
SAA-067e	Increase GW abstraction from existing BHs to partly supply deficit. Recent work has shown potential to get 1-3Ml/d more from this supply.									1	1	-13
SAA-194	Increase GW abstraction from existing BHs to partly supply deficit. Recent work has shown potential to get 1-3Ml/d more from this supply.									1	0	-24
SAA-195	New GW abstraction/wellfield to partly supply deficit. Including upgrade of									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
	Ballymacool WTP for treatment.											
SAA-196	New GW abstraction/wellfield to partly supply deficit at Letterkenny & Inishowen East & Pollan Dam WRZ. Including new WTP on site.									0	0	-21
SAA-208	New GW abstraction/wellfield to partly supply deficit at Letterkenny & Inishowen East & Pollan Dam WRZ									1	0	-21

Table A.3 Fine Screening Summary of Ground Water and Rationalisation Options in SAA

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
SAA-060	Rationalise Milford to Ballymacool WTP									1	1	-12
SAA-066	Rationalise Rathmullen to Ballymacool WTP									1	1	-13

Table A.4 Fine Screening Summary of Rationalisation Options in SAA

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
SAA-217	Rationalise Alt Raws to Lough Mourne WRZ.									0	0	-8
SAA-218	Rationalise Meeneragh to Lough Mourne WRZ									0	0	-8

Table A.5 Fine Screening Summary of Surface Water Options in SAA

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
SAA-017b	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP. Additional 7.6 Ml/d supply available to meet rationalised nearby WRZs.									2	0	-22
SAA-021a	Increase existing SW abstraction from Lough Mourne. It would require significant increase to impoundment.									2	1	-20
SAA-023	New SW abstraction from River Finn. Pump to Lough Mourne WTP									0	1	-12
SAA-199	New SW abstraction from Glen Lough to supplement new									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
	Letterkenny WTP and increase capacity of new Letterkenny WTP.											
SAA-036a	Increase existing SW abstraction from Shannagh Lake.									2	0	-12
SAA-038	New SW abstraction from Kindrum Lough and new WTP.									1	0	-16
SAA-036b	Increase existing SW abstraction from Shannagh Lake.									2	0	-13
SAA-021e	Increase existing SW abstraction from Lough Mourne. It would require significant increase to impoundment. Additional 16.8 Ml/d supply available to both meet local deficit and transfer									2	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
	to partially supply Letterkenny/Pollan Dam.											
SAA-047a	New SW abstraction from Glen Lough to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.									0	1	-11
SAA-049a	New SW abstraction from Gartan Lough to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.									0	1	-13
SAA-017f	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP. Additional 7.6 Ml/d supply available to									2	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
	partially meet local deficit.											
SAA-111b	New SW abstraction from Lough Altan and the WTP.									0	0	-17
SAA-072	New SW abstraction and WTP from Glen Lough and supply Carrigart-Downings & Cranford WRZ									0	0	-14
SAA-126b	Increase existing SW abstraction from Lough Derkmore impoundment. Involves significant project to raise dam.									1	0	-23
SAA-152b	Increase existing SW abstraction from Lough Aderry.									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
SAA-091	New SW abstraction from Lough Natooey.									0	0	-11
SAA-153	Increase existing SW abstraction from Lough Aderry. Rationalise Lettermacaward and Glenties-Ardara WRZs (decommission existing sources) to Killybegs and create a single WRZ.									1	1	-17
SAA-099	New SW abstraction from Glen Lough.									1	0	-21
SAA-152c	Increase existing SW abstraction from Lough Aderry.									1	0	-17
SAA-152d	Increase existing SW abstraction from Lough Aderry.									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
SAA-111a	New SW abstraction from Lough Altan and new WTP.									0	0	-16
SAA-152e	Increase existing SW abstraction from Lough Aderry.									1	0	-16
SAA-118a	New SW abstraction from Loch an Luir and new WTP.									0	0	-18
SAA-169b	New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying compensation flow release requirements from lake to river.									1	0	-20
SAA-126a	Increase existing SW abstraction from Lough									1	1	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Derkmore impoundment. Involves significant project to raise dam.											
SAA-021f	Increase existing SW abstraction from Lough Mourne. It would require significant increase to impoundment.									2	1	-23
SAA-127	New SW abstraction from Lough Finn and new WTP.									0	1	-18
SAA-135a	New SW abstraction from Lough Finn and new WTP.									0	2	-16
SAA-169c	New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying									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
	compensation flow release requirements from lake to river.											
SAA-141	Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume									1	1	-17
SAA-159	New SW abstraction from Lough Eske and new WTP.									0	0	-18
SAA-169a	New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying compensation flow									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
	release requirements from lake to river.											
SAA-017d	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.									1	0	-21
SAA-204	New SW abstraction from Glen Lough to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.									1	0	-21
SAA-047b	New SW abstraction from Glen Lough to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.									0	1	-19
SAA-049b	New SW abstraction from Gartan Lough to									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
	supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.											
SAA-207	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.									1	0	-21
SAA-209	Increase existing SW abstraction from Lough Melvin and upgrade Bundoran WTP.									0	0	-10
SAA-215	Increase existing SW abstraction from Lough Aderry.									1	0	-18
SAA-220	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.									2	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
SAA-221	New SW abstraction from Glen Lough to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.									2	0	-21
SAA-222	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.									1	0	-20
SAA-223	New SW abstraction from Gartan Lough to supplement new Letterkenny WTP and increase capacity of new Letterkenny WTP.									1	0	-20
SAA-224	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.									3	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-225	New SW abstraction from Glen Lough and a new WTP at Glen Lough.									3	0	-26
SAA-226	New SW abstraction from Gartan Lough to treat at Letterkenny Goldrum WTP including increasing WTP capacity.									3	0	-26
SAA-228	Increase existing SW abstraction from Crana River and increase capacity of Illies WTP.									4	0	-29
SAA-229	New SW abstraction from Glen Lough and a new WTP at Glen Lough									4	0	-29
SAA-230	New SW abstraction from Gartan Lough to treat at Letterkenny Goldrum WTP including increasing WTP capacity.									4	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
SAA-237	Rationalise Culdaff to new sources developed near Letterkenny									4	0	-29
SAA-238	Rationalise Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny									4	0	-29
SAA-239	Rationalise Buncrana to new sources developed near Letterkenny									4	0	-29
SAA-240	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									4	0	-29
SAA-241	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny &									4	0	-30

