

Strategic Environmental Assessment for the Draft Water Services Strategic Plan

Customer



Water



Wastewater



Environment



Growth



Investment



Copyright and Non-Disclosure Notice

The contents and layout of this report are subject to copyright owned by Amec Foster Wheeler (© Amec Foster Wheeler Environment & Infrastructure UK Limited 2015), save to the extent that copyright has been legally assigned by us to another party or is used by Amec Foster Wheeler under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Amec Foster Wheeler. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third-Party Disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Amec Foster Wheeler at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Amec Foster Wheeler excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Document Revisions

No.	Details	Date
1	Draft Environmental Report	18.11.14
2	2 nd Draft Environmental Report	21.11.14
3	Final Draft Environmental Report	22.01.15
4	Final Environmental Report	09.02.15

Report for

Suzanne Dempsey, Spatial Planning Specialist
Irish Water
Colvill House
Talbot St.
Dublin 1

Main Contributors

Pete Davis
Alex Melling
Katharine Mason
Angela Dhaliwal
Susannah McLaren

Issued by

.....
Alex Melling

Approved by

.....
Pete Davis

Amec Foster Wheeler Environment & Infrastructure UK Limited

155 Aztec West, Park Avenue, Almondsbury,
Bristol BS32 4UB, United Kingdom
Tel +44 (0) 1454 822 000
Fax +44 (0) 1454 822 010

Doc Reg No. rbri007ir

q:\projects\36222 iw wssp sea and aa\the work\environmental report\final
report submitted\wssp sea environmental report final 05 02 15.docx

/Irish Water

Strategic Environmental Assessment for the Water Services Strategic Plan

Environmental Report

Amec Foster Wheeler Environment & Infrastructure UK Limited

February 2015

This document has been produced by Amec Foster Wheeler Environment & Infrastructure UK Limited in full compliance with the management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

Non-Technical Summary

Purpose of this Report

This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the Strategic Environmental Assessment (SEA) of Irish Water's Draft Water Services Strategic Plan (the draft WSSP). It describes the draft WSSP itself, outlines the SEA process and summarises the likely significant environmental effects anticipated as a result of the implementation of the draft WSSP (and the reasonable alternatives). This NTS also sets out the next steps in the SEA process including proposals for monitoring the implementation of the WSSP.

The assessment, Environmental Report and Non-Technical Summary have been completed by Amec Foster Wheeler Environment and Infrastructure UK Limited (Amec Foster Wheeler), under the management of Nicholas O'Dwyer Ltd. on behalf of Irish Water.

The Draft Water Services Strategic Plan

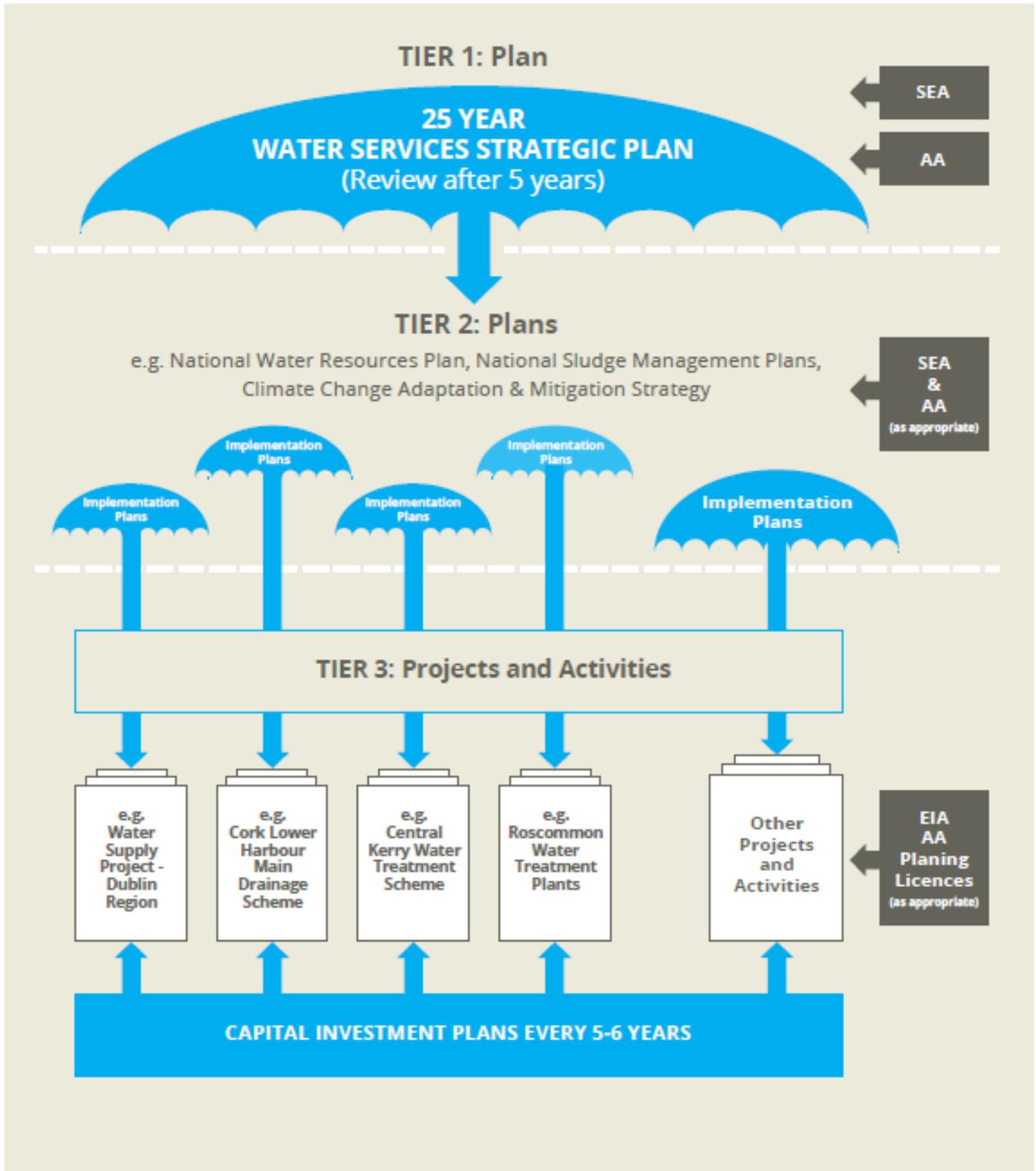
Context

Irish Water was incorporated in July 2013 under the Water Services (No.2) Act of 2013 (the Water Services Act) and in January 2014 assumed responsibility for the provision of public water services from the local authorities. Irish Water has responsibility for wastewater treatment and the supply of drinking water to over 80% of the population and has taken over a large portfolio of assets including pumping stations, approximately 60,000 km of water pipelines and 25,000 km of wastewater pipelines and 856 water treatment plants and over 1,000 wastewater treatment plants.

Section 33 of the Water Services Act requires Irish Water to prepare a WSSP that sets out the objectives of Irish Water over a 25 year period and to outline the strategies to achieve these objectives. Once approved by the Minister of the Environment, Community and Local Government (the Minister), the WSSP will be an overarching strategy for Irish Water, providing the context for all of the plans that are required to meet legislative needs and to manage a modern water utility. **Figure NTS1** shows the relationships between the WSSP (Tier 1), the specific strategies, plans and assessments at Tier 2 and individual projects at Tier 3.

Work on the WSSP began in early 2014 and included the publication of the WSSP Issues Paper and Draft SEA Scoping Report in July 2014 which was put out to public consultation for a period of five weeks. Taking into account responses to the WSSP Issues Paper and consultation with statutory bodies and key stakeholders, Irish Water has prepared the draft WSSP which is subject to consultation between 19th February 2015 and the 17th April 2015.

Figure NTS1 Relationship of the WSSP, Tier 2 Implementation Plans and Tier 3 Projects



Draft WSSP Components

The draft WSSP comprises the following core components:

- Strategic Objectives and Aims; and
- Strategies.

Strategic Objectives and Aims

Irish Water’s vision for water services in the future is that:

“Through responsible stewardship, efficient management and strong partnerships, Ireland has a world-class water infrastructure that ensures secure and sustainable water services, essential for our health, our communities, the economy and the environment.”

To achieve Irish Water’s vision for future water services, the draft WSSP sets out six strategic objectives which in turn are underpinned by a series of aims relevant to the various aspects of water services identified in the Water Services (No. 2) Act 2013. The strategic objectives and associated aims are set out in **Table NTS1**.

Table NTS1 Draft WSSP Strategic Objectives and Aims

Strategic Objective	Aim
Meet Customer Expectations	<ul style="list-style-type: none"> • CE1: Establish both customer trust and a reputation for excellent service.
Ensure a Safe and Reliable Water Supply	<ul style="list-style-type: none"> • WS1: Manage the quality of drinking water from source to tap to protect human health. • WS2: Manage the availability and reliability of water supply now and into the future. • WS3: Manage the affordability of water supplies.
Provide Effective Management of Wastewater	<ul style="list-style-type: none"> • WW1: Manage the operation of wastewater facilities in a manner that protects environmental quality. • WW2: Manage the availability and resilience of wastewater services now and into the future. • WW3: Manage the affordability and reliability of wastewater services.
Protect and Enhance the Environment	<ul style="list-style-type: none"> • EN1: Ensure that Irish Water services are delivered in a sustainable manner that contributes to the protection of the environment. • EN2: Operate our water services infrastructure to support the achievement of water body objectives under the Water Framework Directive. • EN3: Manage all our residual waste in a sustainable manner.
Support Social and Economic Growth	<ul style="list-style-type: none"> • SG1: Support national, regional and local economic and spatial planning policy. • SG2: Facilitate growth in line with national and regional economic and spatial planning policy. • SG3: Ensure that water services are provided in a timely and cost effective manner.
Invest in Our Future	<ul style="list-style-type: none"> • IF1: Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost. • IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance

Strategic Objective	Aim
	<p>between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.</p> <ul style="list-style-type: none"> • IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes. • IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

Strategies

In support of each strategic objective and associated aims, the draft WSSP sets out strategies. A total of sixty-eight strategies are included within the draft WSSP across the following chapters:

- Meet Customer Expectations: which contains six strategies;
- Ensure a Safe and Reliable Water Supply: which contains seventeen strategies;
- Provide Effective Management of Wastewater: which contains fourteen strategies;
- Protect and Enhance the Environment: which contains ten strategies;
- Support Social and Economic Growth: which contains nine strategies; and
- Invest in Our Future: which contains twelve strategies.

Table NTS2 lists the strategies of the draft WSSP by aim.

Table NTS2 Draft WSSP Strategies

Aim	Strategy
Meet Customer Expectations	
Aim CE1: Establish both Customer Trust and a Reputation for Excellent Service.	<ul style="list-style-type: none"> • CE1a: Create and operate a lean and effective Customer Operation. • CE1b: Build and maintain accurate customer databases. • CE1c: Establish sustainable customer revenue. • CE1d: Establish effective communication channels with customers. • CE1e: Establish national customer service standards and robust customer protection measures. • CE1f: Fully support the work of the Public Water Forum.
Ensure a Safe and Reliable Water Supply	
Aim WS1: Manage the quality of drinking water from source to tap to protect human health.	<ul style="list-style-type: none"> • WS1a: Prepare a National Water Resources Plan and implement on a phased basis. • WS1b: Prepare and implement Drinking Water Safety Plans for all Water Supply Zones. • WS1c: Implement Standard Operational Procedures for all water treatment plants, water

Aim	Strategy
<p>Aim WS 2: Manage the availability and reliability of water supply now and into the future.</p> <p>Aim WS3: Manage the affordability of water supplies.</p>	<p>storage facilities and distribution networks.</p> <ul style="list-style-type: none"> • WS1d: Develop and Implement Capital Investment Plans to improve Drinking Water Quality. • WS1e: Prepare and implement a “Lead Compliance Strategy”. • WS1f: Prepare and implement strategies to manage other quality issues in water supplies. • WS2a: Implement risk assessments for all water supply areas in terms of short, medium and long term risks to customer supply. • WS2b: Manage existing water resources and plan for new resources taking a regional view of needs and having regard to the objectives of the Water Framework Directive (WFD). • WS2c: Develop long-term sustainable water sources with resilience to climate change. • WS2d: Develop methodologies to build strategic resilience and network connectivity into resource planning. • WS2e: Manage future regulatory requirements for abstraction licensing, headroom in treatment facilities and population growth. • WS2f: Match water abstraction to availability and quality using surface water and groundwater sources. This is known as Conjunctive Use. • WS2g: Prepare Regional Water Conservation Strategies and implement on a phased basis. • WS3a: Adopt an asset management based approach to capital maintenance and capital investment. • WS3b: Optimise the unit cost of water supply through proper water resource and treatment planning. • WS3c: Prepare and implement water conservation strategies including demand management. • WS3d: Optimise capital and operational investments in water supply.
<p>Provide Effective Management of Wastewater</p>	
<p>Aim WW1: Manage the operation of wastewater facilities in a manner that protects environmental quality.</p> <p>Aim WW2: Manage the availability and resilience of wastewater services now and into the future.</p> <p>Aim WW3: Manage the Affordability and Reliability of Wastewater Services.</p>	<ul style="list-style-type: none"> • WW1a: Prepare and implement a Wastewater Compliance Strategy. • WW1b: Produce appropriate guidance documentation and Standard Operating Procedures. • WW1c: Develop and implement Capital Investment Plans on a prioritised basis to progressively achieve compliance. • WW1d: Manage the wider potential environmental impacts associated with the construction and operation of wastewater systems. • WW2a: Implement risk assessments for all agglomerations in terms of short, medium and long term risks to customer service. • WW2b: Manage existing wastewater assets and plan for new assets based on short, medium and long term sustainability. • WW2c: Identify properties at risk of flooding from combined sewers, and implement measures to reduce risk on a phased basis. • WW2d: Identify and manage critical wastewater assets. • WW3a: Adopt an asset management based approach to capital maintenance and capital investment. • WW3b: Develop and implement strategies and standards to minimise the unit costs of wastewater treatment including standardising treatment processes. • WW3c: Optimise energy consumption in wastewater treatment plants and collection systems. • WW3d: Ensure adequate governance and control of discharges to the sewer network, having regard for best practice and value. • WW3e: Engage with regulators and stakeholders.

Aim	Strategy
	<ul style="list-style-type: none"> • WW3f: Optimise capital and operational investments in wastewater services.
Protect and Enhance the Environment	
<p>Aim EN1: Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment.</p>	<ul style="list-style-type: none"> • EN1a: Implement a Sustainability Policy and Sustainability Framework. • EN1b: Prepare and implement a Sustainable Energy Strategy. • EN1c: Prepare and implement a Climate Change Adaptation and Mitigation Strategy. • EN1d: Adopt a Green Procurement Approach and drive efficient use of all our resources. • EN1e: Adhere to environmental and planning legislation when planning and developing water services assets.
<p>Aim EN2: Operate our water services infrastructure to support the achievement of water body objectives under the Water Framework Directive.</p>	<ul style="list-style-type: none"> • EN2a: Work effectively with other stakeholders to support a catchment based approach. • EN2b: Manage the operation of our water and wastewater infrastructure towards the achievement of water body objectives.
<p>Aim EN3: Manage all our Residual Waste in a Sustainable Manner.</p>	<ul style="list-style-type: none"> • EN3a: Develop and implement a Corporate Waste Management Strategy. • EN3b: Develop and implement a National Wastewater Sludge Management Plan. • EN3c: Develop and implement a National Water Sludge Management Plan.
Support Social and Economic Growth	
<p>Aim SG1: Support National, Regional and Local Economic and Spatial Planning Policy.</p>	<ul style="list-style-type: none"> • SG1a: Work with national, regional and local bodies and potential customers to anticipate and plan water services for growth in line with the statutory planning process.
<p>Aim SG2: Facilitate growth in line with national and regional economic and spatial planning policy.</p>	<ul style="list-style-type: none"> • SG2a: Maximise capacity of existing assets through effective asset management and optimised operation. • SG2b: Plan water service infrastructure at national, regional and river basin level. • SG2c: Invest in the development of strategic networks and treatment works. • SG2d: Maintain appropriate headroom in strategic water services infrastructure. • SG2e: Provide a high quality customer service for new customers.
<p>Aim SG3: Ensure that water services are provided in a timely and cost effective manner.</p>	<ul style="list-style-type: none"> • SG3a: Plan for water services infrastructure development to meet projected demand facilitating delivery on a phased basis. • SG3b: Balance investment for growth in demand with affordability. • SG3c: Operate an equitable New Connections Charging Policy that ensures efficient service provision to new customers with full cost recovery on a least cost basis.
Invest in Our Future	
<p>Aim IF1: Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.</p>	<ul style="list-style-type: none"> • IF1a: Implement asset management systems including comprehensive asset data collection and modelling tools. • IF2b: Develop long term asset strategies and implementation plans (Tier 2 Plans). • IF2c: Development of initiatives such as asset standards and improved supply chain management.
<p>Aim IF2: IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.</p>	<ul style="list-style-type: none"> • IF2a: Engage with our customers, including households, commercial and industrial customers. • IF2b: Engage collaboratively with key stakeholders including CER, EPA, DECLG, HSE regional and local authorities. • IF2c: Apply clear and transparent investment prioritisation criteria.

Aim	Strategy
Aim IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.	<ul style="list-style-type: none"> • IF3a: Transform the water industry in Ireland to an efficient water utility model within a regulated framework. • IF3b: Work with regulators to achieve optimum balance of affordability and service standards taking into account regulatory requirements. • IF3c: Deliver on Irish Water's commitments to raise public awareness of the value of water and achievements delivered.
Aim IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.	<ul style="list-style-type: none"> • IF4a: Actively pursue research and development in water services and track opportunities to develop and adopt new technologies. • IF4b: Engage effectively with universities, Institutes of Further Education, colleges and industry. • IF4c: Develop knowledge management capability and implementation processes.

What is Strategic Environmental Assessment?

SEA became a statutory requirement following the adoption of European Union Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment which has been implemented in Ireland through Statutory Instrument (SI) No. 435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended). The objective of SEA, as defined in Directive 2001/42/EC, is:

‘To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to contributing to sustainable development.’

Throughout the course of the development of a plan or programme, the SEA should seek to identify, describe and evaluate the likely significant effects on the environment of implementing the plan or programme and to propose measures to avoid, manage or mitigate any significant adverse effects and to enhance any beneficial effects.

In this context, the purposes of the SEA of the draft WSSP are to:

- Identify and assess the potentially significant environmental effects of the draft WSSP, including reasonable alternatives;
- Help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the draft WSSP wherever possible;
- Give the statutory SEA bodies (the Environmental Protection Agency, Minister for the Environment, Heritage and Local Government and Minister for Communications, Marine and Natural Resources), stakeholders and the wider public the ability to see and comment upon the effects that the draft WSSP may have on them, their communities and their interests, and encourage them to make responses and suggest improvements to the draft WSSP;

- Demonstrate that the draft WSSP has been developed in a manner consistent with the requirements of the SEA Directive and Regulations; and
- Inform Irish Water’s decisions on the draft WSSP.

The main requirements and stages of SEA are:

- Setting the context and objectives, establishing the baseline and deciding on the scope in consultation with the statutory SEA bodies (**Stage A**);
- Developing and refining alternatives, assessing the likely direct, indirect and cumulative effects of proposed options and identifying mitigating and monitoring measures (**Stage B**);
- Completing an Environmental Report to present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers (**Stage C**);
- Consulting on the draft plan or programme and the Environmental Report (**Stage D**);
- Assessing the environmental implications of any significant changes to the draft plan or programme (**Stage D**);
- Providing information in a Post Adoption SEA Statement on how the Environmental Report and consultees’ opinions were taken into account in deciding the final form of the plan or programme to be adopted (**Stage D**); and
- Undertaking suitable monitoring of the associated impacts of the implementation of the selected options (**Stage E**).

The main output of the SEA of the draft WSSP is the Environmental Report (for which this is the NTS) which has been issued for public consultation alongside the draft WSSP and the Natura Impact Statement.

How has the Draft Water Services Strategic Plan Been Assessed?

What has been assessed?

Following a high level review of the draft WSSP, it was considered necessary to apply SEA to the aims and strategies of the document. A two-stage approach was adopted to assess the draft WSSP strategies in order to ‘screen-out’ those that would not have any significant environmental effects. In consequence, the six strategies under the strategic objective to ‘Meet Customer Expectations’ and the aim ‘CE1: Establish both Customer Trust and a Reputation for Excellent Service’ were excluded from more detailed assessment. These strategies principally relate to either the internal management of Irish Water services and/or external customer communications and were not considered to have any influence on the environment or to conceivably lead to likely significant effects on the

environment. All other aims and strategies were assessed. The reasonable alternative to the preferred option for the WSSP was also assessed.

The Approach to Assessment

Through an analysis of baseline information and projected future trends and a review of the objectives of other plans and programmes, a number of key environmental issues pertinent to the draft WSSP were identified (see **Table 2.2** of the main Environmental Report). These issues have been used as a baseline against which the assessment of the draft WSSP has been undertaken. The key environmental issues also informed the Strategic Environmental Objectives (SEOs) developed to guide the assessment process, as shown in **Table NTS3**.

Table NTS3 Strategic Environmental Objectives

Environmental Component	Strategic Environmental Objectives
Biodiversity and flora and fauna	1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities.
Population and Human Health	2. Protect and reduce risk to human health in undertaking water services.
Water	3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive.
	4. Minimise increases in flood risk resulting from Irish Water's activities.
Air and Climatic Factors	5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change.
Material Assets	6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies.
	7. Protect water as an economic resource.
Soil	8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils.
Cultural Heritage	9. Avoid damage to cultural heritage resources resulting from Irish Water's activities.
Landscape	10. Avoid damage to designated landscapes resulting from Irish Water's activities.

The aims and strategies of the draft WSSP together with reasonable alternatives have been assessed against the 10 SEOs. The findings of the assessment are set out in the accompanying Environmental Report and are summarised in this NTS.

What are the Likely Significant Effects of the Draft Water Services Strategic Plan?

Draft WSSP Aims

The compatibility of the aims which underpin the strategic objectives of the draft WSSP has been tested against the SEOs (see **Section 4.2** of the main Environmental Report).

Broadly, the draft WSSP aims are considered to be supportive of the SEOs with very few incompatibilities identified. This reflects the emphasis of the aims and strategies on both the management of water supply and wastewater infrastructure to protect and enhance environmental quality and on the provision of services and facilities to meet long term needs.

The incompatibilities that have been identified concern those plan aims that are expected to support infrastructure enhancement and SEO 5 (Air and Climatic Factors). This is due to the anticipated increase in emissions to air (including greenhouse gas emissions) during the construction and operational phases of water services infrastructure, although it should be noted that upgrades to existing infrastructure and the provision of new services are likely to present an opportunity to utilise technologies that are more energy efficient. In this respect, a number of the strategies under Aim EN1 (Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment) specifically relate to energy efficiency in the context of Irish Water's wider target to improve energy efficiency by 33% by 2020 (from the 2009 baseline).

The compatibility assessment has also identified that the relationship between plan aims related to infrastructure delivery and SEOs concerning Soil (SEO 8), Cultural Heritage (SEO 9) and Landscape (SEO 10) is largely uncertain. The upgrade of existing, and provision of new services and facilities, such as water treatment works, could have adverse effects on these SEOs but the probability and magnitude of effects is subject to the number, type, scale and location of future proposals as well as the sensitivity of the receiving environments which is currently unknown. However, such uncertainty reflects the strategic and very high level nature of the WSSP. Issues arising from the siting of specific water and wastewater infrastructure will be addressed in the development and implementation of the Tier 2 plans and Tier 3 projects that comprise the draft WSSP.

Draft WSSP Strategies

The assessment of those strategies identified as having the potential for significant environmental effects (including strategies whose environmental effects were considered to be uncertain) has been undertaken by considering the

potential effects of the collective implementation of strategies under each aim of the draft WSSP against each of the SEOs. The detailed assessments are contained in **Appendix D** and are summarised in **Section 4.3** of the main Environmental Report. **Table NTS4** provides a high level overview of the findings of the assessment, summarising the cumulative effects of the strategies by strategic objective of the draft WSSP. **Table NTS5** contains a summary of the anticipated cumulative effects of implementing all of the draft WSSP strategies on the SEOs.

Table NTS4 Draft WSSP Strategy Assessment Summary (Presented by draft WSSP Strategic Objective)

Draft WSSP Strategic Objective	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
Meet Customer Expectations	0	0	0	0	0	0	0	0	0	0
Ensure a Safe and Reliable Water Supply	+/-?	++/-	++	0	+/-?	++	++	?	?	-/?
Provide Effective Management of Wastewater	++	++/- /?	++/- /?	++	++/-	++	+	?	?	-/?
Protect and Enhance the Environment	+/-/?	+/-/?	++/-	++	++	+/?	+/?	+/?	+/?	-/?
Support Social and Economic Growth	+/-/?	++/-	+/-	+	+/-/?	++	+	?	?	?
Invest in Our Future	+/-	+/-	+	0	+/-	+	++	+/-/?	?	?

Note: The strategies identified under 'Meet Customer Expectations' strategic objective have been screened out from assessment. Section 3.4.2 provides the rationale for this screening decision.

Key

Symbol	Likely Effect on the Strategic Environmental Objective
++	The strategies are likely to have a significant positive effect
+	The strategies are likely to have a positive effect
0	The strategies are likely to have a neutral effect
?	Effects are uncertain/there is insufficient information on which to determine effect*
-	The strategies are likely to have a negative effect
--	The strategies are likely to have a significant negative effect
+/-	The strategies are likely to have a mixed positive and negative effect
++/-	The strategies are likely to have a mixed significant positive and negative effect
+/--	The strategies are likely to have a mixed positive and significant negative effect
0/+	The strategies are likely to have a neutral or positive effect
0/-	The strategies are likely to have a neutral or negative effect

*Where a **positive and/or negative effect has been awarded** but the assessment has also identified uncertainties (for example, in respect of the number, type and location of future proposals which may come forward following the implementation of the WSSP), the strategies have been assessed as also having an uncertain effect and this is indicated through '/?.'

Table NTS5 Cumulative Effects of the Draft WSSP

Strategic Environmental Objective	Score	Summary
1. Biodiversity, Flora and Fauna	++/-/?	<p>One of the strategic objectives of the draft WSSP is to protect and enhance the environment and in this context, the strategies that comprise the draft WSSP are expected to conserve and enhance biodiversity, flora and fauna. The upgrade of existing, and provision of new, infrastructure identified in Tier 2 plans, allied with commitments towards the sustainable management of water resources to achieve Water Framework Directive (WFD) water body objectives and compliance with the Urban Waste Water Treatment Directive (UWWTD), is in particular expected to enhance the ecological status of waterbodies and aquatic ecology in Ireland. Given that only 52% of Irish rivers are currently at 'good' or 'high' ecological status, and taking into account the relatively poor status of freshwater species listed under the Habitats Directive, there is the potential for positive effects in this regard to be significant.</p> <p>Construction works associated with infrastructure schemes arising from Tier 2 plans may, however, result in the permanent loss of habitat and/or cause temporary disturbance to biodiversity on and off site. Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species. However, it is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of Tier 2 plans through SEA and Appropriate Assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the</p>

Strategic Environmental Objective	Score	Summary
	++/-/?	<p>requirements of Appropriate Assessment. In consequence, any adverse effects on ecology would not be expected to be significant.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Biodiversity, although it is recognised that the exact magnitude of both positive and negative effects on this SEO will depend to an extent on the number, type and location of future proposals which is currently unknown.</p>
2. Population and Human Health	++/-/?	<p>Whilst the quality of drinking water in Ireland has in general been improving, there have still been short term declines which can pose risks to health and the environment and require interventions (such as boil water notices). In this context, the strategies that comprise the draft WSSP are expected to contribute to protecting the health of the Irish population through the strategic objective to ensure a safe and reliable water supply. This will be achieved in particular through the implementation of the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans allied with commitments towards the sustainable management of water resources.</p> <p>One of the strategic objectives of the draft WSSP is titled 'to invest in our future' and in this context, the strategies that comprise this objective seek to deliver a high quality secure and sustainable service at affordable cost that will support future development. Improving and ensuring water affordability provides a direct benefit to human health by ensuring cost is not a barrier to accessing good quality water.</p> <p>There is the potential that the construction of schemes identified in Tier 2 plans could have temporary and localised adverse effects on human health due to, for example, noise disturbance and air quality impacts. Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Population and Human Health, although it is recognised that the exact magnitude of both positive and negative effects on this SEO will depend to an extent on the number, type and location of future proposals which is currently unknown.</p>
3. Water Quality and Quantity	++/-/?	<p>One of the strategic objectives of the draft WSSP is to ensure a safe and reliable water supply and in this context, the strategies that comprise the draft WSSP are expected to increase the supply of water and improve its quality. The implementation of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and Regional Water Conservation Strategies, allied with commitments towards the sustainable management of water resources to achieve WFD water body objectives and compliance with the UWWTD, are in particular expected to increase the supply of water and reduce the risk of pollution to the aquatic environment. Taking into account the existing drinking water quality issues in Ireland combined with the non compliance against the UWWTD and risks around Combined Sewer Outflows (CSOs), these strategies have been assessed as having a significant positive effect on Water Quality and Quantity.</p> <p>A further strategic objective of the draft WSSP is to protect and enhance the environment and in this context, the strategies that underpin this objective are expected to have a significant effect on Water Quality and Quantity through improvements to the water body status required by regulations and reduced chemical discharges, plus adaptation to potential periods of low water flows which may help manage stresses on water resources. Furthermore, the management of key pollution sources such as wastewater discharges and agriculture through the catchment based approach, and improvements to wastewater treatment plant discharges also contribute to this significant positive effect.</p> <p>Construction works associated with infrastructure schemes arising from Tier 2 plans have the potential to cause contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to watercourses which will have a minor significant effect against this objective. However, this may be mitigated and result in a neutral effect against Water Quality and Quantity.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Water Quality and Quantity, although</p>

Strategic Environmental Objective	Score	Summary
		<p>it is recognised that the exact magnitude of both positive and negative effects on this SEO will depend to an extent on the number, type and location of future proposals which is currently unknown.</p>
4. Flood Risk	++	<p>The strategies that comprise the draft WSSP are expected to help minimise increases in flood risk due to sewer overflows across Ireland. In particular, specific measures to reduce flooding such as storm water separation to help maximise the existing capacity of Irish Water’s assets and the development of strategies for CSO management would have a positive effect on flood risk. Together with flood risk minimisation actions that would arise through actions to mitigate climate change (and therefore help reduce potential increases in future flood risk) and adaptation to the effects of climate change including the implementation of a Climate Change Adaptation and Mitigation Strategy, the cumulative effect could be significant. The location of future proposals for new infrastructure is currently unknown and in consequence, there is some uncertainty over the effect on catchment flood risk from new infrastructure at this stage. New infrastructure could be located in areas of flood risk and/or increase flood risk in catchments (for example, through any associated increase in impermeable areas resulting in increased surface water runoff). However, it is expected that proposals would be subject to flood risk assessment where necessary, such that effects on flooding could largely be avoided and would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water infrastructure to future flood risk. In this respect, the Climate Change Adaptation and Mitigation Strategy will assess the vulnerability of water services to climate change events and identify actions to modify Irish Water’s infrastructure or operations. In consequence, whilst there is some uncertainty of the effects, the mitigation measures proposed are considered adequate to ensure a positive effect will still occur.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a significant positive cumulative effect on Flood Risk.</p>
5. Air and Climatic Factors	++/-	<p>The strategies that comprise the draft WSSP are expected to help mitigate climate change and encourage adaptation to climate change. Some of the draft strategies specifically seek to reduce greenhouse gas emissions, including measures to increase energy efficiency such as more efficient operation of water infrastructure, the use of low energy wastewater treatment solutions, purchase of energy efficient products, the design of new capital projects for energy efficiency and the use of renewable energy sources including energy from sludge.</p> <p>Adaptation measures to respond to a changing climate include enhancement of the resilience of water supply and treatment infrastructure, development of a Sustainability Policy and Sustainability Framework which will include consideration of the changing climate and extreme weather events on water resources, and the implementation of a Climate Change Adaptation and Mitigation Strategy. New infrastructure proposals could also increase the resilience of Irish Water’s services to the effects of climate change through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies.</p> <p>With rising average temperatures and international commitments to reduce greenhouse gas emissions, Ireland has a role to play in helping to mitigate climate change. Although the exact scale of potential energy savings and reductions in greenhouse emissions are not known at this stage, these strategies as a whole should make a significant contribution to climate change mitigation and adaptation in the longer term.</p> <p>Construction activities and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions in the short term. Emissions to air are also likely to be associated with the use of plant and HGV movements during construction as well as the operation of new infrastructure such as water treatment works. As the scale and location of future infrastructure proposals that may be delivered is unknown, the potential impact on local air quality and extent of emissions to air is uncertain. However, minor negative effects may arise across the range of new and existing Irish Water operations.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Air and Climatic Factors.</p>
6. Water Management Infrastructure	++	<p>As noted above, the implementation of the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans, allied with commitments towards the sustainable management of water resources to achieve WFD water body objectives and compliance with the UWWTD, are in-turn expected to result in the upgrade of existing, and provision of new, water treatment and supply infrastructure,</p>

Strategic Environmental Objective	Score	Summary
		<p>helping to protect human health and the ecological status of water bodies through associated improvements to water quality. This will result in significant positive effects on Water Management Infrastructure.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a significant positive cumulative effect on Water Management Infrastructure, principally reflected by the anticipated upgrade, and provision of new, water supply and wastewater infrastructure.</p>
7. Water as an Economic Resource	++	<p>One of the strategic objectives of the draft WSSP concerns future investment and in this context, the strategies that comprise the draft WSSP are expected to have a significant positive effect on Water as an Economic Resource. The strategies that direct future investment in a way that results in maximum benefits to Irish Water's stakeholders, the environment and economic needs of the country recognises the imbalance between the need of investment and the available capital funding. The engagement with stakeholders, as well as the application of transparent investment prioritisation criteria is expected to contribute to determining the best use of the available financial resources, thus ensuring that the provision of water services is recognised and treated as an economic resource.</p> <p>The strategies that promote the affordability of water supplies are assessed as having a significant positive effect on Water as an Economic Resource. Proposals arising from the implementation of these strategies will result in a lower per unit cost of water which is to be achieved through improved asset management, rationalising water sources, standardising treatment processes and using high quality raw water sources and implementing water conservation strategies to address leakage.</p> <p>The strategies that comprise managing the existing wastewater resources and planning for new resources based on short, medium and long term sustainability and the implementation of strategies to cover discharge authorisation, headroom in treatment facilities, population growth and climate change will have a significant positive effect against Water as an Economic Resource. This is because Irish Water's infrastructure is necessary for the continued functioning of the country and for the delivery of essential water services which, if lost or impaired, would have a major detrimental impact on Ireland as a whole.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a significant positive cumulative effect on Water as an Economic Resource.</p>
8. Soil	+/-/?	<p>There is uncertainty around the cumulative effect on soils from the strategies contained in the draft WSSP, and mixed positive and negative effects may arise.</p> <p>Strategies that may contribute towards a positive effect on the appropriate management of soils include sludge management activities such as sludge application as a soil enhancer, and catchment management strategies to address existing pressures on soil quality including, for example, soil erosion.</p> <p>It is not known whether any potential infrastructure development as a result of the strategies would take place on greenfield or brownfield land. This would affect the future impact on soils. New infrastructure proposals could be located on greenfield sites of high agricultural land quality or peatland across Ireland, resulting in negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990. Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on soil management. However, the locations of proposals that may come forward as a result of the implementation of the strategies are unknown at this stage.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed minor positive and minor negative cumulative effect on Soil, with some uncertainty relating to the type of land use at future locations for new infrastructure.</p>
9. Cultural Heritage	?	<p>The enhancement of existing, and development of new, infrastructure arising from the implementation of the draft WSSP could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. With nearly 750 National Monuments, over 138,800 recorded archaeological monuments and approximately 39,400 Protected Structures across Ireland, it is possible that construction activities may be located in the vicinity of cultural heritage assets.</p> <p>However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish the type and magnitude of</p>

Strategic Environmental Objective	Score	Summary
		<p>effect. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of these plans/strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required). In this regard, Strategy EN1e of the draft WSSP seeks to ensure that all future Irish Water infrastructure meets national planning and environmental legislation which will include relevant legislation and planning policy concerning the protection of cultural heritage assets.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having an uncertain effect on Cultural Heritage as the nature of individual schemes and their locations are not known.</p>
10. Landscape	-/?	<p>The strategies that comprise the draft WSSP are expected to have a negative effect on landscape and/or visual amenity, arising from the construction and operational stages of proposals involving new infrastructure.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character, whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity. The magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals across Ireland as well as the landscape sensitivity of the receiving environments.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect longer term visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors. However, at the project stage landscape impacts would be considered as part the planning and EIA process (where required) to avoid significant effects. In this regard, Strategy EN1e of the draft WSSP seeks to ensure that all future Irish Water infrastructure meets national planning and environmental legislation which will include relevant legislation and planning policy concerning landscape. Notwithstanding, the future location of works is unknown at this stage and therefore effects on landscape and visual amenity are uncertain, but potentially negative.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a minor negative cumulative effect on Landscape, with some uncertainty arising from the locations of work and the sensitivity of receiving environments.</p>

Positive Effects

Overall, the assessment has identified that the implementation of the draft WSSP is likely to have either positive or significantly positive effects on the majority of the SEOs (although in some cases these are also accompanied by minor negative effects, which are outlined in the text below).

Significant positive effects are expected in respect of the following SEOs: Biodiversity; Population and Human Health; Water Quality and Quantity; Flood Risk; Air and Climatic Factor; Water Management Infrastructure; and Water as an Economic Resource. This principally reflects the emphasis of the draft WSSP aims and strategies on the sustainable management of water resources and the delivery of infrastructure to support the achievement of Water Framework Directive (WFD) water body objectives and compliance under the Urban Waste Water Treatment Directive.

Negative Effects

No significant negative effects have been identified during the assessment for any of the draft WSSP strategies assessed.

Minor negative effects on some SEOs are likely to arise as a result of the implementation of the plan. In this respect, the potential for negative effects has been identified in respect of SEOs relating to: Biodiversity; Population and Human Health; Water Quality and Quantity; Air and Climatic Factors; Soil; and Landscape (potential effects on Cultural Heritage are considered to be uncertain at this stage).

The upgrade of existing, and provision of new, infrastructure and services identified in Tier 2 plans is expected to generate long term environmental benefits. Similar to other types of development, construction of new infrastructure could also have short term and local adverse environmental effects due to, for example, land take, emissions to air, and disturbance. The probability and magnitude of effects is subject to the number, type, scale and location of future proposals as well as the sensitivity of the receiving environments which is currently unknown. Notwithstanding, it is expected that the potential for adverse environmental effects would be identified and, where possible, addressed during the preparation of Tier 2 plans and through the SEA and Appropriate Assessment process of the respective plans. Similarly, at the project stage, environmental impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) and Appropriate Assessment depending on the scale, location and nature of development proposed). A range of potential mitigation measures has also been identified during this assessment for consideration as part of the further refinement of the draft WSSP, in the preparation of Tier 2 plans or at the Tier 3 project stage which may help to reduce the potential for adverse effects.

Mitigation and Enhancement Measures

The SEA process has identified a range of additional measures to avoid or minimise potential negative effects and to enhance positive effects arising from the implementation of the WSSP. These measures, which are identified in the detailed assessment matrices contained in **Appendix D** and summarised in **Section 4.5** of the main Environmental Report, can be broadly categorised as:

- Measures that could be considered to enhance the performance of the draft WSSP (for example, amendments to strategy wording);
- Measures that could be considered in the development of proposals contained in Tier 2 plans to avoid adverse effects arising from, for example, the delivery of new infrastructure; and
- Measures that could be considered at the individual project stage (Tier 3) to avoid in particular adverse effects arising from the construction and operation of new infrastructure (although as the nature, scale and location of future activities is uncertain, it has not been possible to identify scheme-specific mitigation at this stage).

With the exception of the measure identified in **Table NTS6** below, all other mitigation measure relate to Tier 2 implementation plans and Tier 3 projects.

Table NTS6 Summary of Cross-Cutting Mitigation Measures Identified in Respect of the draft WSSP

Measure	Strategic Environmental Objective
Consider the inclusion of specific wording in the draft WSSP relating to the avoidance of adverse effects on biodiversity, human health, air quality, cultural heritage and landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP).	SEO 1: Biodiversity, Flora and Fauna SEO 2: Population and Human Health SEO 5: Air and Climatic Factors SEO 9: Cultural Heritage SEO 10: Landscape

The mitigation and enhancement measures identified through the SEA process will be considered alongside the findings of the Appropriate Assessment and consultation responses in preparing the Final WSSP.

Reasonable Alternatives to the Draft Water Services Strategic Plan

One alternative to the draft WSSP (as proposed) has been identified and assessed as part of this SEA (and is detailed in **Section 4.6** of the main Environmental Report). This alternative ('Successional WSSP') is based on the principle that the management of water services would continue with previous management practices with the retention of some 856 water treatment plants and investment on large capital works including major improvements at larger wastewater treatment plants. Similar to the draft WSSP (as proposed), the 'Successional WSSP' alternative would be expected to have minor negative effects across a number of the SEOs due to construction-related environmental effects.