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
	Inishowen East & Pollan Dam WRZ and surrounding WRZs											
SAA-242	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									4	0	-29
SAA-243	Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny									4	0	-29
SAA-244	Rationalise Culdaff to new sources developed near Letterkenny									4	0	-30
SAA-245	Rationalise Inishowen West/Carndonagh/ Culdaff to new sources									4	0	-30

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
	developed near Letterkenny											
SAA-246	Rationalise Buncrana to new sources developed near Letterkenny									4	0	-30
SAA-247	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									4	0	-30
SAA-248	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									4	0	-30
SAA-249	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny &									4	0	-30

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
	Inishowen East & Pollan Dam WRZ and surrounding WRZs											
SAA-250	Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny									4	0	-30
SAA-251	Rationalise Creeslough Dunfanaghy to new sources developed near Letterkenny									4	0	-30
SAA-252	Rationalise Culdaff to new sources developed near Letterkenny									3	0	-29
SAA-253	Rationalise Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny									3	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
SAA-254	Rationalise Buncrana to new sources developed near Letterkenny									3	0	-29
SAA-255	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									3	0	-29
SAA-256	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									3	0	-29
SAA-257	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan									3	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
	Dam WRZ and surrounding WRZs											
SAA-258	Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny									3	0	-29
SAA-259	Rationalise Fanad West to new sources developed near Letterkenny									3	0	-29
SAA-260	Rationalise Fanad East to new sources developed near Letterkenny									3	0	-29
SAA-261	Rationalise Culdaff to new sources developed near Letterkenny									4	0	-30
SAA-262	Interconnect Inishowen West/Carndonagh/ Culdaff to new sources									4	0	-30

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
	developed near Letterkenny											
SAA-263	Rationalise Buncrana to new sources developed near Letterkenny									4	0	-30
SAA-264	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									4	0	-30
SAA-265	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs									4	0	-30
SAA-266	Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny &									4	0	-30

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
	Inishowen East & Pollan Dam WRZ and surrounding WRZs											
SAA-267	Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny									4	0	-30
SAA-268	Rationalise Creeslough Dunfanaghy to new sources developed near Letterkenny									4	0	-30
SAA-269	Rationalise Fanad West to new sources developed near Letterkenny									4	0	-30
SAA-270	Rationalise Fanad East to new sources developed near Letterkenny									4	0	-30

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
SAA-271	Increase existing SW abstraction from Lough Derkmore impoundment. Involves signficant project to raise dam.									1	1	-24
SAA-273	Increase existing SW abstraction from Lough Aderry.									1	1	-24
SAA-274	Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry									1	1	-24
SAA-281	Rationalise Lettermacaward to new River Erne source									4	0	-26
SAA-282	Rationalise Glenties Ardara to new River Erne source									4	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-283	Rationalise Killybegs to new River Erne source									4	0	-26
SAA-284	Rationalise Owenteskiny to new River Erne source									4	0	-26