The assessment of this alternative has revealed that whilst investment in large capital works would be expected to enhance water quality and drinking water supply in some areas (with associated benefits in terms of aquatic ecology and human health), these positive effects would not be uniform. Some areas of Ireland would continue to receive substandard drinking water supply whilst the status of some water bodies would not be improved. Further, the approach would restrict the potential for Irish Water to adopt a strategic approach to the management of its assets which could mean that investment, operational improvements and maintenance would not be targeted where greatest benefit would be delivered.

In consequence, the SEA determined that the Successional WSSP was not the preferred alternative from an environmental perspective. Detailed reasoning for the selection of the draft WSSP (as proposed) and the rejection of the Successional WSSP alternative is provided in **Section 4.7** of the main Environmental Report.

How will the Effects of Implementing the Draft Water Services Strategic Plan be Monitored?

Once the WSSP is implemented, its effects on the environment will need to be taken into account. Measures for monitoring the implementation of the WSSP will generally be taken from existing sources. The sources will be consistent with: the River Basin Management Plans and their associated SEAs; data which is monitored to comply with the WFD; and EPA drinking water quality monitoring data. The SEA monitoring programme will also be linked with any monitoring and reporting on implementation of the WSSP.

Monitoring the environmental effects of the WSSP can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Is the WSSP contributing to the achievement of the SEOs?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

Table NTS7 identifies a number of potential SEA indicators that could be used for monitoring the environmental effects of the WSSP for the SEOs considered in this SEA. Further information and specific details about the monitoring proposals for the effects of the WSSP on the SEOs will be presented in the Post Adoption SEA Statement (to be issued with the final WSSP), taking into account comments received during consultation on the draft WSSP and this SEA.

Table NTS7 Potential Indicators for Monitoring Effects

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities.	Halt spread of alien species and their associated impact to the aquatic environment. Halt deterioration of habitats or their associated species due to water quality related issues, in line with the Water Framework Directive.	Interim Indicators: Geographical spread of Alien Species. (NI and Ire) Number of Margaritifera Plans put in place. (Ire) Status of Northern Ireland Priority Species as reported in the UK Biodiversity Action Plan (every 3 years). (NI) Status of Northern Ireland Priority Habitats listed under the Northern Ireland Biodiversity Strategy (every 3 years). (NI) Long term Indicators: The Status of EU Protected Habitats and	Invasive Species (NPWS/NIEA) NPWS JNCC JNCC Not currently

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
	Maintenance of favourable conservation status for all habitats and species protected under national and international legislation to be unaffected by implementation of the WSSP.	<p>Species in Ireland (reports due every 6 years, first report in 2007). (Ire)</p> <p>Report by the UK under Article 17 on the implementation of the Habitats Directive (reports due every 6 years, second report in 2007). (NI)</p> <p>Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar and NHAs). (Ire)</p> <p>Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar, ASSIs) (reports every six years). (NI)</p>	<p>compiled</p> <p>NIEA</p> <p>NPWS</p> <p>NPWS</p>
2. Protect and reduce risk to human health in undertaking water services.	<p>All drinking water areas (including groundwater), as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All bathing waters, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All economic shellfish waters, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All water bodies designated for salmonids, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>Long term reduction in drinking water restriction notices.</p>	<p>Interim Indicators: Compliance with Drinking Water Standards. (Ire)</p> <p>Compliance with Bathing Water Standards. (Ire and NI)</p> <p>Compliance with the Shellfish Pollution Reduction Programmes (Ire and NI)</p> <p>Condition of salmonids in water bodies designated for these. (NI)</p> <p>Water quality in designated salmonid waters. (Ire)</p> <p>Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status. (Ire and NI)</p> <p>Notices in place for more than 200 days</p>	<p>EPA</p> <p>NIEA / EPA</p> <p>NIEA / EPA</p> <p>NIEA</p> <p>EPA</p> <p>NIEA / EPA</p> <p>Irish Water</p>

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive.</p>	<p>No deterioration in status of waters currently with high or good status (WFD Objective).</p> <p>Restoration to good status of waters currently at moderate, poor or bad status (WFD Objective).</p> <p>Progressively reduce chemical pollution in waters (WFD).</p> <p>Limit pollution inputs to groundwaters and prevent deterioration (WFD Objective).</p>	<p>Interim Indicators: Interim Water status in 2011 report. (Ire)</p> <p>Environmental Quality Statistics relating to water quality published in the Northern Ireland Environmental Statistics Report (to be published annually). (NI)</p> <p>Long Term Indicator: Water status in 2015 (and subsequent years) report. (NI and Ire)</p>	<p>EPA</p> <p>NISRA</p> <p>NIEA / EPA</p>
<p>4. Minimise increases in flood risk resulting from Irish Water's activities.</p>	<p>No increase in properties at risk from flooding as a result of Irish Water's activities.</p>	<p>Number of properties at risk of flooding from combined sewers.</p>	<p>Irish Water</p>
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change.</p>	<p>Minimise total emissions to air associated with wastewater collection, treatment and disposal.</p> <p>Minimise total emissions to air (including greenhouse gases) associated with drinking water abstraction, treatment and provision.</p> <p>Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary as set out in license for new or upgraded wastewater infrastructure.</p> <p>Improve energy efficiency</p>	<p>Amount of emissions to air associated with wastewater collection, treatment and disposal.</p> <p>Amount of emissions to air associated with drinking water abstraction, treatment and provision.</p> <p>Number of complaints received related to odour.</p>	<p>Irish Water</p> <p>Irish Water</p> <p>Irish Water</p>

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
	by 33% by 2020 (from the 2009 baseline).	% increase in overall energy efficiency at Irish Water facilities.	Irish Water
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies.	<p>Interim Target: Increase investment in water management infrastructure.</p> <p>Long Term Target: Full compliance with the requirements of the Urban Waste Water Treatment Directive and its associated regulations.</p>	<p>Interim Indicator: Water services investment expenditure per annum.</p> <p>Long Term Indicator: Number of exceedances of the standards contained in the Urban Waste Water Treatment Directive.</p>	<p>Irish Water</p> <p>EPA</p>
7. Protect water as an economic resource.	<p>Achieve sustainable use of water in the context of maintaining its economic benefit.</p> <p>Achieve a reduction in leakage.</p>	<p>Change in economic value of water relative to the baseline report 'The Economic Analysis of Water Use in Ireland'.</p> <p>Leakage as a % of water treated.</p>	<p>Economic studies carried out by the EPA as a part of the plan making process during the 2nd cycle of RBMP.</p> <p>Irish Water</p>
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils.	<p>Avoid conflicts with, and contribute towards, where possible, the appropriate management of peatlands as per the National Peatlands Strategy.</p> <p>Utilise previously developed (brownfield) land where possible.</p>	<p>Information from the NPWS on the management of Peatlands.</p> <p>Number/floorspace of water infrastructure built on previously developed land.</p>	<p>NPWS</p> <p>Irish Water</p>
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities.	No unauthorised physical damage or alteration of the context of cultural heritage features due to Irish Water activities.	<p>Changes in the condition of monuments on the Record of Monuments and Places due to Irish Water activities.</p> <p>Number of National Monuments and Protected Structures at risk due to WSSP implementation.</p>	<p>Archaeological Survey of Ireland Sites and Monuments Record</p> <p>Heritage Council Ireland/ Local</p>

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
			Authorities
10. Avoid damage to designated landscapes resulting from Irish Water's activities.	No damage to designated landscapes as a result of WSSP implementation.	Number of new wastewater / drinking water treatment plants sited in landscapes with a high sensitivity to change.	Irish Water/Local Authorities

What are the Next Steps in the SEA Process?

Following analysis of the comments made on the draft WSSP, this Environmental Report and the Natura Impact Statement, the final WSSP will be produced and issued to the Minister for approval. Once approved, the final WSSP will be published alongside a Post Adoption SEA Statement. The Post Adoption SEA Statement will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final WSSP.

This Consultation: Please Give Us Your Views

We would welcome your views on any aspect of this Environmental Report. We are particularly interested to receive your views on the following questions:

- (i) Do you think that the Environmental Report has identified the significant environmental effects of the draft WSSP? If not, what other significant effects do you think we have missed?
- (ii) Do you agree with the conclusions of the Environmental Report and the recommendations for avoiding, reducing or off-setting the significant effects of implementing the WSSP? If not, what do you think the key recommendations should be and why?
- (iii) Do you agree with the proposed arrangements for monitoring the significant effects of the WSSP, as detailed in the Environmental Report? If not, what measures do you propose?

Please provide comments on or before the 17th April 2015. Comments can be made:

By post to the address below:

Water Services Strategic Plan

P.O. Box 860

South City Delivery Office Cork City

Cork

Online: By clicking the following link <https://www.water.ie/projects-plans/our-plans/>

By e-mail: WSSP@water.ie

Contents

1.	Introduction	1
1.1	Purpose of this Report	1
1.2	Context	1
1.2.1	Irish Water	1
1.2.2	The Requirement for, and Scope of, the Water Services Strategic Plan	4
1.2.3	Development of the Water Services Strategic Plan	6
1.3	The Draft Water Services Strategic Plan	6
1.3.1	Strategic Objectives and Aims	7
1.3.2	Strategies	8
1.4	Strategic Environmental Assessment	11
1.4.1	Strategic Environmental Assessment and the Water Services Strategic Plan	11
1.4.2	Stages of Strategic Environmental Assessment	12
1.5	Reasonable Alternatives to the WSSP	14
1.5.1	Draft Scoping Report Reasonable Alternatives	14
1.5.2	No WSSP	15
1.5.3	Successional WSSP	15
1.5.4	Nationally Integrated WSSP	16
1.5.5	Beyond Compliance WSSP	16
1.5.6	Summary	17
1.6	Appropriate Assessment	17
1.7	Environmental Report Structure	18
1.8	Commenting on this Environmental Report	19
2.	Baseline and Context	21
2.1	Introduction	21
2.2	Review of Plans and Programmes	21
2.3	Baseline Information	25
2.4	Summary of the Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan	26
3.	Approach to the Assessment	28
3.1	Introduction	28
3.2	Scope of the Assessment	28

3.3	Assessment Framework	28
3.4	Assessment Methodology	35
3.4.1	Aims	35
3.4.2	Strategies	35
3.4.3	Assessment of Secondary, Cumulative and Synergistic Effects	39
3.4.4	Assessment of WSSP Alternatives	40
3.5	When the SEA was Undertaken and by Whom	40
3.6	Technical Difficulties	40
3.6.1	Uncertainties	40
3.6.2	Assumptions	40
4.	Assessment of Effects of the Draft Water Services Strategic Plan	42
4.1	Introduction	42
4.2	Assessment of the Strategic Objectives and Aims	42
4.3	Assessment of the Draft WSSP Strategies	46
4.3.1	Meet Customer Expectations	46
4.3.2	Ensure a Safe and Reliable Water Supply	46
4.3.3	Provide Effective Management of Wastewater	49
4.3.4	Protect and Enhance the Environment	51
4.3.5	Support Social and Economic Growth	54
4.3.6	Invest in Our Future	57
4.4	Secondary, Cumulative and Synergistic Effects	60
4.4.1	Cumulative Effects of the Draft WSSP	60
4.4.2	Cumulative Effects of the Draft WSSP in Combination with Other Plans and Programmes	65
4.5	Mitigation and Enhancement	73
4.6	Assessment of Reasonable Alternatives to the Draft Water Services Strategic Plan	75
4.7	Reasons for the Selection of the Preferred Option and Rejection of Reasonable Alternatives	80
5.	Conclusions, Monitoring and Next Steps	83
5.1	Summary of Environmental Effects of the Draft Water Services Strategic Plan	83
5.2	Proposals for Monitoring	83
5.3	Next Steps	88

Table 1.1	Draft WSSP Strategic Objectives and Aims	7
Table 1.2	Draft WSSP Strategies	8
Table 2.1	Plans and Programmes Reviewed for the SEA of the draft WSSP	21
Table 2.2	Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan	26
Table 3.1	WSSP Assessment Framework	30
Table 3.2	Scoring System Used in the Compatibility Assessment of Draft WSSP Aims	35
Table 3.3	Draft WSSP Strategies 'Screened Out' of Further Assessment	37
Table 3.4	Scoring System Used in the SEA of draft WSSP Strategies	39
Table 4.1	Assessment the draft WSSP Aims	42
Table 4.2	Effects of draft WSSP Strategies under Strategic Objective: Ensure a Safe and Reliable Water Supply (by Aim)	46
Table 4.3	Effects of draft WSSP Strategies under Strategic Objective: Provide Effective Management of Wastewater (by Aim)	49
Table 4.4	Effects of draft WSSP Strategies under Strategic Objective: Protect and Enhance the Environment (by Aim)	52
Table 4.5	Effects of draft WSSP Strategies under Strategic Objective: Support Social and Economic Growth (by Aim)	54
Table 4.6	Effects of draft WSSP Strategies under Strategic Objective: Invest in Our Future (by Aim)	57
Table 4.7	Cumulative Effects of the Draft WSSP	61
Table 4.8	Plans and Programmes with the Potential for In-Combination Effects with the draft WSSP	66
Table 4.9	Cross-Cutting Mitigation Measures	74
Table 4.10	Assessment of 'Successional WSSP' Alternative	76
Table 5.1	Potential Indicators for Monitoring Effects	84
Figure 1.1	Water Treatment Plants Operated by Irish Water	2
Figure 1.2	Wastewater Treatment Plants Operated by Irish Water	3
Figure 1.3	Relationship of the WSSP, Tier 2 Implementation Plans and Tier 3 Projects	5
Figure 1.4	Linking the SEA and the Water Services Strategic Plan	13
Figure 3.1	Assessment Matrix	38
Appendix A	Quality Assurance Checklist	
Appendix B	Review of Plans and Programmes	
Appendix C	Baseline Information	
Appendix D	Assessment Matrices	
Appendix E	Larger Urban Areas Not Meeting Urban Waste Water Treatment Directive Standards (2013)	

1. Introduction

1.1 Purpose of this Report

This Environmental Report has been prepared as part of the Strategic Environmental Assessment (SEA) of Irish Water's draft Water Services Strategic Plan (WSSP). It sets out how the SEA has been undertaken and presents the findings of the assessment of the aims and strategies contained in the draft WSSP as well as reasonable alternatives.

The Environmental Report complies with the requirements of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) as implemented in Ireland through Statutory Instrument (SI) No. 435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended). These regulations are a statutory requirement for plans or programmes which could have significant environmental effects, and the assessment process aims to identify where there are potential effects and how any negative effects might be mitigated. **Appendix A** indicates the location in this report of the relevant information required under these regulations.

The assessment and Environmental Report have been completed by Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler), under the management of Nicholas O'Dwyer Ltd., on behalf of Irish Water.

1.2 Context

1.2.1 Irish Water

Irish Water was incorporated in July 2013 under the Water Services (No. 2) Act of 2013 (the Water Services Act) and in January 2014 assumed responsibility for the provision of public water services from the local authorities. Irish Water has responsibility for the supply of drinking water to over 80% of the population and has taken over a large portfolio of assets including pumping stations, approximately 60,000 km of water pipelines, 25,000 km of wastewater pipelines, 856 water treatment plants (see **Figure 1.1**) and over 1,000 wastewater treatment plants (see **Figure 1.2**).

Irish Water is regulated by both the Commission for Energy Regulation (CER) for economic matters and the Environmental Protection Agency (EPA) for environmental matters.

Figure 1.1 Water Treatment Plants Operated by Irish Water

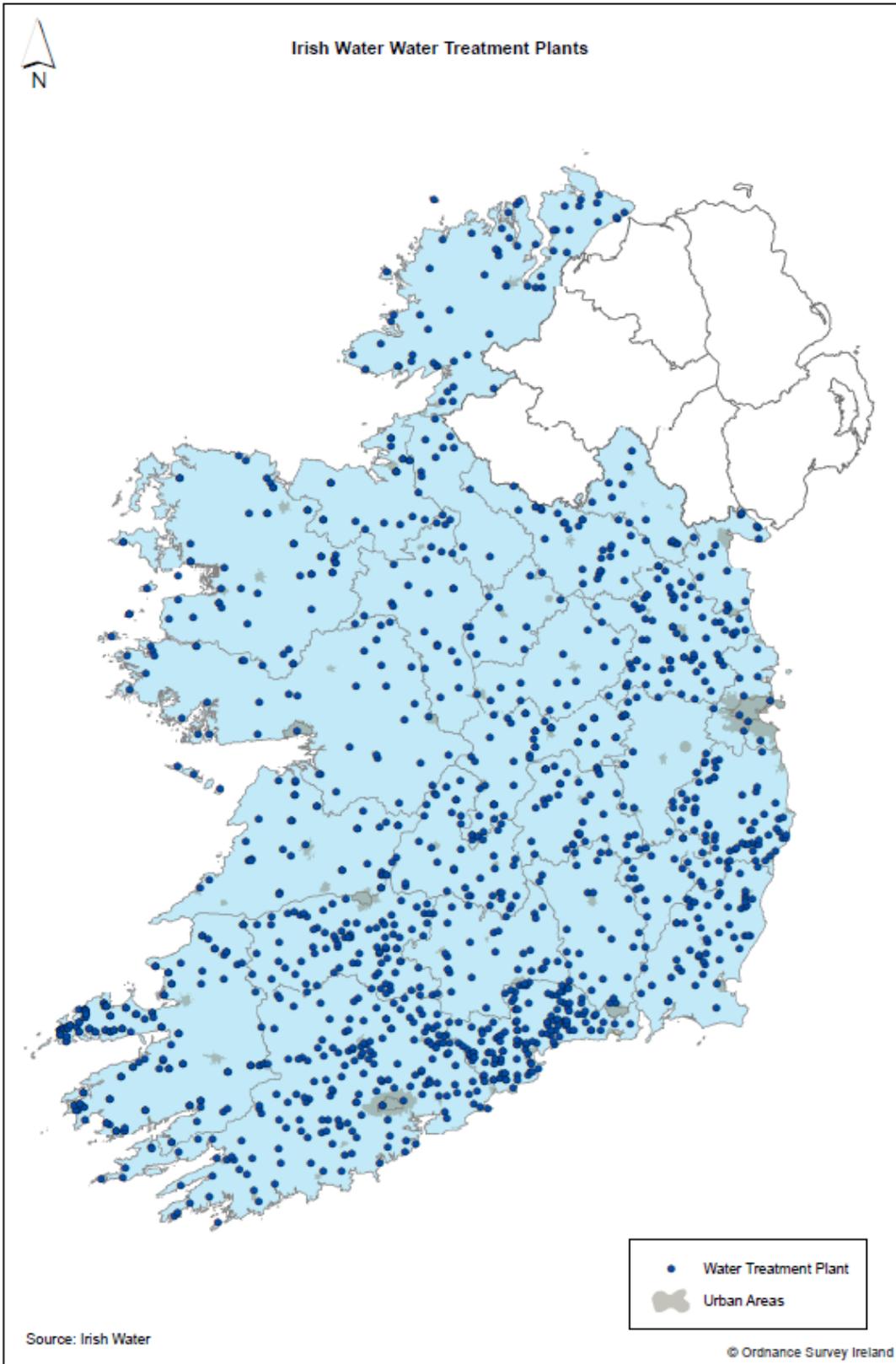
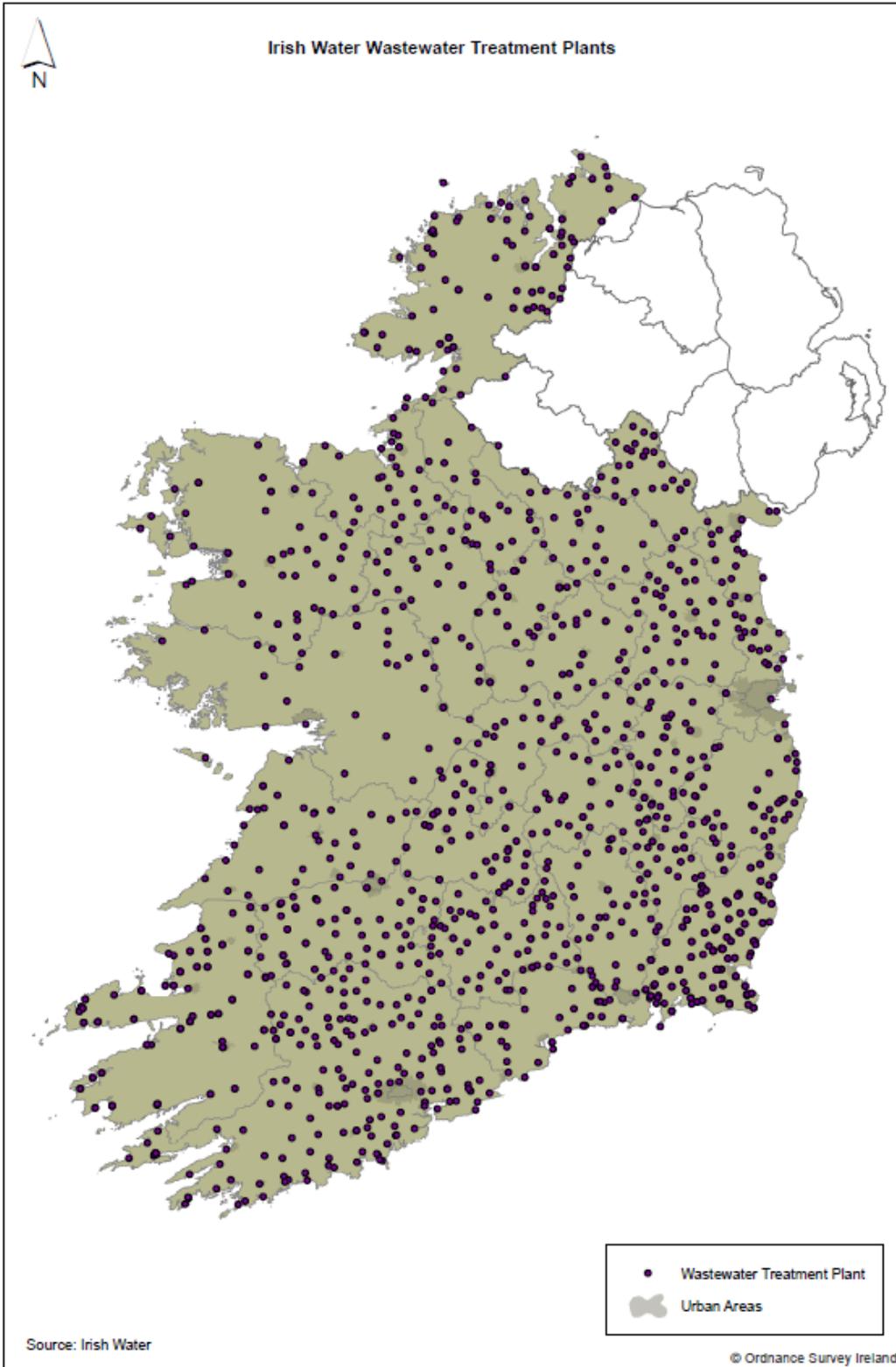


Figure 1.2 Wastewater Treatment Plants Operated by Irish Water



1.2.2 The Requirement for, and Scope of, the Water Services Strategic Plan

Section 33 of the Water Services Act requires Irish Water to prepare a WSSP that sets out the objectives of Irish Water over a 25 year period following its approval by the Minister. Under Section 33 of the Water Services Act, aspects of water services which Irish Water must address in the WSSP in respect of objectives and strategies are identified as follows:

- Drinking water quality;
- Prevention or abatement of risk to human health or environment relating to the provision of water services;
- Existing and projected demand for water services;
- Existing and planned arrangements for provisions of water services;
- Existing and reasonably foreseeable deficiencies in the provision of water services;
- Existing and planned water conservation measures; and
- Management of the property of Irish Water.

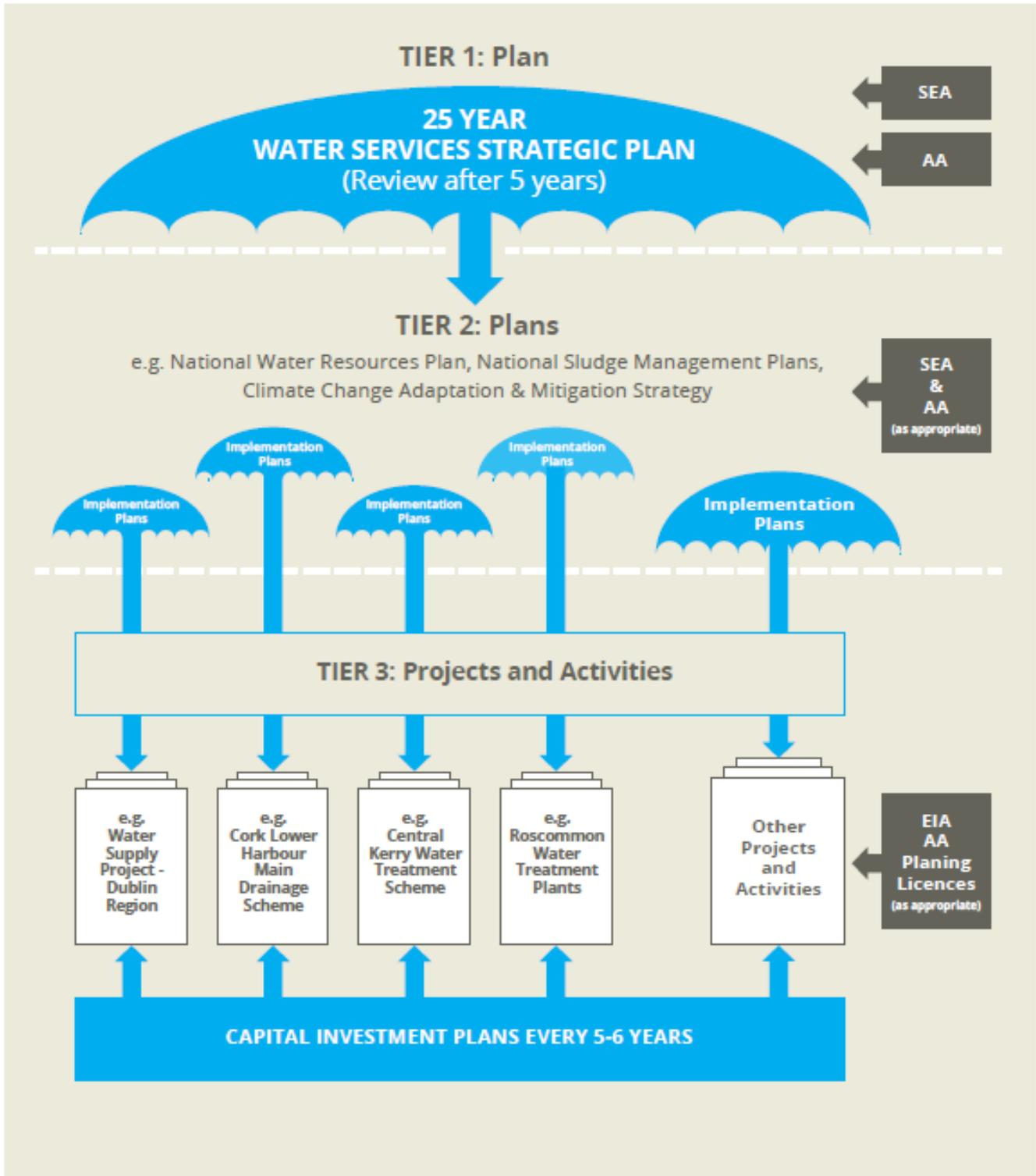
Once approved by the Minister of the Environment Community and Local Government (the Minister), the WSSP will be an overarching strategy for Irish Water, providing the context for all of the plans that are required to meet legislative needs and to manage a modern water utility. **Figure 1.3** shows the relationships between the WSSP (Tier 1), the specific strategies, plans and assessments at Tier 2 and projects at Tier 3.

The WSSP is at the highest tier (Tier 1) of water services planning and is intended to outline Irish Water's high level strategies for providing water services that meet environmental compliance commitments. In this context, it is not the purpose of the WSSP to identify spatially specific projects. The implementation of the strategies identified in the WSSP will be detailed in a number of Implementation Plans (Tier 2) which will be prepared by Irish Water following the approval of the WSSP. These Implementation Plans will include, for example, a National Water Resources Plan, Wastewater Compliance Strategy, National Sludge Management Plan, and a Climate Change Adaptation and Mitigation Strategy (note this list is not exhaustive and titles of plans may change) and each plan or strategy will be subject to environmental assessment (SEA and Appropriate Assessment (AA) as appropriate).

At Tier 3 of the hierarchy, the projects and activities required to implement the strategies outlined in the WSSP and detailed in the Implementation Plans will be identified and developed and will be subject to all appropriate Environmental Impact Assessment (EIA), planning, licensing and permitting processes.

Periodically, Irish Water will produce Capital Investment Plans which set out the detail of the investment required for its infrastructure and the details of projects it intends to carry out. In addition, capital maintenance will be carried out to replace or refurbish existing equipment that is either failing, at risk of failing or whose condition represents an unacceptable risk to the provision of water services to customers.

Figure 1.3 Relationship of the WSSP, Tier 2 Implementation Plans and Tier 3 Projects



1.2.3 Development of the Water Services Strategic Plan

The preparation of the WSSP comprises seven key stages, as follows:

- **Stage 1:** Identification of key WSSP issues and objectives;
- **Stage 2:** Consultation on WSSP Issues Paper;
- **Stage 3:** Development of WSSP aims and strategies;
- **Stage 4:** Preparing the Draft WSSP;
- **Stage 5:** Consultation on the Draft WSSP;
- **Stage 6:** Consideration of responses to the Draft WSSP; and
- **Stage 7:** Preparing the Final WSSP and Minister approval.

Work on the WSSP began in early 2014 and included the identification of key objectives and issues through initial consultation with key stakeholders (**Stage 1**). This culminated in the publication of the WSSP Issues Paper in July 2014 which was consulted on for a period of five weeks (**Stage 2**). The WSSP Issues Paper set out Irish Water's vision for future water service provision together with draft key objectives and key challenges associated with their delivery.

Responses to the WSSP Issues Paper were recorded in an Evaluation Report and informed the development of WSSP aims and strategies (**Stage 3**). These are set out in the draft WSSP (**Stage 4**). The draft WSSP, to which this Environmental Report relates, is subject to consultation between 19th February 2015 and the 17th April 2015 (**Stage 5**). Responses to the consultation will be considered (**Stage 6**) and the final WSSP will be issued to the Minister for approval (**Stage 7**).

The WSSP will be reviewed at least every five years to ensure that it is appropriate and updated as necessary thereafter. An interim review is also planned to ensure alignment between the WSSP, the new National Spatial Strategy (National Planning Framework), Regional Spatial and Economic Strategies and River Basin Management Plans which will be developed in the next few years.

1.3 The Draft Water Services Strategic Plan

The draft WSSP comprises the following core components:

- Strategic Objectives and Aims; and
- Strategies to achieve the aims and objectives.

Each component of the draft WSSP is discussed in-turn below.

1.3.1 Strategic Objectives and Aims

Irish Water’s vision for water services in the future is that:

“Through responsible stewardship, efficient management and strong partnerships, Ireland has a world-class water infrastructure that ensures secure and sustainable water services, essential for our health, our communities, the economy and the environment.”

To achieve Irish Water’s vision for future water services, the draft WSSP sets out six strategic objectives which in turn are underpinned by a series of aims relevant to the various aspects of water services identified in the Water Services Act. The strategic objectives and associated aims are set out in **Table 1.1**.

Table 1.1 Draft WSSP Strategic Objectives and Aims

Strategic Objective	Aim
Meet Customer Expectations	<ul style="list-style-type: none"> CE1: Establish both customer trust and a reputation for excellent service.
Ensure a Safe and Reliable Water Supply	<ul style="list-style-type: none"> WS1: Manage the quality of drinking water from source to tap to protect human health. WS2: Manage the availability and reliability of water supply now and into the future. WS3: Manage the affordability of water supplies.
Provide Effective Management of Wastewater	<ul style="list-style-type: none"> WW1: Manage the operation of wastewater facilities in a manner that protects environmental quality. WW2: Manage the availability and resilience of wastewater services now and into the future. WW3: Manage the affordability and reliability of wastewater services.
Protect and Enhance the Environment	<ul style="list-style-type: none"> EN1: Ensure that Irish Water services are delivered in a sustainable manner that contributes to the protection of the environment. EN2: Operate our water services infrastructure to support the achievement of water body objectives under the Water Framework Directive. EN3: Manage all our residual waste in a sustainable manner.
Support Social and Economic Growth	<ul style="list-style-type: none"> SG1: Support national, regional and local economic and spatial planning policy. SG2: Facilitate growth in line with national and regional economic and spatial planning policy. SG3: Ensure that water services are provided in a timely and cost effective manner.
Invest in Our Future	<ul style="list-style-type: none"> IF1: Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost. IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country. IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes. IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

1.3.2 Strategies

In support of each strategic objective and aim, the draft WSSP sets out a series of strategies. A total of sixty eight strategies are included across the following chapters:

- Meet Customer Expectations: which contains six strategies;
- Ensure a Safe and Reliable Water Supply: which contains seventeen strategies;
- Provide Effective Management of Wastewater: which contains fourteen strategies;
- Protect and Enhance the Environment: which contains ten strategies;
- Support Social and Economic Growth: which contains nine strategies; and
- Invest in Our Future: which contains twelve strategies.

Table 1.2 lists the strategies of the draft WSSP by aim.

Table 1.2 Draft WSSP Strategies

Aim	Strategy
Meet Customer Expectations	
Aim CE1: Establish both Customer Trust and a Reputation for Excellent Service.	<ul style="list-style-type: none"> • CE1a: Create and operate a lean and effective Customer Operation. • CE1b: Build and maintain accurate customer databases. • CE1c: Establish sustainable customer revenue. • CE1d: Establish effective communication channels with customers. • CE1e: Establish national customer service standards and robust customer protection measures. • CE1f: Fully support the work of the Public Water Forum.
Ensure a Safe and Reliable Water Supply	
Aim WS1: Manage the quality of drinking water from source to tap to protect human health.	<ul style="list-style-type: none"> • WS1a: Prepare a National Water Resources Plan and implement on a phased basis. • WS1b: Prepare and implement Drinking Water Safety Plans for all Water Supply Zones. • WS1c: Implement Standard Operational Procedures for all water treatment plants, water storage facilities and distribution networks. • WS1d: Develop and Implement Capital Investment Plans to improve Drinking Water Quality. • WS1e: Prepare and implement a "Lead Compliance Strategy". • WS1f: Prepare and implement strategies to manage other quality issues in water supplies.
Aim WS 2: Manage the availability and reliability of water supply now and into the future.	<ul style="list-style-type: none"> • WS2a: Implement risk assessments for all water supply areas in terms of short, medium and long term risks to customer supply. • WS2b: Manage existing water resources and plan for new resources taking a regional view of needs and having regard to the objectives of the Water Framework Directive (WFD). • WS2c: Develop long-term sustainable water sources with resilience to climate change. • WS2d: Develop methodologies to build strategic resilience and network connectivity into resource planning. • WS2e: Manage future regulatory requirements for abstraction licensing, headroom in treatment

Aim	Strategy
Aim WS3: Manage the affordability of water supplies.	facilities and population growth. <ul style="list-style-type: none"> • WS2f: Match water abstraction to availability and quality using surface water and groundwater sources. This is known as Conjunctive Use. • WS2g: Prepare Regional Water Conservation Strategies and implement on a phased basis. • WS3a: Adopt an asset management based approach to capital maintenance and capital investment. • WS3b: Optimise the unit cost of water supply through proper water resource and treatment planning. • WS3c: Prepare and implement water conservation strategies including demand management. • WS3d: Optimise capital and operational investments in water supply.
Provide Effective Management of Wastewater	
Aim WW1: Manage the operation of wastewater facilities in a manner that protects environmental quality.	<ul style="list-style-type: none"> • WW1a: Prepare and implement a Wastewater Compliance Strategy. • WW1b: Produce appropriate guidance documentation and Standard Operating Procedures. • WW1c: Develop and implement Capital Investment Plans on a prioritised basis to progressively achieve compliance. • WW1d: Manage the wider potential environmental impacts associated with the construction and operation of wastewater systems.
Aim WW2: Manage the availability and resilience of wastewater services now and into the future.	<ul style="list-style-type: none"> • WW2a: Implement risk assessments for all agglomerations in terms of short, medium and long term risks to customer service. • WW2b: Manage existing wastewater assets and plan for new assets based on short, medium and long term sustainability. • WW2c: Identify properties at risk of flooding from combined sewers, and implement measures to reduce risk on a phased basis. • WW2d: Identify and manage critical wastewater assets.
Aim WW3: Manage the Affordability and Reliability of Wastewater Services.	<ul style="list-style-type: none"> • WW3a: Adopt an asset management based approach to capital maintenance and capital investment. • WW3b: Develop and implement strategies and standards to minimise the unit costs of wastewater treatment including standardising treatment processes. • WW3c: Optimise energy consumption in wastewater treatment plants and collection systems. • WW3d: Ensure adequate governance and control of discharges to the sewer network, having regard for best practice and value. • WW3e: Engage with regulators and stakeholders. • WW3f: Optimise capital and operational investments in wastewater services.
Protect and Enhance the Environment	
Aim EN1: Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment.	<ul style="list-style-type: none"> • EN1a: Implement a Sustainability Policy and Sustainability Framework. • EN1b: Prepare and implement a Sustainable Energy Strategy. • EN1c: Prepare and implement a Climate Change Adaptation and Mitigation Strategy. • EN1d: Adopt a Green Procurement Approach and drive efficient use of all our resources. • EN1e: Adhere to environmental and planning legislation when planning and developing water services assets.
Aim EN2: Operate our water services infrastructure to support the achievement of water body objectives under the Water Framework Directive.	<ul style="list-style-type: none"> • EN2a: Work effectively with other stakeholders to support a catchment based approach. • EN2b: Manage the operation of our water and wastewater infrastructure towards the achievement of water body objectives.
Aim EN3: Manage all our Residual Waste in a Sustainable Manner.	<ul style="list-style-type: none"> • EN3a: Develop and implement a Corporate Waste Management Strategy. • EN3b: Develop and implement a National Wastewater Sludge Management Plan.

Aim	Strategy
	<ul style="list-style-type: none"> EN3c: Develop and implement a National Water Sludge Management Plan.
Support Social and Economic Growth	
<p>Aim SG1: Support National, Regional and Local Economic and Spatial Planning Policy.</p>	<ul style="list-style-type: none"> SG1a: Work with national, regional and local bodies and potential customers to anticipate and plan water services for growth in line with the statutory planning process.
<p>Aim SG2: Facilitate growth in line with national and regional economic and spatial planning policy.</p>	<ul style="list-style-type: none"> SG2a: Maximise capacity of existing assets through effective asset management and optimised operation. SG2b: Plan water service infrastructure at national, regional and river basin level. SG2c: Invest in the development of strategic networks and treatment works. SG2d: Maintain appropriate headroom in strategic water services infrastructure. SG2e: Provide a high quality customer service for new customers.
<p>Aim SG3: Ensure that water services are provided in a timely and cost effective manner.</p>	<ul style="list-style-type: none"> SG3a: Plan for water services infrastructure development to meet projected demand facilitating delivery on a phased basis. SG3b: Balance investment for growth in demand with affordability. SG3c: Operate an equitable New Connections Charging Policy that ensures efficient service provision to new customers with full cost recovery on a least cost basis.
Invest in Our Future	
<p>Aim IF1: Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.</p>	<ul style="list-style-type: none"> IF1a: Implement asset management systems including comprehensive asset data collection and modelling tools. IF2b: Develop long term asset strategies and implementation plans (Tier 2 Plans). IF2c: Development of initiatives such as asset standards and improved supply chain management.
<p>Aim IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.</p>	<ul style="list-style-type: none"> IF2a: Engage with our customers, including households, commercial and industrial customers. IF2b: Engage collaboratively with key stakeholders including CER, EPA, DECLG, HSE regional and local authorities. IF2c: Apply clear and transparent investment prioritisation criteria.
<p>Aim IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.</p>	<ul style="list-style-type: none"> IF3a: Transform the water industry in Ireland to an efficient water utility model within a regulated framework. IF3b: Work with regulators to achieve optimum balance of affordability and service standards taking into account regulatory requirements. IF3c: Deliver on Irish Water's commitments to raise public awareness of the value of water and achievements delivered.
<p>Aim IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.</p>	<ul style="list-style-type: none"> IF4a: Actively pursue research and development in water services and track opportunities to develop and adopt new technologies. IF4b: Engage effectively with universities, Institutes of Further Education, colleges and industry. IF4c: Develop knowledge management capability and implementation processes.

1.4 Strategic Environmental Assessment

SEA became a statutory requirement for certain plans and programmes following the adoption of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive). This was transposed into Irish law through Statutory Instrument (SI) No. 435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended) and the Planning and Development (SEA) Regulations 2004 (SI No. 436 of 2004) which became operational on 21 July 2004. SI No. 435 of 2004 relates to sectors including water management and was amended by the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 (SI No. 200 of 2011). Collectively, this legislation is referred to as the ‘SEA Regulations’ for the purposes of this report.

The objective of the SEA Directive is *‘to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view of contributing towards sustainable development’*.