Table A.6 Fine Screening Summary of Surface Water and Interconnection Options in SAA

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
SAA-102	Interconnect Creeslough Dunfanaghy WRZ with Goldrum/Letterkenny (Supplement Letterkenny									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
	with additional import from the Illies WTP).											
SAA-197	Interconnect Carrigart-Downings with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).									2	0	-22
SAA-198	Interconnect Cranford with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).									2	0	-22
SAA-035	Improve interconnectivity between Fanad West and Fanad East and supply deficit from Fanad East.									2	0	-12
SAA-092	Interconnect Letterkenny Milford WRZ with Lough									2	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
	Mourne WRZ (supplement Lough Mourne with additional impoundment at Lough Mourne)											
SAA-105	Interconnect Creeslough Dunfanaghy WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional impoundment at Lough Mourne)									2	0	-21
SAA-189	Interconnect Inishowen East & Pollan Dam WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional impoundment at Lough Mourne)									2	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
SAA-106	Interconnect Creeslough Dunfanaghy WRZ with Gortahork-Falcarragh WRZ and supply from new Lough Altan WTP to meet deficit									0	0	-17
SAA-161	Interconnect Frosses-Inver and Killybegs and supply deficit from Killybegs.									1	0	-16
SAA-165	Interconnect Frosses-Inver and Donegal (new Lough Eske source) supply deficit from Donegal (River Eske) WRZ.									1	0	-22
SAA-166	Interconnect Frosses-Inver WRZ with Lough Mourne WRZ and supply									2	1	-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 Lough Mourne.											
SAA-172	Interconnect Donegal (River Eske) WRZ with Lough Mourne WRZ and supply deficit from Lough Mourne.									2	1	-23
SAA-160	Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									0	0	-22
SAA-171	Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									0	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
SAA-182	New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									0	0	-22
SAA-026a	Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit.									0	0	-23
SAA-191	New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									0	0	-23
SAA-192	Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									0	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
SAA-193	Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									0	0	-23
SAA-026b	Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit.									2	0	-26
SAA-042	Interconnect Fanad WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional import from the new WTP at Knaddar Ballyshannon)									2	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-093	Interconnect Letterkenny Milford WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional import from the new WTP at Knaddar Ballyshannon)									2	0	-26
SAA-104	Interconnect Creeslough Dunfanaghy WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional import from the new WTP at Knaddar Ballyshannon)									2	0	-26
SAA-185	Interconnect Fanad East WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional									2	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	import from the new WTP at Knaddar Ballyshannon)											
SAA-187	New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									2	0	-26
SAA-190	Interconnect Inishowen WRZ with Lough Mourne WRZ (supplement Lough Mourne with additional import from the new WTP at Knaddar Ballyshannon)									2	0	-26
SAA-205	Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									2	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-206	Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									2	0	-26
SAA-041	Interconnect Fanad West with Goldrum/Letterkenny (supplement Letterkenny with additional import from the Illies WTP) as part of grouped solution including Carrigart/Downings and Cranford WSZs.									1	0	-21
SAA-044	Interconnect Goldrum/Letterkenny with Illies WTP and supplement Letterkenny with additional import									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
	from the Illies WTP as part of grouped solution including Carrigart/Downings and Cranford WSZs.											
SAA-073	Interconnect Carrigart-Downings with Goldrum/Letterkenny (supplement Letterkenny with additional import from the Illies WTP) as part of grouped solution including Fanad and Cranford WSZs.									1	0	-21
SAA-082	Interconnect Cranford with Goldrum/Letterkenny (supplement Letterkenny with additional import from the Illies WTP) as part of grouped solution including Fanad and									1	0	-21

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Carrigart-Downings WSZs.											
SAA-186	Interconnect Fanad East with Goldrum/Letterkenny (supplement Letterkenny with additional import from the Illies WTP) as part of grouped solution including Carrigart/Downings and Cranford WSZs.									1	0	-21
SAA-214	Interconnect Owenteskiny WRZ to Killybegs WRZ to meet deficit.									1	0	-19
SAA-227	Interconnect Lough Mourne WRZ with Letterkenny/Pollan Dam WRZ and supply deficit from new									3	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Letterkenny/Pollan Dam sources.											
SAA-231	Interconnect Lough Mourne WRZ with Letterkenny/Pollan Dam WRZ and supply deficit from new sources Glen Lough and Gartan Lough									4	0	-29
SAA-234	Interconnect Creeslough Dunfanaghy WRZ with Letterkenny/Pollan Dam WRZ and supply from Letterkenny Goldrum WTP new sources Glen Lough and Gartan Lough									4	0	-29
SAA-235	Interconnect Fanad West with Letterkenny/Pollan Dam WRZ and supply from Letterkenny Goldrum WTP new									4	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
	sources Glen Lough and Gartan Lough											
SAA-236	Interconnect Fanad East with Letterkenny/Pollan Dam WRZ and supply from Letterkenny Goldrum WTP new sources Glen Lough and Gartan Lough									4	0	-29
SAA-278	New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									3	0	-26

Table A.7 Fine Screening Summary of Surface Water and Rationalisation Options in SAA

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
SAA-002b	Rationalise Culdaff WRZ to Illies WTP (Letterkenny 25-year plan)									2	0	-22
SAA-006b	Rationalise Inishowen West WSZ to Illies WTP.									2	0	-22
SAA-010b	Rationalise Carndonagh WSZ to Illies WTP (Letterkenny 25-year plan)									2	0	-22
SAA-015b	Rationalise Slavery WTP to Illies WTP.									2	0	-22
SAA-019b	Rationalise Inishowen East to Illies WTP.									2	0	-22
SAA-015c	Rationalise Slavery WTP to Illies WTP.									2	0	-21
SAA-131	Rationalise Lettermacaward to									1	1	-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
	Killybegs and decommission existing source.											
SAA-139	Rationalise Glenties-Ardara to Killybegs and decommission existing source.									1	1	-17
SAA-151	Rationalise Owenteskiny WRZ to Killybegs WRZ.									1	0	-17
SAA-162	Rationalise Frosses-Inver to Killybegs WRZ									1	0	-16
SAA-181	Rationalise Ballyshannon/ Ballymagroarty to Donegal (new Lough Eske WTP) WRZ.									1	0	-21
SAA-178	New Ballyshannon WTP at Knaddar on River									0	0	-18

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
	Erne/ESB Dam-Kathleen Falls and supply deficit.											
SAA-056	Rationalise Milford to new Letterkenny WTP. New SW abstraction from Glen Lough to supplement new Letterkeny WTP.									0	1	-19
SAA-062	Rationalise Rathmullen to new Letterkenny WTP. New SW abstraction from Glen Lough to supplement new Letterkeny WTP.									0	1	-19
SAA-075	Rationalise Carrigart-Downings to new Letterkenny WTP. New SW abstraction from Glen Lough to									0	1	-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
	supplement new Letterkeny WTP.											
SAA-084	Rationalise Cranford to new Letterkenny WTP. New SW abstraction from Glen Lough to supplement new Letterkeny WTP.									0	1	-19
SAA-058	Rationalise Milford to new Letterkenny WTP. New SW abstraction from Gartan Lough to supplement new Letterkeny WTP.									1	0	-21
SAA-064	Rationalise Rathmullen to new Letterkenny WTP. New SW abstraction from Gartan Lough to supplement new Letterkeny WTP.									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
SAA-077	Rationalise Carrigart-Downings to new Letterkenny WTP. New SW abstraction from Gartan Lough to supplement new Letterkeny WTP.									1	0	-21
SAA-086	Rationalise Cranford to new Letterkenny WTP. New SW abstraction from Gartan Lough to supplement new Letterkeny WTP.									1	0	-21
SAA-232	Rationalise Buncrana WRZ (Slavery WTP) to Letterkenny /Pollan Dam WRZ and supply from Illies WTP Pollan Dam source									4	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
SAA-233	Rationalise Carrigart-Downings WRZ to Letterkenny/Pollan Dam WRZ and supply from Letterkenny Goldrum WTP new sources Glen Lough and Gartan Lough									4	0	-29
SAA-277	Rationalise Lough Mourne to new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit.									3	0	-26
SAA-279	Rationalise Frosses-Inver WRZ to new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									3	0	-26

Option Reference	Name	Environmental								Total - 3 Scores	Environmental Scoring	
		Population, Health, Economy and Recreation	Water Environment: Quality and Resources	Biodiversity, Flora and Fauna	Material Assets	Landscape and Visual	Climate Change	Culture, Heritage and Archaeology	Geology and Soils		Positive Score - Potential Beneficial Effects	Negative Scores - Potential Adverse Effects
SAA-280	Rationalise Donegal (River Eske) WRZ to new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.									3	0	-26

Table A.8 Fine Screening Summary of Surface Water and Split WRZ Options in SAA

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
SAA-138	Split WRZ and supply part of the WRZ from Killybegs and another									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
	part from Lettermaccaward and decommission existing source.											
SAA-272	Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source.									1	1	-24

Table A.9 Fine Screening Summary of WTP Options in SAA

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
SAA-183	Killybegs WTP is not in deficit - Upgrade WTP									0	0	-6