Throughout the course of the development of plans, policies or programmes, the aim of SEA is to identify the potential impact of options proposed in terms of their environmental effects. If any adverse effects are identified, these options can then be avoided or proposals modified to manage or mitigate adverse effects.

1.4.1 Strategic Environmental Assessment and the Water Services Strategic Plan

The SEA Directive requires *‘an environmental assessment ... of certain plans and programmes which are likely to have significant effects on the environment’* (Article 1). Plans and programmes are defined as those:

- *‘which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government; and*
- *which are required by legislative, regulatory or administrative provisions’ (Article 2(a)).*

As noted previously, the preparation of a WSSP is a statutory requirement and is being prepared by a semi-state company. It is therefore considered to meet the requirements of Article 2(a) of the SEA Directive.

Plans and programmes that may have significant effects on the environment are identified as those:

- *‘which are prepared for... water management... and which set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC [the Environmental Impact Assessment Directive]; or*
- *which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/EEC [the Habitats Directive]’ (Article 3, paragraph 2(a)).*

The WSSP concerns the management of water and Irish Water, as the competent authority who is responsible for preparing the WSSP and undertaking the SEA, has determined that the implementation of the WSSP would have the potential, if unmitigated, to result in significant environmental effects, including on European sites and has accordingly commenced the preparation of the SEA (and Appropriate Assessment (AA) under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna).

1.4.2 Stages of Strategic Environmental Assessment

SEA has a number of stages:

- **Stage A:** Scoping the assessment;
- **Stage B:** Assessing the effects of the plan or programme and reasonable alternatives;
- **Stage C:** Reporting the findings of the assessment;
- **Stage D:** Consultation on the draft plan or programme and the accompanying Environmental Report; and
- **Stage E:** Monitoring of the Implementation of the plan or programme.

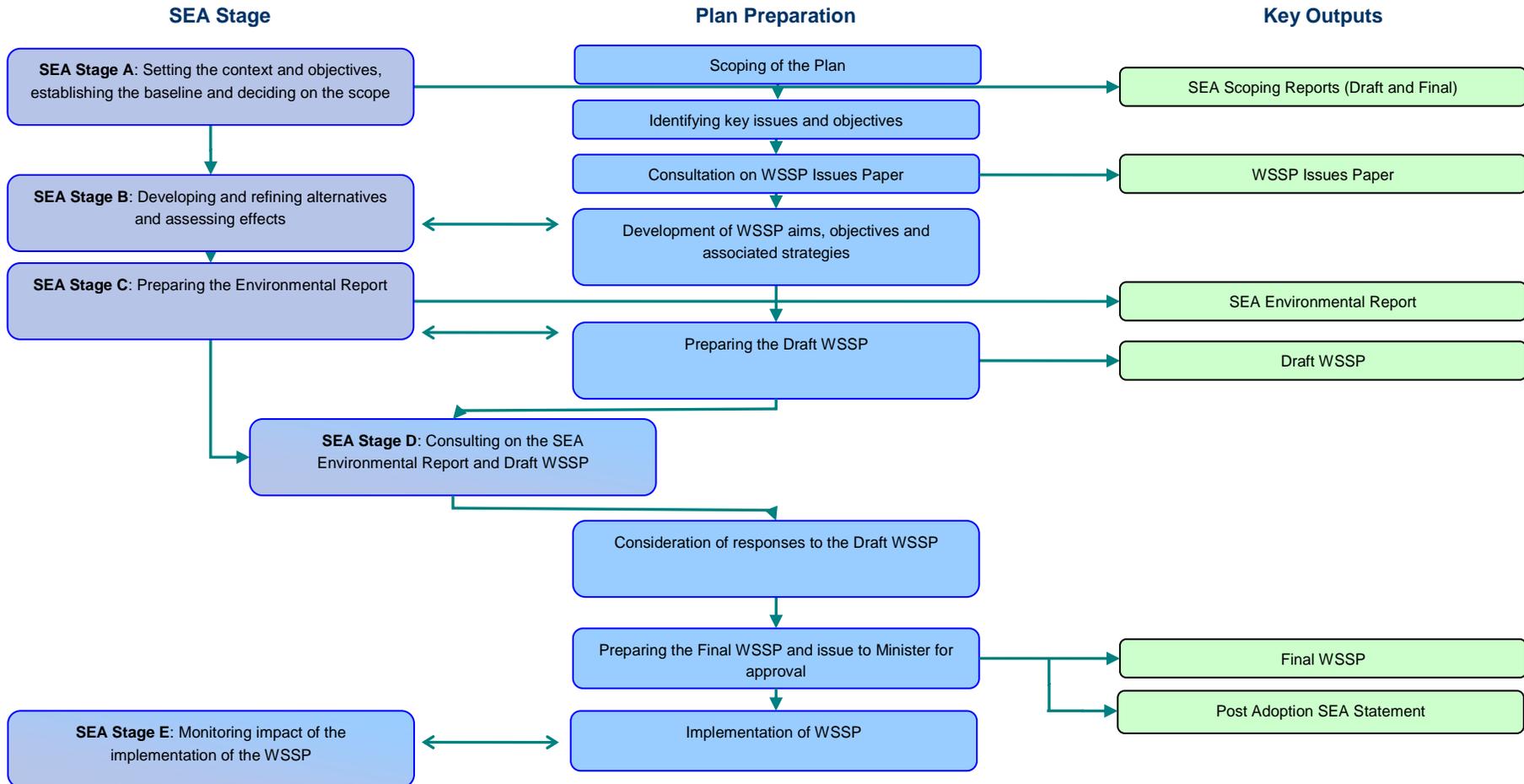
Stage A comprises the preparation of a Scoping Report. This reviews plans and programmes that could affect the WSSP or be affected by it, outlines baseline information and sets out the proposed framework for assessing potential environmental effects. A consultation on the proposed scope of the assessment was held with the SEA statutory consultees in May 2014. Subsequently, a Draft Scoping Report was prepared and consulted on alongside the WSSP Issues Paper for a five week period between July and September 2014. Following this consultation, an addendum was prepared which set out a revised framework for assessing the environmental effects of the draft WSSP and this framework has been used in this report. The Draft Scoping Report and addendum together formed the Final Scoping Report for the purposes of the SEA of the WSSP.

The draft WSSP has been subject to assessment using the framework for assessing the environmental effects (**Stage B**) and the findings are presented in this SEA Environmental Report (**Stage C**). The Environmental Report is now being consulted on alongside the draft WSSP (**Stage D**) and Natura Impact Statement.

Following consultation on the draft WSSP and taking into account the responses received, the final WSSP will be issued to the Minister for approval before being published together with a Post Adoption SEA Statement. The Post Adoption SEA Statement will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final WSSP. The SEA Directive then requires any resultant environmental effects of the WSSP to be monitored (**Stage E**).

The processes and interrelationships between SEA and the WSSP are shown in **Figure 1.4**.

Figure 1.4 Linking the SEA and the Water Services Strategic Plan



1.5 Reasonable Alternatives to the WSSP

As part of the SEA process, environmental reports are required to present specific information concerning reasonable alternatives to the plan or programme. Article 5 (1) of the SEA Directive 2001/42/EC requires that “*an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated*”. Information to be provided includes “an outline of the reasons for selecting the alternatives dealt with” (Annex I (h)).

The European Commission guidance on the SEA Directive discusses possible interpretations of handling ‘reasonable alternatives’ as required by Article 5(1). It states that “*The alternatives chosen should be realistic. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme*”.

The development of reasonable alternatives to the WSSP has been an iterative and consultative process, drawing on the views of consultees through the scoping stage. The results of this are presented below.

1.5.1 Draft Scoping Report Reasonable Alternatives

The Draft Scoping Report (July 2014) suggested the following provisional categories of alternatives for the WSSP:

1. The type of overall strategy: which proposed an asset centred strategy and holistic approach;
2. Drinking water: which proposed an emphasis on one of the following three, water supply, leakage management or demand management; and
3. Wastewater: which proposed considering issues concerning management, treatment and loading of the wastewater system.

In addition to these alternatives, it was proposed that a ‘do-minimum’ alternative would also be considered for the WSSP, within the parameters of the legislation.

When reflecting further on the alternatives considered in the Draft Scoping Report, however, there were a number of concerns raised that have meant that the above alternatives have been taken forward in a modified form and these are presented in the paragraphs below. In part, this reflects the natural refinement of proposals as part of the iterative process of the development of the WSSP. The integrated approach to catchment management proposed as part of the ‘holistic’ reasonable alternative has been included within the preferred option for the WSSP. Its inclusion is consistent with the requirements of the Water Framework Directive (Directive 2000/60/EC) and with best practice and will lead to more sustainable outcomes. Alternatives proposed under the heading of water supply and water treatment: supply management, leakage management and demand management all need to be implemented optimally to produce a safe, reliable and sustainable water supply. Finally, the aspects of wastewater treatment proposed in the Draft Scoping Report suggested differing approaches without clear articulation of the

options. In hindsight, there appears to be overlap of the suggested options that means they have not been taken forward for further consideration.

Responses to the scoping consultation and further consideration by Irish Water suggested that a number of additional alternatives could be considered. These are:

- Do Nothing: not to have a WSSP at all;
- Successional WSSP: with investment decisions guided by current criteria focusing on provision of water services along Local Authority boundaries without reference to catchment or national need for prioritisation;
- Nationally Integrated WSSP: national based approach, incorporating water supply zone rationalisation and management, integrated catchment based and risk based prioritisation to asset management and investment; and
- Going Beyond Compliance.

Each alternative is discussed below in regard to its reasonableness.

1.5.2 No WSSP

The ‘Do Nothing’ option is a common alternative considered within many SEAs as it provides the most straight forward contrast to proposals. However, in this instance, the production and adoption of the WSSP is a requirement under Section 33 of the Water Services Act and therefore, for this assessment, the do nothing alternative is not a reasonable alternative. In addition, Irish Water will still be required to make investments and improvements in the water supply and wastewater treatment and networks in order to meet the requirements of the European Union (Drinking Water) Regulations 2014, the Urban Waste Water Treatment Directive (91/271/EEC) and the Water Framework Directive (2000/60/EC). In consequence, **do nothing, either in terms of not having a WSSP or in terms of not making any further investment in water services, are not reasonable, credible or realistic alternatives and so have not been taken forward in this assessment.**

1.5.3 Successional WSSP

Irish Water is subject to statutory commitments regarding water resources, water quality and wastewater treatment. This reasonable alternative provides a response to this based on the principle that the management of the water services will continue with previous management practices, so:

- Regarding water supply, the service will continue as is in terms of planning for and providing water supply. This will include the retention of the existing 856 water treatment plants with many abstracting from small vulnerable sources.
- Regarding wastewater treatment, the service will continue to support major improvements at larger plants to ensure full compliance. Combined Sewer Outflows (CSOs) will continue to be managed on a responsive basis.

Investment will be on large capital works, generally to achieve full compliance and catering for future projected growth/demand. The approach builds on the local contextual knowledge and experience gained over many years. **A ‘Successional WSSP’ is consistent with current approaches and methods of delivery, is compliant with existing statutory commitments and is considered a reasonable alternative for the WSSP and so has been taken forward for assessment.**

1.5.4 Nationally Integrated WSSP

The development of the WSSP presents a significant opportunity to plan for water services at the national level, looking to take advantage of the potential to integrate between areas of service provision. This would include:

- Planning for water supply on a national, regional and river basin level in order to build resilience in networks. It would also include developing a national network of Water Supply Zones, delivering water from large, resilient and sustainable water sources, which may also involve bulk transfers between zones. In order to increase efficiency, it is envisaged that a national programme of water conservation to reduce leakage and encourage demand management would be effected.
- Developing long term plans for wastewater treatment, focusing on improving operation and maintenance of existing assets to ensure compliance and looking to prioritise future investment. A national strategy for managing CSOs would be developed which would include climate change adaptation and promoting removal/separation of surface water from foul sewers.

Investment would be targeted and prioritised at a national level based on risk assessment to water supply and incremental approach to compliance. The approach looks to build on the opportunity to develop an integrated, coherent and sustainable approach to water services, with the national perspective providing clear strategic direction. **A ‘Nationally Integrated WSSP’ is compliant with existing statutory commitments and is the preferred option for the WSSP and so will be taken forward for assessment.**

1.5.5 Beyond Compliance WSSP

The development of the WSSP presents Irish Water with an opportunity to make a step change in the performance of its water services (which is acknowledged in the ‘nationally integrated’ alternative). However, the WSSP could be used for transformational purposes to improve the quality of water supply, water quality and water treatment not merely to meet statutory and regulatory standards but to take them beyond those current standards. It would also involve Irish Water looking to improve water quality in areas where there are no standards (such as aesthetics), where voluntary initiatives would be employed (in terms of reducing water per capita demand) and where low carbon solutions would be given priority. In so doing, Irish Water would seek to become the leading performer on an international basis for the provision of water services.

However, such an approach to the WSSP requires significant, early and sustained investment which may not be reconciled with the Commission for Energy Regulation (CER) focus on ensuring that the costs of providing water services to customers are affordable. To achieve the aims of the ‘beyond compliance’ alternative also requires information that has not yet been collected (regarding the status of assets and water quality) and so its achievement would be constrained by the need to gather and complete such monitoring. In the absence of such information,

Irish Water may then be forced to make sub-optimal decisions regarding investment, which again suggests concerns with regard to ensuring that costs to consumers are affordable. Irish Water, as a new entity, also recognises that it needs to demonstrate credibility in all its proposals for the delivery of its services. Commitments to go beyond compliance so early after its formation, whilst laudable, are unlikely to be viewed as realistic by many stakeholders. **In consequence, ‘Beyond Compliance WSSP’ is not viewed as a reasonable or realistic alternative at this stage, and is not taken forward for further assessment;** however, it is seen as a medium term goal, that could be considered again, once Irish Water has delivered on the first 5 years of the WSSP.

1.5.6 Summary

Following the application of the reasonableness test in compliance with Article 5(1) of the SEA Directive, the following preferred option and reasonable alternative have been taken forward for assessment within the SEA:

- Successional WSSP; and
- Nationally Integrated WSSP.

Each has been assessed using the approach outlined in **Section 3**. The results of the assessment are presented in **Section 4**.

1.6 Appropriate Assessment

In recognition of the potential effects on European sites¹, Irish Water has also undertaken an Appropriate Assessment (AA) under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna, enacted through the Republic of Ireland (ROI) by the European Communities (Birds and Natural Habitats) Regulations 2011.

AA comprises up to four stages:

- **Stage 1:** Screening for AA;
- **Stage 2:** AA;
- **Stage 3:** Assessment of Alternative Solutions;
- **Stage 4:** Assessment of Imperative Reasons of Overriding Public Interest (IROPI).

AA screening of the emerging WSSP was undertaken by AoS Planning on behalf of Irish Water in June 2014. The Appropriate Assessment Screening Report concluded that the WSSP:

¹ European Site is any classified Special Protected Area (SPA) and any Special Area of Conservation (SAC) from the point where the Commission and the Government agree the site as a Site of Community Importance. SPAs and SACs have been created under the EC Birds Directive and Habitats Directive. In Ireland they form part of a larger European network called Natura 2000. AA is also required, as a matter of Government policy, for proposed SPAs (pSPAs) and candidate SACs (cSACs). As such, pSPAs and cSACs must also be considered by any AA. Within this report “European site” is used as a generic term for all of the above designated sites.

- i. Is not directly connected with or necessary to the management of a European site; and
- ii. May have significant impacts on the Natura 2000 network.

Therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, a Stage 2 AA has been undertaken.

The findings of the AA are reported in a Natura Impact Statement² that has also been published alongside the draft WSSP for consultation. Most of the strategies either could not be assessed at this stage in the planning hierarchy or would have ‘no effect’ (as opposed to no significant effect) due to the absence of impact pathways.

Where there is uncertainty over the ultimate outcomes, avoidance measures have been proposed to ensure that these would not occur as a consequence of the WSSP’s implementation, although it will remain necessary to undertake Appropriate Assessment on the lower-tier Implementation Plans and projects (Tier 2 and Tier 3, respectively) as these are developed.

Potential positive effects on European sites are not factored into the Appropriate Assessment (the legislative test does not consider the balance of positive and negative effects). However, it is worth noting that the Natura Impact Statement sets out that development of the WSSP, and the strategic management of water resources and wastewater provision by a national body, will help improve the condition of many European sites and support the achievement and maintenance of favourable conservation status across the Natura 2000 network.

1.7 Environmental Report Structure

This Environmental Report is structured as follows:

- **Non-Technical Summary** - Provides a summary of the Environmental Report, including information on the draft WSSP and the approach to the assessment;
- **Section 1: Introduction** - Includes a summary of the draft WSSP, an overview of the SEA process and details of how to respond to consultation on this Environmental Report;
- **Section 2: Context and Baseline** - Provides an overview of the baseline and context that has informed the assessment of the draft WSSP;
- **Section 3: Approach to the Assessment** - Details the approach to the assessment of the draft WSSP including the Strategic Environmental Objectives (SEOs) used to assess effects, the assumptions underpinning the assessment and the technical difficulties encountered;
- **Section 4: Assessment of Effects of the Draft Water Services Strategic Plan** - Summarises the likely significant effects of the implementation of the draft WSSP, including cumulative effects;
- **Section 5: Conclusions, Monitoring and Next Steps** - presents the main conclusions of the assessment, proposals for monitoring the significant effects of implementing the WSSP and the next stage in the SEA process.

² Amec Foster Wheeler (2015) *Irish Water Water Services Strategic Plan Appropriate Assessment / Natura Impact Statement*.

In addition, this Environmental Report is accompanied by a volume of appendices. The appendices include the baseline information collated as part of the assessment (**Appendix C**) and the detailed assessment of the effects of draft WSSP strategies (**Appendix D**).

1.8 Commenting on this Environmental Report

This Environmental Report is being issued for public consultation between 19th February 2015 and the 17th April 2015 alongside the draft WSSP and the Natura Impact Statement. Details of how to respond to the consultation are provided overleaf.

This Consultation: Please Give Us Your Views

We would welcome your views on any aspect of this Environmental Report. We are particularly interested to receive your views on the following questions:

- (i) Do you think that the Environmental Report has identified the significant environmental effects of the draft WSSP? If not, what other significant effects do you think we have missed?
- (ii) Do you agree with the conclusions of the Environmental Report and the recommendations for avoiding, reducing or off-setting the significant effects of implementing the WSSP? If not, what do you think the key recommendations should be and why?
- (iii) Do you agree with the proposed arrangements for monitoring the significant effects of the WSSP, as detailed in the Environmental Report? If not, what measures do you propose?

Please provide comments on or before the 17th April 2015. Comments can be made:

By post to the address below:

Water Services Strategic Plan

P.O. Box 860

South City Delivery Office Cork City

Cork

Online: By clicking the following link <https://www.water.ie/projects-plans/our-plans/>

By e-mail: WSSP@water.ie

2. Baseline and Context

2.1 Introduction

This section provides an overview of the baseline and context that has informed the development of the SEOs used to assess the environmental effects of the draft WSSP. It includes a review of other relevant policies, plans and programmes (**Section 2.2**) and baseline information (**Section 2.3**) and culminates in the identification of key environmental issues relevant to the WSSP (**Section 2.4**).

2.2 Review of Plans and Programmes

One of the first steps in undertaking the SEA is to identify and review other relevant plans, programmes, policies and strategies (hereinafter referred to as ‘plans and programmes’) which could influence the draft WSSP. These may be plans and programmes at an international (European), national (including cross-boundary), regional or sub-regional level, commensurate with the scope of the draft WSSP. The review aims to identify the relationships between the draft WSSP and these other documents i.e. how the draft WSSP could be affected by the other plans’ and programmes’ aims, objectives and/or targets, or how it could contribute to the achievement of their environmental and sustainability objectives.

An understanding of these plans and programmes is important in developing a baseline approach to the assessment. It is also a valuable source of information to support the completion of environmental baseline and to determine the key issues. The completed review of plans and programmes is also used to provide the policy context for the subsequent assessment process and helps to inform the development of the SEOs that comprise the assessment framework.

The Draft SEA Scoping Report included a review of plans and programmes, consistent with the requirements of the SEA Directive, and this was updated as part of the addendum to the Scoping Report to include those plans and programmes suggested for inclusion by consultees. The plans and programmes reviewed included international and national (including cross-boundary) plans and programmes in addition to a number of sub-regional plans and programmes and plans and programmes currently under preparation. These are listed in **Table 2.1**, with the results of the review provided in **Appendix B**. The information from the review is used to provide baseline information on environmental issues (**Appendix C**), and in **Section 3.3** to help to develop proposed SEOs for the SEA.

Table 2.1 Plans and Programmes Reviewed for the SEA of the draft WSSP

Plan/Programme	Relevant legislation in Ireland
European	
Water Framework Directive (2000/60/EC)	European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) (as amended)

Plan/Programme	Relevant legislation in Ireland
Groundwater Directive (2006/118/EC)	European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) (as amended)
Drinking Water Directive (98/83/EC)	European Union (Drinking Water) Regulations 2014 (S.I. No. 106 of 2007) (as amended) European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)
Bathing Water Directive (2006/7/EC)	Bathing Water Quality (Amendment) Regulations 2008 (S.I. No. 79 of 2008) (as amended)
Marine Strategy Framework Directive (2008/56/EC)	European Communities (Marine Strategy Framework) Regulations 2011 (S.I. No. 249/2011)
Urban Waste Water Treatment Directive (91/271/EEC)	European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)
Flood Directive (2007/60/EC)	European Communities (Assessment and Management of Flood Risks) Regulations (S.I. 122/2010) European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012)
Habitats Directive (92/43/EEC)	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000
Birds Directive (2009/147/EC)	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)
Nitrates Directive (91/676/EEC)	European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2009 (S.I. No. 101/2009) (as amended)
Environmental Quality Standards Directive (Directive 2008/105/EC) (also known as the Priority Substances Directive) as amended by Directive 2013/39/EU)	European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272/2009) European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)
Environmental Liability Directive (2004/35/EC)	European Communities (Environmental Liability) Regulations, 2008
SEA Directive (2001/42/EC)	European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435/ 2004) (as amended) Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436/2004) (as amended)
EIA Directive (85/337/EEC)	European Communities (Environmental Impact Assessment) Regulations 1989 (S.I. No. 349/1989) (as amended) European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012)
Renewable Energy Directive (2009/28/EC)	European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011)
EU 2020 climate and energy package	The Framework for Climate Change Bill European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011)
A Blueprint to Safeguard Europe's Water Resources	European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) (as amended)
European Union Biodiversity Strategy to 2020	Actions for Biodiversity 2011-2016 Ireland's National Biodiversity Plan, 2011
Biocidal Products Regulation (528/2012) as amended (334/2014)	S.I. No. 427 of 2013 European Union (Biocidal Products) Regulations 2013 (as amended)
National/Regional	
National Spatial Strategy for Ireland 2002-2020 People, Places and Potential	Local Government (Planning and Development) Act, 1963 (as amended) Requirement of the Planning and Development (Amendment) Act (2010)

Plan/Programme	Relevant legislation in Ireland
Regional Planning Guidelines	Planning and Development (Amendment) Act (2010)
River Basin Management Plans and associated Programmes of Measures - including International (Northern Ireland) Plans and Programmes	Requirement of the Water Framework Directive (2000/60/EC) European Communities (Water Policy) Regulations, 2003 (SI No. 722) (as amended) Guidelines for the Establishment of River Basin District Advisory Councils (RBDAC)
Groundwater Protection Schemes	European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) (as amended)
Water Quality Management Plans	Requirement of the Water Pollution Act 1977
National Renewable Energy Action Plan	European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011) Requirement of the Renewable Energy Directive (2009/28/EC)
Offshore Renewable Energy Development Plan	Foreshore Acts 1933 (as amended)
Harnessing Our Ocean Wealth	
Grid25 Implementation Programme	
Harvest 2020	European Communities (Food and Feed Hygiene) Regulations 2009 (S.I. No. 432 of 2009) (as amended) European Communities (Hygiene of Foodstuffs) (S.I. No. 369 of 2006)
Agri-vision 2015 Action Plan	
Rural Environmental Protection Scheme (REPS)	
Agri-Environmental Options Scheme(AEOS)	
Green, Low-Carbon, Agri-environment Scheme (GLAS)	
Raised Bog SAC Management Plan and Review of Raised Bog Natural Heritage Areas	
National Climate Change Strategy	European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011) The Framework for Climate Change Bill
National Climate Change Adaptation Framework – Building Resilience to Climate Change 2012	
Office of Public Works Arterial Drainage Maintenance and High Risk Designation Programme 2011-2015	
Northern Ireland Water Resources Management Plan 2012	
Food Regulations	
European Union (Water Policy) Regulations 2014, S.I. No. 350 of 2014	Requirements of the Water Framework Directive (2000/60/EC) Guidelines for the Establishment of River Basin District Advisory Councils (RBDAC)
S.I. No. 427 of 2013 European Union (Biocidal Products) Regulations 2013 (as amended)	
Sub-Regional	
County and Town Development Plans	Local Government (Planning and Development) Act, 1963 (as amended)

Plan/Programme	Relevant legislation in Ireland
	Requirement of the Planning and Development (Amendment) Act (2010)
Local Area Plans	Local Government (Planning and Development) Act, 1963 (as amended) Requirement of the Planning and Development (Amendment) Act (2010)
Strategic Development Zones(SDZ)	Local Government (Planning and Development) Act, 1963 (as amended)
Housing Strategies	Local Government (Planning and Development) Act, 1963 (as amended) Requirement of the Planning and Development Act 2000 (as amended)
Biodiversity Action Plans	
Heritage Plans	
County Landscape Character Assessments	Requirement of the Planning and Development) Act, 2000 (as amended) Landscape and Landscape Assessment Guidelines
Special Amenity Area Order	Local Government (Planning and Development) Act, 1963 (as amended) Requirement of the Planning and Development Act 1963 (as amended)
Shellfish Pollution Reduction Programmes	European Communities (Quality of Shellfish Waters) Regulations 2006 (SI 268/2006) (as amended) Requirement of Shellfish Waters Directive (2006/113/EC) for designated shellfish waters
Freshwater Pearl Mussel Sub-Basin Management Plans	Requirement of Water Framework Directive (2000/60/EC) and Habitats Directive (92/43/EEC) European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000
County Renewable Energy Strategies	Renewable Energy Directive (2009/28/EC) European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011) The Framework for Climate Change Bill
Sludge Management Plans	Waste Management Act 1996 (as amended) Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 (as amended) Urban Waste Water Treatment Directive (91/271/EEC) European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)
Greater Dublin Strategic Drainage Strategy	
Northern Ireland Water Resources Management Plan 2012	
Strategic Integrated Framework Plan for the Shannon Estuary	
Local Catchment Flood Risk Management Plans	
Plans / Programmes / Studies currently in preparation	
National Landscape Strategy 2014 (draft/in preparation)	
National Rural Development Programme (draft/in preparation)	
National Forestry Programme 2014-2020 (draft/in preparation)	

Plan/Programme	Relevant legislation in Ireland
National Peatlands Strategy (draft/in preparation)	
New Waste Management Plans (draft/in preparation)	
National Strategic Plan for Aquaculture (draft/in preparation)	
National Seafood Operational Programme 2014-2020 (draft/in preparation)	
Flood Risk Management Plans arising from National Catchment Flood Risk Assessment and Management Programme (draft/in preparation)	
Greater Dublin Drainage Project	
Water Supply Project for Dublin Region	

2.3 Baseline Information

An essential part of the SEA process is the identification of the current baseline conditions and their likely evolution. It is only with a knowledge of existing conditions, and a consideration of their significance, that the subsequent success or otherwise of the WSSP can be monitored.

The SEA Directive requires that the evolution of the baseline conditions of the plan area (that would take place without the plan or programme) is identified. This is useful in informing assessments of significance, particularly with regard to the effect that conditions may already be improving or worsening and the rate of such change. Where information on these trends is available it has been identified.

The Draft SEA Scoping Report provided a preliminary assessment of baseline conditions that was subsequently updated to reflect consultee comments in the addendum to the report. The baseline information presented in the Draft Scoping Report has been further updated and expanded upon (where appropriate) as part of the preparation of this Environmental Report and is presented in **Appendix C** for: biodiversity, flora and fauna; population and human health; soil; water; air quality and noise; climatic factors; material assets; water services; cultural heritage (including architectural and archaeological heritage); and landscape. For each topic, the following information is provided:

- Baseline characteristics;
- Future trends (i.e. the likely evolution of the plan area without the WSSP);
- The key environmental issues relevant to the WSSP based on the baseline characteristics and future trends and taking into account the environmental sensitivities identified in Section 5.2 of the Draft Scoping Report.

2.4 Summary of the Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relevant to Irish Water's activities and the WSSP as identified through the analysis of baseline conditions contained in **Appendix C** are summarised in **Table 2.2** by topic area. It should be noted that the environmental issues identified are in most cases wide ranging and do not relate solely to Irish Water's activities or the WSSP. The issues identified will be influenced by a range of factors including the activities of other sectors.

Table 2.2 Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

Topic Area	Key Environmental Issues
Biodiversity	<ul style="list-style-type: none"> • The need to contribute to the protection and improvement of the condition of sites that have been designated for nature conservation purposes; • The need to help improve the status of protected habitats and species; • The need to help maintain/enhance ecological connectivity; and • The need to support the protection and enhancement of non-designated sites.
Population and Human Health	<ul style="list-style-type: none"> • The need to accommodate for a rising population and growing economy through the associated delivery of water supply and wastewater services without placing undue pressure on the environment; • The need to support the protection of the health of the Irish population through the provision of affordable water and wastewater services; and • The need to ensure that water infrastructure resulting from the implementation of the WSSP does not have an adverse impact on the economy.
Soil	<ul style="list-style-type: none"> • The need to contribute to the protection and enhancement of geodiversity and sites designated for their geological importance; • The need to support the protection and enhancement of soil quality, particularly in peatland areas which have been degraded or are at risk of degradation; and • The need to help maintain the hydrogeological and ecological function of the soil resource.
Water	<ul style="list-style-type: none"> • The need to help maintain and improve the status and quality of surface and ground waters including bathing waters; • The need to help reverse the decline in the number of high-status waterbodies; and • The need to reduce pollution from wastewater treatment works.
Air Quality and Noise	<ul style="list-style-type: none"> • The need to avoid detrimental impacts on air quality; • The need to adopt fuel efficiency and minimise transport use; and • The need to avoid causing noise nuisance.
Climatic Factors	<ul style="list-style-type: none"> • The need to reduce emissions of greenhouse gases from Irish Water's activities; • The need to take into account, and where possible mitigate for, the potential effects of climate change on water resources and infrastructure; • The need to ensure the resilience of water supply and treatment infrastructure to the impacts of climate change; and • The need to manage the impact of climate change on water resource availability.

Topic Area	Key Environmental Issues
Material Assets	<ul style="list-style-type: none"> • The need to account for the growth in urban populations across Ireland and their potential water and wastewater needs; • The need to reduce waste generated from Irish Water's activities and the proportion of that waste which is sent to landfill; and • The need to reduce the consumption of non-renewable resources related to Irish Water's activities through measures such as improved energy efficiency and enhanced uptake of renewable energy.
Water Services	<ul style="list-style-type: none"> • The need to maintain or improve the quality of drinking water supplies; • The need to improve standards of wastewater treatment and reduce pollution events; and • The need to ensure sufficient water and wastewater capacity is available to meet demand.
Cultural Heritage	<ul style="list-style-type: none"> • The need to contribute to the protection and enhancement of features and sites of archaeological importance and cultural heritage interest in relation to Irish Water activities; • The need to help protect and enhance sites of architectural cultural heritage; and • The need to help ensure the protection of unknown archaeology.
Landscape	<ul style="list-style-type: none"> • The need to contribute to the protection and enhancement of the landscape and natural beauty of Ireland including designated sites; • The need to help protect and maintain the landscape distinctiveness across Ireland; and • The need to help protect visual amenity.

3. Approach to the Assessment

3.1 Introduction

This section sets out how the SEA of the draft WSSP has been undertaken. Drawing on the information presented in Sections 1 and 2, it defines the scope of the assessment (in terms of the environmental issues considered), presents the assessment framework and describes how this framework has been applied to assess the key components of the draft WSSP and the reasonable alternative. The section also highlights the difficulties encountered during the assessment process.

3.2 Scope of the Assessment

The first stage in the development of the SEA was to determine the scope of the assessment in terms of which, if any, of the 12 topics identified in the SEA Directive should be scoped out of the assessment. The scope of the assessment was principally defined in the SEA Scoping Report through the review of plans and programmes, an initial analysis of baseline information and the identification of key environmental sensitivities. The identification of key environmental issues relevant to the WSSP in this report (see **Section 2.4**) has also helped to re-affirm the scope of the assessment and in this instance, none of the SEA topics have been scoped out of the assessment.

3.3 Assessment Framework

The framework that was used to assess draft WSSP strategies and reasonable alternative comprises of ten Strategic Environmental Objectives (SEOs).

SEOs are measures against which the environmental effects of the draft WSSP can be tested. The SEOs are set out under a range of topics and are used as standards against which the provisions of the draft WSSP can be evaluated in order to help identify areas in which potential adverse impacts may occur. SEOs are distinct from the objectives of the draft WSSP and are developed from the review of international and national plans and programmes (summarised in **Section 2.2**) which collectively provide the framework of environmental protection objectives relevant to the assessment of the WSSP.

By assessing each draft WSSP strategy/reasonable alternative against the SEOs, it is more apparent where the draft WSSP will contribute to environmental sustainability, where it might have a negative effect, and where a positive effect could be improved.

The SEOs are linked to ‘SEA indicators’ which can, where relevant, facilitate monitoring of the environmental effects of implementing the WSSP, and ‘targets’ that are relevant to the environmental legislation, plans and programmes from which the SEOs and indicators have been developed. It should be noted that the SEA indicators and targets identified represent high level and wide ranging environmental parameters derived from existing plans and programmes and are not the sole responsibility of Irish Water. The indicators and the achievement of associated targets will be influenced by a range of factors including the activities of other sectors.

The SEOs have taken into account the objectives of other relevant plans and programmes, the analysis of baseline information and consultation on the Draft Scoping Report. The SEOs were also reconsidered during the preparation of this report in light of the key environmental issues identified in **Section 2.4**, although in this instance no amendments to the framework were deemed to be necessary.

The final assessment framework is shown in **Table 3.1**.

Table 3.1 WSSP Assessment Framework

Environmental Component	Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
Biodiversity and flora and fauna	1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities.	<p>Halt spread of alien species and their associated impact to the aquatic environment.</p> <p>Halt deterioration of habitats or their associated species due to water quality related issues, in line with the Water Framework Directive.</p> <p>Maintenance of favourable conservation status for all habitats and species protected under national and international legislation to be unaffected by implementation of the WSSP.</p>	<p>Interim Indicators: Geographical spread of Alien Species. (NI and Ire)</p> <p>Number of Margaritifera Plans put in place. (Ire)</p> <p>Status of Northern Ireland Priority Species as reported in the UK Biodiversity Action Plan (every 3 years). (NI)</p> <p>Status of Northern Ireland Priority Habitats listed under the Northern Ireland Biodiversity Strategy (every 3 years). (NI)</p> <p>Long term Indicators: The Status of EU Protected Habitats and Species in Ireland (reports due every 6 years, first report in 2007). (Ire)</p> <p>Report by the UK under Article 17 on the implementation of the Habitats Directive (reports due every 6 years, second report in 2007). (NI)</p> <p>Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar and NHAs). (Ire)</p> <p>Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar, ASSIs) (reports every six years). (NI)</p>	<p>Invasive Species (NPWS/NIEA)</p> <p>NPWS</p> <p>JNCC</p> <p>JNCC</p> <p>Not currently compiled</p> <p>NIEA</p> <p>NPWS</p> <p>NPWS</p>

Environmental Component	Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
Population and Human Health	2. Protect and reduce risk to human health in undertaking water services.	<p>All drinking water areas (including groundwater), as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All bathing waters, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All economic shellfish waters, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All water bodies designated for salmonids, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>Long term reduction in drinking water restriction notices.</p>	<p>Interim Indicators: Compliance with Drinking Water Standards. (Ire and NI)</p> <p>Compliance with Bathing Water Standards. (Ire and NI)</p> <p>Compliance with the Shellfish Pollution Reduction Programmes (Ire and NI)</p> <p>Condition of salmonids in water bodies designated for these. (NI)</p> <p>Water quality in designated salmonid waters. (Ire)</p> <p>Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status. (Ire and NI)</p> <p>Notices in place for more than 200 days</p>	<p>EPA</p> <p>NIEA / EPA</p> <p>NIEA / EPA</p> <p>NIEA</p> <p>EPA</p> <p>NIEA / EPA</p> <p>Irish Water</p>

Environmental Component	Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
Water	3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive.	<p>No deterioration in status of waters currently with high or good status (WFD Objective).</p> <p>Restoration to good status of waters currently at moderate, poor or bad status (WFD Objective).</p> <p>Progressively reduce chemical pollution in waters (WFD).</p> <p>Limit pollution inputs to groundwaters and prevent deterioration (WFD Objective).</p>	<p>Interim Indicators: Interim Water status in 2011 report. (Ire)</p> <p>Environmental Quality Statistics relating to water quality published in the Northern Ireland Environmental Statistics Report (to be published annually). (NI)</p> <p>Long Term Indicator: Water status in 2015 (and subsequent years) report. (NI and Ire)</p>	<p>EPA</p> <p>NISRA</p> <p>NIEA / EPA</p>
	4. Minimise increases in flood risk resulting from Irish Water's activities.	No increase in properties at risk from flooding as a result of Irish Water's activities.	Number of properties at risk of flooding from combined sewers.	Irish Water
Air and Climatic Factors	5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change.	<p>Minimise total emissions to air associated with wastewater collection, treatment and disposal.</p> <p>Minimise total emissions to air (including greenhouse gases) associated with drinking water abstraction, treatment and provision.</p> <p>Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary as set out in license for new or upgraded wastewater infrastructure.</p> <p>Improve energy efficiency by 33% by 2020 (from the 2009 baseline).</p>	<p>Amount of emissions to air associated with wastewater collection, treatment and disposal.</p> <p>Amount of emissions to air associated with drinking water abstraction, treatment and provision.</p> <p>Number of complaints received related to odour.</p> <p>% increase in overall energy efficiency at Irish Water facilities.</p>	<p>Irish Water</p> <p>Irish Water</p> <p>Irish Water</p> <p>Irish Water</p>

Environmental Component	Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
Material Assets	6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies.	Interim Target: Increase investment in water management infrastructure. Long Term Target: Full compliance with the requirements of the Urban Waste Water Treatment Directive and its associated regulations.	Interim Indicator: Water services investment expenditure per annum. Long Term Indicator: Number of exceedances of the standards contained in the Urban Waste Water Treatment Directive.	Irish Water EPA
	7. Protect water as an economic resource.	Achieve sustainable use of water in the context of maintaining its economic benefit. Achieve a reduction in leakage.	Change in economic value of water relative to the baseline report The 'Economic Analysis of Water Use and Economic Analysis of Water Use in Ireland'. Leakage as a % of water treated.	Economic studies carried out by the EPA as a part of the plan making process during the 2nd cycle of RBMP. Irish Water
Soil	8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils.	Avoid conflicts with, and contribute towards, where possible, the appropriate management of peatlands as per the National Peatlands Strategy.	Information from the NPWS on the management of Peatlands.	NPWS
		Utilise previously developed (brownfield) land where possible.	Number/floorspace of water infrastructure built on previously developed land.	Irish Water
Cultural Heritage	9. Avoid damage to cultural heritage resources resulting from Irish Water's activities.	No unauthorised physical damage or alteration of the context of cultural heritage features due to Irish Water activities.	Changes in the condition of monuments on the Record of Monuments and Places due to Irish Water activities.	Archaeological Survey of Ireland Sites and Monuments

Environmental Component	Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
			Number of National Monuments and Protected Structures at risk due to WSSP implementation.	Record Heritage Council Ireland / Local Authorities
Landscape	10. Avoid damage to designated landscapes resulting from Irish Water's activities.	No damage to designated landscapes as a result of WSSP implementation.	Number of new wastewater / drinking water treatment plants sited in landscapes with a high sensitivity to change.	Irish Water/ Local Authorities

3.4 Assessment Methodology

Following a high level review of the draft WSSP, it was considered necessary to apply SEA to those principal plan components set out in **Section 1.3**, namely the strategic objectives (in terms of their supporting aims) and strategies. The reasonable alternative to the preferred option for the WSSP was also assessed.

The approach to the assessment of each component of the draft WSSP is discussed in-turn below.

3.4.1 Aims

The draft WSSP contains 17 aims which underpin the strategic objectives and are reproduced in **Section 1.3** of this report. It is important that the aims are aligned with the SEOs in order to identify potential synergies or inconsistencies between the aims of the draft WSSP and the SEOs and help in refining the aims. This has been tested by assessing the relationship between the SEOs and the draft WSSP aims using a compatibility matrix (presented in **Table 4.1**). The scoring system that has been used to determine their compatibility is shown in **Table 3.2**.

Table 3.2 Scoring System Used in the Compatibility Assessment of Draft WSSP Aims

Symbol	Compatibility Between the Draft WSSP Aim and SEO
+	Compatible
0	Neutral
?	Uncertain
-	Incompatible

3.4.2 Strategies

A two-stage approach has been adopted to assess the draft WSSP strategies:

1. A screening assessment to identify those strategies that do not have any significant effects against the SEOs. These strategies were ‘screened out’ from further assessment; and
2. A more detailed assessment of those strategies identified in the screening assessment that may result in significant effects against the SEOs.

Each stage is described in-turn below.

Screening Assessment

As set out in **Section 1.3**, the draft WSSP sets out a total of 68 strategies across each of the following strategic objectives:

- Meet Customer Expectations;
- Ensure a Safe and Reliable Water Supply;
- Provide Effective Management of Wastewater;
- Protect and Enhance the Environment;
- Support Social and Economic Growth;
- Invest in Our Future.

An initial screening assessment was undertaken to determine which strategies had the potential for likely significant effects against each of the SEOs. Strategies were screened out where there were no anticipated significant effects against any of the SEOs as they involved/and/or related to:

- Consultation and communications without a known outcome/no clear environmental links;
- Governance structures;
- The collation of information not linked to environmental or operational factors;
- Customer services.

Table 3.3 lists those strategies that were ‘screened out’ at this stage together with a rationale. The screening process has identified that those strategies under the strategic objective ‘Meet Customer Expectations’ and the aim ‘CE1: Establish both Customer Trust and a Reputation for Excellent Service’ were excluded from more detailed assessment (a total of six strategies). These strategies principally relate to either the internal management of Irish Water services and/or external customer communications and are not considered to have any influence on the environment or conceivably lead to likely significant effects on the environment. The remaining draft WSSP strategies were considered to have the potential to generate significant environment effects (or the potential for significant effects was considered to be uncertain) and were taken forward for more detailed assessment.

Table 3.3 Draft WSSP Strategies ‘Screened Out’ of Further Assessment

Strategic Objective	Aim	Strategy	Rationale for ‘Screening Out’ Strategy
Meet Customer Expectations	CE1: Establish both Customer trust and a reputation for excellent service.	CE 1a: Create and operate a lean and effective Customer Operation.	<p>This strategy seeks to establish a robust governance structure for Irish Water services and recruit an effective workforce. There is not considered to be a clear environmental link and this strategy is therefore not expected to generate significant environmental effects on the SEOs.</p> <p>As there is no clear environmental link, Strategy CE1a has been screened out of further assessment.</p>
		CE1b: Build and maintain accurate customer databases.	<p>This strategy concerns the establishment of framework contracts for services which provide flexibility to Irish Water and implementing a robust contract management system. There is not considered to be a clear link between the appointment/management of contractors (which are principally internal management /financial issues) and the SEOs. In consequence, Strategy CE1b has been screened out of further assessment.</p>
		CE 1c: Establish sustainable customer revenue.	<p>This strategy broadly relates to ensuring that Irish Water has a sustainable income stream through customer payment for water services. This includes facilitating customer payment including in respect of customer billing, payment methods and the putting in place of effective tariff structures. However, the strategy does not relate directly to water supply affordability (which is captured under Strategy IF3b).</p> <p>There is not considered to be a clear link between this strategy and the SEOs. In consequence, Strategy CE1c has been screened out of further assessment.</p>
		CE1d: Establish effective communication channels with customers.	<p>This strategy relates to customer communications which is not expected to have any environmental effects. In consequence, Strategy CE1d has been screened out of further assessment.</p>
		CE1e: Establish national customer service standards and robust customer protection measures.	<p>This strategy concerns the development of customer relationships including the publication of a Code of Practice for customer communications and customer service standards. It principally relates to customer relations as opposed to proposals which could result in environmental effects. No environmental effects are therefore expected to occur as a result of this strategy. In consequence, Strategy CE1e has been screened out of further assessment.</p>
		CE1f: Fully support the work of the Public Water Forum.	<p>This strategy concerns the communication and engagement with the Public Water Forum in relation to the performance of Irish Water in the delivery of its functions.</p> <p>No environmental effects are therefore expected to occur as a result of this strategy. In consequence, Strategy CE1f has been screened out of further assessment.</p>

Detailed Strategy Assessment

The assessment of those strategies identified as having the potential for significant environmental effects (including strategies whose environmental effects were considered to be uncertain) has been undertaken by considering the potential effects of the collective implementation of strategies under each aim of the draft WSSP against each of the SEOs using an assessment matrix. The matrix used to record the assessment is shown in **Figure 3.1**.

Figure 3.1 Assessment Matrix

Strategic Environmental Objective	Effect of Draft Strategies	Commentary on Effects
1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities.	+	<p>Likely Significant Effects</p> <p>A description of effects of the draft WSSP strategies under each aim on the SEO under consideration has been provided here, with reasoning and justification included.</p> <p>Mitigation</p> <p>Measures to offset adverse effects and enhance positive effects have been identified.</p> <p>Assumptions</p> <p>Any assumptions that have underpinned the assessment have been highlighted here.</p> <p>Uncertainties</p> <p>Uncertainties encountered during the assessment have been noted.</p>
2. Protect and reduce risk to human health in undertaking water services.	++	<i>Etc...</i>
<i>Etc...</i>		

The following information has been recorded in the matrix in order to present the findings of the SEA:

- The SEOs (the first column);
- A score indicating the nature of the potential effect that may arise from the implementation of all strategies under each aim of the draft WSSP (column two);
- A commentary on significant effects (including consideration of the cumulative, synergistic and indirect effects as well as the geography, temporary/permanence and likelihood of any effects) and on any assumptions or uncertainties (column three); and
- Recommendations as to how the proposed strategies may be improved against the SEOs, including any mitigation or enhancements measures (column three).

The qualitative scoring system used to assess the effects of the strategies is shown in **Table 3.4** below.

Table 3.4 Scoring System Used in the SEA of draft WSSP Strategies

Symbol	Likely Effect on the Strategic Environmental Objective
++	The strategies are likely to have a significant positive effect
+	The strategies are likely to have a positive effect
0	The strategies are likely to have a neutral effect
?	Effects are uncertain/there is insufficient information on which to determine effect
-	The strategies are likely to have a negative effect
--	The strategies are likely to have a significant negative effect
+/-	The strategies are likely to have a mixed positive and negative effect
++/-	The strategies are likely to have a mixed significant positive and negative effect
+/--	The strategies are likely to have a mixed positive and significant negative effect
0/+	The strategies are likely to have a neutral or positive effect
0/-	The strategies are likely to have a neutral or negative effect

*Where a positive and/or negative effect has been awarded but the assessment has also identified uncertainties (for example, in respect of the number, type and location of future proposals which may come forward following the implementation of the WSSP), the strategies have been assessed as also having an uncertain effect and this is indicated through '?.'

A summary of the results of the assessment of draft WSSP strategies is presented in **Section 4.3** of this report. The assessment matrices are presented in **Appendix D**.

3.4.3 Assessment of Secondary, Cumulative and Synergistic Effects

The strategies of the draft WSSP do not sit in isolation from each other. The strategies will work together to achieve the strategic objectives and aims of the draft WSSP. For this reason, it is important to understand what the combined environmental effects of the strategies will be.

As noted above, the assessment of the draft strategies has been undertaken by considering the effects of their collective implementation on the SEOs, grouped by draft WSSP aim. Throughout the assessment matrices, reference is also made to where cumulative effects could occur between the strategies across different aims. In addition to the inclusion of cross reference between the strategy themes, a cumulative effect assessment has been undertaken in order to clearly identify areas where strategies across different aims work together. The cumulative assessment matrix is presented in **Section 4.4**. Additional commentary is also provided where the draft WSSP may have effects in-combination with other plans and programmes.

3.4.4 Assessment of WSSP Alternatives

As set out in **Section 1.5**, one alternative to the draft WSSP has been identified namely ‘Successional WSSP’. This reasonable alternative has been assessed against each of the SEOs. An assessment matrix is presented in **Section 4.6**.

3.5 When the SEA was Undertaken and by Whom

This SEA of the draft WSSP was undertaken by Amec Foster Wheeler in autumn/winter 2014 (the Draft Scoping Report was prepared by AoS Planning in spring/summer 2014).

3.6 Technical Difficulties

The SEA Directive requires the identification of any difficulties (such as technical deficiencies or lack of knowledge) encountered during the assessment process. In this respect, a range of uncertainties and assumptions have been identified in the assessment matrices. Those uncertainties and assumptions that cut across the assessment are outlined below.

3.6.1 Uncertainties

As set out in **Section 1.2**, the WSSP is intended to set out Irish Water’s high level strategies for providing water services and does not identify specific projects. The implementation of the strategies identified in the WSSP will be detailed in a number of Implementation Plans (Tier 2 Plans) such as the National Water Resources Plan that will be prepared by Irish Water following the approval of the WSSP. As the exact type, nature, scale and location of future projects that may comprise the Implementation Plans are unknown at this stage, the associated environmental effects are difficult to predict. The assessment has therefore sought to identify the range/magnitude of potential environmental effects that could potentially arise at the project stage at a generic level although it is recognised that a degree of uncertainty will remain until further project details are known.

In other instances there is uncertainty with regard to what the outcome/success of a specific strategy will be. For example, Strategy WW1b ‘Produce appropriate guidance documentation and Standard Operating Procedures’ is expected to generate environmental benefits and in such instances the broad intent of the strategy has been reflected in the assessment. Even with this assumption, there is still uncertainty over the scale of potential change and associated effects.

3.6.2 Assumptions

Reflecting the uncertainties identified during the assessment process, a number of assumptions have been made. The principal assumptions underpinning the assessments include (inter alia):

- It is assumed that the implementation of strategies will comply (where appropriate) with all relevant regulations;

- It is assumed that the environmental effects of infrastructure proposals identified in future Implementation Plans will be fully considered through SEA and AA (as appropriate) as well as through an Environmental Impact Assessment (EIA) and AA at the project stage, where appropriate;
- It is assumed that the potential for construction activity associated with the implementation of projects to generate adverse environmental effects would be managed/mitigated where possible using best practice; and
- It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity consumption from renewable sources.

4. Assessment of Effects of the Draft Water Services Strategic Plan

4.1 Introduction

This section presents the findings of the assessment of effects of the draft WSSP against the SEOs. It assesses the compatibility of the strategic objectives/aims with the SEOs (Section 4.2) before presenting the summary of the assessment of effects of the draft WSSP strategies (Section 4.3), including cumulative, synergistic and secondary effects (Section 4.4), and an overview of mitigation and enhancement measures identified during the assessment process (Section 4.5). Finally, the section presents the findings of the assessment of reasonable alternatives to the draft WSSP (Section 4.6) together with the reasons for the selection of the preferred option and rejection of reasonable alternatives (Section 4.7).

4.2 Assessment of the Strategic Objectives and Aims

As set out in Section 3.4, a matrix has been completed to assess the compatibility of the aims which underpin the strategic objectives of the draft WSSP against the SEOs. Table 4.1 presents the results of this assessment.

Table 4.1 Assessment the draft WSSP Aims

Draft WSSP Aim (according to Strategic Objective)	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
Objective: Meet Customer Expectations										
Aim CE1: Establish both customer trust and a reputation for excellent service.	0	0	0	0	0	0	0	0	0	0
Objective: Ensure a Safe and Reliable Water Supply										
Aim WS1: Manage the quality of drinking water from source to tap to protect human health.	+/?	+	+	?	-	+	+	?	?	?
Aim WS2: Manage the availability and reliability of water supplies now	+/?	+	+	+	+	+	+	?	?	?

Draft WSSP Aim (according to Strategic Objective)	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
and into the future.										
Aim WS3: Manage the affordability of water supplies.	0	+	+	0	+	+	+	?	?	?
Objective: Provide Effective Management of Wastewater										
Aim WW1: Manage the operation of wastewater facilities in a manner that protects environmental quality.	+/?	+	+	+	-	+	+	?	?	?
Aim WW2: Manage the availability and resilience of wastewater services now and into the future.	+/?	+	+	+	+	+	+	?	?	?
Aim WW3: Manage the affordability and reliability of wastewater services.	+	+	+	?	+	+	+	?	?	?
Objective: Protect and Enhance the Environment										
Aim EN1: Ensure that Irish Water services are delivered in a sustainable manner that contributes to the protection of the environment.	+	+/?	+	+	+	+	+	+	+	+
Aim EN2: Operate our water services infrastructure to support achievement of water body objectives under the Water Framework Directive.	+	+/?	+	0	0	+	+	?	?	?
Aim EN3: Manage all our residual waste in a sustainable manner.	+/?	+	+	?	+	+	+	+	?	?
Objective: Support Social and Economic Growth										
Aim SG1: Support national, regional and local economic and spatial planning policy.	+/?	+	+	?	?	+	+	?	?	?
Aim SG2: Facilitate growth in line with national and regional economic and spatial planning policy.	+?	+	+	?	?	+	+	?	?	?
Aim SG3: Ensure that water services are provided in a timely and cost effective manner.	+/?	+	+	?	?	+	+	?	?	?

Draft WSSP Aim (according to Strategic Objective)	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
Objective: Invest in Our Future										
Aim IF1: Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.	+	+	+	0	0	+	+	0	0	0
Aim IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.	+	+	+	+	+	+	+	+	+	+
Aim IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.	+	+	+	+	+	+	+	+	+	+
Aim IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.	0	0	+	0	0	+	+	0	0	0

Key

Symbol	Compatibility Between the Draft WSSP Aim and SEO
+	Compatible
0	Neutral
?	Uncertain
-	Incompatible

Compatibilities

Broadly, the draft WSSP aims are supportive of the SEOs with very few incompatibilities identified. Those SEOs that are particularly well supported by the plan aims include SEO 1 (Biodiversity, Flora and Fauna), SEO 2 (Population and Human Health), SEO 3 (Water Quality and Quantity), SEO 6 (Water Management Infrastructure) and SEO 7 (Water as an Economic Resource). This principally reflects the emphasis of the draft WSSP aims on both the management of water supply and wastewater infrastructure to protect and enhance environmental quality and on the provision of services and facilities to meet long term needs which is expected to help ensure that the draft WSSP meets the current/projected demand for safe and clean water supply and protects and enhances the quality of waterbodies including the aquatic ecology they support.

Many of the draft WSSP aims are also supportive of SEO 4 (Flood Risk), reflecting in particular the potential for investment in Irish Water's assets such as Combined Sewer Overflows (CSO) to alleviate flood risk to properties. However, there is also the potential for new infrastructure to be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff), although as the scale, type and location of new development is unknown at this stage any such incompatibilities are considered to be uncertain.

Incompatibilities

Incompatibilities have been identified between those aims of the draft WSSP that are expected to support infrastructure enhancement (in particular those aims under the strategic objectives of Ensure a Safe and Reliable Water Supply, Provide Effective Management of Wastewater and Support Social and Economic Growth) and SEO 5 (Air and Climatic Factors). This is due to the anticipated increase in emissions to air (including greenhouse gas emissions) during the construction and operational phases of water resources infrastructure, although it should be noted that upgrades to existing infrastructure and the provision of new services are likely to present an opportunity to utilise technologies that are more energy efficient. In this respect, a number of the strategies under Aim EN1 (Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment) specifically relate to energy efficiency in the context of Irish Water's wider target to improve energy efficiency by 33% by 2020 (from the 2009 baseline).

Uncertain Relationships

The compatibility assessment has also identified that the relationship between those draft WSSP aims related to infrastructure delivery and SEOs concerning soil (SEO 8), cultural heritage (SEO 9) and landscape (SEO 10) is largely uncertain. The upgrade of existing, and provision of new services and facilities such as water treatment works could have adverse effects on these SEOs but the probability/magnitude of effects is subject to the number, type, scale and location of future proposals as well as the sensitivity of the receiving environments which is currently unknown. It is also noted that Aim EN1 of the draft WSSP concerns the delivery of Irish Water services in a sustainable manner that contribute to the protection of the environment. This aim may help to reduce the potential for negative effects on these SEOs to arise (although this aim could also serve to restrict the potential delivery of facilities to meet water supply demand which may be incompatible with SEO 2 (Population and Human Health) though this is uncertain). However, such uncertainty reflects the strategic and very high level nature of the

WSSP. Issues arising from the siting of specific water and wastewater infrastructure will be addressed in the development and implementation of the strategies, Tier 2 plans and Tier 3 projects.

4.3 Assessment of the Draft WSSP Strategies

The assessment of strategies contained in the draft WSSP has been undertaken in accordance with the approach set out in **Section 3.4**. Where appropriate, mitigation measures have been identified in order to address adverse effects and enhance positive effects. The detailed assessments are contained in **Appendix D**. A summary of the principal findings of the assessment is presented in the following sub-sections (grouped by draft WSSP strategic objective/aim) and focuses on the significant positive and significant negative effects identified during the assessment process.

4.3.1 Meet Customer Expectations

The strategies identified under the ‘Meet Customer Expectations’ strategic objective have been screened out from further assessment. **Section 3.4.2** provides the rationale for this screening decision.

4.3.2 Ensure a Safe and Reliable Water Supply

Table 4.2 summarises the potential effects of those strategies, grouped by draft WSSP aim, under strategic objective: Ensure a Safe and Reliable Water Supply against the SEOs. The detailed assessment is contained in **Appendix D** (Tables D1 to D3).

Table 4.2 Effects of draft WSSP Strategies under Strategic Objective: Ensure a Safe and Reliable Water Supply (by Aim)

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
WS 1: Manage the Quality of Drinking Water From Source to Tap to Protect Human Health (Strategies WS1a to WS1f).	+/-/?	++/-	++	0	+/-/?	++	+	?	?	-/?
WS2: Manage the Availability and Reliability of Water Supply Now and Into the Future (Strategies WS2a to WS2g).	+/-/?	++/-	+	0	+/-/?	++	+	?	?	-/?

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
WS3: Manage the Affordability of Water Supplies (Strategies WS3a to WS3d).	+/-/?	+/-	+	0	+/-	+	++	?	?	?
Summary of the effects of all 3 WS aims.	+/-/?	++/-	++	0	+/-/?	++	++	?	?	-/?

Overall, the strategies that support the strategic objective to Ensure a Safe and Reliable Water Supply have been assessed as having a significant positive effect on SEOs relating to the following topics: Population and Human Health; Water Quality and Quantity; Water Management Infrastructure; and Water as an Economic Resource. No significant negative effects were identified during the assessment.

Positive Effects

As highlighted in the baseline analysis presented in **Appendix C**, while the quality of drinking water has in general been improving in Ireland, there have still been short term declines which can pose risks to health and the environment. Currently, around 20,000 customers are affected by boil water notices in Ireland as a result of microbiological contamination of the water supplies. In this context, the strategies under aims WS1, WS2 and WS3 seek to improve water quality in Ireland and ensure long term water supply availability and resilience. This will be principally achieved through the implementation of the National Water Resources Plan, Drinking Water Safety Plans and other plans/programmes under Aim WS1 that together will detail specific projects and initiatives designed to meet customer demands for drinking water. Those strategies under Aim WS2, meanwhile, broadly seek to manage existing and new water resources sustainably in order to ensure that supplies are resilient. Taking into account existing drinking water quality issues in Ireland, these strategies have been assessed as having a significant positive effect on Population and Human Health (SEO 2), although it is noted that construction works associated with infrastructure upgrades/new provision could have temporary and localised adverse effects on human health, particular on those within communities who are living, working or studying closest to any proposed works.

Improvements to existing, and the development of new, infrastructure and facilities under Aim WS1 in particular are expected to facilitate the achievement of water body objectives under the Water Framework Directive (WFD) and generate significant positive effects in respect of Water Quality and Quantity (SEO 3). Those strategies under aims WS2 and WS3 are expected to have positive effects on this SEO through the implementation of, for example, Regional Water Conservation Strategies (which are expected to alleviate pressure on sources drawing on WFD

water bodies) and the commitment by Irish Water to manage existing water resources and plan for new resources based on short, medium and long term sustainability in terms of contributing to achieving the objectives of the WFD.

As noted above, the implementation of the National Water Resources Plan, Drinking Water Safety Plans as well as other initiatives to enhance water quality and the resilience of supplies are in-turn expected to result in the upgrade of existing, and provision of new, water treatment and supply infrastructure, helping to protect human health and the ecological status of water bodies through associated improvements to water quality. Positive effects on Water Management Infrastructure (SEO 6) have therefore been assessed as significant in respect of those strategies under aims WS1 and WS2. Effects associated with strategies under Aim WS3 on this SEO have been assessed as positive.

The strategies under Aim WS3 promote the affordability of water supplies and have been assessed as having a significant positive effect on SEO 7 (Water as an Economic Resource). Proposals arising from the implementation of these strategies are expected to result in a lower per unit cost of water which is to be achieved through proper water resource and treatment planning including improved asset management, rationalising the number of sources, standardising treatment processes and using high quality raw water sources and implementation of water conservation strategies to address leakage. The protection/enhancement of sustainable water sources supported by aims WS1 and WS2 has been assessed as having a positive effect on this SEO.

Negative Effects

There is the potential that the construction and operation of proposals identified in the National Water Resources Plan and implementation of the Capital Investment Plan in particular to have some local adverse impact on landscape and/or visual amenity and in consequence, the potential for minor negative effects has been identified in respect of SEO 10 (Landscape). However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.

Mixed Positive and Negative Effects

The strategies that comprise aims WS1, WS2 and WS3 have been assessed as having mixed positive and negative effects on Biodiversity, Flora and Fauna (SEO 1). This reflects both the potential for adverse effects on biodiversity during the construction of proposals that come forward as a result of these strategies and the expectation that such proposals will lead to longer term enhancements to aquatic ecology during their subsequent operation. Notwithstanding, the exact magnitude of both positive and negative effects on this SEO is uncertain and will depend on the number, type and location of future proposals which is currently unknown. Mixed positive and negative effects have also been identified in respect of Air and Climatic Factors (SEO 5) due to the expectation that future infrastructure proposals will result in increased emissions to air (including greenhouse gas emissions) in the construction phase (so the short to medium term) but also the potential for these proposals to generate emissions reductions in the operational phase (so longer term) when compared to the current baseline. New infrastructure proposals could also increase resilience of Irish Water's services to the effects of climate change (although this will

also be through the implementation of other strategies, notable Strategy EN1c of the draft WSSP which seeks to ensure the resilience of Irish Water's water services to the impacts of climate change).

Uncertain Effects

Effects on Soil (SEO 8) and Cultural Heritage (SEO 9) have been assessed as uncertain as the future locations of proposals that may come forward as a result of the implementation of the strategies under this strategic objective are unknown at this stage.

4.3.3 Provide Effective Management of Wastewater

Table 4.3 summarises the potential effects of those strategies, grouped by draft WSSP aim, under the strategic objective to Provide Effective Management of Wastewater against the SEOs. The detailed assessment is contained in **Appendix D** (Tables D4 to D6).

Table 4.3 Effects of draft WSSP Strategies under Strategic Objective: Provide Effective Management of Wastewater (by Aim)

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
WW1: Manage the operation of wastewater facilities in a manner that protects environmental quality (Strategies WW1a to WW1d).	++/- /?	++/-	++	+	++/-	++	+	?	?	-/?
WW2: Manage the availability and resilience of wastewater services now and into the future (Strategies WW2a to WW2d).	+/-	+/-	+/-	++	+/-	++	++	?	?	-/?
WW3: Manage the Affordability and Reliability of Wastewater Services (Strategies WW3a to WW3f).	+/-/?	++/- /?	++/- /?	+	++/-	++	0	?	?	-/?
Summary of the effects of all 3 WW aims.	++	++/- /?	++/- /?	++	++/-	++	+	?	?	-/?

Overall, the strategies that support the strategic objective Provide Effective Management of Wastewater have been assessed as having a significant positive effect on SEOs relating to the following topics: Population and Human Health; Water Quality and Quantity; Flood Risk; Air and Climatic Factors; and Water Management Infrastructure. No significant negative effects were identified during the assessment.

Positive Effects

Irish Water is currently starting from a position of non-compliance against the Urban Waste Water Treatment Directive (UWWTD). Discharges from wastewater treatment works and CSOs need to improve. In this context, the strategies under aims WW1, WW2 and WW3 seek to improve the operation of wastewater facilities in a way that protects the environment and manages the availability, resilience and affordability of wastewater services. This will be principally achieved through implementation of a Wastewater Compliance Strategy and the development of Standard Operating Procedures and appropriate guidance. Those strategies under aims WW2 and WW3, meanwhile, broadly seek to manage the availability, resilience and affordability of wastewater services in an environmentally and financially sustainable way. Taking into account the existing lack of compliance against the UWWTD and the risks around CSOs, these strategies have been assessed as having a significant effect on Biodiversity, Flora and Fauna (SEO 1), Population and Human Health (SEO 2), Water Quality and Water Quantity (SEO 3) and in turn on Water Management Infrastructure (SEO 6) as they will help reduce the risk of polluting the aquatic environment from effluent discharges. Notwithstanding, it is noted that construction works associated with infrastructure upgrades/new provision could have temporary and localised adverse effects on biodiversity and human health, particularly on those within communities who are living, working or studying closest to any proposed works.

A significant positive effect has also been identified in respect of Air and Climatic Factors (SEO 5). This is predominantly due to the proposed strategy to manage the wider potential environmental impacts associated with the construction and operation of wastewater systems (noise, odour, nuisance) under Aim WW1. In the long term, this is expected to enhance energy efficiency and increase the resilience of assets to the effects of climate change. The strategies to adopt an asset based management approach, to optimise energy consumption and to optimise capital and operational wastewater investments under Aim WW3 will also have a significant positive effect against SEO 5. Notwithstanding, it is noted that in the short to medium term, targeted capital investment is likely to result in increased emissions to air including greenhouse gas emissions.

The development of national strategies for combined sewers including the identification of properties at risk of flooding under Aim WW2 will have a significant positive effect against Flood Risk (SEO4) as combined sewers currently represent one of Irish Water's greatest flood risks. The strategies under Aim WW2 to manage the existing wastewater resources and plan for new resources based on short, medium and long term sustainability and to implementation of strategies to cover discharge authorisation, headroom in treatment facilities, population growth and climate change are assessed as having a significant positive effect against Water as an Economic Resource (SEO 7). This is because Irish Water's infrastructure is necessary for the continued functioning of the country and for the delivery of essential water services which, if lost or impaired, would have a major detrimental impact on Ireland as a whole.

Whilst the strategies under Aim WW1 do not relate specifically to the sustainable use of water and its protection as an economic resource, proposals arising from the implementation of the Wastewater Compliance and CSO strategies and the Capital Investment Plan are expected to protect/enhance water sources by increasing the quality of wastewater discharges and thus have a positive effect on Water as an Economic Resource (SEO 7).

Negative Effects

There is the potential that the construction and operation of proposals arising from the implementation of, for example, the Wastewater Compliance Strategy will have some local adverse impacts on landscape and/or visual amenity and in consequence, the potential for minor negative effects has been identified in respect of SEO 10 (Landscape). However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.

Mixed Positive and Negative Effects

The strategies that comprise aims WW2 and WW3 have been assessed as having mixed positive and negative effects on Biodiversity, Flora and Fauna (SEO 1). This reflects both the potential for adverse effects on biodiversity during the construction of proposals that come forward as a result of these strategies and the expectation that such proposals will lead to longer term enhancements to aquatic ecology during their subsequent operation. Notwithstanding, the exact magnitude of both positive and negative effects on this SEO is uncertain and will depend on the number, type and location of future proposals which is currently unknown.

Uncertain Effects

Effects on Soil (SEO 8) and Cultural Heritage (SEO 9) have been assessed as uncertain as the future locations of proposals that may come forward as a result of the implementation of the strategies under this strategic objective of the draft WSSP are unknown at this stage.

4.3.4 Protect and Enhance the Environment

Table 4.4 summarises the potential effects of those strategies, grouped by draft WSSP aim, under the strategic objective to Protect and Enhance the Environment against the SEOs. The detailed assessment is contained in **Appendix D** (Tables D7 to D9).

Table 4.4 Effects of draft WSSP Strategies under Strategic Objective: Protect and Enhance the Environment (by Aim)

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
EN1: Ensure that Irish Water Services are Delivered in a Sustainable Manner that Contributes to Protection of the Environment (Strategies EN1a to EN1e).	+/?	+/?	++	++	++	0/+	+/?	0	+/?	0
EN2: Operate our Water Services Infrastructure to Support the Achievement of Water Body Objectives under the Water Framework Directive (Strategies EN2a to EN2b).	+/?	+/?	++	0/+	+	+/?	+	?	?	-/?
EN3: Manage all our Residual Waste in a Sustainable Manner (Strategies EN3a to EN3c).	0/-	0/-	-	0	+	0	0	+	0	0
Summary of the effects of all 3 WS aims.	+/-/?	+/-/?	++/-	++	++	+/?	+/?	+/?	+/?	-/?

Significant positive effects have been identified against three SEOs for the strategies supporting this strategic objective, which relate to the following topics: Water Quality and Quantity; Flood Risk; and Air and Climatic Factors. No strategies were assessed as having a significant negative effect on the SEOs.

Positive Effects

Irish Water is seeking to take action to help protect the environment from negative effects on the environment associated with water and wastewater services through the strategies under aims EN1, EN2 and EN3. The strategies of EN1 relate to a range of sustainability and climate measures, including a Sustainability Policy and Sustainability Framework, a Sustainable Energy Strategy, a Climate Change Adaptation and Mitigation Strategy, green procurement and adherence to environmental and planning legislation. This is expected to have a significant positive effect on Water Quality and Quantity (SEO 3) through the design of projects and engagement with stakeholders to achieve improvements to water body status, and the implementation of changes in resource use to reduce the quantity of chemicals used where feasible. In addition, climate change adaptation actions to increase resilience to potential periods of low water flows may help manage stresses on water resources.

The strategies under EN2, which include working with stakeholders using a catchment based approach and managing the operation of infrastructure to help achieve WFD objectives, have also been assessed as having a significant positive effect on SEO 3. This arises from the management of key pollution sources such as wastewater discharges and agriculture through the catchment based approach, and improvements to wastewater treatment plant discharges.

Significant positive effects were also identified for Aim EN1 for Flood Risk (SEO 4) and Air and Climatic Factors (SEO 5). The effect for SEO 4 predominantly arose from the flood risk minimisation actions that would arise through compliance with planning legislation, in addition to measures to mitigate climate change (and therefore help reduce potential increases in future flood risk) and adaptation to the effects of climate change including the implementation of a Climate Change Adaptation and Mitigation Strategy. A neutral or minor positive effect is also anticipated for EN2 against this SEO due to reduced storm runoff. Aim EN1 resulted in a significant positive effect for SEO 5 due to measures to reduce greenhouse gas emissions, install renewable energy sources and ensure infrastructure is resilient to the changing climate. Adherence to environmental legislation for reductions in carbon emissions also contributed to the significant positive effect. The strategies under EN2 and EN3 were assessed as having minor positive effects against SEO 5 due to potential reductions in greenhouse gas emissions.

Aims EN1 and EN2 have been assessed as having minor positive effects against Biodiversity, Flora and Fauna (SEO 1). This is due to strategies promoting the protection of biodiversity and helping limit the effects of climate change on habitats under EN1, and improvements to water quality and aquatic ecosystems as part of EN2. There is also some uncertainty over the effects that will arise from the commitments proposed in new strategies and the extent of any construction disturbance.

Aim EN1 was identified as having a neutral or minor positive effect against Water Management Infrastructure (SEO 6) due to regulatory contributions towards avoiding detrimental environmental or health impacts from new infrastructure. EN2 was assessed as a mixed positive and uncertain effect against this SEO due to the potential but uncertain scale of beneficial new infrastructure and infrastructure upgrades.

Minor positive effects were identified against Water as an Economic Resources (SEO 7) for aims EN1 and EN2 due to strategies which seek to protect the quality of water resources and improve water efficiency. Some uncertainty was present for EN1 as the exact content of the strategies to be developed under this aim is not yet known.

Aim EN3 was assessed as having a minor positive effect against Soil (SEO 8) through the use of sludge management activities and its potential for application as a soil enhancer. A minor positive effect with some uncertainty was identified for EN1 against Cultural Heritage (SEO 9), relating to the extent of the protection of cultural heritage assets under the Sustainability Policy.

Negative Effects

Minor negative or neutral and minor negative effects were identified for EN3 against SEOs 1, 2 and 3. For SEO 1, the mixed effect on biodiversity arose from potential construction impacts on habitats and pollution of aquatic ecosystems from sludge runoff (should treated sludge be applied to land). The potential for sludge runoff to pollute

drinking water supplies contributed to the negative effect against SEO 2, however this may be mitigated and result in a neutral effect against health. Diffuse water pollution from sludge application was also the reason for the minor negative effect against SEO 3. A further minor negative effect was recorded against Landscape (SEO 10) for EN2 as a result potential long term impacts on landscape from new infrastructure, albeit of uncertain scale.

Mixed Positive and Negative Effects

The overall effect of the strategies supporting the strategic objective Protect and Enhance the Environment on this SEO are considered to be mixed. Whilst aims EN1 and EN2 have been assessed as having minor positive effects against Biodiversity, Flora and Fauna (SEO 1), there is also the potential for the construction of any new facilities required to generate energy from sludge (which may be identified in national sludge strategies proposed under Aim EN3) to have a negative effect on biodiversity, depending on the scale and location of a proposed scheme and the quality and conservation importance of existing biota and habitats.

Uncertain Effects

Uncertain effects were recorded for EN2 against SEO 8 and SEO 9 as the location of any potential works is unknown. In consequence it is not certain whether any potential development would take place on greenfield or brownfield land which would affect the future impact on soils, and the proximity to or impacts on any cultural heritage or archaeological assets is also uncertain at this stage.

4.3.5 Support Social and Economic Growth

Table 4.5 summarises the potential effects of those strategies, grouped by plan aim, under the strategic objective to Support Social and Economic Growth against the SEOs. The detailed assessment is contained in **Appendix D** (Tables D10 to D12).

Table 4.5 Effects of draft WSSP Strategies under Strategic Objective: Support Social and Economic Growth (by Aim)

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
SG1: Support National, Regional and Local Economic and Spatial Planning Policy (Strategy SG1a).	+	++	+	+	0	++	0	0	0	0

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
SG2: Facilitate Growth in line with National and Regional Economic and Spatial Planning Policy (Strategies SG2a to SG2e).	+/-/?	++/-	+/-	0	+/-/?	++	0	?	?	?
SG3: Ensure that Water Services are Provided in a Timely and Cost Effective Manner (Strategies SG3a to SG3c).	-/?	++/-	+/-	0	+/-/?	++	+	?	?	?
Summary of the effects of all 3 SG aims.	+/-/?	++/-	+/-	+	+/-/?	++	+	?	?	?

Overall, the strategies that support this strategic objective have been assessed as having a significant positive effect on two of the SEOs relating to the following topics: Population and Human Health; and Water Management Infrastructure. No significant negative effects were identified during the assessment.

Positive Effects

As highlighted in the baseline analysis presented in **Appendix C**, while the quality of drinking water has in general been improving in Ireland, there have been instances where poor water quality can pose risks to health and the environment, if untreated. In this context, the strategies under aims SG1, SG2 and SG3 seek to ensure that new development receives timely and adequate water services. This will be principally achieved through forward planning together with national, regional and local bodies under Aim SG1. The strategies under aims SG2 and SG3 seek to ensure new development receives timely, adequate and cost effective water services by co-ordination and integration of forward planning of future infrastructure. The individual strategies consist of investing in the network and treatment works, maintaining appropriate headroom to facilitate growth between investment periods, ensuring infrastructure is developed to meet projected demand on a phased basis, and balancing investment for growth in demand with affordability. Taking into account existing drinking water quality issues in Ireland, these strategies have been assessed as having a significant positive effect on Population and Human Health (SEO 2), although it is noted that construction works associated with infrastructure upgrades/new provision could have temporary and localised adverse effects on human health, particular on those within communities who are living, working or studying closest to any proposed works.

As noted above, the implementation of the strategies under aims SG1, SG2 and SG3 to ensure that new development receives timely and adequate water services are expected to result in the upgrade of existing, and

provision of new, water treatment and supply infrastructure, helping to protect human health through the associated provision of a good quality, reliable and affordable water supply and wastewater disposal. Positive effects on Water Management Infrastructure (SEO 6) have therefore been assessed as significant in respect of those strategies under aims SG1, SG3 and SG3.

Working with national, regional and local bodies to anticipate and plan water services as advocated under Aim SG1 will provide the opportunity to identify alternative locations for new water infrastructure in a way that minimises any increase in flood risk and create resilience of water supply and treatment infrastructure to future flood risk. A minor positive effect against SEO 4 has therefore been determined.

The strategies under Aim SG3 to ensure that water services are provided in a timely and cost effective manner are expected to ensure that the value of water is protected, thus scoring a minor positive effect on SEO 7. This will be achieved through putting an emphasis on the affordability of water services to customers, and through seeking to recover the cost of connecting new developments to Irish Water networks from new customers, rather than the existing ones. The cost of providing water services to new developments will therefore be incorporated into the planning of these future developments.

Negative Effects

No overall negative effects have been identified although the strategies under Aim SG3 have been assessed as having a minor negative effect on Biodiversity, Flora and Fauna (SEO 1). This reflects the potential for adverse effects on biodiversity during the upgrade and construction of new networks and treatment works although the exact magnitude of negative effects on this objective is uncertain and will depend on the number, type and location of future proposals which is currently unknown.

Mixed Positive and Negative Effects

The strategies that comprise aims SG1 and SG2 have also been assessed as having mixed positive and negative effects on Biodiversity, Flora and Fauna (SEO 1). This reflects both the potential for adverse effects on biodiversity during the construction of proposals that come forward as a result of these strategies and the expectation that such proposals will lead to longer term enhancements to aquatic ecology during their subsequent operation. Notwithstanding, the exact magnitude of both positive and negative effects on this SEO is uncertain and will depend on the number, type and location of future proposals which is currently unknown.

Planning ahead for the provision of adequate water services infrastructure under Aim SG1 in particular is expected to facilitate the achievement of water body objectives under the Water Framework Directive (WFD) and generate minor positive effects in respect of Water Quality and Quantity (SEO 3). Those strategies under aims SG2 and SG3 are expected to have both positive effects on this SEO through provision and improvement of wastewater treatment and thus the quality of discharge to the environment. At the same time minor negative effects are expected from the associated construction works, as there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses.

Mixed positive and negative effects have also been identified in respect of Air and Climatic Factors (SEO 5) due to the expectation that future infrastructure proposals will result in increased emissions to air (including greenhouse gas emissions) in the construction phase (so the short to medium term) but also the potential for these proposals to generate emissions reductions in the operational phase (so longer term) when compared to the current baseline. Through the implementation of other strategies, notable Strategy EN1c of the draft WSSP, any new infrastructure proposed under SG Aims could also increase resilience of Irish Water's services to the effects of climate change, by increasing capacity and flexibility in supplies.

Uncertain Effects

Effects on Soil (SEO 8), Cultural Heritage (SEO 9) and Landscape (SEO 10) have been assessed as uncertain as the future locations of proposals that may come forward as a result of the implementation of the strategies under this strategic objective of the draft WSSP are unknown at this stage.

4.3.6 Invest in Our Future

Table 4.6 summarises the potential effects of those strategies, grouped by plan aim, under the strategic objective to Invest in Our Future against the SEOs. The detailed assessment is contained in **Appendix D** (Tables D13 to D16).

Table 4.6 Effects of draft WSSP Strategies under Strategic Objective: Invest in Our Future (by Aim)

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
IF1: Asset Management - Manage Our Assets and Investments in Accordance with Best Practice Asset Management Principles so as to Deliver a High Quality Secure and Sustainable Service at Lowest Cost (Strategies IF1a to IF1c).	+/-	+/-	+	0	+/-	+	0	+/-/?	?	?
IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country (Strategies IF2a to IF2c).	+	+	+	0	0	+	++	0	0	0

Draft WSSP Aim	Strategic Environmental Objective									
	1. Biodiversity, Flora and Fauna	2. Population and Human Health	3. Water Quality and Quantity	4. Flood Risk	5. Air and Climatic Factors	6. Water Management Infrastructure	7. Water as an Economic Resource	8. Soil	9. Cultural Heritage	10. Landscape
IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes (Strategies IF3a to IF3c).	+	+	+	0	0	+	+	0	0	0
IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency (Strategies IF4a to IF4c).	+	+	+	0	+	+	+	0	0	0
Summary of the effects of all 4 IF aims.	+/-	+/-	+	0	+/-	+	++	+/-/?	?	?

Overall, the strategies that support this strategic objective have been assessed as having a significant positive effect on SEO 7 relating to Water as an Economic Resource. No significant negative effects were identified during the assessment.

Positive Effects

The strategies under Aim IF2 promote the best use of the available financial resources and have been assessed as having a significant positive effect on SEO 7 (Water as an Economic Resource). Directing future investment in a way that results in maximum benefits to Irish Water's stakeholders, which include household, commercial and industrial customers, the environment and economic needs of the country, is the concern of these strategies. The engagement with stakeholders as well as the application of transparent investment prioritisation criteria is expected to contribute to determining the best use of the available financial resources, thus ensuring that the provision of water services is recognised and treated as an economic resource.