Appendix B SA Approaches for SAA

Note: SA Options are also referred to as Group Options

WRZ	Preferred Approach - SA Approach 5		Least Cost - SA Approach 3		Best Environmental - SA Approach 5	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0600SC0001: Inishowen West & Carndonagh & Culdaff	SAA-262 Interconnect Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny	66	SAA-006b and SAA-010b Rationalise Inishowen West WSZ, and Carndonagh WSZ to Illies WTP.	2	SAA-262 Interconnect Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny	66
0600SC0006: Rosses	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-
0600SC0007: Arranmore Island	SAA-141 Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	-	SAA-141 Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	-	SAA-141 Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	-
0600SC0009: Killybegs	SAA-273 Increase existing SW abstraction from Lough Aderry.	67	SAA-215 Increase existing SW abstraction from Lough Aderry.	58	SAA-273 Increase existing SW abstraction from Lough Aderry.	67
0600SC0010: Donegal (River Eske)	SAA-193 Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP	42	SAA-171 Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP	41	SAA-193 Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP	42

WRZ	Preferred Approach - SA Approach 5		Least Cost - SA Approach 3		Best Environmental - SA Approach 5	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.		at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.		at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	
0600SC0012: Culdaff	SAA-261 Rationalise Culdaff to new sources developed near Letterkenny	66	SAA-002b Rationalise Culdaff WRZ to Illies WTP (Letterkenny 25 year plan)	2	SAA-261 Rationalise Culdaff to new sources developed near Letterkenny	66
0600SC0013: Owenteskiny	SAA-274 Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry	67	SAA-214 Interconnect Owenteskiny WRZ to Killybegs WRZ to meet deficit.	58	SAA-274 Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry	67
0600SC0026: Gortahork-Falcarragh	SAA-111a New SW abstraction from Lough Altan and new WTP.	-	SAA-111a New SW abstraction from Lough Altan and new WTP.	-	SAA-111a New SW abstraction from Lough Altan and new WTP.	-
0600SC0028: Lough Mourne	SAA-026a Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit.	42	SAA-023 New SW abstraction from River Finn. Pump to Lough Mourne WTP	-	SAA-026a Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit.	42
0600SC0029: Letterkenny & Inishowen East & Pollan Dam	SAA-264, SAA-265 and SAA-266 Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny	66	SAA-017b, SAA-019b, SAA-199, SAA-200, SAA-201 and SAA-202 Rationalise Culdaff, Inishowen West, Inishowen East, Carndonagh	2	SAA-264, SAA-265 and SAA-266 Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny	66

WRZ	Preferred Approach - SA Approach 5		Least Cost - SA Approach 3		Best Environmental - SA Approach 5	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	& Inishowen East & Pollan Dam WRZ and surrounding WRZs		WSZs and Slavery WTP. Interconnect Creeslough Dunfanaghy, Carrigart-Downings and Cranford with Goldrum/Letterkenny. Develop a new SW abstraction from Glen Lough. Increase the existing GW abstraction from existing BHs and provide two new GW abstractions to partly supply deficit. Upgrade Ballymacool WTP and build a new WTP.		& Inishowen East & Pollan Dam WRZ and surrounding WRZs	
0600SC0030: Ballyshannon &Bundoran	SAA-191 New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	42	SAA-182 New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	41	SAA-191 New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	42
0600SC0035: Glenties-Ardara	SAA-272 Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source.	67	SAA-135a New SW abstraction from Lough Finn and new WTP.	-	SAA-272 Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source.	67
0600SC0036: Frosses-Inver	SAA-192 Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at	42	SAA-160 Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at	41	SAA-192 Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at	42

WRZ	Preferred Approach - SA Approach 5		Least Cost - SA Approach 3		Best Environmental - SA Approach 5	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.		Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.		Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	
0600SC0038: Lettermacaward	SAA-271 Increase existing SW abstraction from Lough Derkmore impoundment. Involves signficant project to raise dam.	67	SAA-126a Increase existing SW abstraction from Lough Derkmore impoundment. Involves signficant project to raise dam.	-	SAA-271 Increase existing SW abstraction from Lough Derkmore impoundment. Involves signficant project to raise dam.	67
0600SC0039: Creeslough Dunfanaghy	SAA-268 Rationalise Creeslough Dunfanaghy to new sources developed near Letterkenny	66	SAA-102 Interconnect Creeslough Dunfanaghy WRZ with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).	2	SAA-268 Rationalise Creeslough Dunfanaghy to new sources developed near Letterkenny	66
0600SC0043: Carrigart-Downings & Cranford	SAA-267 Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny	66	SAA-197 and SAA-198 Interconnect Carrigart-Downings and Cranford with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).	2	SAA-267 Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny	66
0600SC0045: Buncrana	SAA-263 Rationalise Buncrana to new sources developed near Letterkenny	66	SAA-015b Rationalise Slavery WTP to Illies WTP.	2	SAA-263 Rationalise Buncrana to new sources developed near Letterkenny	66