Optimised asset management under Aim IF1 and the use of innovative technology under Aim IF4 are expected to facilitate the achievement of water body objectives under the Water Framework Directive (WFD) and generate positive effects in respect of Water Quality and Quantity (SEO 3). This will be achieved through improving and upgrading treatment technologies, aiming to achieve lower unit cost which in turn increases the capacity to treat more water at the same cost to a higher standard. Giving a voice to environmental concerns by involving the EPA as a stakeholder and taking into account environmental needs when developing Irish Water's funding model are also expected to result in positive effects on SEO 3.

As noted above, the implementation of the strategies under IF2 and IF3 aim to lower the cost of treatment and emphasise the needs of the environment through sustainable funding models that balance the needs for affordability, quality, sustainability and growth. This is expected to result in the provision of sustainable, and affordable sources of good quality drinking water and effluent being treated to a higher standard being discharged to the environment, helping to protect both human health and the ecological status of water bodies. It is noted that until the founding of Irish Water as a national water company, the costs of water services were not transparent to customers (as they were funded through general taxation). As a consequence, customers have viewed the introduction of any water charges as an additional (and in some cases unwanted) burden. Nevertheless, ensuring water affordability provides direct benefits to human health by ensuring cost is no barrier to accessing good quality water. Positive effects on Water Management Infrastructure (SEO 6) have therefore been assessed as minor positive in respect of those strategies under aims IF1 to IF4.

Negative Effects

No overall negative effects have been identified against any of the SEOs.

Mixed Positive and Negative Effects

The strategies that comprise Aims IF1 to IF4 have been assessed as having mixed positive and negative effects on Biodiversity, Flora and Fauna (SEO 1). This reflects both the potential for adverse effects on biodiversity during the construction of proposals that come forward as a result of the asset management strategies under IF1 and the implementation of innovative technology under IF4, and the expectation that such proposals will lead to longer term enhancements to aquatic ecology during their subsequent operation. Positive effects are also expected from the balanced sustainable investment in Irish Water assets that will take into account the interest of the environment and engaging the EPA as a key stakeholder under IF2, and the sustainable funding model that is a pre-requisite for achieving benefits for the environment under IF3.

The strategies under aims IF1, IF2, IF3 and IF4 seek to achieve a long term provision of good quality water in Ireland at an affordable price to customers. This will be principally achieved through efficient asset management under IF1, stakeholder engagement under IF2, the development of a sustainable funding model under IF3 and the promotion of research and innovation under strategy IF4. Water affordability provides direct benefits to human health by ensuring that cost is no barrier to accessing good quality water. However, it is noted that the present debate over water charging affects how any statements regarding affordability by Irish Water are viewed by stakeholders. Taking into account existing drinking water quality issues in Ireland in conjunction with the commitments to water affordability, the strategies under the IF Aims have been assessed as having a minor positive effect on Population and Human Health (SEO 2). Although, it is noted that construction works associated with infrastructure upgrades/new provision could have temporary and localised adverse effects on human health, particular on those within communities who are living, working or studying closest to any proposed works, resulting in an overall mixed minor positive and minor negative effect on SEO 2.

Mixed positive and negative effects have also been identified in respect of Air and Climatic Factors (SEO 5) due to the expectation that future infrastructure proposals stipulated by asset management under IF1 will result in increased emissions to air (including greenhouse gas emissions) in the construction phase (so the short to medium

term) but also the potential for these proposals to generate emissions reductions in the operational phase (so longer term) when compared to the current baseline. The implementation of innovative technology is also expected to lower emissions overall. New infrastructure proposals could also increase resilience of Irish Water's services to the effects of climate change (although this will also be through the implementation of other strategies, notable Strategy EN1c of the draft WSSP).

A mixed minor positive and negative effect has been determined against the Soil Objective (SEO 8). This is owed to the potential that new infrastructure proposals could be located on greenfield sites of high agricultural land quality or peatland, resulting in negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented at **Appendix C** for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective. However, the locations of proposals that may come forward as a result of the implementation of the strategies under this strategic objective of the draft WSSP are unknown at this stage.

Uncertain Effects

Effects on Cultural Heritage (SEO 9) and Landscape (SEO 10) have been assessed as uncertain as the future locations of proposals that may come forward as a result of the implementation of the strategies under this strategic objective of the draft WSSP are unknown at this stage.

4.4 Secondary, Cumulative and Synergistic Effects

In determining the significance of effects of a plan or programme, the SEA Directive requires that consideration is given to the secondary, cumulative and synergistic nature of the effects. Relevant secondary and synergistic effects are included in the detailed assessment in **Appendix D** whilst the effects of the collective implementation of the strategies by aim of the draft WSSP are summarised in **Section 4.3**.

This section considers two further categories of cumulative effects, namely:

- The combined effects of all draft WSSP strategies; and
- The effects of the draft WSSP in-combination with other plans and programme.

4.4.1 Cumulative Effects of the Draft WSSP

Table 4.7 presents the assessment of the cumulative effects of the draft WSSP strategies. The cumulative effects of the draft WSSP (as well as its interaction with other plans and programmes) have been qualitatively assessed, building on the consideration of the individual assessments of WSSP aims and strategies. Necessarily, there are some uncertainties, given the strategic nature of the assessment; however, our best judgment indicates that the majority of the SEOs will experience positive effects as a result of the implementation of the strategies contained in the draft WSSP.

Significant positive effects are expected in respect of the following SEOs: Biodiversity (SEO 1); Population and Human Health (SEO 2); Water Quality and Quantity (SEO 3); Food Risk (SEO 4); Air and Climatic Factor (SEO 5); Water Management Infrastructure (SEO 6) and Water as an Economic Resource (SEO 7). Positive cumulative effects have also been identified in respect of Soil (SEO 8). This principally reflects the emphasis of the draft WSSP strategies on the sustainable management of water resources and the delivery of infrastructure to support the achievement of WFD water body objectives and compliance under the Urban Waste Water Treatment Directive.

No significant negative cumulative effects have been identified during the assessment. Minor negative effects on some SEOs are likely to arise as a result of the implementation of the draft WSSP. In this respect, the potential for negative effects has been identified in respect of SEOs relating to Biodiversity; Population and Human Health; Water Quality and Quantity; Air and Climatic Factors; Soil; and Landscape (potential effects on Cultural Heritage (SEO 9) are considered to be uncertain at this stage). As noted above, the upgrade of existing, and provision of new, infrastructure and services identified in Tier 2 plans is expected to generate long term environmental benefits. Similar to other types of development, construction of new infrastructure could also have short term and local adverse environmental effects due to, for example, land take, emissions to air, and disturbance. The probability/magnitude of effects is subject to the number, type, scale and location of future proposals as well as the sensitivity of the receiving environments which is currently unknown. Notwithstanding, it is expected that the potential for adverse environmental effects would be identified and, where possible, addressed during the preparation of Tier 2 plans and through the SEA and Appropriate Assessment process of the respective plans. Similarly, at the project stage (Tier 3), environmental impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) and Appropriate Assessment depending on the scale, location and nature of development proposed).

Table 4.7 Cumulative Effects of the Draft WSSP

Strategic Environmental Objective	Score	Summary
1. Biodiversity, Flora and Fauna	++/-/?	<p>One of the strategic objectives of the draft WSSP is to protect and enhance the environment and in this context, the strategies that comprise the draft WSSP are expected to conserve and enhance biodiversity, flora and fauna. The upgrade of existing, and provision of new, infrastructure identified in Tier 2 plans, allied with commitments towards the sustainable management of water resources to achieve Water Framework Directive (WFD) water body objectives and compliance with the Urban Waste Water Treatment Directive (UWWTD), is in particular expected to enhance the ecological status of waterbodies and aquatic ecology in Ireland. Given that only 52% of Irish rivers are currently at 'good' or 'high' ecological status, and taking into account the relatively poor status of freshwater species listed under the Habitats Directive, there is the potential for positive effects in this regard to be significant.</p> <p>Construction works associated with infrastructure schemes arising from Tier 2 plans may, however, result in the permanent loss of habitat and/or cause temporary disturbance to biodiversity on and off site. Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species. However, it is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of Tier 2 plans through SEA and Appropriate Assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment. In consequence, any adverse effects on ecology would not be expected to be significant.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed</p>

Strategic Environmental Objective	Score	Summary
		<p>significant positive and minor negative cumulative effect on Biodiversity, although it is recognised that the exact magnitude of both positive and negative effects on this SEO will depend to an extent on the number, type and location of future proposals which is currently unknown.</p>
2. Population and Human Health	++/-/?	<p>Whilst the quality of drinking water in Ireland has in general been improving, there have still been short term declines which can pose risks to health and the environment and require interventions (such as boil water notices). In this context, the strategies that comprise the draft WSSP are expected to contribute to protecting the health of the Irish population through the strategic objective to ensure a safe and reliable water supply. This will be achieved in particular through the implementation of the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans allied with commitments towards the sustainable management of water resources.</p> <p>One of the strategic objectives of the draft WSSP is titled 'to invest in our future' and in this context, the strategies that comprise this objective seek to deliver a high quality secure and sustainable service at affordable cost that will support future development. Improving and ensuring water affordability provides a direct benefit to human health by ensuring cost is not a barrier to accessing good quality water.</p> <p>There is the potential that the construction of schemes identified in Tier 2 plans could have temporary and localised adverse effects on human health due to, for example, noise disturbance and air quality impacts. Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Population and Human Health, although it is recognised that the exact magnitude of both positive and negative effects on this SEO will depend to an extent on the number, type and location of future proposals which is currently unknown.</p>
3. Water Quality and Quantity	++/-/?	<p>One of the strategic objectives of the draft WSSP is to ensure a safe and reliable water supply and in this context, the strategies that comprise the draft WSSP are expected to increase the supply of water and improve its quality. The implementation of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and Regional Water Conservation Strategies, allied with commitments towards the sustainable management of water resources to achieve WFD water body objectives and compliance with the UWWTD, are in particular expected to increase the supply of water and reduce the risk of pollution to the aquatic environment. Taking into account the existing drinking water quality issues in Ireland combined with the non compliance against the UWWTD and risks around Combined Sewer Outflows (CSOs), these strategies have been assessed as having a significant positive effect on Water Quality and Quantity.</p> <p>A further strategic objective of the draft WSSP is to protect and enhance the environment and in this context, the strategies that underpin this objective are expected to have a significant effect on Water Quality and Quantity through improvements to the water body status required by regulations and reduced chemical discharges, plus adaptation to potential periods of low water flows which may help manage stresses on water resources. Furthermore, the management of key pollution sources such as wastewater discharges and agriculture through the catchment based approach, and improvements to wastewater treatment plant discharges also contribute to this significant positive effect.</p> <p>Construction works associated with infrastructure schemes arising from Tier 2 plans have the potential to cause contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to watercourses which will have a minor significant effect against this objective. However, this may be mitigated and result in a neutral effect against Water Quality and Quantity.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Water Quality and Quantity, although it is recognised that the exact magnitude of both positive and negative effects on this SEO will depend to an extent on the number, type and location of future proposals which is currently unknown.</p>
4. Flood Risk	++	<p>The strategies that comprise the draft WSSP are expected to help minimise increases in flood risk due to sewer overflows across Ireland. In particular, specific measures to reduce flooding such as storm water separation to help maximise the existing capacity of Irish Water's assets and the development of strategies for CSO management would have a positive effect on flood risk. Together with flood risk</p>

Strategic Environmental Objective	Score	Summary
		<p>minimisation actions that would arise through actions to mitigate climate change (and therefore help reduce potential increases in future flood risk) and adaptation to the effects of climate change including the implementation of a Climate Change Adaptation and Mitigation Strategy, the cumulative effect could be significant.</p> <p>The location of future proposals for new infrastructure is currently unknown and in consequence, there is some uncertainty over the effect on catchment flood risk from new infrastructure at this stage. New infrastructure could be located in areas of flood risk and/or increase flood risk in catchments (for example, through any associated increase in impermeable areas resulting in increased surface water runoff). However, it is expected that proposals would be subject to flood risk assessment where necessary, such that effects on flooding could largely be avoided and would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water infrastructure to future flood risk. In this respect, the Climate Change Adaptation and Mitigation Strategy will assess the vulnerability of water services to climate change events and identify actions to modify Irish Water's infrastructure or operations. In consequence, whilst there is some uncertainty of the effects, the mitigation measures proposed are considered adequate to ensure a positive effect will still occur.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a significant positive cumulative effect on Flood Risk.</p>
5. Air and Climatic Factors	++/-	<p>The strategies that comprise the draft WSSP are expected to help mitigate climate change and encourage adaptation to climate change. Some of the draft strategies specifically seek to reduce greenhouse gas emissions, including measures to increase energy efficiency such as more efficient operation of water infrastructure, the use of low energy wastewater treatment solutions, purchase of energy efficient products, the design of new capital projects for energy efficiency and the use of renewable energy sources including energy from sludge.</p> <p>Adaptation measures to respond to a changing climate include enhancement of the resilience of water supply and treatment infrastructure, development of a Sustainability Policy and Sustainability Framework which will include consideration of the changing climate and extreme weather events on water resources, and the implementation of a Climate Change Adaptation and Mitigation Strategy. New infrastructure proposals could also increase the resilience of Irish Water's services to the effects of climate change through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies.</p> <p>With rising average temperatures and international commitments to reduce greenhouse gas emissions, Ireland has a role to play in helping to mitigate climate change. Although the exact scale of potential energy savings and reductions in greenhouse emissions are not known at this stage, these strategies as a whole should make a significant contribution to climate change mitigation and adaptation in the longer term.</p> <p>Construction activities and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions in the short term. Emissions to air are also likely to be associated with the use of plant and HGV movements during construction as well as the operation of new infrastructure such as water treatment works. As the scale and location of future infrastructure proposals that may be delivered is unknown, the potential impact on local air quality and extent of emissions to air is uncertain. However, minor negative effects may arise across the range of new and existing Irish Water operations.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed significant positive and minor negative cumulative effect on Air and Climatic Factors.</p>
6. Water Management Infrastructure	++	<p>As noted above, the implementation of the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans, allied with commitments towards the sustainable management of water resources to achieve WFD water body objectives and compliance with the UWWTD, are in-turn expected to result in the upgrade of existing, and provision of new, water treatment and supply infrastructure, helping to protect human health and the ecological status of water bodies through associated improvements to water quality. This will result in significant positive effects on Water Management Infrastructure.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a significant positive cumulative effect on Water Management Infrastructure, principally reflected by the anticipated upgrade, and provision of new, water supply and wastewater infrastructure.</p>
7. Water as an Economic	++	<p>One of the strategic objectives of the draft WSSP concerns future investment and in this context, the strategies that comprise the draft WSSP are expected to have a significant positive effect on Water as an Economic Resource. The strategies that direct future investment in a way that results in maximum benefits</p>

Strategic Environmental Objective	Score	Summary
Resource		<p>to Irish Water's stakeholders, the environment and economic needs of the country recognises the imbalance between the need of investment and the available capital funding. The engagement with stakeholders, as well as the application of transparent investment prioritisation criteria is expected to contribute to determining the best use of the available financial resources, thus ensuring that the provision of water services is recognised and treated as an economic resource.</p> <p>The strategies that promote the affordability of water supplies are assessed as having a significant positive effect on Water as an Economic Resource. Proposals arising from the implementation of these strategies will result in a lower per unit cost of water which is to be achieved through improved asset management, rationalising water sources, standardising treatment processes and using high quality raw water sources and implementing water conservation strategies to address leakage.</p> <p>The strategies that comprise managing the existing wastewater resources and planning for new resources based on short, medium and long term sustainability and the implementation of strategies to cover discharge authorisation, headroom in treatment facilities, population growth and climate change will have a significant positive effect against Water as an Economic Resource. This is because Irish Water's infrastructure is necessary for the continued functioning of the country and for the delivery of essential water services which, if lost or impaired, would have a major detrimental impact on Ireland as a whole.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a significant positive cumulative effect on Water as an Economic Resource.</p>
8. Soil	+/-/?	<p>There is uncertainty around the cumulative effect on soils from the strategies contained in the draft WSSP, and mixed positive and negative effects may arise.</p> <p>Strategies that may contribute towards a positive effect on the appropriate management of soils include sludge management activities such as sludge application as a soil enhancer, and catchment management strategies to address existing pressures on soil quality including, for example, soil erosion.</p> <p>It is not known whether any potential infrastructure development as a result of the strategies would take place on greenfield or brownfield land. This would affect the future impact on soils. New infrastructure proposals could be located on greenfield sites of high agricultural land quality or peatland across Ireland, resulting in negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990. Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on soil management. However, the locations of proposals that may come forward as a result of the implementation of the strategies are unknown at this stage.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a mixed minor positive and minor negative cumulative effect on Soil, with some uncertainty relating to the type of land use at future locations for new infrastructure.</p>
9. Cultural Heritage	?	<p>The enhancement of existing, and development of new, infrastructure arising from the implementation of the draft WSSP could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. With nearly 750 National Monuments, over 138,800 recorded archaeological monuments and approximately 39,400 Protected Structures across Ireland, it is possible that construction activities may be located in the vicinity of cultural heritage assets.</p> <p>However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish the type and magnitude of effect. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of these plans/strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required). In this regard, Strategy EN1e of the draft WSSP seeks to ensure that all future Irish Water infrastructure meets national planning and environmental legislation which will include relevant legislation and planning policy concerning the protection of cultural heritage assets.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having an uncertain effect on Cultural Heritage as the nature of individual schemes and their locations are not known.</p>
10. Landscape	-/?	<p>The strategies that comprise the draft WSSP are expected to have a negative effect on landscape and/or visual amenity, arising from the construction and operational stages of proposals involving new infrastructure.</p>

Strategic Environmental Objective	Score	Summary
		<p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character, whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity. The magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals across Ireland as well as the landscape sensitivity of the receiving environments.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect longer term visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors. However, at the project stage landscape impacts would be considered as part of the planning and EIA process (where required) to avoid significant effects. In this regard, Strategy EN1e of the draft WSSP seeks to ensure that all future Irish Water infrastructure meets national planning and environmental legislation which will include relevant legislation and planning policy concerning landscape. Notwithstanding, the future location of works is unknown at this stage and therefore effects on landscape and visual amenity are uncertain, but potentially negative.</p> <p>Overall, the strategies that comprise the draft WSSP have been assessed as having a minor negative cumulative effect on Landscape, with some uncertainty arising from the locations of work and the sensitivity of receiving environments.</p>

4.4.2 Cumulative Effects of the Draft WSSP in Combination with Other Plans and Programmes

There is the potential for the draft WSSP to generate cumulative effects in combination with other plans and programmes. In this respect, a number of plans and programmes at the national, regional and sub-regional level, as well as Northern Ireland plans, have been considered for their potential to interact with draft WSSP strategies to generate significant cumulative environmental effects. These plans and programmes are listed in **Table 4.8**.

It is noted that a number of plans are currently being prepared which have the potential, in combination with the draft WSSP, to generate cumulative effects (see those emerging plans listed in **Table 2.1**). However, as these plans have not yet been published, they have not been considered in this assessment. Notwithstanding, it would be expected that, once finalised, these plans will be considered in the future assessment of Tier 2 plans, as appropriate.

Table 4.8 Plans and Programmes with the Potential for In-Combination Effects with the draft WSSP

Tier (National, Regional, Sub-Regional, Northern Ireland)	Plan/Programme Considered
National	<ul style="list-style-type: none"> • National Spatial Strategy for Ireland (2002-2020) • National Development Plan (2007-2013) • National Climate Change Strategy (2007-2012) • National Renewable Energy Action Plan • National Climate Change Adaptation Framework: Building Resilience to Climate Change
Regional	<ul style="list-style-type: none"> • Regional Planning Guidelines (various) • River Basin Management Plans (various)
Sub-Regional	<ul style="list-style-type: none"> • County and Town Development Plans (various) • Greater Dublin Strategic Drainage Strategy • Strategic Integrated Framework Plan for the Shannon Estuary
Northern Ireland	<ul style="list-style-type: none"> • Northern Ireland Regional Development Strategy 2035 • Northern Ireland Water Water Resources Management Plan 2012

The effects of the draft WSSP in-combination with the other plans and programmes listed in **Table 4.8** are difficult to meaningfully or accurately assess, particularly given the high level and strategic nature of the draft WSSP. The sub-sections below highlight where there may be the potential for cumulative effects based on the information currently available.

National Spatial Strategy and National Development Plan

The **National Spatial Strategy for Ireland (NSS)** is a 20-year planning framework designed to achieve a better balance of social, economic, physical development and population growth between regions, supported by more effective planning. In order to drive development in the regions, the NSS proposes that areas of sufficient scale and critical mass will be built up through a network of gateways and hubs. The role of the gateways acting at the national level, together with the hubs acting at the regional and county levels, needs to be partnered by the county towns and other larger towns as a focus for business, residential, service and amenity functions. The NSS also identifies an important need to support the role of smaller towns, villages and rural areas at the local level.

The NSS recognises that a high quality environment is a prerequisite for economic success, social cohesion and sustainable development. Of particular relevance to the draft WSSP, the NSS identifies water supply, wastewater disposal systems and an environment capable of accommodating current water services requirements and major additional requirements into the future, as key elements vital to fostering a wide range of enterprise activity and employment creation in strategic locations that will help drive competitiveness in the Irish economy. The NSS also identifies water services among the economic infrastructure needed to support balanced regional development.

The **National Development Plan (NDP) *Transforming Ireland — A Better Quality of Life for All*** is Ireland's fourth NDP since 1989 and sets out the roadmap to Ireland's better long-term future. The NDP integrates strategic

development frameworks for regional development, rural communities, all-island co-operation, and for protection of the environment with common economic and social goals.

The NDP has identified economic infrastructure as a priority spending area as it recognises that addressing infrastructure deficits is crucial to Ireland's future economic growth, regional development and environmental sustainability. Of particular relevance to the draft WSSP is the fact that economic infrastructure includes Water Services (grouped under 'Environmental Services') which has been allocated funding of €4.75 billion. As a result, a key output of economic infrastructure is expected to be "to further enhance the water and wastewater infrastructure thereby facilitating residential and commercial development throughout the regions whilst also improving the quality of the environment".

The draft WSSP includes a strategic objective for Irish Water to support social and economic growth, which is directly aligned with the strategic aims of the NSS and NDP. Specifically, Strategy SG1 promotes working with national, regional and local bodies to anticipate and plan for future growth. The strategy concentrates on enabling better planning and pro-active engagement with planning bodies on all levels. This is to be achieved through working with the planning bodies in developing population projections to identify population growth and associated demand for water services; to identify short, medium and long term requirements for water services and fulfilling Irish Water's role as in the preparation of development plans. The strategies under SG2 seek to facilitate growth by meeting demand for water services where and when they are needed. In particular, SG2b requires Irish Water to plan water service infrastructure at national, regional and river basin level so as to ensure water services are planned at strategic level and can be provided when needed in line with development plans. This will be achieved primarily through the availability of the National Water Resources Plan and Wastewater Compliance Strategy.

The strategies under SG2 to meet the future demand for water services through planning infrastructure, investing in networks and treatment works and maintaining appropriate headroom are likely to require the implementation of a combination of measures including the management of existing assets and planning for an increase in capacity through upgrades and construction of new networks and treatment works. This is aligned with the NSS and NDP strategic priorities around water services infrastructure.

The strategic objective to protect and enhance the environment within the draft WSSP also complements the NSS and NDP as it seeks to deliver water services in a sustainable manner, thereby protecting the environment from any negative effects associated with water and wastewater services.

National Climate Change Strategy, National Renewable Energy Action Plan and National Climate Change Adaptation Framework

The **National Climate Change Strategy 2007-2012** builds on Ireland's first Climate Change Strategy (2000) and its purpose is to show clearly the measures by which Ireland will meet its 2008-2012 Kyoto Protocol commitment; limiting greenhouse gas emissions to 13% above 1990 levels. The Strategy specifically sets out principles and actions for the reduction of CO₂ emissions in Ireland in the areas of: energy supply; transport; waste management; industry, commercial and services sector; agriculture; residential; and the public sector. The Strategy includes a commitment for the Irish Government to develop a national adaptation strategy and also commits Government to

publish the third National Climate Change Strategy in good time to ensure that Ireland is well placed to meet its post-Kyoto commitments.

The **National Renewable Energy Action Plan (NREAP)**, submitted to the European Commission in July 2010, sets out the Irish Government's strategic approach and concrete measures to deliver on Ireland's 16% target under Directive 2009/28/EC on renewable energy. The NREAP states that the development of renewable energy is central to overall energy policy in Ireland and recognises that implementing and delivering on this will be a challenge and will require enhanced coordination and collaboration between all relevant Government departments and state bodies.

The **National Climate Change Adaptation Framework** provides a strategic policy focus to ensure adaptation measures are taken across different sectors and levels of Government to reduce Ireland's vulnerability to the negative impacts of climate change. The aim of the Framework is to ensure that an effective role is played by all stakeholders in putting in place an active and enduring adaptation policy regime. The governance structure provides for climate change adaptation to be addressed at national and local level. Similar to the approach being taken at EU level in the White Paper on Adaptation, it is intended to follow a two-phased approach to adaptation in Ireland. The first phase is focused on identifying national vulnerability to climate change, based on potential impacts relative to current adaptive capacity. The second phase involves the development and implementation of sectoral and local adaptation action plans which will form part of the comprehensive national response to the impacts of climate change.

Of relevance to the draft WSSP, the Framework identifies the climate risks to water resources and water supply systems and recognises that the management of these resources affects the vulnerability of ecosystems, socioeconomic activity and human health. The risks identified include: water vulnerability and shortages; pressures on sewer networks and water purification during extremes; increased microbial activity; and increased risk of flooding in river systems which could lead to a risk of contamination and pollution of water supplies. The Strategy requires that strategies for the management of water need to be adapted to take into account these climate risks.

Overall, the strategies that comprise the draft WSSP will help Irish Water to support national objectives for climate change mitigation and to meet its obligations under National Climate Change Adaptation Framework, as well as to comply with NREAP. The preparation and implementation of the Sustainable Energy Strategy and a Climate Change Adaptation and Mitigation Strategy are key measures proposed to help Irish Water achieve this. Additional draft strategies proposed in the draft WSSP specifically seek to reduce greenhouse gas emissions; including measures to increase energy efficiency such as more efficient operation of water infrastructure, the use of low energy wastewater treatment solutions, purchase of energy efficient products, the design of new capital projects for energy efficiency and the use of renewable energy sources including energy from sludge.

Adaptation measures to respond to a changing climate include enhancement of the resilience of water supply and treatment infrastructure, development of a Sustainability Policy and Sustainability Framework which will include consideration of the changing climate and extreme weather events on water resources. New infrastructure proposals could also increase the resilience of Irish Water's services to the effects of climate change through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies.

The strategies that comprise the draft WSSP are also expected to help minimise increases in flood risk across Ireland identified in the National Climate Change Strategy and National Climate Change Adaptation Framework. In particular, specific measures to reduce flooding such as storm water separation to help maximise the existing capacity of Irish Water's assets and the development of strategies for Combined Sewer Overflow management would directly support the National Climate Change Adaptation Framework.

Although the exact scale of potential energy savings and reductions in greenhouse emissions are not known at this stage, these strategies as a whole should make a significant longer term contribution to the achievement of the aims and objectives in the National Climate Change Strategy, NREAP and National Climate Change Adaptation Framework. However, in the short to medium term, construction activities and the associated embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions. As the scale and location of future infrastructure proposals that may be delivered is unknown, the extent of emissions is currently uncertain. However, there is the potential for this to negatively impact Ireland's achievement of its overall contribution to the overall EU 2020 emissions reduction target.

Regional Planning Guidelines

The **Regional Planning Guidelines (RPGs)** aim to give regional effect to the National Spatial Strategy and to guide the Development Plans for each county, while expanding on the NSS approach in more detail in relation to matters such as settlement, transportation and enterprise. The RPGs inform the Development Plans in each Council area and have effect for six years. The overall objective of the RPGs is to provide a long-term strategic planning framework for the development of the region. RPGs are now in place for each of the Regional Authorities to 2016.

The RPGs give regard to the strategic infrastructure priorities of the NSS and have a crucial role in supporting regionally important infrastructure. Of relevance to the draft WSSP is that fact that this includes prioritising the need for investment in water services (including water supply and quality and wastewater facilities). Consideration is also given to the capacity to accommodate growth as determined by analysis of a number of factors, including water services.

The strategic objectives of the draft WSSP around water supply and wastewater management reinforces and supports the implementation of the water services elements of the RPGs. In particular, the strategies under WS1 of the draft WSSP include the preparation and implementation of a National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans that together are expected to identify and target investment in the water supply and treatment infrastructure needed to enhance water quality in Ireland. The strategies under WW2 seek to manage the availability and resilience of wastewater services in the short, medium and long term are also expected to result in the upgrades and construction of new wastewater infrastructure. WW3e reflects the RPG requirement to take into consideration the capacity to accommodate population and economic growth whereby the strategy will evaluate the potential overloading of the existing wastewater networks and the capacity of Irish Water's systems to support growth from available headroom taking into account the potential impacts of population growth on the wastewater networks and the resultant encroachment on existing headroom.

River Basin Management Plans

The implementation of the Water Framework Directive (WFD) requires the development and publication of **River Basin Management Plans (RBMPs)** and Programmes of Measures (PoMs) prepared for each of the River Basin Districts (RBD). They are valid for a six-year period and the current plans run from 2009-2014. The plans summarise the waterbodies that may not meet the environmental objectives of the WFD by 2015 and identify which pressures are contributing to the environmental objectives not being achieved. The plans describe the classification results and identify measures that can be introduced in order to safeguard waters and meet the environmental objectives of the WFD.

The draft WSSP includes a strategic objective for Irish Water to protect and enhance the environment, which directly supports the RBMPs. Specifically, Aim EN2 proposes that Irish Water operates its water services infrastructure in a manner that facilitates the achievement of water body objectives under the WFD. Measures include actions under RBMPs which should help address issues such as pollution from wastewater. The catchment based model that is proposed to assess the impact and environmental benefits of operations and capital investments should also help identify where damage to ecosystems may occur, so that preventative action can be taken. Benefits could be significant if water bodies are in a designated nature conservation area or provide habitats for protected species.

County and Local Area Development Plans

Members of City, Borough, Town and County Councils are entrusted by law to make a **Development Plan** every six years, which sets the agenda for the development of the local authority's area over this time period. The Development Plan underpins the National Spatial Strategy and is central to achieving greater balance in regional development and enabling all areas to develop to their maximum potential. The plan must set out an overall strategy for the proper planning and sustainable development of the planning authority's area through the objectives to be included in the plan.

The adequacy of existing provision, maximising the use of existing infrastructure and the need for additional facilities are required to be taken into account in the preparation of Development Plans. Planning authorities must ensure that relevant objectives of any water quality management plans for any waters in or adjoining the local authority's functional areas are included in the Development Plan. Development Plans for counties, gateways, hubs and other large towns are also required to give regard to and make adequate provision for the scale of population growth in the most recent relevant population projections.

The strategic objectives of the draft WSSP around water supply and wastewater management reinforces and supports the implementation of the water services elements of the Development Plans. In particular, the strategies under WS1 of the draft WSSP include the preparation and implementation of a National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans that together are expected to identify and target investment in the water supply and treatment infrastructure needed to enhance water quality in Ireland. The strategies under WW2 seek to manage the availability and resilience of wastewater services in the short, medium and long term are also expected to result in the upgrades and construction of new wastewater infrastructure. WW3e reflects the development plan requirement to take into consideration the capacity to give regard to and make

adequate provision for population growth whereby the strategy will evaluate the potential overloading of the existing wastewater networks and the capacity of Irish Water's systems to support growth from available headroom taking into account the potential impacts of population growth on the wastewater networks and the resultant encroachment on existing headroom.

The draft WSSP also includes a strategic objective for Irish Water to support social and economic growth, which is directly aligned with the long term objectives for growth of Development Plans. Strategy SG1 concentrates on enabling better planning and pro-active engagement with planning bodies on all levels. By working with the planning bodies in developing population projections to identify population growth and associated demand for water services, Irish Water has a key role as in the preparation of development plans, reflected in future requirements for water services outlined in the WSSP.

Greater Dublin Strategic Drainage Strategy

Work on the **Greater Dublin Strategic Drainage Strategy** dates from 2005 when a strategic analysis was completed of the existing foul and surface water systems in the local authority areas of Dublin City, Fingal, South Dublin, Dun Laoghaire-Rathdown and the adjacent catchments in Counties Meath, Kildare and Wicklow. The analysis identified policies, strategies and projects for the development of a sustainable drainage system for the Greater Dublin Region. The aim was to develop an environmentally sustainable drainage strategy, which would be able to meet the demand of the region now and in the future (with 2031 as the long-term horizon). The study identified the overloading of the existing drainage systems which resulted in a marked deterioration in water quality and that the drainage system and wastewater treatment plants would have insufficient capacity to cater for future development. The population of the city was projected to rise to over 2 million in 2031 with a steep increase in housing units as household sizes decrease.

The Drainage Strategy has since been advanced to the selection of a single option consisting of an underground orbital sewer and two pumping stations, a wastewater treatment plant at Clonshagh (Clonsbaugh), coupled with an outfall pipe discharging 6 km out to sea from Baldoyle (<http://www.greaterdublindrainage.com/>).

The Greater Dublin Drainage Strategy is aligned with the strategic objective to manage: the operation of wastewater facilities in a manner that protects the environment (WW1), the availability and resilience of wastewater services now and into the future (WW2), and the reliability of wastewater services (WW3).

Strategic Integrated Framework Plan for the Shannon Estuary

The **Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary** is an inter-jurisdictional land and marine based framework plan to guide the future development and management of the Shannon Estuary. The Shannon Estuary is considered to be an immensely important asset and one of the most valuable natural resources in Ireland and is therefore of strategic significance to the regional and national economy. It is also a very important and sensitive ecosystem as the entire area is designated as a Special Area of Conservation (SAC) under the Habitats Directive. Also, all of the Shannon Estuary as far west as Foynes is a Special Protection Area (SPA) protected under the Birds Directive. The SIFP sets out an overall strategy for proper sustainable growth, development and environmental management of the Shannon Estuary Region for the next 30 years.

One of the strategic objectives of the draft WSSP is to protect and enhance the environment and in this context, the draft WSSP strategies are expected to conserve and enhance biodiversity, flora and fauna in the Shannon Estuary and ensure that any proposal for new infrastructure in this region does not conflict with the requirements of the WFD. The upgrade of existing, and provision of new, infrastructure identified in Tier 2 plans, allied with commitments towards the sustainable management of water resources to achieve WFD water body objectives and compliance with the UWWTD, is in particular expected to enhance the ecological status of waterbodies and aquatic ecology in the Shannon Estuary.

Notwithstanding, construction works associated with infrastructure schemes arising from Tier 2 plans may result in the permanent loss of habitat and/or cause temporary disturbance to biodiversity on and off site. This is likely to conflict with the SIFP as the effects on biodiversity in the Shannon Estuary could be significant since it is a designated nature conservation site and area of special protection. However, it is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of Tier 2 plans through SEA and Appropriate Assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed)). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment. In consequence, any adverse effects would not be expected to be significant.

Northern Ireland Regional Development Strategy

The **Regional Development Strategy 2035 (RDS)** for Northern Ireland is the long-term spatial strategy for the future development of Northern Ireland. The RDS addresses economic, social and environmental issues in order to achieve sustainable development and social cohesion. The eight aims of the strategy (underpinned by a series of Regional Guidance) are to support growth benefiting all of Northern Ireland; to strengthen Belfast and Londonderry as regional economic drivers; to support rural communities; to promote development which improves health and well-being; to improve connectivity between places for people, goods, energy and information; to protect and enhance the environment; to reduce Northern Ireland's carbon footprint and to facilitate adaptation to climate change; and to strengthen links between the north and south, east and west, with Europe and the rest of the world. Regional Guidance 12 of the RDS specifically promotes a more sustainable approach to the provision of water and sewerage services. The focus lies on water services for new developments and encourages integrated water and land-use planning, management of demand from new development and sustainable drainage systems. The provision of water infrastructure is viewed as essential to deliver on economic and social aspirations. In this respect, there are parallels with the WSSP strategies under the strategic objective to 'Support Social and Economic Growth'.

The Strategy could have effects across the border into the Republic of Ireland resulting in in-combination effects with WSSP. The Spatial Framework Guidance for the North West recognises the important links between the city of Londonderry/Derry as the North West City Gateway and Letterkenny in the Republic of Ireland. In this respect the strategy promotes the enhancement of transport links to Donegal. It is expected that the need for housing in Londonderry/Derry will continue to increase, possibly fuelling the demand for water services. Further links are identified between the town of Newry as the South Eastern City Gateway and Dundalk in the Republic of Ireland.

Newry & Mourne Council and Louth Local Authorities have signed a ‘Memorandum of Understanding’ (MOU) committing the region to increased cross border co-operation. For both Gateway Cities, the Strategy emphasises the need for good land transport links to the Republic of Ireland.

Northern Ireland Water Resources Management Plan

Northern Ireland Water’s Water Resources Management Plan is a 25 year planning framework demonstrating how supply and demand will be balanced over the long term. In this context the plan appraises options to help increase supply and reduce demand. The constrained list of options contains strategic transfers, demand management (water efficiency measures, leakage control, metering), the increase of abstraction from existing sources and refurbishment of existing sources. The existing sources from which more water shall be abstracted under the plan are Lough Neagh, Lough Island Reavy and Lough Erne.

Of Lough Neagh, only 9% of the catchment lies in the Republic of Ireland and the lake drains via the River Bann through territory of Northern Ireland. In-combination effects would therefore be small. Lough Island Reavy is a man-made reservoir in Kilcoo, County Down, with no hydrological connection to the Republic of Ireland. Lough Erne consists of widened sections of the River Erne. The upper and lower reaches of the River Erne are located in the Republic of Ireland. Increased abstraction from Lough Erne in Northern Ireland could have a negative effect on water available to abstract in the downstream section between Belleek and the estuary at Ballyshannon.

Conversely, increased abstractions, which may arise from Irish Water’s National Water Resources Plan under strategy WS1a of the draft WSSP, could impact on the ability to abstract from Lough Erne in Northern Ireland. In-combination effects of both plans could consist of deterioration of the water body status under WFD and the Ramsar Wetland designation.

Northern Ireland Water expect NIEA (Northern Ireland Environment Agency) to advise on sustainability reductions to abstractions. Such reductions would trigger a re-issue of the Northern Ireland Water Resources Management Plan.

4.5 Mitigation and Enhancement

The SEA process has identified a range of additional measures to avoid or minimise potential negative effects and to enhance positive effects arising from the implementation of the WSSP. These measures are identified in the detailed assessment matrices contained in **Appendix D**, and can be broadly categorised as:

- Measures that could be considered to enhance the performance of the draft WSSP (for example, amendments to strategy wording);
- Measures that could be considered in the development of proposals contained in Tier 2 plans to avoid adverse effects arising from, for example, the delivery of new infrastructure; and
- Measures that could be considered at the individual project stage (Tier 3) to avoid in particular adverse effects arising from the construction and operation of new infrastructure (although as the nature, scale and location of future activities is uncertain, it has not been possible to identify scheme-specific mitigation at this stage).

Table 4.9 highlights those measures identified during the assessment that cut across a number of the strategies together with the SEO(s) to which they relate and at what level they should be implemented (i.e. through the development of the draft WSSP, in the preparation of Tier 2 plans or at the Tier 3 project stage, reflecting the mitigation categories listed above). The mitigation and enhancement measures identified through the SEA process will be considered alongside the findings of the Appropriate Assessment and consultation responses in preparing the Final WSSP.

Table 4.9 Cross-Cutting Mitigation Measures

Measure	Strategic Environmental Objective	Category/Level (Draft WSSP, Tier 2 Plans, Tier 3 Projects)
Consider the inclusion of specific wording in the draft WSSP relating to the avoidance of adverse effects on biodiversity, human health, air quality, cultural heritage and landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP).	SEO 1: Biodiversity, Flora and Fauna SEO 2: Population and Human Health SEO 5: Air and Climatic Factors SEO 9: Cultural Heritage SEO 10: Landscape	Draft WSSP or Tier 2 (Sustainability Policy and Sustainability Framework)
Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites.	SEO 1: Biodiversity, Flora and Fauna	Tier 2 Plans, Tier 3 Projects
Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised.	SEO 1: Biodiversity, Flora and Fauna	Tier 3 Projects
Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors.	SEO 2: Population and Human Health	Tier 2 Plans, Tier 3 Projects
If required, construction activities should be undertaken in accordance with relevant best practice pollution prevention guidance and appropriate mitigation implemented (such as dust suppression, spill containment and emergency response procedures) to avoid adverse impacts on water quality.	SEO 3: Water Quality and Quantity	Tier 3 Projects
Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood protection measures should be implemented by Irish Water. New infrastructure should not increase flood risk of other development located downstream within a catchment.	SEO 4: Flood Risk	Tier 2 Plans, Tier 3 Projects
Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression.	SEO 5: Air and Climatic Factors	Tier 3 Projects

Measure	Strategic Environmental Objective	Category/Level (Draft WSSP, Tier 2 Plans, Tier 3 Projects)
Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value.	SEO 9: Cultural Heritage	Tier 2 Plans, Tier 3 Projects
Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors.	SEO 10: Landscape	Tier 2 Plans, Tier 3 Projects
At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts.	SEO 10: Landscape	Tier 3 Projects
Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts.	SEO 10: Landscape	Tier 3 Projects

4.6 Assessment of Reasonable Alternatives to the Draft Water Services Strategic Plan

As set out in **Section 1.5**, one reasonable alternative to the draft WSSP has been identified, namely the ‘Successional WSSP’. This reasonable alternative is based on the principle that the management of water services will be undertaken using current managing arrangements and practices, so:

- Regarding water supply, the service will continue as is in terms of planning for and providing water supply. This will include the retention of all 856 water treatment plants with many abstracting from small local supplies;
- Regarding wastewater treatment, the service will continue to support major improvements at larger plants to ensure full compliance. CSO will continue to be managed on a responsive basis.
- Investment will focus on large capital works and be undertaken to generally achieve full compliance and/or meet future projected growth/demand. The approach builds on the local contextual knowledge and experience gained over many years.

The assessment of this reasonable alternative is presented in **Table 4.10**.

Table 4.10 Assessment of 'Successional WSSP' Alternative

Strategic Environmental Objective	Effect	Commentary on Effects
1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species	+/-/?	<p>One of the main contributors to poor water quality and aquatic ecology in Ireland is large point sources such as wastewater treatment plants, many of which are failing their licensed consent standards. Major improvements at larger plants as proposed under this alternative would therefore be expected to help achieve compliance and reduce adverse effects on ecology associated with wastewater discharges in some areas. However, focusing on large capital works and treatment plants may restrict operational improvements and maintenance across the wider network. It may also limit the ability of Irish Water to target investment where there is the greatest need in terms of threats to ecology due to poor water quality (in this respect, it is noted that the performance of smaller assets suffer from poor performance).</p> <p>CSOs currently represent one of Irish Water's greatest compliance risks. Under this alternative, CSOs would continue to be managed on a responsive basis as opposed to the adoption of a long term, informed and coordinated approach to help identify those CSOs that represent the greatest compliance risk and, therefore, threat to ecology. This could mean that investment/works are not appropriately targeted to address WFD and Habitats Directive requirements.</p> <p>Under this alternative, water would continue to be supplied from 856 water treatment plants, many abstracting from small sources. It is considered that this approach would limit (relative to the draft WSSP as proposed) the potential for Irish Water to identify and remove unsustainable sources (for example, where abstraction is adversely affecting designated nature conservation sites) by, for example, the transfer of water from more sustainable sources. Further, many of these smaller sources are not capable of meeting future growth demand and smaller water bodies have a lower capacity to accept discharges from wastewater treatment plants without significant impact to aquatic ecology. In consequence, there is a risk that a Successional WSSP could impede the achievement of WFD objectives with the potential for adverse effects on ecology.</p> <p>Construction works associated with infrastructure schemes arising from the implementation of this alternative may result in the permanent loss of habitat and/or cause temporary disturbance to biodiversity on and off site. Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species. As this alternative would focus on large capital works, there may be a greater risk of adverse effects on biodiversity relative to the draft WSSP (which also seeks to optimise existing assets which would presumably have reduced potential for adverse environmental effects). Notwithstanding, it is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of Tier 2 plans through SEA and Appropriate Assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment. In consequence, any adverse effects on ecology would not be expected to be significant.</p> <p>Overall, it is considered that this alternative would restrict the potential for Irish Water to adopt a strategic approach to the management of its assets. This could mean that investment, operational improvements and maintenance are not targeted where needed to protect and enhance biodiversity and that unsustainable sources continue to be utilised. However, investment at larger wastewater treatment works would have the potential to enhance water quality and associated aquatic ecology where they discharge. In consequence, this alternative has been assessed as having a mixed positive and negative effect on Biodiversity, Flora and Fauna although there is the potential for adverse effects to be significant particularly if operations affect designated nature conservation sites.</p>
2. Protect and reduce risk to human health in undertaking water management activities	+/-	It would be fully expected that a Successional WSSP would seek to enhance drinking water quality and supply resilience particularly through major capital investment in treatment infrastructure which would have a positive effect on this

Strategic Environmental Objective	Effect	Commentary on Effects
	+/-	<p>SEO. However, under this alternative water would continue to be supplied from 856 water treatment plants, many abstracting from small sources which are vulnerable to microbiological contamination and not capable of meeting future demand. Whilst a local-based approach could help to ensure that future investment decisions are taken, and measures adopted, that specifically address local water quality issues, it is anticipated that risks to human health due to poor water quality would continue. Additionally, a local approach combined with a focus on large capital works may restrict investment, operational improvements and maintenance across the wider network thereby hindering the ability of Irish Water to target investment where there is the greatest need in terms of drinking water supply. This could mean that investment, operational improvements and maintenance are not targeted where needed to deliver a safe and resilient water supply and there would be likely to continue to be localised areas of substandard supply.</p> <p>In continuing to plan for water supply at a local level, and focusing on single, smaller sources, opportunities to remove vulnerable/at risk sources and increase the continuity of water supply and resilience (e.g. through water transfer or targeted leakage reduction) may be missed (relative to the draft WSSP). In this respect, a local approach may also limit the potential to plan at a strategic level to meet future demands for water across Ireland.</p> <p>There is the potential that the construction of schemes/projects arising from the implementation of this alternative could have temporary and localised adverse effects on human health due to, for example, noise disturbance and air quality impacts. The potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality). As this alternative would focus on large capital works, there may be a greater risk of adverse effects on human health relative to the draft WSSP (which also seeks to optimise existing assets). Notwithstanding, works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects in this regard are not expected to be significant.</p> <p>Overall, through investment in water infrastructure and related measures (albeit planned for locally), this alternative would be expected to enhance drinking water quality relative to baseline conditions in some localities. In this respect, it is noted that the quality of drinking water in Ireland has in general been improving. However, it is considered that this alternative would restrict the potential to adopt a strategic approach to the management of Irish Water's assets. This could have locally significant negative effects for those communities/areas that continue to receive substandard supply (although in a national context effects in this regard would be unlikely to be significant). Taking into account the potential for adverse effects on human health associated with the construction of infrastructure, this alternative has been assessed as having a mixed positive and negative effect on Population and Human Health.</p>
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity and improve water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the WFD</p>	+/-	<p>Like the draft WSSP (as proposed), a strategic objective of a Successional plan would be to meet the water body objectives of the WFD. In continuing a local approach to water resources management and focusing on major capital works, however, this alternative may restrict investment, operational improvements and maintenance across the wider network and limit the extent to which Irish Water can target investment where there is the greatest, need taking into account, for example, River Basin Management Plans. In this respect, it is noted that many smaller assets suffer from poor performance.</p> <p>CSOs currently represent one of Irish Water's greatest compliance risks. Under this alternative, CSOs would continue to be managed on a responsive basis as opposed to the adoption of a long term, informed and coordinated approach to help identify those CSOs that represent the greatest compliance risk. This could mean that investment/works are not appropriately targeted to address those CSOs posing greatest compliance risk.</p> <p>Under this alternative, water would continue to be supplied from 856 water treatment plants, many abstracting from small sources. It is considered that this approach would limit the potential for Irish Water to identify and remove unsustainable sources by, for example, the transfer of water from more sustainable sources. Further, many of these smaller sources are not capable of</p>

Strategic Environmental Objective	Effect	Commentary on Effects
	+	<p>meeting future growth demand and smaller water bodies have a lower capacity to accept discharges from wastewater treatment plants. In consequence, there is a risk that a Successional WSSP could impede the achievement of WFD objectives.</p> <p>Construction works associated with infrastructure schemes/projects arising from this alternative may give rise to the potential for water contamination, particularly given the expectation that some works are likely to be undertaken in close proximity to watercourses. However, this is likely to be mitigated such that no significant negative effects on water quality would be expected.</p> <p>Overall, whilst a strategic objective of a Successional plan would be to meet the water body objectives of the WFD, it is considered that this alternative would restrict the potential to adopt a strategic approach to the management of Irish Water's assets. This could mean that investment, operational improvements and maintenance are not targeted where most needed and that water quality would not be enhanced in some areas. In consequence, this alternative has been assessed as having a mixed positive and negative effect on Water Quality and Quantity.</p>
4. Minimise increases in flood risk	0	<p>Under this alternative, Irish Water would continue to seek to reduce flood risk arising from, for example, sewer flooding. This investment would be locally co-ordinated which may mean that localised flooding issues are addressed more effectively than under a national based approach. However, a local as opposed to national approach may undermine the potential for catchment-wide planning, to prioritise investment in areas of greatest risk and coordinate CSO management. Further, in focusing on large scale capital works, opportunities may be missed to enhance the resilience of other smaller assets to flood risk.</p> <p>The location of future proposals for new infrastructure would be unknown and in consequence, there is some uncertainty over the effect of this alternative on flood risk. New infrastructure could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff). However, it is expected that proposals would be subject to flood risk assessment where necessary, such that effects on flooding could largely be avoided and would not be significant.</p> <p>Overall, this alternative has been assessed as having a neutral effect on this Flood Risk.</p>
5. Minimise the contribution to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change	+/-	<p>A Successional WSSP would be expected to include strategies to mitigate climate change and encourage adaptation. In this respect, major capital works and improvements to larger treatment facilities could help to reduce operational emissions in the long term (relative to the existing baseline). A focus on local water supply management could also mean that emissions associated with, for example, the pumping of water are reduced relative to a national based approach that could involve water transfers. However, opportunities to reduce emissions through, for example, operational/maintenance improvements, smaller works improvements, energy recovery and targeted leakage reduction may be missed.</p> <p>Construction activities and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions in the short term. Emissions to air are also likely to be associated with the use of plant and HGV movements during construction as well as the operation of new infrastructure such as water treatment works. As the scale and location of future infrastructure proposals that could be delivered as a result of this alternative is unknown, the potential impact on local air quality and extent of emissions to air is uncertain. However, as this alternative would focus on large capital works, emissions during construction and operation may be greater relative to the draft WSSP (which also seeks to optimise existing assets).</p> <p>Whilst large scale capital works are likely to help ensure that Irish Water's services are more resilient to the effects of climate change, in continuing to plan for water supply at a local level opportunities to remove vulnerable/at risk sources and increase the continuity of water supply and resilience by, for example water transfer, may be more limited. Opportunities may also be missed to enhance the resilience of Irish Water's existing infrastructure through targeted enhancement works.</p> <p>Overall, this alternative has been assessed as having a mixed positive and</p>

Strategic Environmental Objective	Effect	Commentary on Effects
		negative effect on Air and Climatic Factors.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	+/-	<p>A Successional WSSP would be expected to support the delivery of water and wastewater management infrastructure that would help to meet the water body objectives of the WFD and enhance water supply in some areas. However, as highlighted above, it is considered that this alternative would mean that some areas would continue to receive substandard supply whilst the status of some water bodies would not be improved. Further, the approach would restrict the potential to adopt a strategic approach to the management of Irish Water's assets which could mean that investment, operational improvements and maintenance are not targeted where greatest benefit would be delivered.</p> <p>Overall, this alternative has been assessed as having a positive effect on this SEO.</p>
7. Protect water as an economic resource	0	<p>Under a Successional WSSP alternative, assets would continue to be managed at a local/regional scale. As noted above, relative to the draft WSSP (as proposed), this approach is likely to restrict the potential to adopt a strategic approach to the management of Irish Water's assets which could mean that investment, operational improvements and maintenance are not targeted where greatest benefit would be delivered. Further, opportunities may be lost to rationalise assets and water sources. This is particularly pertinent given the imbalance between the need of investment, the available capital funding in Ireland and the need to minimise costs to customers.</p> <p>A focus on large scale capital works could be at the expense of measures that, for example, seek to reduce leakage and deliver water efficiency. Further, whilst investment in large scale capital works would be expected to help support population and economic growth for key cities and towns, a lack of strategic level planning could mean that investment is not optimised, or integrated and Irish Water and customers are not getting best value from the investment and some in rural areas may view that they are not receiving appropriate investment to their localised needs.</p> <p>Overall, it is expected that this alternative would broadly continue the current approach to water resources management planning. In consequence, it has been assessed as having a neutral effect on this SEO.</p>
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	-/?	<p>The focus of this alternative on large capital works may limit opportunities for managing sludge at a national scale which could in-turn undermine the potential to utilise sludge to enhance soil quality. A local, as opposed to national approach, to water resources management could also mean that opportunities for Irish Water to contribute to the management of land at a catchment scale are missed.</p> <p>There is some uncertainty in respect of the cumulative effects of a Successional WSSP on soils as it is not known whether any potential infrastructure development arising from the plan would take place on greenfield or brownfield land. This would affect the future impact on soils. New infrastructure proposals could be located on greenfield sites of high agricultural land quality or peatland across Ireland, resulting in negative effects on this SEO. Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on soil management. Whilst the locations of proposals that may come forward as a result of the implementation of this alternative are unknown, a focus on major capital works could increase the potential for adverse effect on this SEO relative to the draft WSSP (as proposed) due to the additional land take that may be required.</p> <p>Overall, this alternative has been assessed as having a negative effect on Soils, although it is recognised that there is some uncertainty relating to scale and location of future development.</p>
9. Avoid damage to cultural heritage resources	?	<p>The enhancement of existing, and development of new, infrastructure arising from the implementation of a Successional WSSP could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas.</p>

Strategic Environmental Objective	Effect	Commentary on Effects
		<p>Until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it would not be possible to establish the type and magnitude of effect. However, a focus on major capital works as proposed under this alternative could increase the risk of adverse effects on this SEO relative to the draft WSSP (as proposed). Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of Tier 2 plans/strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>Overall, this alternative has been assessed as having an uncertain effect on Cultural Heritage as the scale, type and location of schemes/projects is not known at this stage.</p>
10. Avoid damage to designated landscapes	-/?	<p>Capital works arising from the implementation of this alternative are expected to have a negative effect on landscape and/or visual amenity. A focus on major capital works could increase the risk of adverse effects on this SEO relative to the draft WSSP (as proposed).</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character, whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity. The magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals across Ireland as well as the landscape sensitivity of the receiving environments.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect longer term visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors. It is expected that, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required) to avoid significant effects. However, the future location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape and visual amenity are uncertain, but potentially negative.</p> <p>Overall, this alternative has been assessed as having a minor negative effect on Landscape, with some uncertainty arising from the locations of work and the sensitivity of receiving environments.</p>

4.7 Reasons for the Selection of the Preferred Option and Rejection of Reasonable Alternatives

Overall, the assessment has identified that the implementation of the draft WSSP (as proposed) is likely to have positive effects on the majority of the SEOs. This principally reflects the emphasis of the draft WSSP aims and strategies on the sustainable management of water resources and the delivery of infrastructure to support the achievement of WFD water body objectives and compliance under the Urban Waste Water Treatment Directive. No significant negative effects have been identified although there is the potential for the draft WSSP to have minor negative effects on SEOs related to: Biodiversity; Population and Human Health; Water Quality and Quantity; Air and Climatic Factors; Soil; and Landscape (potential effects on Cultural Heritage are considered to be uncertain at this stage) principally due to short term effects related to the construction of new infrastructure identified in Tier 2 plans.

The 'Successional WSSP' alternative is based on the principle that the management of water services would continue with previous management practices with the retention of 856 water treatment plants and investment on large capital works including major improvements at larger wastewater treatment plants. Similar to the draft WSSP (as proposed), the 'Successional WSSP' alternative would be expected to have minor negative effects across a number of the SEOs due to construction-related environmental effects. However, the assessment of this alternative has revealed that whilst investment in large capital works would be expected to enhance water quality and drinking water supply in some areas (with associated benefits in terms of aquatic ecology and human health), these positive effects would not be uniform. Some areas of Ireland would continue to receive substandard drinking water supply whilst the status of some water bodies would not be improved. Further, the approach would restrict the potential for Irish Water to adopt a strategic approach to the management of its assets which could mean that investment, operational improvements and maintenance would not be targeted where greatest benefit would be delivered. In consequence, the 'Successional WSSP' has been determined through the SEA as not the preferred alternative from an environmental perspective.

More broadly, Irish Water currently operates a fragmented network of water and wastewater services. The assets are wide ranging in their type, operation, efficiency and effectiveness. The origins of this position lie in the dispersed and rural nature of a significant part of the Irish population and the development of water and wastewater services along Local Authority boundaries.

Drinking water quality in many supplies does not meet European Directive and Irish Drinking Water Regulations due to microbiological, algal and chemical concentrations. This is due to the quality of the water source and the performance of the treatment plant and network. Water abstractions have in many areas been sourced from smaller water bodies (lakes, rivers or groundwater) which are not capable of meeting future growth in demand. Likewise, smaller water bodies have a lower capacity to accept discharges from wastewater treatment plants without significant impact to the ecology (fish, invertebrates and plants).

The resilience (i.e. reliability, security and ability to cope with change) of water and wastewater services is weak in many areas with networks reliant on a single source, treatment plant or storage reservoir and low headroom (additional capacity above that required to deliver its service).

Cost effective provision of water and wastewater services becomes more possible as Irish Water consolidate toward resilient, interconnected regional supply networks, served by larger treatment plants, where an actual emerging need for water, or wastewater capacity, can be planned, and readily delivered from a capacity reserve, subsequently replenished.

The proposed WSSP that is based on consolidation and interconnection of water assets, so that constructed capacity is more regionally deployable and cost effective offers a number of advantages. It will improve security of supply of services through interconnection and enable national planning for future provision of water services. It aims to be safe, sustainable and affordable.

A continuity of the current local scale provision of water and wastewater services would not be as cost effective as a regionally planned business model and will result in some water services continuing to struggle to meet European

standards for drinking water quality and wastewater discharge and measures required under the Water Framework Directive.

5. Conclusions, Monitoring and Next Steps

5.1 Summary of Environmental Effects of the Draft Water Services Strategic Plan

The likely significant environmental effects of implementing the aims and strategies that comprise the draft WSSP (including secondary, cumulative and synergistic effects) have been identified, described and evaluated in order to comply with the requirements of the SEA Directive (2001/42/EC).

Overall, the assessment has identified that the implementation of the draft WSSP is likely to have positive effects on the majority of the SEOs that have been used in the assessment to help characterise the environmental effects of the draft WSSP. Significant positive effects are expected in respect of the following SEOs: Biodiversity; Population and Human Health; Water Quality and Quantity; Food Risk; Air and Climatic Factor; Water Management Infrastructure; and Water as an Economic Resource. This principally reflects the emphasis of the draft WSSP aims and strategies on the sustainable management of water resources and the delivery of infrastructure to support the achievement of WFD water body objectives and compliance under the Urban Waste Water Treatment Directive.

No significant negative effects have been identified during the assessment for any of the draft WSSP strategies assessed. Minor negative effects on some SEOs are likely to arise as a result of the implementation of the draft WSSP. In this respect, the potential for negative effects has been identified in respect of SEOs relating to: Biodiversity; Population and Human Health; Water Quality and Quantity; Air and Climatic Factors; Soil; and Landscape (potential effects on Cultural Heritage are considered to be uncertain at this stage). As noted above, the upgrade of existing, and provision of new, infrastructure and services is expected to generate long term environmental benefits. Similar to other types of development, the construction of new infrastructure could also have short term and local adverse environmental effects due to, for example, land take, emissions to air, and disturbance. The probability/magnitude of effects is subject to the number, type, scale and location of future proposals as well as the sensitivity of the receiving environments which is currently unknown. Notwithstanding, it is expected that the potential for adverse environmental effects would be identified and, where possible, addressed during the preparation of Tier 2 plans and through the SEA and Appropriate Assessment process of the respective plans. Similarly, at the project stage (Tier 3 projects), environmental impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) and Appropriate Assessment depending on the scale, location and nature of development proposed). A range of potential mitigation measures have also been identified during this assessment for consideration as part of the further refinement of the draft WSSP, in the preparation of Tier 2 plans or at the project stage (Tier 3) which may help to reduce the potential for adverse effects.

5.2 Proposals for Monitoring

Irish Water will continue to develop the WSSP in consultation with the public and key stakeholders and expect to publish the final WSSP in the second quarter of 2015. Once the WSSP is implemented, its effects on the

environment will need to be taken into account. Measures for monitoring the implementation of the WSSP will generally be taken from existing sources. The sources will be consistent with: the River Basin Management Plans and their associated SEAs; data which is monitored to comply with the WFD; and EPA drinking water quality monitoring data. The SEA monitoring programme will also be linked with any monitoring and reporting on implementation of the WSSP.

Monitoring the environmental effects of the WSSP can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Is the WSSP contributing to the achievement of the SEOs?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

It is not necessary to monitor everything or monitor an effect indefinitely. Instead monitoring should be focussed on:

- Significant effects that may give rise to irreversible damage, with a view to identifying trends before such damage is caused; and
- Significant effects where there was uncertainty in the SEA and where monitoring would enable preventative or mitigation measures to be undertaken.

Table 5.1 identifies a number of potential SEA indicators and targets that could be used for monitoring the environmental effects of the WSSP for the SEOs considered in this SEA. It should be noted that the indicators and targets identified represent high level and wide ranging environmental parameters derived from existing plans and programmes and are not the sole responsibility of Irish Water. The indicators and the achievement of associated targets will be influenced by a range of factors including the activities of other sectors.

Further information and specific details about the monitoring proposals for the effects of the WSSP on the SEOs identified in the Environmental Report will be presented in the Post Adoption SEA Statement (to be issued with the final WSSP), taking into account comments received during consultation on the draft WSSP and this SEA.

Table 5.1 Potential Indicators for Monitoring Effects

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
1. Prevent damage to terrestrial, aquatic and soil biodiversity,	Halt spread of alien species and their associated impact to the aquatic environment.	Interim Indicators: Geographical spread of Alien Species. (NI and Ire)	Invasive Species (NPWS/NIEA)

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
<p>particularly EU designated sites and protected species resulting from Irish Water's activities.</p>	<p>Halt deterioration of habitats or their associated species due to water quality related issues, in line with the Water Framework Directive.</p> <p>Maintenance of favourable conservation status for all habitats and species protected under national and international legislation to be unaffected by implementation of the WSSP.</p>	<p>Number of Margaritifera Plans put in place. (Ire)</p> <p>Status of Northern Ireland Priority Species as reported in the UK Biodiversity Action Plan (every 3 years). (NI)</p> <p>Status of Northern Ireland Priority Habitats listed under the Northern Ireland Biodiversity Strategy (every 3 years). (NI)</p> <p>Long term Indicators: The Status of EU Protected Habitats and Species in Ireland (reports due every 6 years, first report in 2007). (Ire)</p> <p>Report by the UK under Article 17 on the implementation of the Habitats Directive (reports due every 6 years, second report in 2007). (NI)</p> <p>Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar and NHAs). (Ire)</p> <p>Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar, ASSIs) (reports every six years). (NI)</p>	<p>NPWS</p> <p>JNCC</p> <p>JNCC</p> <p>Not currently compiled</p> <p>NIEA</p> <p>NPWS</p> <p>NPWS</p>
<p>2. Protect and reduce risk to human health in undertaking water services.</p>	<p>All drinking water areas (including groundwater), as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All bathing waters, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All economic shellfish waters, as identified on the register of protected areas, to achieve good status, or maintain high status.</p> <p>All water bodies designated for salmonids, as identified on the register of protected areas, to achieve good status, or maintain high status.</p>	<p>Interim Indicators: Compliance with Drinking Water Standards. (Ire)</p> <p>Compliance with Bathing Water Standards. (Ire and NI)</p> <p>Compliance with the Shellfish Pollution Reduction Programmes (Ire and NI)</p> <p>Condition of salmonids in water bodies designated for these. (NI)</p> <p>Water quality in designated salmonid waters. (Ire)</p>	<p>EPA</p> <p>NIEA / EPA</p> <p>NIEA / EPA</p> <p>NIEA</p> <p>EPA</p>

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
	Long term reduction in drinking water restriction notices.	Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status. (Ire and NI) Notices in place for more than 200 days	NIEA / EPA Irish Water
3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive.	No deterioration in status of waters currently with high or good status (WFD Objective). Restoration to good status of waters currently at moderate, poor or bad status (WFD Objective). Progressively reduce chemical pollution in waters (WFD). Limit pollution inputs to groundwaters and prevent deterioration (WFD Objective).	Interim Indicators: Interim Water status in 2011 report. (Ire) Environmental Quality Statistics relating to water quality published in the Northern Ireland Environmental Statistics Report (to be published annually). (NI) Long Term Indicator: Water status in 2015 (and subsequent years) report. (NI and Ire)	EPA NISRA NIEA / EPA
4. Minimise increases in flood risk resulting from Irish Water's activities.	No increase in properties at risk from flooding as a result of Irish Water's activities.	Number of properties at risk of flooding from combined sewers.	Irish Water
5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change.	Minimise total emissions to air associated with wastewater collection, treatment and disposal. Minimise total emissions to air (including greenhouse gases) associated with drinking water abstraction, treatment and provision. Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary as set out in license for	Amount of emissions to air associated with wastewater collection, treatment and disposal. Amount of emissions to air associated with drinking water abstraction, treatment and provision. Number of complaints received related to odour.	Irish Water Irish Water Irish Water

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
	<p>new or upgraded wastewater infrastructure.</p> <p>Improve energy efficiency by 33% by 2020 (from the 2009 baseline).</p>	<p>% increase in overall energy efficiency at Irish Water facilities.</p>	<p>Irish Water</p>
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies.</p>	<p>Interim Target: Increase investment in water management infrastructure.</p> <p>Long Term Target: Full compliance with the requirements of the Urban Waste Water Treatment Directive and its associated regulations.</p>	<p>Interim Indicator: Water services investment expenditure per annum.</p> <p>Long Term Indicator: Number of exceedances of the standards contained in the Urban Waste Water Treatment Directive.</p>	<p>Irish Water</p> <p>EPA</p>
<p>7. Protect water as an economic resource.</p>	<p>Achieve sustainable use of water in the context of maintaining its economic benefit.</p> <p>Achieve a reduction in leakage.</p>	<p>Change in economic value of water relative to the baseline report The Economic Analysis of Water Use in Ireland.</p> <p>Leakage as a % of water treated.</p>	<p>Economic studies carried out by the EPA as a part of the plan making process during the 2nd cycle of RBMP.</p> <p>Irish Water</p>
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils.</p>	<p>Avoid conflicts with, and contribute towards, where possible, the appropriate management of peatlands as per the National Peatlands Strategy.</p> <p>Utilise previously developed (brownfield) land where possible.</p>	<p>Information from the NPWS on the management of Peatlands.</p> <p>Number/floorspace of water infrastructure built on previously developed land.</p>	<p>NPWS</p> <p>Irish Water</p>
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities.</p>	<p>No unauthorised physical damage or alteration of the context of cultural heritage features due to Irish Water activities.</p>	<p>Changes in the condition of monuments on the Record of Monuments and Places due to Irish Water activities.</p> <p>Number of National Monuments and Protected Structures at risk due to WSSP implementation.</p>	<p>Archaeological Survey of Ireland Sites and Monuments Record</p> <p>Heritage Council Ireland/ Local</p>

Strategic Environmental Objectives (SEOs)	SEO Targets	SEA Indicators	Data Source
			Authorities
10. Avoid damage to designated landscapes resulting from Irish Water's activities.	No damage to designated landscapes as a result of WSSP implementation.	Number of new wastewater / drinking water treatment plants sited in landscapes with a high sensitivity to change.	Irish Water/Local Authorities

5.3 Next Steps

Following analysis of the comments made on the draft WSSP, this Environmental Report and Natura Impact Statement, the final WSSP will be produced and issued to the Minister for approval. Once approved, the final WSSP will be published alongside a Post Adoption SEA Statement. The Post Adoption SEA Statement will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final WSSP.

Appendix A

Quality Assurance Checklist

This Environmental Report has been prepared in accordance with Statutory Instrument (SI) No. 435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended). **Table A1** indicates the location in this report of the relevant information required under Schedule 2 of these regulations.

Table A1 Information Provided in this Report to Meet the Requirements of the SEA Regulations

SEA Requirement	Section of this Report where Relevant Information is Presented
An outline of the contents and main objectives of the plan or programme, or modification to a plan or programme, and relationship with other relevant plans or programmes.	1.3, 2.2, Appendix B
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme.	2.3, Appendix C
The environmental characteristics of areas likely to be significantly affected.	2.3, Appendix C
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive.	2.3, 2.4, Appendix C (see also Natura Impact Statement)
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to a plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation.	2.2, 2.3, Appendix B, Appendix C
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.	4.2, 4.3, 4.4, 4.6, 5.1, Appendix D
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme.	4.5, Appendix D
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	1.5, 3.6
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme.	5.2

SEA Requirement	Section of this Report where Relevant Information is Presented
A non-technical summary of the information provided under the above headings.	Non-Technical Summary

Appendix B

Review of Plans and Programmes

Table B1 European Level Plans and Programmes

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
Water Framework Directive (2000/60/EC)	<ul style="list-style-type: none"> Establish a framework for the protection of water bodies to include inland surface waters, transitional waters, coastal waters and groundwater and their dependent wildlife and habitats Preserve and prevent the deterioration of water status and where necessary improve and maintain "good status" of water bodies Promote sustainable water usage The Water Framework Directive repealed the following Directives: <ul style="list-style-type: none"> The Drinking Water Abstraction Directive Sampling Drinking Water Directive Exchange of Information on Quality of Surface Freshwater Directive Shellfish Directive Freshwater Fish Directive Groundwater (Dangerous Substances) Directive Dangerous Substances Directive 	<ul style="list-style-type: none"> Protect, enhance and restore all water bodies and meet the environmental objectives outlined in Article 4 of the Directive Achieve "good status" for all waters by December 2015 Manage water bodies based on identifying and establishing river basins districts Involve the public and streamline legislation Prepare and implement a River Basin Management Plan for each river basin districts identified and a Register of Protected Areas Establish a programme of monitoring for surface water status, ground water status and protected areas Recover costs for water services 	European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) (as amended).	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations.
Groundwater Directive (2006/118/EC)	<ul style="list-style-type: none"> Protect, control and conserve groundwater Prevent the deterioration of the status of all bodies of groundwater Implements measures to prevent and control groundwater pollution, including criteria for assessing good groundwater chemical status and criteria for the identification of significant and sustained 	<ul style="list-style-type: none"> Meet minimum groundwater standards listed in Annex 1 of Directive Meet threshold values adopted by national legislation for the pollutants, groups of pollutants and indicators of pollution which have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk, also taking into account Part B of Annex II 	European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) (as amended).	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
	upward trends and for the definition of starting points for trend reversals.			regulations.
Drinking Water Directive (98/83/EC)	<ul style="list-style-type: none"> Improve and maintain the quality of water intended for human consumption Protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean 	<ul style="list-style-type: none"> Set values applicable to water intended for human consumption for the parameters set out in Annex I Set values for additional parameters not included in Annex I, where the protection of human health within national territory or part of it so requires. The values set should, as a minimum, satisfy the requirements of Article 4(1) (a) Implement all measures necessary to ensure that regular monitoring of the quality of water intended for human consumption is carried out, in order to check that the water available to consumers meets the requirements of this Directive and in particular the parametric values set in accordance with Article 5 Ensure that any failure to meet the parametric values set in accordance with Article 5 is immediately investigated in order to identify the cause Ensure that the necessary remedial action is taken as soon as possible to restore its quality and shall give priority to their enforcement action Undertake remedial action to restore the quality of the water where necessary to protect human health Notify consumers when remedial action is being undertaken except where the competent authorities consider the non-compliance with the parametric value to be trivial 	<p>European Union (Drinking Water) Regulations 2014 (S.I. No. 106 of 2007) (as amended).</p> <p>European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).</p>	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations with regard to public water supplies.
Bathing Water Directive (2006/7/EC)	<ul style="list-style-type: none"> Preserve, protect and improve the quality of the environment and to protect human health by complementing the Water Framework Directive 2000/60/EC 	<ul style="list-style-type: none"> Identify all bathing waters and define the length of the bathing season Monitor bathing water quality as per Annex 1, Column A at the frequency outlined in Annex IV of the Directive Determine the quality status of the bathing water Achieve at least 'sufficient' standard by 2015 with the aim increase the standard to 'excellent' or 'good' Prepare, review and update a bathing water profile of each in accordance with Annex III Manage bathing water areas in exceptional circumstances to prevent an adverse impact on bathing water quality and on bathers' health Provide information to the public on bathing water quality 	Bathing Water Quality (Amendment) Regulations 2008 (S.I. No. 79 of 2008) (as amended).	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations with regard to public wastewater schemes.
Marine Strategy Framework Directive	<ul style="list-style-type: none"> Establishes a framework whereby the necessary measures are undertaken to 	<ul style="list-style-type: none"> Develop a marine strategy for marine waters in accordance with the plan of action set out in points (a) 	European Communities (Marine Strategy)	Irish Water is obliged to comply with, as

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
(2008/56/EC)	<p>achieve or maintain good environmental status in the marine environment by the year 2020</p> <ul style="list-style-type: none"> Marine strategies shall be developed and implemented in order to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected and prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea. 	<p>and (b) of paragraph 2</p> <ul style="list-style-type: none"> Prepare an assessment of the current environmental status of the waters concerned and the environmental impact of human activities Achieve 'good' environmental status of the waters concerned by 2012 Establish a series of environmental targets and associated indicators, in accordance with Article 10(1) Establish a monitoring programme for ongoing assessment and regular updating of targets, in accordance with Article 11(1) Develop a programme of measures designed to achieve or maintain good environmental status, in accordance with Article 13(1), (2) and (3) by 2015 Cooperate with transboundary Member States to implement these measures 	Framework) Regulations 2011 (S.I. No. 249/2011).	relevant and appropriate, the requirements of the Directive and transposing regulations with regard to public wastewater schemes.
Urban Waste Water Treatment Directive (91/271/EEC)	<ul style="list-style-type: none"> This Directive concerns the collection, treatment and discharge of urban wastewater and the treatment and discharge of wastewater from certain industrial sectors The objective of the Directive is to protect the environment from the adverse effects of wastewater discharges 	<ul style="list-style-type: none"> Urban wastewater entering collecting systems shall before discharge, be subject to secondary treatment Annex II requires the designation of areas sensitive to eutrophication which receive water discharges Establishes minimum requirements for urban wastewater collection and treatment systems in specified agglomerations to include special requirements for sensitive areas and certain industrial sectors 	European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001).	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations with regard to public wastewater schemes.
Flood Directive (2007/60/EC)	<ul style="list-style-type: none"> Establishes a framework for the assessment and management of flood risks Reduce adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community 	<ul style="list-style-type: none"> Assess all water courses and coast lines at risk from flooding through Flood Risk Assessment Prepare flood hazard maps and flood risk maps outlining the extent or potential of flooding and assets and humans at risk in these areas at River Basin District level (Article 3(2) (b)) and areas covered by Article 5(1) and Article 13(1) (b) in accordance with paragraphs 2 and 3 Implement flood risk management plans and take adequate and coordinated measures to reduce flood risk for the areas covered by the Articles listed above Inform the public and allow the public to participate in planning process 	European Communities (Assessment and Management of Flood Risks) Regulations (S.I. 122/2010). European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012).	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations.
Habitats Directive (92/43/EEC)	<ul style="list-style-type: none"> Promote the preservation, protection and improvement of the quality of the environment, including the conservation of 	<ul style="list-style-type: none"> Propose and protect sites of importance to habitats, plant and animal species 	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No.	Irish Water is obliged to comply with, as relevant and

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
	natural habitats and of wild fauna and flora <ul style="list-style-type: none"> Contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora. Maintain or restore to favourable conservation status, natural habitats and species of wild fauna and flora of Community interest Promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. 	<ul style="list-style-type: none"> Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range Carry out comprehensive assessment of habitat types and species present Establish a system of strict protection for the animal species and plant species listed in Annex IV 	477/2011). The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000.	appropriate, the requirements of the Directive and transposing regulations.
Birds Directive (2009/147/EC)	<ul style="list-style-type: none"> Conserve all species of naturally occurring birds in the wild state including their eggs, nests and habitats Protect, manage and control these species and comply with regulations relating to their exploitation The species included in Annex I shall be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution 	<ul style="list-style-type: none"> Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex 1. Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones, re-establish destroyed biotopes and creation of biotopes Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands and particularly wetlands of international importance. 	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations.
Nitrates Directive (91/676/EEC)	<ul style="list-style-type: none"> Aims to protect and reduce groundwater and surface water pollution caused or induced by nitrates from agricultural sources by encouraging best practices 	<ul style="list-style-type: none"> Aims to create good farming practices Establishes a voluntary code of good agricultural practices Identify and designate zones at risk of surface water and groundwater pollution from nitrates Implement compulsory action programmes for nitrates vulnerable zones Enforce the implementation of a national Nitrates Action Programmes Monitor water quality to assess nitrogen compound 	European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2009 (S.I. No. 101/2009) (as amended).	Irish Water will have regard to this Directive and will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management.
Environmental Quality Standards Directive (Directive 2008/105/EC) (also known as the	<ul style="list-style-type: none"> Establishes environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of the Water Framework Directive 	<ul style="list-style-type: none"> Apply the EQS laid down in Part A of Annex I to this Directive for bodies of surface water Determine the frequency of monitoring in biota and/or sediment of substances 	European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No.	Irish Water is obliged to comply with, as relevant and appropriate, the

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
Priority Substances Directive), as amended by Directive 2013/39/EU.	<ul style="list-style-type: none"> Aims to achieve good surface water chemical status and in accordance with the provisions and objectives of Article 4 of the Water Framework Directive 	<ul style="list-style-type: none"> Monitoring shall take place at least once every year, unless technical knowledge and expert judgment justify another interval Notify the European Commission if the substances for which EQS have been established if a deviation of the monitoring is planned along with the rationale and approach Establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive for each river basin district 	272/2009). European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).	requirements of the Directive as amended and transposing regulations.
Environmental Liability Directive (2004/35/EC)	<ul style="list-style-type: none"> Establish a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage 	<ul style="list-style-type: none"> Relates to environmental damage caused by any of the occupational activities listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities; damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures Where environmental damage has occurred the operator shall, without delay, inform the competent authority of all relevant aspects of the situation and take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services and the necessary remedial measures, in accordance with Article 7. The operator shall bear the costs for the preventive and remedial actions taken pursuant to this Directive The competent authority shall be entitled to initiate cost recovery proceedings against the operator The operator may be required to provide financial security guarantees to ensure their responsibilities under the directive are met 	European Communities (Environmental Liability) Regulations, 2008.	Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations.
SEA Directive	<ul style="list-style-type: none"> Contribute to the integration of environmental considerations into the 	<ul style="list-style-type: none"> Carry out and environmental assessment for plans or programmes referred to in Articles 2 to 4 of the 	European Communities (Environmental Assessment	Irish Water is obliged to comply with, as

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
(2001/42/EC)	<p>preparation and adoption of plans and programmes with a view to promoting sustainable development</p> <ul style="list-style-type: none"> Provide for a high level of protection of the environment by carrying out an environmental assessment of plans and programmes which are likely to have significant effects on the environment 	<p>Directive</p> <ul style="list-style-type: none"> Prepare an environmental report which identifies, describes and evaluates the likely significant effects on the environment of implementing the plan or programme and reasonable alternatives that consider the objectives and the geographical scope of the plan or programme Consult with relevant authorities, stakeholders and public allowing sufficient time to make a submission Consult other Member States where the implementation of a plan or programme is likely to have transboundary environmental effects Inform relevant authorities and stakeholders on the decision to implement the plan or programme Issue a statement to include requirements detailed in Article 9 of the Directive Monitor and mitigate significant environmental effects identified by the assessment 	<p>of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435/ 2004) (as amended).</p> <p>Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436/2004) (as amended).</p>	<p>relevant and appropriate, the requirements of the Directive and transposing regulations.</p>
EIA Directive (2011/92/EU as amended by 2014/52/EU)	<ul style="list-style-type: none"> Requires the assessment of the environmental effects of public and private projects which are likely to have significant effects on the environment Aims to assess and implement avoidance or mitigation measures to eliminate environmental effects, before consent is given of projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects. Those projects are defined in Article 4 	<ul style="list-style-type: none"> All projects listed in Annex I are considered as having significant effects on the environment and require an EIA For projects listed in Annex II, a "screening procedure" is required to determine the effects of projects on the basis of thresholds/criteria or a case by case examination. This should take into account Annex III. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 12, the direct and indirect effects of a project on the following factors: human beings, fauna and flora, soil, water, air, climate and the landscape, material assets and the cultural heritage, the interaction between each factor Consult with relevant authorities, stakeholders and public allowing sufficient time to make a submission before a decision is made The information to be provided by the developer in accordance with paragraph 1 shall include at least: <ul style="list-style-type: none"> a description of the project comprising information on the site, design and size of the project; a description of the measures envisaged in 	<p>European Communities (Environmental Impact Assessment) Regulations 1989 (S.I. No. 349/1989) (as amended).</p> <p>European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012).</p>	<p>Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Directive as amended and transposing regulations.</p>

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
		<p>order to avoid, reduce and, if possible, remedy significant adverse effects;</p> <ul style="list-style-type: none"> ○ the data required to identify and assess the main effects which the project is likely to have on the environment; ○ an outline of the main alternatives studied by the developer and an indication of the main reasons for his choice, taking into account the environmental effects; ○ a non-technical summary of the information referred to each of the above. 		
Renewable Energy Directive (2009/28/EC)	<ul style="list-style-type: none"> • Framework for the production and promotion of energy from renewable sources 	<ul style="list-style-type: none"> • Identify national targets for renewable sources consumed in transport, electricity and heating and cooling by 2020 • Meet a target of 20% for renewable energy sources and outline how the national target will be met under the Directive • Prepare and implement a national energy action plan 	European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011).	Irish Water will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of this Directive.
EU 2020 climate and energy package	<ul style="list-style-type: none"> • Binding legislation which aims to ensure the European Union meets its climate and energy targets for 2020 • Aims to achieve a 20% reduction in EU greenhouse gas emissions from 1990 levels • Aims to raise the share of EU energy consumption produced from renewable resources to 20% • Achieve a 20% improvement in the EU's energy efficiency 	<p>Four pieces of complimentary legislation:</p> <ul style="list-style-type: none"> • Reform of the EU Emissions Trading System (EU ETS) to include a cap on emission allowances in addition to existing system of national caps • Member States have agreed national targets for non-EU ETS emissions from countries outside the EU • Meet the national renewable energy targets of 16% for Ireland by 2020 • Preparing a legal framework for technologies in carbon capture and storage 	<p>The Framework for Climate Change Bill.</p> <p>European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011).</p>	Irish Water will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of these requirements.
A Blueprint to Safeguard Europe's Water Resources	<ul style="list-style-type: none"> • To ensure sufficient availability of good quality water for sustainable and equitable water use 	<ul style="list-style-type: none"> • Aims to ensure the availability of a sufficient quantity of good quality water • Aims to improve the implementation of current EU water policy • Promotes the integration of water and other policies • Outlines actions required for the implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency. 		Irish Water will have regard to this Blueprint and will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
				management.
European Union Biodiversity Strategy to 2020	<ul style="list-style-type: none"> • Aims to halt or reverse biodiversity loss and speed up the EU's transition towards a resource efficient and green economy • Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible 	<ul style="list-style-type: none"> • Outlines six targets and twenty actions to aid European in halting the loss to biodiversity and eco-system services • The six targets cover: <ul style="list-style-type: none"> ○ Full implementation of EU nature legislation to protect biodiversity ○ Maintaining, enhancing and protecting for ecosystems, and green infrastructure ○ Ensuring sustainable agriculture, and forestry ○ Sustainable management of fish stocks ○ Reducing invasive alien species ○ Addressing the global need to contribute towards averting global biodiversity loss 	Actions for Biodiversity 2011-2016 Ireland's National Biodiversity Plan, 2011.	Irish Water will have regard to this Strategy and will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management.
Biocidal Products Regulation (528/2012) as amended (334/2014)	<ul style="list-style-type: none"> • The Biocidal Products Directive (98/8/EC) introduced a common authorisation scheme covering the placing on the market of biocidal products and their subsequent use. • The Biocidal Products Directive had three main aims: <ul style="list-style-type: none"> ○ to harmonise the European market for biocidal active substances and products containing them; ○ to provide a high level of protection for humans, animals and the environment; and ○ to ensure that products are sufficiently effective against target species. • The EU Biocides Regulation revises and replaces the current regulatory framework for the marketing and use of biocidal products contained in the Biocidal Products Directive 98/8/EC. It aims to improve the functioning of the internal market in biocidal products in five key policy areas: <ul style="list-style-type: none"> • Scope, bringing treated articles into the scope of the biocides regime; • Product authorisation, establishing a 	<ul style="list-style-type: none"> • Ensure that Irish Water activities do not contravene the Regulation. 	S.I. No. 427 of 2013 European Union (Biocidal Products) Regulations 2013 (as amended).	Irish Water is required to, when preparing the WSSP, ensure that the plan measures/ strategies do not contravene the Regulation.