WRZ	Preferred Approach - SA Approach 5		Least Cost - SA Approach 3		Best Environmental - SA Approach 5	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0600SC0046: Fanad West	SAA-269 Rationalise Fanad West to new sources developed near Letterkenny	66	SAA-035 Improve interconnectivity between Fanad West and Fanad East and supply deficit from Fanad East.	12	SAA-269 Rationalise Fanad West to new sources developed near Letterkenny	66
0600SC0047: Fanad East	SAA-270 Rationalise Fanad East to new sources developed near Letterkenny	66	SAA-036b Increase existing SW abstraction from Shannagh Lake.	12	SAA-270 Rationalise Fanad East to new sources developed near Letterkenny	66
0600PRI3077: Alt Raws	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-
0600PRI3078: Meeneragh/ Cronalaghey	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0600SC0001: Inishowen West &	SAA-006b and SAA-010b Rationalise Inishowen West WSZ, and Carndonagh WSZ to Illies WTP.	2	SAA-253	65	SAA-006b and SAA-010b	2

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
Carndonagh & Culdaff			Rationalise Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny		Rationalise Inishowen West WSZ, and Carndonagh WSZ to Illies WTP.	
0600SC0006: Rosses	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-
0600SC0007: Arranmore Island	SAA-141 Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	-	SAA-141 Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	-	SAA-141 Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	-
0600SC0009: Killybegs	SAA-215 Increase existing SW abstraction from Lough Aderry.	58	SAA-273 Increase existing SW abstraction from Lough Aderry.	67	SAA-215 Increase existing SW abstraction from Lough Aderry.	58
0600SC0010: Donegal (River Eske)	SAA-169a New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying compensation flow release requirements from lake to river.	-	SAA-169a New SW abstraction from Lough Eske and new WTP. To supplement existing river abstraction. Operate two sources conjunctively, applying compensation flow release requirements from lake to river.	-	SAA-172 Interconnect Donegal (River Eske) WRZ with Lough MourneWRZ and supply deficit from Lough Mourne.	37

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
0600SC0012: Culdaff	SAA-002b Rationalise Culdaff WRZ to Illies WTP (Letterkenny 25 year plan)	2	SAA-252 Rationalise Culdaff to new sources developed near Letterkenny	65	SAA-002b Rationalise Culdaff WRZ to Illies WTP (Letterkenny 25 year plan)	2
0600SC0013: Owenteskiny	SAA-214 Interconnect Owenteskiny WRZ to Killybegs WRZ to meet deficit.	58	SAA-274 Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry	67	SAA-214 Interconnect Owenteskiny WRZ to Killybegs WRZ to meet deficit.	58
0600SC0026: Gortahork-Falcarragh	SAA-111a New SW abstraction from Lough Altan and new WTP.	-	SAA-111a New SW abstraction from Lough Altan and new WTP.	-	SAA-111a New SW abstraction from Lough Altan and new WTP.	-
0600SC0028: Lough Mourne	SAA-023 New SW abstraction from River Finn. Pump to Lough Mourne WTP	-	SAA-023 New SW abstraction from River Finn. Pump to Lough Mourne WTP	-	SAA-021f Increase existing SW abstraction from Lough Mourne. It would require significant increase to impoundment.	37
0600SC0029: Letterkenny & Inishowen East & Pollan Dam	SAA-017b, SAA-019b, SAA-199, SAA-200, SAA-201 and SAA-202 Rationalise Culdaff, Inishowen West, Inishowen East, Carndonagh WSZs and Slavery WTP. Interconnect Creeslough Dunfanaghy, Carrigart-Downings and Cranford with	2	SAA-255, SAA-256, SAA-257 Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs	65	SAA-017b, SAA-019b, SAA-199, SAA-200, SAA-201 and SAA-202 Rationalise Culdaff, Inishowen West, Inishowen East, Carndonagh WSZs and Slavery WTP. Interconnect Creeslough Dunfanaghy, Carrigart-Downings and Cranford with	2

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Goldrum/Letterkenny. Develop a new SW abstraction from Glen Lough. Increase the existing GW abstraction from existing BHs and provide two new GW abstractions to partly supply deficit. Upgrade Ballymacool WTP and build a new WTP.				Goldrum/Letterkenny. Develop a new SW abstraction from Glen Lough. Increase the existing GW abstraction from existing BHs and provide two new GW abstractions to partly supply deficit. Upgrade Ballymacool WTP and build a new WTP.	
0600SC0030: Ballyshannon &Bundoran	SAA-209 Increase existing SW abstraction from Lough Melvin and upgrade Bundoran WTP.	-	SAA-209 Increase existing SW abstraction from Lough Melvin and upgrade Bundoran WTP.	-	SAA-209 Increase existing SW abstraction from Lough Melvin and upgrade Bundoran WTP.	-
0600SC0035: Glenties-Ardara	SAA-135a New SW abstraction from Lough Finn and new WTP.	-	SAA-272 Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source.	67	SAA-135a New SW abstraction from Lough Finn and new WTP.	-
0600SC0036: Frosses-Inver	SAA-159 New SW abstraction from Lough Eske and new WTP.	-	SAA-159 New SW abstraction from Lough Eske and new WTP.	-	SAA-166 Interconnect Frosses-Inver WRZ with Lough Mourne WRZ and supply deficit from Lough Mourne.	37
0600SC0038: Lettermacaward	SAA-126a Increase existing SW abstraction from Lough Derkmore	-	SAA-271 Increase existing SW abstraction from Lough Derkmore impoundment.	67	SAA-126a Increase existing SW abstraction from Lough Derkmore	-

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	impoundment. Involves significant project to raise dam.		Involves signficant project to raise dam.		impoundment. Involves significant project to raise dam.	
0600SC0039: Creeslough Dunfanaghy	SAA-102 Interconnect Creeslough Dunfanaghy WRZ with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).	2	SAA-099 New SW abstraction from Glen Lough.	-	SAA-102 Interconnect Creeslough Dunfanaghy WRZ with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).	2
0600SC0043: Carrigart-Downings & Cranford	SAA-197 and SAA-198 Interconnect Carrigart-Downings and Cranford with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).	2	SAA-258 Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny	65	SAA-197 and SAA-198 Interconnect Carrigart-Downings and Cranford with Goldrum/Letterkenny (Supplement Letterkenny with additional import from the Illies WTP).	2
0600SC0045: Buncrana	SAA-015b Rationalise Slavery WTP to Illies WTP.	2	SAA-254 Rationalise Buncrana to new sources developed near Letterkenny	65	SAA-015b Rationalise Slavery WTP to Illies WTP.	2
0600SC0046: Fanad West	SAA-035 Improve interconnectivity between Fanad West and Fanad East and supply deficit from Fanad East.	12	SAA-259 Rationalise Fanad West to new sources developed near Letterkenny	65	SAA-035 Improve interconnectivity between Fanad West and Fanad East and supply deficit from Fanad East.	12
0600SC0047: Fanad East	SAA-036b	12	SAA-260	65	SAA-036b	12

WRZ	Quickest Delivery - SA Approach 1		Most Resilient - SA Approach 4		Lowest Carbon - SA Approach 2	
	Option Description	SA Option	Option Description	SA Option	Option Description	SA Option
	Increase existing SW abstraction from Shannagh Lake.		Rationalise Fanad East to new sources developed near Letterkenny		Increase existing SW abstraction from Shannagh Lake.	
0600PRI3077: Alt Raws	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-
0600PRI3078: Meeneragh/ Cronalaghey	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
0600SC0001: Inishowen West & Carndonagh & Culdaff	SAA-262 Interconnect Inishowen West/Carndonagh/ Culdaff to new sources developed near Letterkenny	66
0600SC0006: Rosses	SAA-118a New SW abstraction from Loch an Luir and new WTP.	-
0600SC0007: Arranmore Island	SAA-141	-

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
	Increase existing SW abstraction from Lough Shore. Involves rebuilding dam structure to increase operational lake storage volume	
0600SC0009: Killybegs	SAA-273 Increase existing SW abstraction from Lough Aderry.	67
0600SC0010: Donegal (River Eske)	SAA-193 Interconnect Donegal (River Eske) WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	42
0600SC0012: Culdaff	SAA-261 Rationalise Culdaff to new sources developed near Letterkenny	66
0600SC0013: Owenteskiny	SAA-274 Interconnect Owenteskiny and Killybegs to meet deficit from Lough Aderry	67
0600SC0026: Gortahork-Falcarragh	SAA-111a New SW abstraction from Lough Altan and new WTP.	-
0600SC0028: Lough Mourne	SAA-026a Interconnect Lough Mourne with new WTP at Knaddar, Balllyshannon on River Erne/Kathleen Falls (ESB) and supply deficit.	42
0600SC0029: Letterkenny & Inishowen East & Pollan Dam	SAA-264, SAA-265 and SAA-266 Develop Pollan Dam, Glen Lough and Gartan Lough for Letterkenny & Inishowen East & Pollan Dam WRZ and surrounding WRZs	66