Directive/ Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level objectives, actions etc.	Relevant legislation in Ireland	Relevance to WSSP
	centralised Union authorisation system; <ul style="list-style-type: none"> • Data sharing; • Data requirements; • Fees, harmonising the fee structure (but not the level of fees) across the Member States without reducing the high level of protection provided by the regime for human and animal health and the environment. 			

Table B2 National/Regional Level Plans and Programmes

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
National Spatial Strategy for Ireland 2002-2020 People, Places and Potential	<ul style="list-style-type: none"> Planning framework for Ireland Aims to achieve a better balance of social, economic and physical development across Ireland, supported by effective planning 	<ul style="list-style-type: none"> Proposes that areas of sufficient scale and critical mass will be built up through a network of gateways, hubs and key town 	<p>Local Government (Planning and Development) Act, 1963 (as amended).</p> <p>Requirement of the Planning and Development (Amendment) Act (2010).</p>	Irish Water is required to, when preparing the WSSP, ensure that the plan is consistent with, as far as is practical, with the National Spatial Strategy.
Regional Planning Guidelines	<ul style="list-style-type: none"> Gives regional effect to National Spatial Strategy 	<ul style="list-style-type: none"> Guides development for each county in the region Inform County Development Plans in situ with National Spatial Strategy recommendations 	Planning and Development (Amendment) Act (2010).	Irish Water is required to, when preparing the WSSP, ensure that the plan is consistent with, as far as is practical, with the Regional Planning Guidelines.
River Basin Management Plans and associated Programmes of Measures - including International (Northern Ireland) Plans and Programmes	<ul style="list-style-type: none"> Establish a framework for the protection of water bodies at River Basin District (RBD) level Preserve, prevent the deterioration of water status and where necessary improve and maintain "good status" of water bodies in that RBD before 2015 Promote sustainable water usage 	<ul style="list-style-type: none"> Aims to protect and enhance all water bodies in the RBD and meet the environmental objectives outlined in Article 4 of the Water Framework Directive Identifies and manages water bodies in the RBD Establishes a programme of measures for monitoring and improving water quality in the RBD Involves the public through consultations 	<p>Requirement of the Water Framework Directive (2000/60/EC).</p> <p>European Communities (Water Policy) Regulations, 2003 (SI No. 722) (as amended).</p> <p>Guidelines for the Establishment of River Basin District Advisory Councils (RBDAC).</p>	Irish Water is required to, when preparing the WSSP, ensure that the plan is consistent with, as far as is practical, with the River Basin Management Plans.
Water Quality	<ul style="list-style-type: none"> Aims to manage and protect water at 	<ul style="list-style-type: none"> Ensure quality of water covered by the plan is 	Requirement of the Water	Irish Water will have

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
Management Plans	catchment based level	<p>maintained and protected</p> <ul style="list-style-type: none"> • Manages the status of water at catchment level • Aims to prevent and abate pollution of waters 	Pollution Act 1977.	regard to these Plans and will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management.
National Renewable Energy Action Plan	<ul style="list-style-type: none"> • Sets out the national strategic approach and measures to deliver on the Renewable Energy Directive 2009/28/EC • Aims to achieve target of 16% renewable energy usage by 2020 	<ul style="list-style-type: none"> • Sets national targets to be met by 2020 as follows: <ul style="list-style-type: none"> ○ 40% electricity consumption from renewable sources ○ 10% electric vehicles by 2020 ○ 12% renewable heat by 2020 	<p>European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011).</p> <p>Requirement of the Renewable Energy Directive (2009/28/EC).</p>	Irish Water will have regard to this Plan and will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management.
Offshore Renewable Energy Development Plan	<ul style="list-style-type: none"> • Aims to harness the market opportunities presented by offshore renewable energy to achieve economic development, growth and jobs • Increase awareness of the value, opportunities and societal benefits of developing offshore renewable energy • Ensure offshore renewable energy developments do not adversely impact the rich marine environment and its living and non-living resources 		Foreshore Acts 1933 (as amended).	Irish Water is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
				management.
Harnessing Our Ocean Wealth	<ul style="list-style-type: none"> Aims to increase our engagement with the sea. Building on Ireland's rich maritime heritage, our goal is to strengthen our maritime identity and increase our awareness of the value (market and non-market), opportunities and social benefits of engaging with the sea 	<ul style="list-style-type: none"> Establishes two targets: <ul style="list-style-type: none"> Double the value of our ocean wealth to 2.4% of GDP by 2030 Increase the turnover from Ireland's ocean economy to exceed €6.4bn by 2020 Focuses on a thriving maritime economy, whereby Ireland harnesses the market opportunities to achieve economic recovery and socially inclusive, sustainable growth. Sets out to achieve healthy ecosystems that provide monetary and non-monetary goods and services 		Irish Water is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Grid25 Implementation Programme	<ul style="list-style-type: none"> Framework for the development of the electricity transmission grid in the short, medium and long terms, to support a long-term sustainable and reliable electricity supply 	<ul style="list-style-type: none"> Seeks to implement the provisions of the 2007 Government White Paper on Energy -"Delivering a Sustainable Energy Future for Ireland" in terms of development of electricity transmission infrastructure 		Irish Water will have regard to the Grid25 Implementation Programme.
Harvest 2020	<ul style="list-style-type: none"> Aims to innovate and expand the Irish food industry in response to increased global demand for quality foods Sets out a vision for the potential growth in agricultural output after the removal of milk quotas in 2015 		<p>European Communities (Food and Feed Hygiene) Regulations 2009 (S.I. No. 432 of 2009) (as amended).</p> <p>European Communities (Hygiene of Foodstuffs) (S.I. No. 369 of 2006).</p>	Irish Water will have regard to Harvest 2020 and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Agri-vision 2015 Action	<ul style="list-style-type: none"> Outlines the vision for agricultural industry to improve competitiveness and response to 			Irish Water will have regard to this plan and

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
Plan	market demand while respecting and enhancing the environment			is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Rural Environmental Protection Scheme (REPS) Agri-Environmental Options Scheme(AEOS) Green, Low-Carbon, Agri-environment Scheme (GLAS)	<ul style="list-style-type: none"> • Agri-environmental funding schemes aimed at rural development for the environmental enhancement and protection 			Irish Water will have regard to these schemes and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
National Rural Development Programme	<ul style="list-style-type: none"> • Sets out a national programme based on the EU framework for rural development • Prioritises improving the competitiveness of agriculture, improving the environment and improving the quality of life in rural areas 	<ul style="list-style-type: none"> • Supports structural change at farm level including training young farmers and encouraging early retirement, support for restructuring, development and innovation • Aims to improve the environment, biodiversity and the amenity value of the countryside by support for land management through funds such as Natura 2000 payments etc. • Aims to improve quality of life in rural areas and encouraging diversification of economic activity through the implementation of local development strategies 		Irish Water will have regard to this programme and is committed to contributing towards, in combination with other users and bodies, the achievement of the

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
		such as non-agricultural activities		objectives of the regulatory framework for environmental protection and management.
Raised Bog SAC Management Plan and Review of Raised Bog Natural Heritage Areas	<ul style="list-style-type: none"> Aims to meet nature conservation obligations while having regard to national and local economic, social and cultural needs 	<ul style="list-style-type: none"> Ensure that the implications of management choices for water levels, quantity and quality are fully explored, understood and factored into policy making and land use planning Review the current raised bog NHA network in terms of its contribution to the national conservation objective for raised bog habitats and determine the most suitable sites to replace the losses of active raised bog habitat and high bog areas within the SAC network and to enhance the national network of NHAs 		Irish Water will have regard to this review and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
National Climate Change Strategy	<ul style="list-style-type: none"> Establishes a framework for action to reduce Ireland's greenhouse gas emissions 	<ul style="list-style-type: none"> Sets out principles and actions for the reduction of CO2 emissions in Ireland in the following areas: <ul style="list-style-type: none"> energy supply transport waste management industry, commercial and services sector agriculture residential public sector 	European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011). The Framework for Climate Change Bill.	Irish Water will have regard to this strategy and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
National Climate Change Adaptation	<ul style="list-style-type: none"> Aims to provide the policy context for a strategic national adaptation response to climate change, promote dialogue and 			Irish Water will have regard to this

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
Framework – Building Resilience to Climate Change 2012	understanding of adaptation issues identify and promote adaptation solutions and committing to actions to support the adaptation process			framework and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Office of Public Works Arterial Drainage Maintenance and High Risk Designation Programme 2011-2015	<p>Part 1 of the Programme comprises Arterial Drainage Maintenance (including Scheme Channel Maintenance Works, Maintenance of Scheme Structures, Scheme Embankment Maintenance and Flood Relief Scheme Maintenance.</p> <p>Part 2 of the Programme comprises High Risk Channel Designation.</p>			Irish Water will have regard to this programme and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Northern Ireland Water Resources Management Plan 2012	<p>Northern Ireland Water (NIW) is the organisation responsible under law for the supply of drinking water to the population of Northern Ireland.</p> <p>As part of its statutory duty, NIW has produced and maintains a Water Resources Management Plan (WRMP). The WRMP sets out the following:</p>			

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
	<ul style="list-style-type: none"> • NIW estimate of the quantities of drinking water required to meet the needs of the population of Northern Ireland over the period for which the plan is effective (the 25 years between 2008/09 and 2034/35); • The measures which NI Water intends, or will continue to take, in order to supply the estimated required quantity of drinking water; and • The schedule of activities that will be needed to be taken to implement the WRMP. 			
Food Regulations	<p>Food Regulations including:</p> <p>Regulation (EC) No. 853/2004 on the hygiene of food of animal origin, governs the total amount of marine biotoxins that may be present in shellfish for the protection of consumers. Three groups of toxins are established by the Regulation and the monitoring of shellfish is necessary to comply with the regulation before they can be placed on the market.</p> <p>Regulation (EC) No. 2074/2005 stipulates which test methods may be used to detect marine biotoxins.</p>			
European Union (Water Policy) Regulations 2014, S.I. No. 350 of 2014	<ul style="list-style-type: none"> • Provides for the establishment and composition of a Water Policy Advisory Committee and related procedural and ancillary matters. The Regulations also transfer certain local authority responsibilities provided for in the European Communities (Water Policy) Regulations 2003 to the Environmental Protection 	<ul style="list-style-type: none"> • Protect, enhance and restore all water bodies and meet the environmental objectives outlined in Article 4 of the Water Framework Directive. • Achieve "good status" for all waters by December 2015. • Take account of and support River Basin Management Plans. 	<p>Requirements of the Water Framework Directive (2000/60/EC).</p> <p>Guidelines for the Establishment of River Basin District Advisory Councils (RBDAC).</p>	<p>Irish Water is required to, when preparing the WSSP, ensure that the plan is consistent with, as far as is practical, River Basin Management Plans.</p>

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
	<p>Agency and to the Minister for the Environment, Community and Local Government. The purpose of the Advisory Committee is to promote appropriate activities necessary to support the achievement of the objectives of the Water Framework Directive and to advise the Minister on policy in relation to:</p> <ul style="list-style-type: none"> o the preparation of river basin management plans; o the establishment of environmental objectives in relation to river basin districts; o the preparation of programmes of measures to achieve the environmental objectives; and o other related matters concerning the protection and management of the aquatic environment and water resources. 			<p>Irish Water is obliged to comply with, as relevant and appropriate, the requirements of the Water Framework Directive and transposing regulations.</p>

Table B3 Sub-Regional Plans and Programmes

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
County and Town Development Plans	<ul style="list-style-type: none"> • Outlines planning objectives for County/Town development over six year lifespan • Strategic framework for planning and sustainable development including those set out in National Spatial Strategy and Regional Planning Guidelines 	<ul style="list-style-type: none"> • Identifies future infrastructure, development and zoning required • Protects and enhances amenities and environment • Guides planning authority in assessing proposals 	Requirement of the Planning and Development Act (2000), as amended.	Irish Water will have regard to these Plans and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Local Area Plans	<ul style="list-style-type: none"> • Statutory document which provides detailed planning policies to ensure proper planning and sustainable development of area • Sets out objectives for future planning and development 	<ul style="list-style-type: none"> • Identifies issues of relevance to the area and outlines principles for future development of area • Is consistent with relevant County/Town Development Plans, National Spatial Strategy and Regional Planning Guidelines 	Local Government (Planning and Development) Act, 1963 (as amended). Requirement of the Planning and Development (Amendment) Act (2010).	Irish Water will have regard to these Plans and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Planning Schemes for Strategic Development Zones (SDZ)	<ul style="list-style-type: none"> • An area of land designated by the Government to contain specified developments of economic or social importance to the State • Aims to create sustainable communities under a master plan to facilitate the requirements by which it was acquired by 	<ul style="list-style-type: none"> • Development includes necessary infrastructural and community facilities and services 	Local Government (Planning and Development) Act, 1963 (as amended).	Irish Water will have regard to these Schemes and is committed to contributing towards, in combination with

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
	the State			other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Housing Strategies	<ul style="list-style-type: none"> Ensures proper planning and sustainable development of the area of the development plan Provides housing policy for existing and future population of the area 	<ul style="list-style-type: none"> Identifies the existing needs or likely future need for housing Ensures the availability of housing for persons of different levels of income Ensures a mixture of housing types to suit demographics Each Local Authority is required to prepare a housing strategy and review it every two years 	<p>Local Government (Planning and Development) Act, 1963 (as amended).</p> <p>Requirement of the Planning and Development Act 2000 (as amended).</p>	Irish Water will have regard to these Strategies and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Biodiversity Action Plans	<ul style="list-style-type: none"> Aims to protect, conserve, enhance and restore biodiversity and ecosystem services across all spectrums 	<ul style="list-style-type: none"> Outlines the status of biodiversity and identifies species of importance Outlines objectives and targets to be met to maintain and improve biodiversity Aims increase awareness 		Irish Water will have regard to these Plans and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
				management.
Heritage Plans	<ul style="list-style-type: none"> Aims to highlight the importance of heritage at a strategic level 	<ul style="list-style-type: none"> Manage and promote heritage as well as increase awareness Aim to conserve and protect heritage 		Irish Water will have regard to these Plans and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
County Landscape Character Assessments	<ul style="list-style-type: none"> Characterises the geographical dimension of the landscape 	<ul style="list-style-type: none"> Identifies the quality, value, sensitivity and capacity of the landscape area Guides strategies and guidelines for the future development of the landscape 	Requirement of the Planning and Development) Act, 2000 (as amended). Landscape and Landscape Assessment Guidelines.	Irish Water will have regard to these assessments and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Special Amenity Area Orders	<ul style="list-style-type: none"> Aims to protect special areas of landscape, environmental or amenity value 		Local Government (Planning and Development) Act, 1963 (as amended). Requirement of the Planning	Irish Water will have regard to these Orders and is committed to contributing towards, in combination with

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
			and Development Act 1963 (as amended).	other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Shellfish Pollution Reduction Programmes	<ul style="list-style-type: none"> Aims to improve water quality and ensure the protection or improvement of designated shellfish waters in order to support shellfish life and growth and contribute to the high quality of shellfish products directly edible by man 	<ul style="list-style-type: none"> Identifies key and secondary pressures on water quality in designated shellfish areas Outlines specific measures to address identified key and secondary pressures on water quality Addresses the specific pressures acting on water quality in each area 	<p>European Communities (Quality of Shellfish Waters) Regulations 2006 (SI 268/2006) (as amended).</p> <p>Requirement of Shellfish Waters Directive (2006/113/EC) for designated shellfish waters.</p>	Irish Water will have regard to these Programmes and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Freshwater Pearl Mussel Sub-Basin Management Plans	<ul style="list-style-type: none"> Identifies the current status of the species and the reason for loss or decline Identifies measure required to improve or restore current status 	<ul style="list-style-type: none"> Identifies pressures on Freshwater Pearl Mussels for each of the designated populations in Ireland Outlines restoration measures required to ensure favourable conservation status 	<p>Requirement of Water Framework Directive (2000/60/EC) and Habitats Directive (92/43/EEC).</p> <p>European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).</p> <p>European Communities</p>	Irish Water will have regard to these Plans and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
			<p>(Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).</p> <p>The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000.</p>	management.
Groundwater Protection Schemes	<ul style="list-style-type: none"> • Preserve and prevent deterioration in quality and identify the status of groundwater • Protect groundwater quality for drinking water purposes • Provides a framework for and informs planning authorities 	<ul style="list-style-type: none"> • Assess and identify the vulnerability, aquifer potential and source protection of groundwater • Map Groundwater Protections Zones • Identify groundwater protection responses for existing and potential environmental risks • Integrate Groundwater Protection Schemes into County Development Plans 		Irish Water will have regard to these Schemes and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
County Renewable Energy Strategies	<ul style="list-style-type: none"> • Aims to ensure competitive, secure and sustainable energy 	<ul style="list-style-type: none"> • Progress renewable energy forms at county level • Develop sustainable energy forms including renewable electricity, bioenergy, wind energy etc. 	<p>Renewable Energy Directive (2009/28/EC).</p> <p>European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011).</p> <p>The Framework for Climate Change Bill.</p>	Irish Water will have regard to these Strategies and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
				management.
Sludge Management Plans	<ul style="list-style-type: none"> Outlines how all types of non-hazardous sludge arising from wastewater and water treatment, agriculture and industry will be dealt with 		<p>Waste Management Act 1996 (as amended).</p> <p>Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 (as amended).</p> <p>Urban Waste Water Treatment Directive (91/271/EEC).</p> <p>European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001).</p>	Irish Water will have regard to these Plans and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Greater Dublin Strategic Drainage Strategy	<ul style="list-style-type: none"> Identifies policies, strategies and projects for the development of a sustainable drainage system for the Greater Dublin Region 			Irish Water is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Northern Ireland Water Resources Management Plan 2012	<ul style="list-style-type: none"> Sets the framework for strategically managing water resources in Northern Ireland and at the Water Resource Zone (WRZ) level within which such decisions should be taken 	<ul style="list-style-type: none"> Identifies a strategy to ensure that there is sufficient water available to meet projected demands taking account of uncertainties in the various elements of the supply demand Final Water Resources Management Plan balance and the level of risk to continuity of 		Irish Water will have regard to this Plan and is committed to contributing towards,

Plan/Programme	Highest Level Aim/ Purpose/ Objective	Lower level relevant objectives , actions etc.	Relevant legislation in Ireland	Relevance to WSSP
		supplies		in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Strategic Integrated Framework Plan for the Shannon Estuary	<ul style="list-style-type: none"> Inter-jurisdictional land and marine based framework plan to guide the future development and management of the Shannon Estuary Statutory planning policy to be included in relevant Local Area Plans County/Town Development Plans 	<ul style="list-style-type: none"> Research and develop an integrated approach to facilitating economic growth and promoting environmental management within and adjacent to the Shannon Estuary 		Irish Water will have regard to this Plan and is committed to contributing towards, in combination with other users and bodies, the achievement of the objectives of the regulatory framework for environmental protection and management.
Economic development plans for rural and urban areas	<ul style="list-style-type: none"> Aim to promote economic development and employment generation. 			Irish Water will have regard to these plans and where appropriate will seek to support economic development.
Local Catchment Flood Risk Management Plans	<ul style="list-style-type: none"> Aim to assess flood risk and identify flood risk management options. 			Irish Water will seek to ensure that the WSSP supports flood risk management.

Table B4 Plans / Programmes / Studies Currently in Preparation

Plan/Programme/Study	Summary
National Landscape Strategy 2014 (draft/in preparation)	Having consulted on a Strategic Issues Paper for a National Landscape Strategy, the Department of Arts, Heritage and the Gaeltacht is preparing a Draft National Landscape Strategy for Ireland.
National Rural Development Programme (draft/in preparation)	<p>The National Rural Development Programme, prepared by the Department of Agriculture, Fisheries and Food, sets out a national programme based on the EU framework for rural development and prioritises improving the competitiveness of agriculture, improving the environment and improving the quality of life in rural areas.</p> <p>At a more detailed level, the programme also:</p> <ul style="list-style-type: none"> • Supports structural change at farm level including training young farmers and encouraging early retirement, support for restructuring, development and innovation; • Aims to improve the environment, biodiversity and the amenity value of the countryside by support for land management through funds such as Natura 2000 payments etc.; and • Aims to improve quality of life in rural areas and encouraging diversification of economic activity through the implementation of local development strategies such as non-agricultural activities
National Forestry Programme 2014-2020 (draft/in preparation)	The Draft National Forestry Programme 2014-2020, <i>Forests, Products and People. Ireland's Forest Policy - A Renewed Vision</i> , is currently being prepared by the Department of Agriculture, Food and the Marine and views of stakeholders are now being sought on the composition of the new proposed forestry measures. These proposed measures represent a continuation of the previous Forestry Programme 2007-2013 which has been effective in supporting the growth and development of the forestry sector and rural economies.
National Peatlands Strategy (draft/in preparation)	The Draft National Peatlands Strategy, prepared by the National Parks and Wildlife Service, will, when finalised, establish principles in relation to Irish peatlands in order to guide Government policy. The Draft Strategy aims to provide a framework for which all of the peatlands within the State can be managed responsibly in order to optimise their social, environmental and economic contribution.
New Waste Management Plans (draft/in preparation)	<p>In accordance with Section 22 of the Waste Management Act, 1996 and the Waste Management (Planning) Regulations, 1997, notice was given of the intention to commence the preparation of new Regional Waste Management Plans in 2013.</p> <p>There will be three new Plans prepared for the following new waste management planning regions:</p> <ul style="list-style-type: none"> • Connacht-Ulster (comprising local authorities Cavan, Donegal, Galway City, Galway County, Leitrim, Mayo, Monaghan, Roscommon and Sligo); • Eastern-Midland (comprising local authorities: Dublin City, Dun Laoghaire/Rathdown, Fingal, Kildare, Laois, Longford, Louth, Meath, Offaly, South Dublin, Wicklow and Westmeath); and

Plan/Programme/Study	Summary
	<ul style="list-style-type: none"> • Southern (comprising local authorities: Carlow, Clare, Cork City, Cork County, Kerry, Kilkenny, Limerick, Tipperary, Waterford and Wexford)
National Strategic Plan for Aquaculture (draft/in preparation)	<p>Bord Iascaigh Mhara (BIM) is assisting the Department of Agriculture, Fisheries and the Marine in preparing a National Strategic Aquaculture Plan. The Plan is being prepared in compliance with Strategic EU Guidelines for the Sustainable Development of EU Aquaculture and will be consistent with the aim of the proposal for the Common Fisheries Policy reform to promote aquaculture through “an open method of co-ordination”. The NSPA will complement the National Seafood Operational Programme and will cover the period 2014-2020 (with mid-term assessment in 2017).</p>
National Seafood Operational Programme 2014-2020 (draft/in preparation)	<p>The National Seafood Operational Programme 2014-2020 will give effect to European Maritime and Fisheries Fund (EMFF).</p>
Flood Risk Management Plans arising from National Catchment Flood Risk Assessment and Management Programme (draft/in preparation)	<p>The national Catchment Flood Risk Assessment and Management (CFRAM) programme commenced in Ireland in 2011 and is being overseen by the Office of Public Works. The CFRAM Programme is intended to deliver on core components of the National Flood Policy, adopted in 2004, and on the requirements of the EU Floods Directive. The Programme is being implemented through CFRAM Studies which are being undertaken for each of the six river basin districts in Ireland.</p> <p>CFRAM Studies are being undertaken for all River Basin Districts.</p> <p>The studies are focusing on areas known to have experienced flooding in the past and areas that may be subject to flooding in the future either due to development pressures or climate change. In 2014, draft Flood Maps will be published. The final output from the studies will be CFRAM Plans, to be published in December 2016. The Plans will define the current and future flood risk in the River Basin Districts and set out how this risk can be managed.</p>
Greater Dublin Drainage Project	<p>Work on the Greater Dublin Strategic Drainage Strategy dates from 2005 when a strategic analysis was completed of the existing foul and surface water systems in the local authority areas of Dublin City, Fingal, South Dublin, Dun Laoghaire-Rathdown and the adjacent catchments in Counties Meath, Kildare and Wicklow. The analysis identified policies, strategies and projects for the development of a sustainable drainage system for the Greater Dublin Region. The aim was to develop an environmentally sustainable drainage strategy, which would be able to meet the demand of the region now and in the future (with 2031 as the long-term horizon). The study identified the overloading of the existing drainage systems which resulted in a marked deterioration in water quality and that the drainage system and wastewater treatment plants would have insufficient capacity to cater for future development. The population of the city was projected to rise to over 2 million in 2031 with a steep increase in housing units as household sizes decrease.</p> <p>The Drainage Strategy has since been advanced to the selection of a single option consisting of an underground</p>

Plan/Programme/Study	Summary
	orbital sewer and two pumping stations, a wastewater treatment plant at Clonshagh (Clonshaugh), coupled with an outfall pipe discharging 6 km out to sea from Baldoyle (http://www.greaterdublindrainage.com/).
Water Supply Project for Dublin Region	The Water Supply Project seeks to meet the projected long-term water supply needs of the Greater Dublin Area, up to 2050 and beyond.

Appendix C

Baseline Information

C.1 Biodiversity, Flora and Fauna

Baseline Characteristics

Biodiversity is the variety and variability of plants (flora) and animals (fauna) in an area and their associated habitats. The importance of preserving biodiversity is recognised from an international to a local level. Biodiversity is important in its own right and has value in terms of quality of life and amenity. The natural environment is also critical in providing clean air and water, food and raw materials.

Ireland has a range of varied habitats across the country, with a large number of sites that are designated as internationally, nationally or locally important for biodiversity. Internationally designated sites include Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) established under European Union Directives, and Ramsar sites designated as part of global agreements. National designations include Natural Heritage Areas, National Parks and Nature Reserves. The distribution of designated sites across Ireland is shown in **Figure C.1**.

Ireland contains the following designated sites, all of which are subject to protective measures:

- 423 SACs designated under the Habitats Directive, covering an area of 13,500 km². Habitats which are protected through SACs in Ireland include raised bogs, blanket bogs, turloughs, sand dunes, heaths, lakes, rivers, woodlands, estuaries and sea inlets, with 53% of the SACs being land-based and the remainder marine or lakes. Salmon, otter, freshwater pearl mussel, bottlenose dolphin and Killarney fern are among the species protected by SACs³;
- 132 SPAs designated under the Birds Directive which cover an area of 5,700 m². This includes wetlands, bays and estuaries, agricultural and inland habitats and marine colonies. Key species include light-bellied Brent goose, black-tailed godwit, whooper swan, dunlin, knot, merlin, golden plover and dunlin⁴;
- 45 Ramsar sites, which are wetlands of international importance, including shallow marine waters, rocky shores, estuaries, intertidal mudflats or marshes, plus inland rivers, lakes, wetlands and peats. The majority of these sites are also SACs and/or SPAs.⁵

There are also six National Parks across the country, 72 Nature Reserves and 148 Natural Heritage Areas. A further 630 proposed Natural Heritage Areas have been identified on a non-statutory basis, but which have some limited protection.⁶ In addition, biosphere reserves are sites recognised under UNESCO's Man and the Biosphere (MAB) Programme to promote sustainable development based on local community efforts and sound science.

³ National Parks & Wildlife Service, SACs <http://www.npws.ie/protectedsites/specialareasofconservationsac/> (accessed 08/10/14)

⁴ National Parks & Wildlife Service, SPAs <http://www.npws.ie/protectedsites/specialprotectionareasspa/> (accessed 08/10/14)

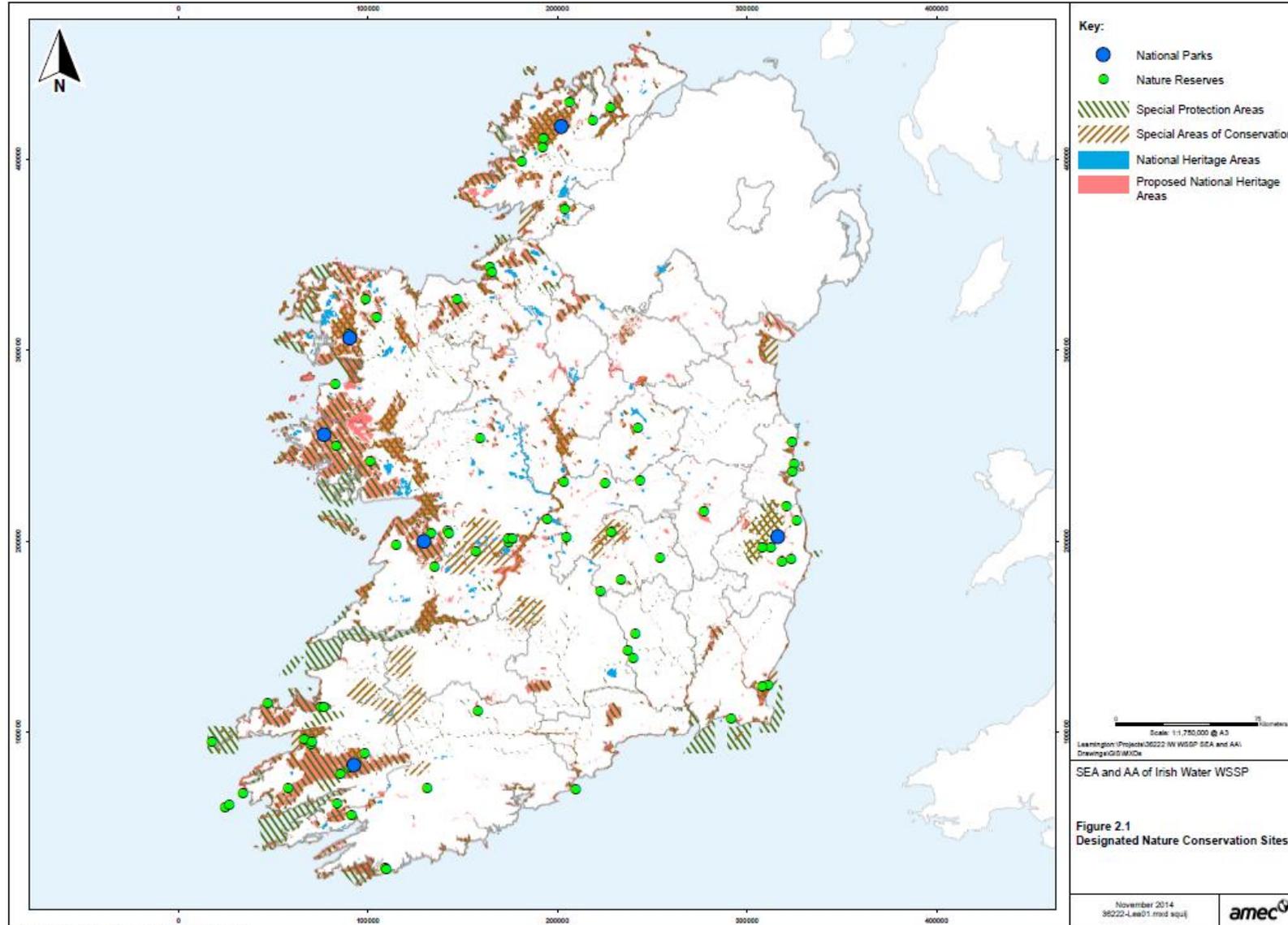
⁵ Irish Ramsar Wetlands Committee, Ramsar Locations in Ireland <http://www.ramsar.org/sites-countries/ramsar-sites-around-the-world> (accessed 08/10/14)

⁶ National Parks & Wildlife Service, Protected Sites <http://www.npws.ie/protectedsites/> (accessed 08/10/14)

Ireland has two biosphere reserves: North Bull Island and Killarney. Ireland also has 140 Important Bird Areas, covering over 4,000 km² predominantly in coastal and cliff areas.⁷

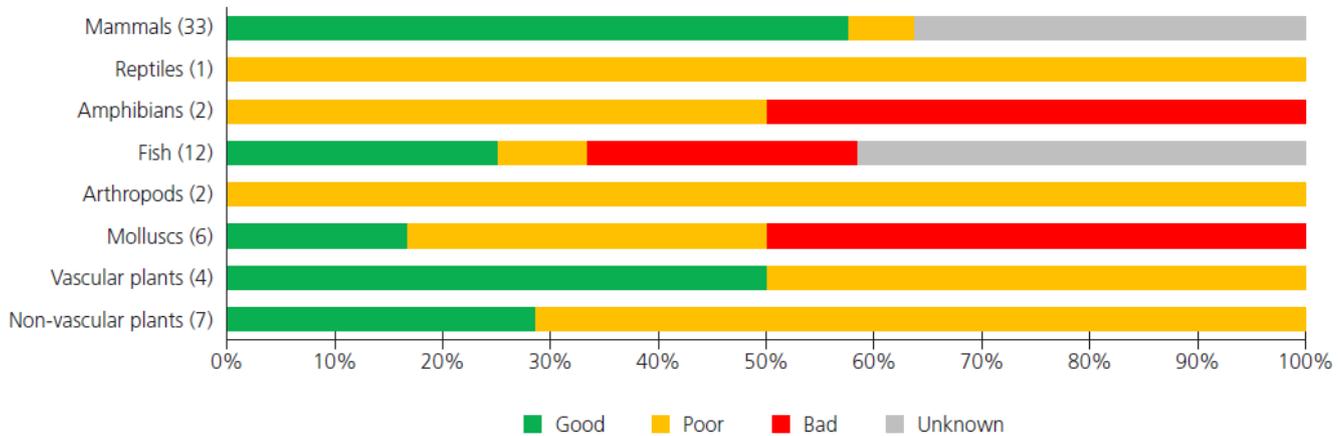
⁷ Bird Watch Ireland, Important Bird Areas
<http://www.birdwatchireland.ie/OurWork/SpeciesHabitatConservationinIreland/ImportantBirdAreas/tabid/204/Default.aspx> (accessed 14/10/14)

Figure C.1 Distribution of Designated Nature Conservation Sites in Ireland



The majority of habitats protected under the Habitats Directive in Ireland are of ‘poor’ or ‘bad’ conservation status, with only 7% of habitats in ‘favourable’ status. **Figure C.2** provides an overview of the condition of protected species in Ireland and serves to highlight that protected species including bats, seals and plants are in a slightly better position with 39% in favourable condition overall. However, wetland and freshwater species such as fish, molluscs and toads are typically in less good condition. Further to this, a red list (based on the International Union for the Conservation of Nature (IUCN) categories) identifies species of key conservation concern. The groups containing critically endangered species include: water beetles; non-marine molluscs; amphibians, reptiles and freshwater fish; and bees.

Figure C.2 Overall Conservation Status of Species in Ireland Listed under the Habitats Directive by Major Species Group ((x) = number of occurrences)



Source: Reproduced from EPA (2012) *Ireland’s Environment 2012: Nature and Biodiversity*

Irish rivers and coastal waters support a variety of species and notably include protected Shellfish Waters (with 63 sites across Ireland), Salmonid Waters (which support eight varieties of salmonid fish) and Freshwater Pearl Mussel Catchments (with mussel populations in 139 rivers although these are in serious decline)^{8,9}. Freshwater pearl mussels require water of high ecological status in order to thrive, however the number of high status sites has been in decline since the late 1980s.

Future Trends

Biodiversity in Ireland is facing ongoing pressure which has the potential to cause deterioration to the status of habitats and species. Ireland has committed to halt biodiversity loss by 2020 and action is being taken through the National Biodiversity Plan 2011-2016 to aid conservation and strengthen awareness and national decision making. The EPA has identified the key threats faced by biodiversity in Ireland as including:

⁸ Department of Environment, Community and Local Government, *The Shellfish Waters Directive* <http://www.environ.ie/en/Environment/Water/WaterQuality/ShellfishWaterDirective/> (accessed 08/10/14)

⁹ IUCN, *Margaritifera margaritifera* <http://www.iucnredlist.org/details/12799/1> (accessed 08/10/14)

- Direct habitat damage such as peat cutting, wetland drainage/reclamation and infrastructural development;
- Water pollution, particularly from nutrients and silt;
- Unsustainable exploitation such as over-fishing and peat extraction;
- Overgrazing and undergrazing;
- Invasive alien species;
- Climate change; and
- Recreational pressure.¹⁰

Population growth would further exacerbate many of these pressures, with greater potential impacts from pollution, recreation and exploitation.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to biodiversity, flora and fauna which may be relevant to Irish Water's activities and the WSSP are:

- The need to contribute to the protection and improvement of the condition of sites that have been designated for nature conservation purposes;
- The need to help improve the status of protected habitats and species;
- The need to help maintain/enhance ecological connectivity; and
- The need to support the protection and enhancement of non-designated sites.

C.2 Population and Human Health

Baseline Characteristics

Demographics

The 2011 Census for Ireland showed that the country had a population of 4,588,252. The population of Ireland has generally been rising since the 1960s as a result of declines in emigration, an increase in birth rate and falling death rates. Between 2006 and 2011, the population grew by an average of 1.6% per year.