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
0600SC0030: Ballyshannon &Bundoran	SAA-191 New Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	42
0600SC0035: Glenties-Ardara	SAA-272 Split WRZ and supply part of the WRZ from Killybegs and another part from Lettermaccaward and decommission existing source.	67
0600SC0036: Frosses-Inver	SAA-192 Interconnect Frosses-Inver WRZ with new Ballyshannon WTP at Knaddar on River Erne/ESB Dam-Kathleen Falls and supply deficit.	42
0600SC0038: Lettermacaward	SAA-271 Increase existing SW abstraction from Lough Derkmore impoundment. Involves signficant project to raise dam.	67
0600SC0039: Creeslough Dunfanaghy	SAA-268 Rationalise Creeslough Dunfanaghy to new sources developed near Letterkenny	66
0600SC0043: Carrigart-Downings & Cranford	SAA-267 Rationalise Carrigart-Downings & Cranford to new sources developed near Letterkenny	66
0600SC0045: Buncrana	SAA-263 Rationalise Buncrana to new sources developed near Letterkenny	66

WRZ	Best Appropriate Assessment - SA Approach 5	
	Option Description	SA Option
0600SC0046: Fanad West	SAA-269 Rationalise Fanad West to new sources developed near Letterkenny	66
0600SC0047: Fanad East	SAA-270 Rationalise Fanad East to new sources developed near Letterkenny	66
0600PRI3077: Alt Raws	SAA-217 Rationalise Alt Raws to Lough Mourne WRZ.	-
0600PRI3078: Meeneragh/ Cronalaghey	SAA-218 Rationalise Meeneragh to Lough Mourne WRZ	-

Appendix C Figure Index Tables

Designated Site	Label	Designated Site	Label	Designated Site	Label
SACs (Figure 2.2)					
North Inishowen Coast SAC	A201	Lough Swilly SAC	A215	Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	A229
Tory Island Coast SAC	A202	Fawnboy Bog/Lough Nacung SAC	A216	Croaghonagh Bog SAC	A230
Ballyhoorisky Point To Fanad Head SAC	A203	Ballyarr Wood SAC	A217	Meenaguse/Ardbane Bog SAC	A231
Kindrum Lough SAC	A204	Leannan River SAC	A218	Lough Eske and Ardnamona Wood SAC	A232
Tranarossan And Melmore Lough SAC	A205	Cloghernagore Bog And Glenveagh National Park SAC	A219	Slieve League SAC	A233
Lough Nagreany Dunes SAC	A206	Rutland Island And Sound SAC	A220	Donegal Bay (Murvagh) SAC	A234
Magheradrumman Bog SAC	A207	Termon Strand SAC	A221	Dunragh Loughs/Pettigo Plateau SAC	A235
Horn Head And Rinclevan SAC	A208	Gannivegil Bog SAC	A222	St. John's Point SAC	A236
Mulroy Bay SAC	A209	Meentygrannagh Bog SAC	A223	Durnesh Lough SAC	A237
Sessiagh Lough SAC	A210	Coolvoy Bog SAC	A224	Ballintra SAC	A238
Sheephaven SAC	A211	West Of Ardara/Maas Road SAC	A225	Tamur Bog SAC	A239
Ballyness Bay SAC	A212	River Finn SAC	A226	Lough Golagh And Breesy Hill SAC	A240
Muckish Mountain SAC	A213	Meenaguse Scragh SAC	A227	Aran Island (Donegal) Cliffs SAC	A241
Gweedore Bay And Islands SAC	A214	Lough Nillan Bog (Carrickatlieve) SAC	A228		
SPAs (Figure 2.2)					
Malin Head SPA	A101	Lough Foyle SPA	A107	Lough Nillan Bog SPA	A113

Designated Site	Label	Designated Site	Label	Designated Site	Label
Trawbreaga Bay SPA	A102	Lough Fern SPA	A108	Lough Derg (Donegal) SPA	A114
Tory Island SPA	A103	Lough Swilly SPA	A109	Pettigo Plateau Nature Reserve SPA	A115
Fanad Head SPA	A104	Derryveagh And Glendowan Mountains SPA	A110	Durnesh Lough SPA	A116
Horn Head to Fanad Head SPA	A105	Sheskinmore Lough SPA	A111	Donegal Bay SPA	A117
Falcarragh to Meenlaragh SPA	A106	West Donegal Coast SPA	A112		
NHAs (Figure 2.2)					
Slieve Snaght Bogs NHA	A301	Corveen Bog NHA	A305	Cashelnavean Bog NHA	A309
Illies Hill Bog NHA	A302	Meenmore West Bog NHA	A306	Crocknamurrin Mountain Bog NHA	A310
Umrycam Bog NHA	A303	Meenagarranroe Bog NHA	A307	Barnesmore Bog NHA	A311
Camowen River Bog NHA	A304	Lough Hill Bog NHA	A308	Lough Fad Bog NHA	A312