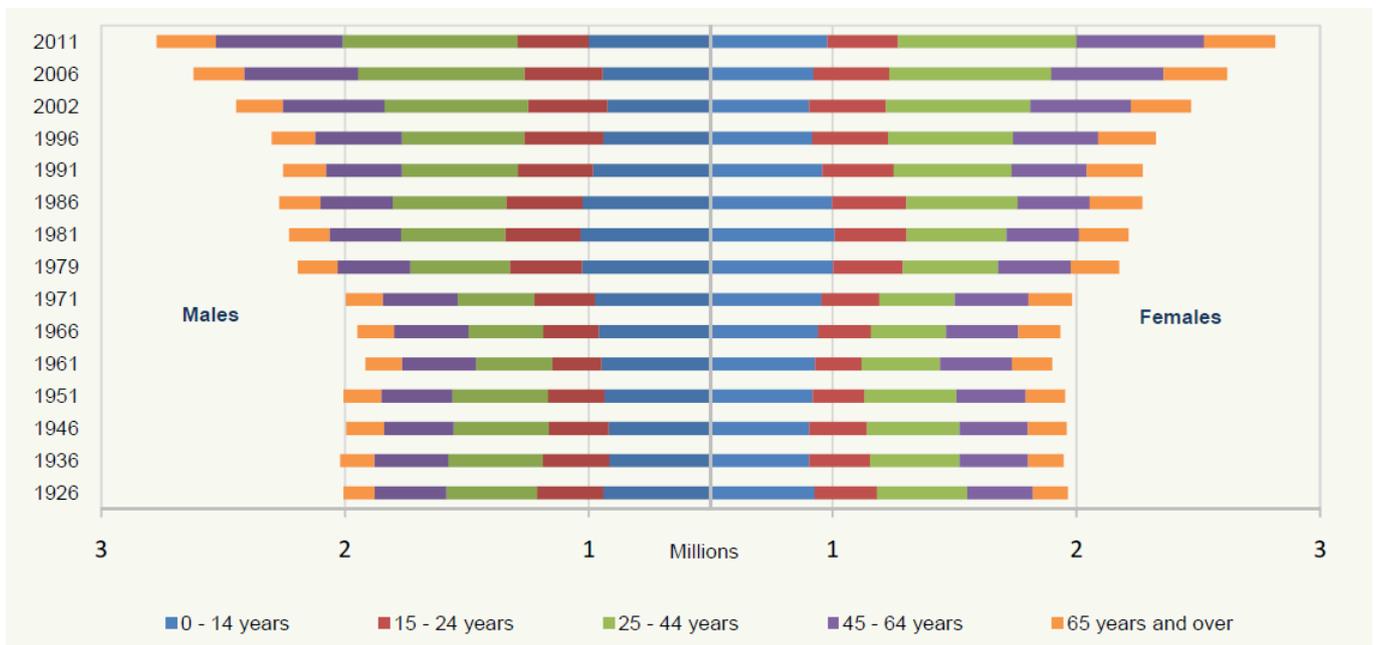
In 2011 Ireland had an average population density of 67 persons per km² (and increase from 62 persons per km² in 2006). There is a significant difference in population density depending on location, with of 1,736 persons per km²

¹⁰ Environmental Protection Agency (2012) *Ireland's Environment 2012: Nature and Biodiversity*
http://www.epa.ie/media/00061_EPA_SoE12_Ch06.pdf (accessed 08/10/14)

in urban areas compared to 26 persons per km² in rural areas. The urban population represents 62% of the total population in Ireland.

Figure C.3 shows the change in Ireland’s population structure by age group between 1926 and 2011. Overall, the average age of Ireland’s population increased and between 2006 and 2011 this rose by half a year to 36.1 years. The rural population is typically older than in urban areas. All age groups showed a rise in population numbers between 2006 and 2011 with the exception of young adults (aged 15 - 24) which fell by 12%. There were also slightly more women than men, with a ratio of 98.1 males for every 100 females.

Figure C.3 Change in Population Structure by Age Group, 1926-2011



Source: Reproduced from Central Statistics Office (2012) *Census 2011 Profile 2: Older and Younger*

Housing

There were a total of 1.65 million private households in 2011, containing an average of 2.7 persons per household. 290,000 dwellings were identified as vacant at the time of the Census. There was an increase in housing stock from 2006 to 2011 although this was at a slower rate than during previous periods. Households living in rented accommodation rose to 29% and home ownership accounted for 70% of households.

Health

Life expectancy at birth in 2012 was 78.7 for men and 83.2 for women, which continued a gradual rise in life expectancy over the previous 10 years.¹¹ At the time of the 2011 Census, 88.3% of the total population considered themselves to be in ‘very good’ or ‘good’ health. Perceptions of healthiness showed substantial deterioration with

¹¹ Eurostat, Life Expectancy at Birth by Sex
<http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tps00025&language=en> (accessed 09/10/14)

age, with 11.6% of the population aged 85 and above identifying themselves as having ‘bad’ or ‘very bad’ health compared to 0.4% of 20 - 24 year olds. Cities were also found to have the poorest levels of health compared to suburbs, smaller towns and rural areas.

A total of 13% of the population indicated that they have a disability, with the number of people with a disability generally rising with age. The cities of Limerick, Cork and Waterford had the greatest proportions of local population with a disability.

Economy

Gross Domestic Product (GDP) at current market prices for 2014 is €46,340 million, an increase of 7.6% on the previous year.¹² The industry sectors with the greatest numbers of employees include wholesale and retail trade, health and social work, manufacturing and education. However, there are strong regional variations in industry sectors across Ireland with the central southern counties having greater prevalence of manufacturing jobs, while the east has more of the workforce employed in wholesale and retail. Average hourly earnings across 2013 were €21.83, which has remained relatively constant since 2008.¹³

Unemployment rose sharply from 8.5% to 19% in the five years prior to 2011. The construction and manufacturing sectors experienced the greatest decline in employment numbers over that period. Unemployment is particularly prevalent in young people aged 15 – 24, with 39% of this age group out of work.

Tourism plays an important role in Ireland’s economy, particularly for the accommodation and food services sector. Expenditure by tourists visiting Ireland grew by 12% from 2012 to €4.5 billion in 2013 and this figure rises to €5.9 billion when spending by Irish residents is taken into account. This represents a notable increase compared to previous years where revenue had remained relatively static since 2009. Strongest growth by overseas tourists came from the long haul markets such as North America. Dublin was the most visited region of Ireland in 2013 and the majority of domestic trips were short (up to three night) holidays.¹⁴

Future Trends

The population of Ireland is projected to continue to rise but at a slower rate than that seen between 2006 and 2011. Projected annual increases (depending on fertility and migration variants) range between 0.4% and 1.0% (compared to the recent 1.6% increase observed) giving a forecast population for 2026 of between 4.85 and 5.31 million people. The population of Ireland is projected to rise further to between 5.00 and 6.73 million by 2046.

The population aged 65 and over is projected to rise significantly from 532,000 in 2011 to approximately 850,000 in 2026, and up to 1.4 million in 2046. As health is typically found to decline with increasing age, this may place further pressure on health systems and care facilities. Primary school aged children are also forecast to rise in numbers up to 2021, before a downturn by 2026 with birth rates expected to be in decline by this point.

¹² Central Statistics Office, IMF Summary Data Page <http://www.cso.ie/en/statistics/imfsummarydatapage/> (accessed 09/10/14)

¹³ Central Statistics Office, Earnings and Labour Costs http://www.cso.ie/multiquicktables/quickTables.aspx?id=ehq03_ehq08 (accessed 09/10/14)

¹⁴ Fáilte Ireland, Tourism Facts 2013 http://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/3_General_SurveysReports/Tourism-facts-2013.pdf?ext=.pdf (accessed 09/10/14)

The labour force is forecast to increase by approximately 11,000 people each year up to 2026 under a moderate migration scenario, predominantly as a result of net migration. This represents 0.5% annual growth in the labour force. Under all scenarios considered in the population projections, the over 50s age group is projected to represent a greater share of the labour force by 2026, as a result of both demographic changes and increased workforce participation.¹⁵

Tourism expenditure has shown an upturn in the last year which may continue to rise as the global economy continues to improve and consumer spending increases.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to population and human health which may be relevant to Irish Water's activities and the WSSP are:

- The need to accommodate for a rising population and growing economy through the associated delivery of water supply and wastewater services without placing undue pressure on the environment;
- The need to support the protection of the health of the Irish population through the provision of affordable water and wastewater services; and
- The need to ensure that water infrastructure resulting from the implementation of the WSSP does not have an adverse impact on the economy.

C.3 Soil

Baseline Characteristics

There is a wide variety of bedrock, superficial deposits and soils across Ireland known as 'geodiversity'. Geology and soils are important to ecosystems and their protection is vital as they provide essential functions including food production, storage of carbon, fibre and wood production and protection of biodiversity.

The bedrock across a large swathe of central Ireland comprises of Carboniferous limestone which was deposited in tropical seas 350 million years ago. Devonian 'Old Red Sandstone' is present in the south-west, where thick layers of sediment were laid down in semi-arid and mountain river systems. Sandstone and shale of varying ages from 500 – 300 million years ago are the next most prevalent across the country, some of which are interspersed with basalt and rhyolite, followed by Ordovician to Devonian granite intrusions.¹⁶

¹⁵ Central Statistics Office, Population and Labour Force Projections 2016 – 2046
http://www.cso.ie/en/media/csoie/releasespublications/documents/population/2013/poplabfor2016_2046.pdf (accessed 09/10/14)

¹⁶ GSI, Bedrock Geology of Ireland <http://www.gsi.ie/en-ie/geoscience-topics/geology/Pages/Geology-of-Ireland.aspx>

There is a mining legacy across some parts of the country. Minerals and metals that were mined include zinc, lead, gypsum, coal, silver, copper and gold. In addition to metals, crushed rock, sand and gravel are also currently quarried at over 400 sites in Ireland.¹⁷

Glacial episodes helped shape the Irish landscape and resulted in deposits of finer gravels, sands silts and clays. These formed tills and clays which affect the soil types and drainage found today. Key soils types categorised according to the landscape they are found in have been set out in **Table C.1**.

Table C.1 Soil Classifications by Landscape Type

Landscape	Soil Types	Characteristics
Mountain	Lithosols, Groundwater and Surfacewater Gleys, Podzols, Blanket Peat	Shallow soils on steeper soils, with wet and acidic soils in less steep areas.
Hill	Brown Podzolics, Brown Earths, Surfacewater Gleys	Mainly acidic in nature. Developed from shale, sandstone or granite.
Drumlin (small oval hills)	Luvisols, Brown Earths, Brown Podzolics, Surfacewater Gleys, Groundwater Gleys and Peats	Soils vary in thickness, with thin deposits typically containing drier soils than the wetter soils found at the base of Drumlins.
Flat to Undulating	Rendzinas, Luvisols and Surface-water Gleys	Varying thickness soils, some very shallow. Deeper soils develop on glacial till.
Lowland	Brown Earths, Brown Podzolics, Surface-water and Groundwater Gleys.	More acidic soils are found in the lowland areas underlain by sandstone, shales and granite than the surrounding hill areas.
Alluvial and Valley	Groundwater Gleys, Alluvial Soils and Peat	Soils found at the base of hills and across floodplains.

Source: EPA (2014) *Irish Soil Information System: Synthesis Report*

There is limited data on soil quality and protection for Ireland as historically this topic has received little attention. However, soil is generally considered to be of good quality as a result of long growing seasons and frequent rainfall. The lack of heavy industry has also meant that ground contamination is not a significant issue across the country whilst permanent pastures have typically prevented substantial degradation.

Contamination can arise from leakages, spillages and mining operations, as well as diffuse sources such as agriculture and septic tanks. Seven mining districts are designated as requiring further monitoring for contamination while 22 need no intervention. Overall, the weight of soil managed for remediation has substantially decreased since 2008 although this is likely to reflect the downturn in building and redevelopment projects.

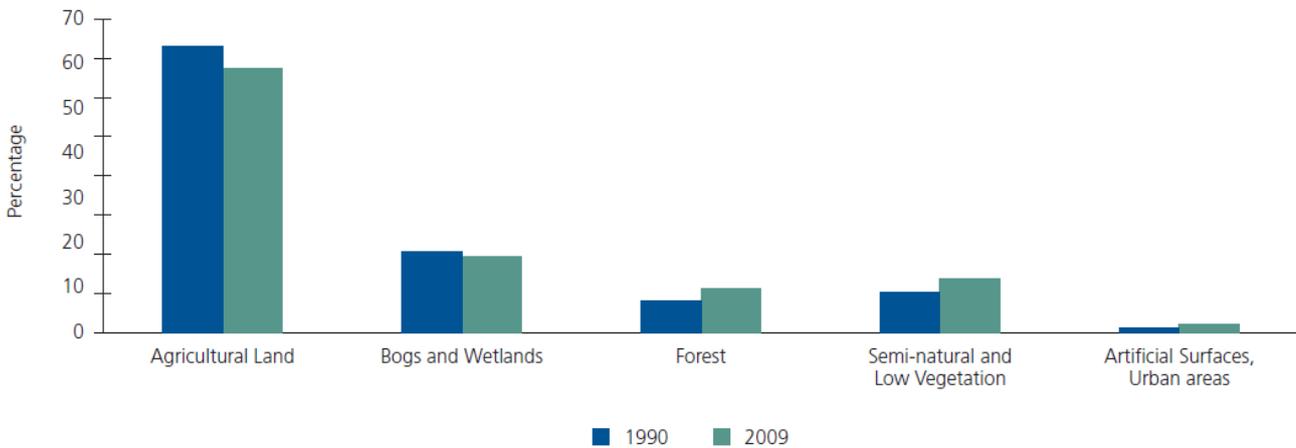
Figure C.4 shows land use/land cover across Ireland in 1990 and 2000. Land cover in Ireland is predominantly agricultural (approximately 60%), followed by 20% peatland and wetlands, and then forestry and semi-natural areas. Agriculture accounts for over 4.5 million hectares of land and there are 140,000 individual farms across the country. Agricultural uses of land predominantly comprise of grassland for pastures, silage and hay (80%), followed by rough grazing and crop production.¹⁸

¹⁷Minerals Ireland, Mining in Ireland <http://www.mineralsireland.ie/MiningInIreland/> (accessed 08/10/14) Teagasc, Agriculture in

¹⁸Ireland: Land Use <https://www.teagasc.ie/rural-economy/rural-economy/agri-food-business/> (accessed 08/10/14)

Peatland includes raised bogs, blanket bogs and fens. Ireland’s soils are rich in organic matter, most notably peat which is carbon-rich and acts as a long-term carbon sink. Peat has experienced the greatest degradation compared to other soils, with up to 95% of Irish peatland in a degraded state. Damage and disturbance to peatland results in the release of carbon and contributes to climate change, and also has further negative effects on biodiversity and water quality.

Figure C.4 Percentage Land Use/Land Cover Change in Ireland 1990–2009



Source: Reproduced from EPA (2012) *Ireland’s Environment 2012: Land and Soil*

Ireland has three UNESCO geoparks, which are areas of internationally significant geology. These sites are: Marble Arch Caves; the Copper Coast; and the Burren and Cliffs of Moher. The diverse geological features together with the heritage and ecology of the sites are used to promote the geological landscape and support the local economy through sustainable tourism. The Geological Survey of Ireland and the Department of Arts, Heritage and the Gaeltacht are currently identifying sites of geological interest across the country that will be proposed as Natural Heritage Areas.

Future Trends

Since 1990 the percentage of land use/land cover classified as agricultural and peat/wetlands has decreased while forest cover and semi-natural areas have increased (see **Figure C.4**). This has predominantly arisen from coniferous plantations being developed on pastures and peatland. Future changes to farm production are also anticipated with an expected increase in livestock. This is unlikely to significantly affect land cover but changes to soil quality may take place.

Peatland is suffering degradation through peat extraction, afforestation, construction, recreational use and invasive species. Turf cutting in SPAs has been banned following intervention from the European Commission and industrial peat extraction is expected to decline. The future use of previous peat extraction sites could result in land use changes and substantial carbon emissions if not carefully managed.

Forest cover is expected to continue to rise through Government planting programmes with a trend towards greater consideration of land and soil types to help reduce the environmental impacts of afforestation and harvesting processes.

Further threats to soils include loss organic matter, loss of top soil from erosion and construction, contamination risks and acidification. As such, changing land use and population growth can drive negative effects on soil quality. Poor land management also plays a role in soil degradation and policy measures such as the Rural Environmental Protection Scheme have been put in place to help improve farming practices and enhance soil quality.

Key Environmental Issues Relevant to Irish Water’s Activities and the Water Services Strategic Plan

The key environmental issues relating to soil which may be relevant to Irish Water’s activities and the WSSP are:

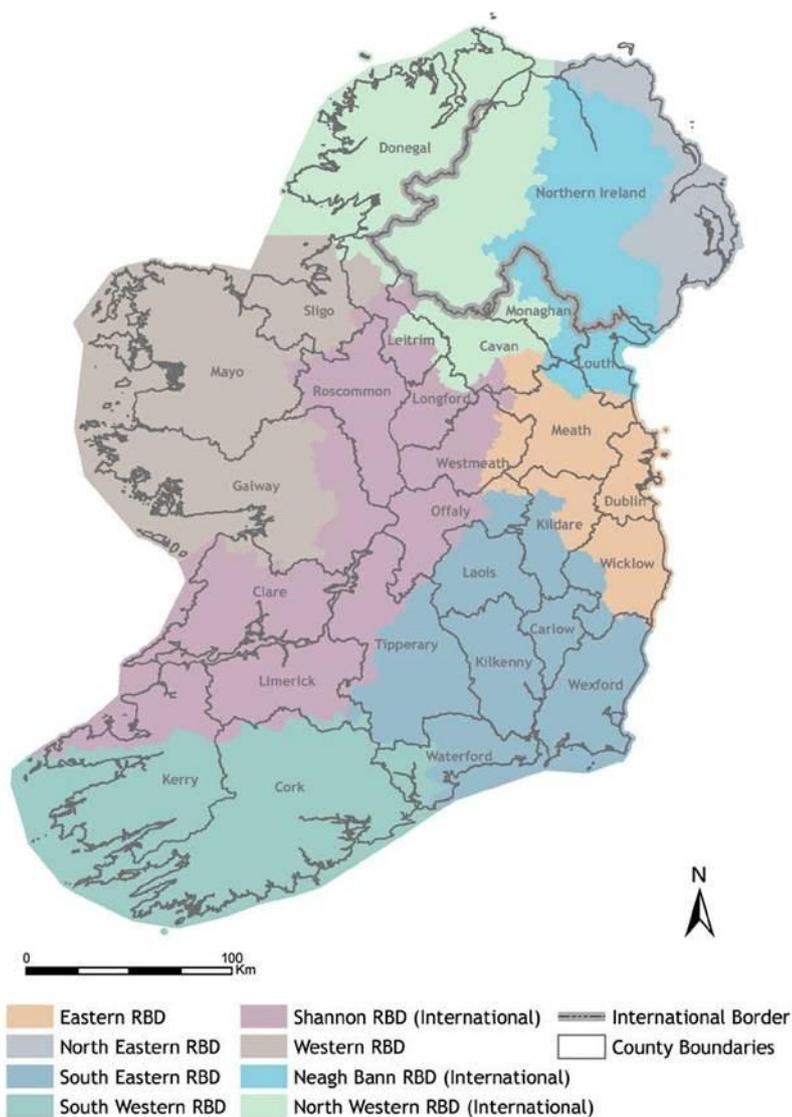
- The need to contribute to the protection and enhancement of geodiversity and sites designated for their geological importance;
- The need to support the protection and enhancement of soil quality, particularly in peatland areas which have been degraded or are at risk of degradation; and
- The need to help maintain the hydrogeological and ecological function of the soil resource.

C.4 Water

Baseline Characteristics

The area of influence of the WSSP covers part or all of seven of the eight Water Framework Directive (WFD) River Basin Districts (RBDs) in Ireland: the North Western International RBD; the Neagh-Bann International RBD; the Western RBD; the Shannon International RBD; the Eastern RBD; the South Eastern RBD; and the South Western RBD (see **Figure C.5**). The WFD requires that all Member States implement the necessary measures to prevent deterioration of the status of all waters – surface, ground, estuarine and coastal – and protect, enhance and restore all waters with the aim of achieving at least ‘good’ status in all water bodies by 2015. All public bodies are required to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and improve polluted water bodies to good status by 2015.

Figure C.5 River Basin Districts on the Island of Ireland



Includes Ordnance Survey Ireland data reproduced under OSI License number EN 0059208.

Source: EPA (2008) *Ireland's Environment 2008*

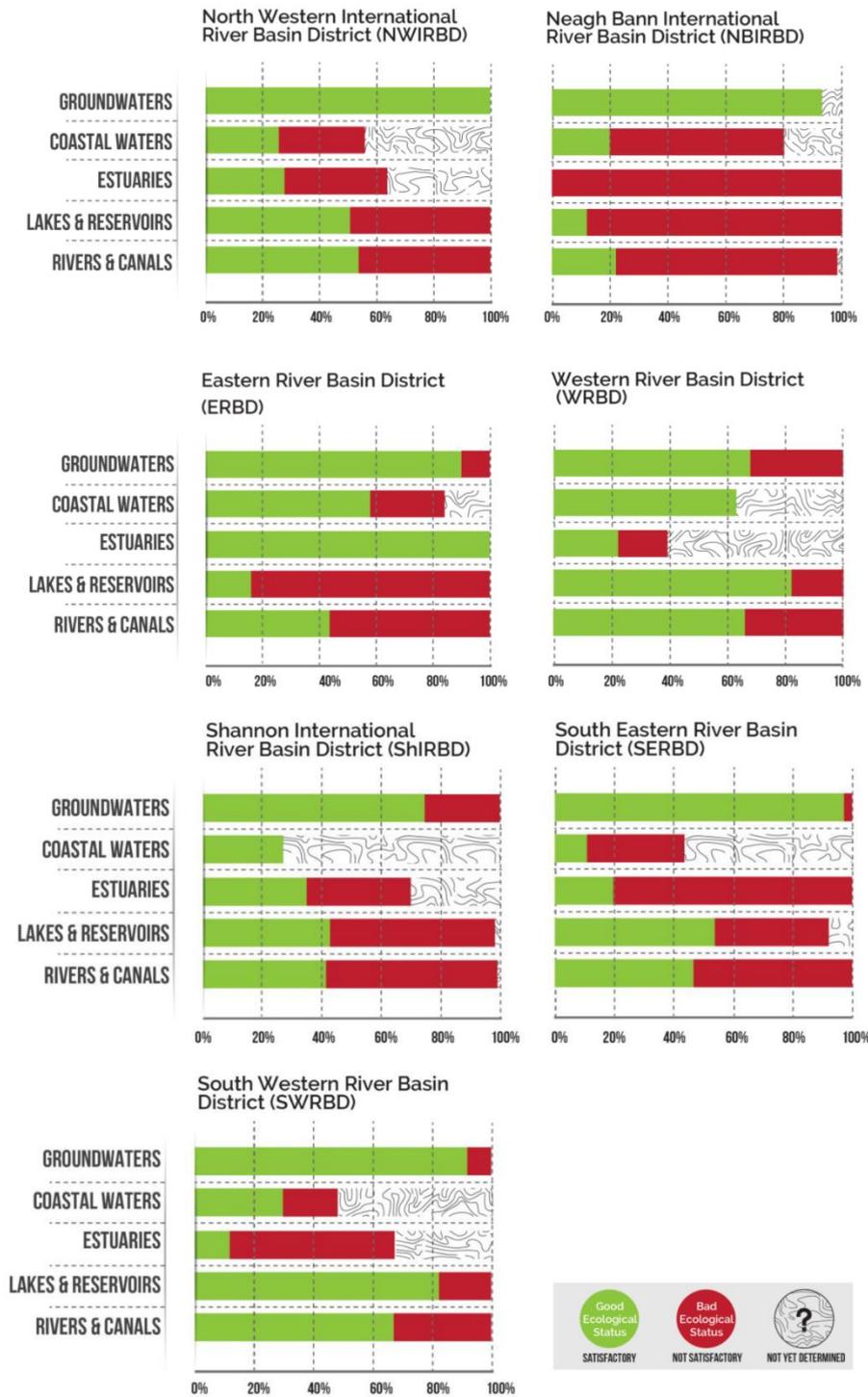
Overall, the status of Ireland's water bodies compared to the WFD target is:

- 71 per cent of river channel is at high or good status;
- 44.6 per cent of lake area monitored is at high or good status;
- 46 per cent of the area of transitional and coastal waters are at high or good status; and
- 85.6 per cent of the area of groundwater aquifers is at good status.¹⁹

¹⁹ Environmental Protection Agency (2012) *Ireland's Environment 2012: Water* http://www.epa.ie/media/00061_EPA_SoE12_Ch04.pdf (accessed 08/10/14)

Figure C.6 highlights the ecological status of water bodies located within the various catchments, as identified in the 2009 River Basin Management Plans.

Figure C.6 Ecological Water Status as set out in the Draft River Basin Management Plans (2009)



Source: Reproduced from Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines (Regional Authorities of Ireland, 2014); data were sourced and adapted for this Regional Indicators Report from (a) status assessments carried out by the Environmental Protection Agency on behalf of the various River Basin Districts for their respective River Basin Management Plans; and (b) Surface water trends data for the period 2009 – 2011 (EPA, 2013).

As a source of drinking water, the quality of groundwater is highly significant. It also supports the ecology of surface water bodies as groundwater can contribute to surface flows in low-flow periods. The status of groundwater across the seven river basin districts is set out in **Table C.2**. Sites that are ‘poor’ status typically have high levels of phosphate as a result of eutrophication from diffuse pollution or historic contamination. Higher concentrations are a greater issue in the southeast and south of Ireland compared to the rest of the country. The changes are partly attributed to variation in rainfall, such that drier years result in less nutrient dilution, alongside improvements to fertiliser use and storage reducing diffuse pollution. Additionally, 40% of wells and springs, which are important sources of drinking water for private supplies, were found to be contaminated by microbial pathogens in 2010.

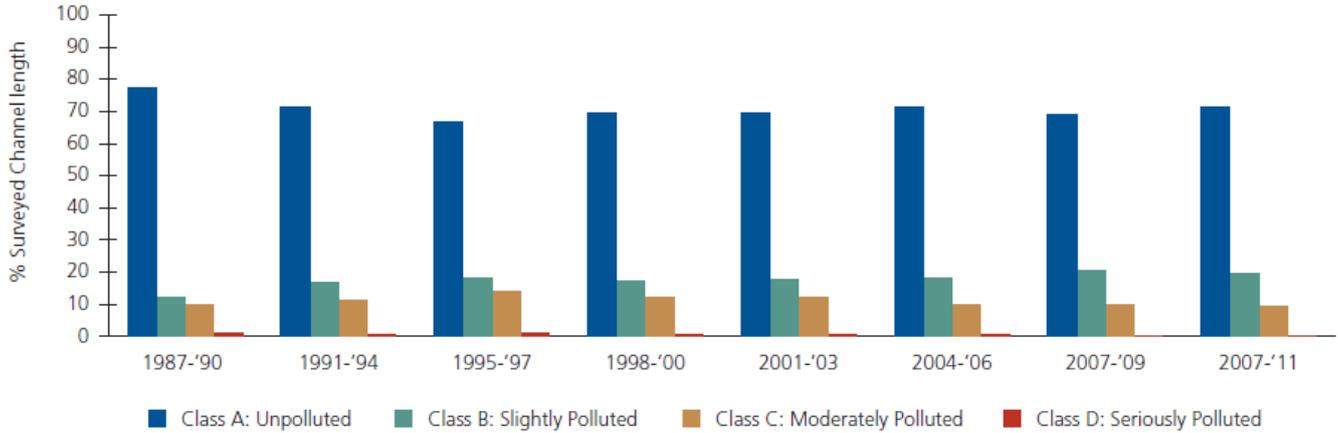
Table C.2 River Basin District Summary of Status Classification Results for Groundwater Bodies

RBD	Good Status (No. of water bodies)	Good Status (% RBD Area)	Poor Status (No. of water bodies)	Poor Status (% RBD area)
Eastern	67	89.7	8	10.3
Neagh Bann	26	95.3	2	4.7
North West	72	100	0	0
South East	146	97.8	5	2.2
Shannon	182	74.5	60	25.5
South West	77	96.8	7	3.2
Western	71	65.2	34	34.8
National	641	85.6	116	14.4

Source: EPA (2012) *Ireland's Environment 2012: Water*

Figure C.7 shows trends in the quality of the 13,000 km of river channel monitored in Ireland between 1987-90 and 2007-11. The majority of river channel (71%) was classified as ‘unpolluted’ in the period 2007-11 with the remainder predominantly falling into the ‘slightly polluted’ or ‘moderately polluted’ categories. While the river channel classified as ‘seriously polluted’ has been in decline since the late 1980s, the length of channel with more minor pollution has increased. This is predominately due to eutrophication reducing water quality, typically from agricultural sources. High quality water (high ecological status) as needed for freshwater pearl mussels has also been in decline for the last 20 years, dropping from almost 30% of river sites in 1990 to approximately 16% in 2009.

Figure C.7 National Trends in the 13,188 km Baseline Showing the Percentage of Surveyed River Channel in the Four EPA Biological Classes



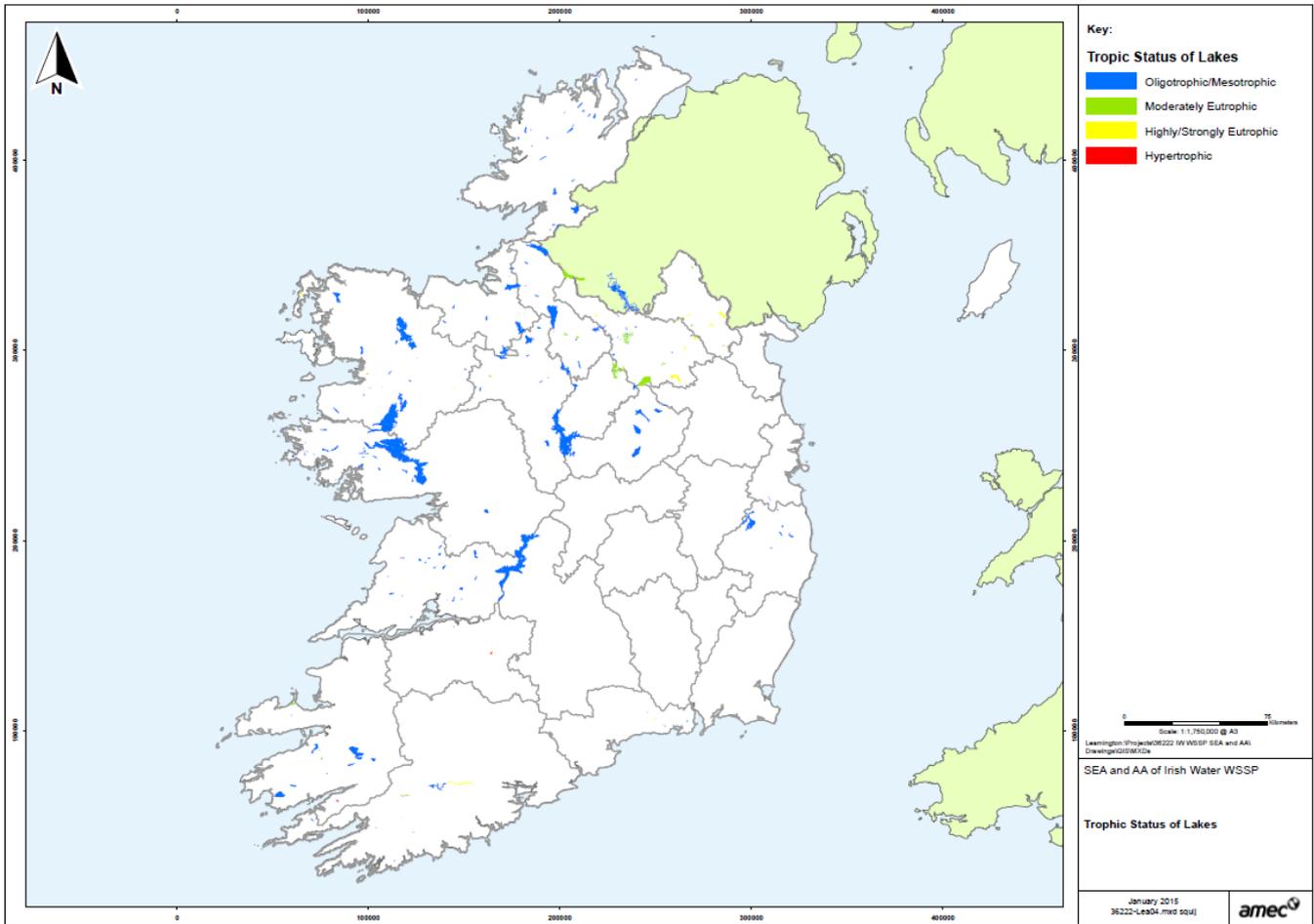
Source: Reproduced from EPA (2012) *Ireland's Environment 2012: Water*

Canal systems across Ireland are designated as Artificial Water Bodies under the WFD. These are generally in good condition with 87% of the canal length classified as having ‘good’ ecological potential in 2008.

The quality of 208 lakes was assessed in 2010, accounting for 65% of the total lake area in Ireland. 47% of the lakes were found to have ‘good’ or ‘high’ ecological status with the remainder not yet achieving the WFD targets. As with other Irish waters, a key contributor to poor water quality is nutrient loading from diffuse and point sources so measures to improve tributary river water quality would also benefit lakes²⁰ (Figure C.8 shows the trophic status of lakes).

²⁰ Environmental Protection Agency (2012) *Ireland's Environment 2012: Water* http://www.epa.ie/media/00061_EPA_SoE12_Chp04.pdf (accessed 10/10/14)

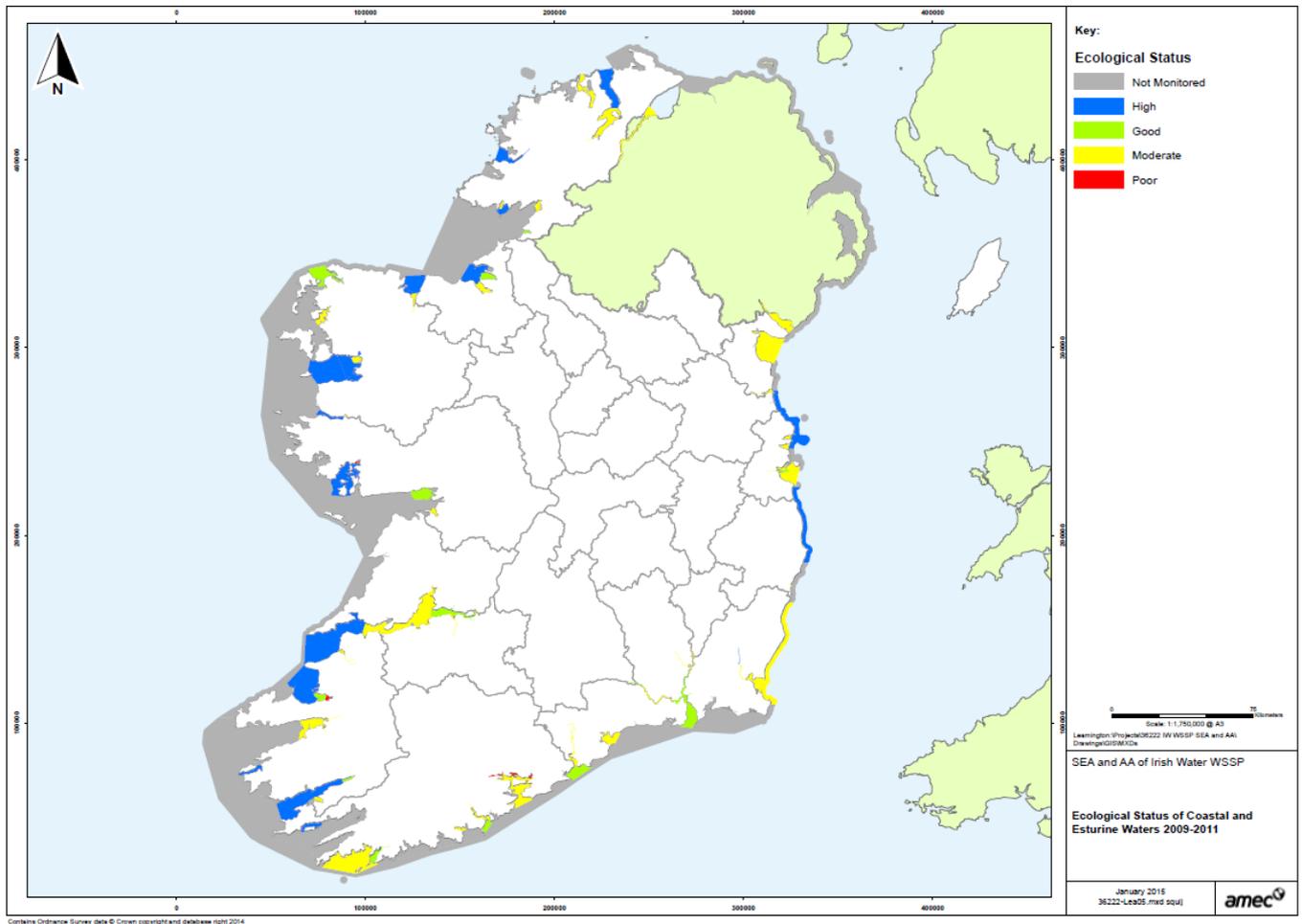
Figure C.8 Trophic Status of Lakes



Source: EPA data, available from <http://gis.epa.ie/Envision/>

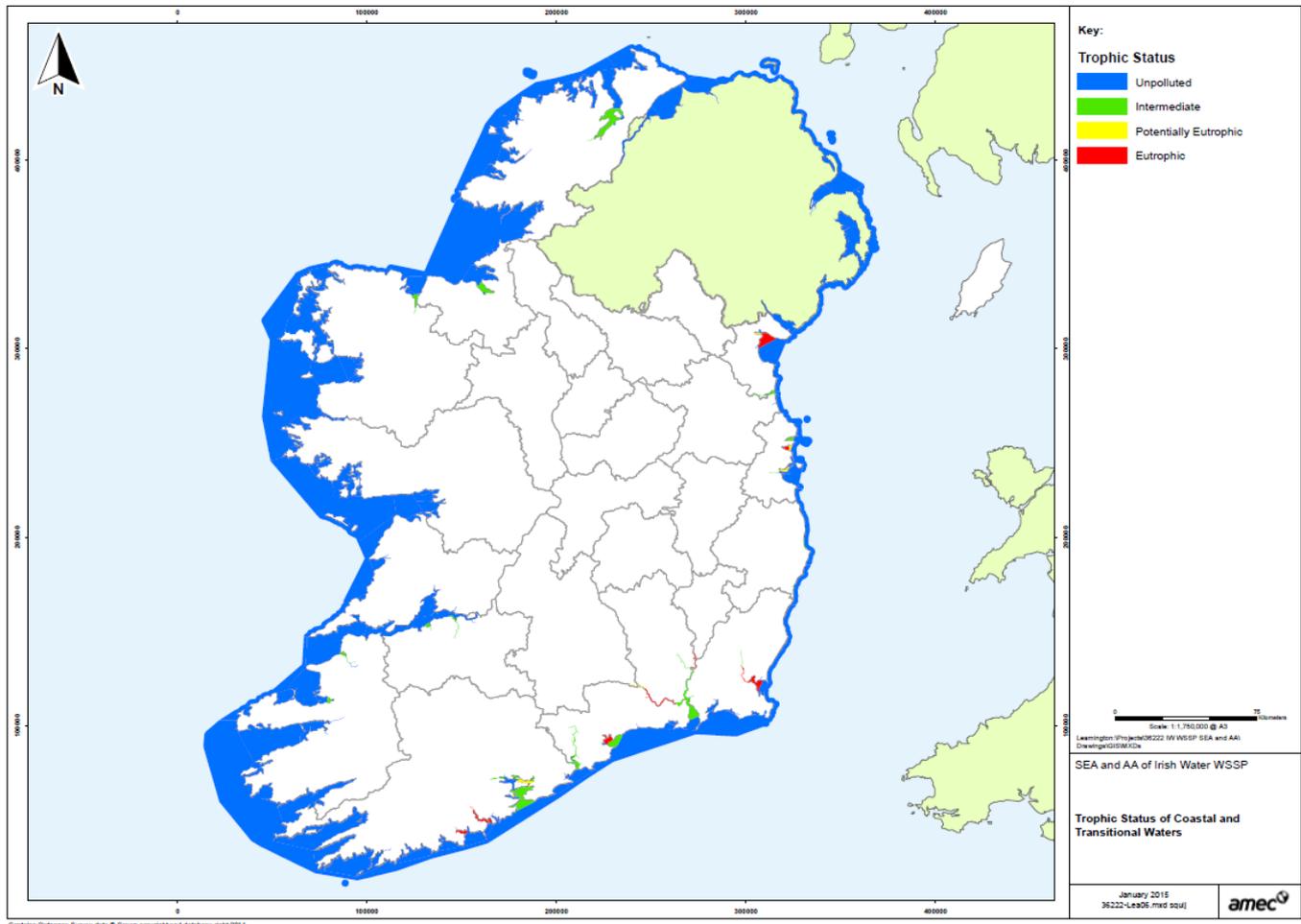
The ecological status of coastal and estuarine waters on the island of Ireland for the period 2009-2011 is mapped in **Figure C.9**. 46% of transitional and coastal water bodies were of ‘good’ or above ecological status, although this represents only two-thirds of the total transitional and coastal area in Ireland. Areas of lower quality were typically estuaries or nearshore coastal zones. Much of the population lives close to the coast and discharges from urban wastewater treatment plants and agricultural point and diffuse source pollution are the greatest source of contaminants to these waters (**Figure C.10** shows the trophic status of coastal and transitional waters).

Figure C.9 Ecological Status of Coastal and Estuarine Waters 2009-2011



Source: EPA Data from 2009-2011, available from <http://gis.epa.ie/Envision/>

Figure C.10 Trophic Status of Coastal and Transitional Waters

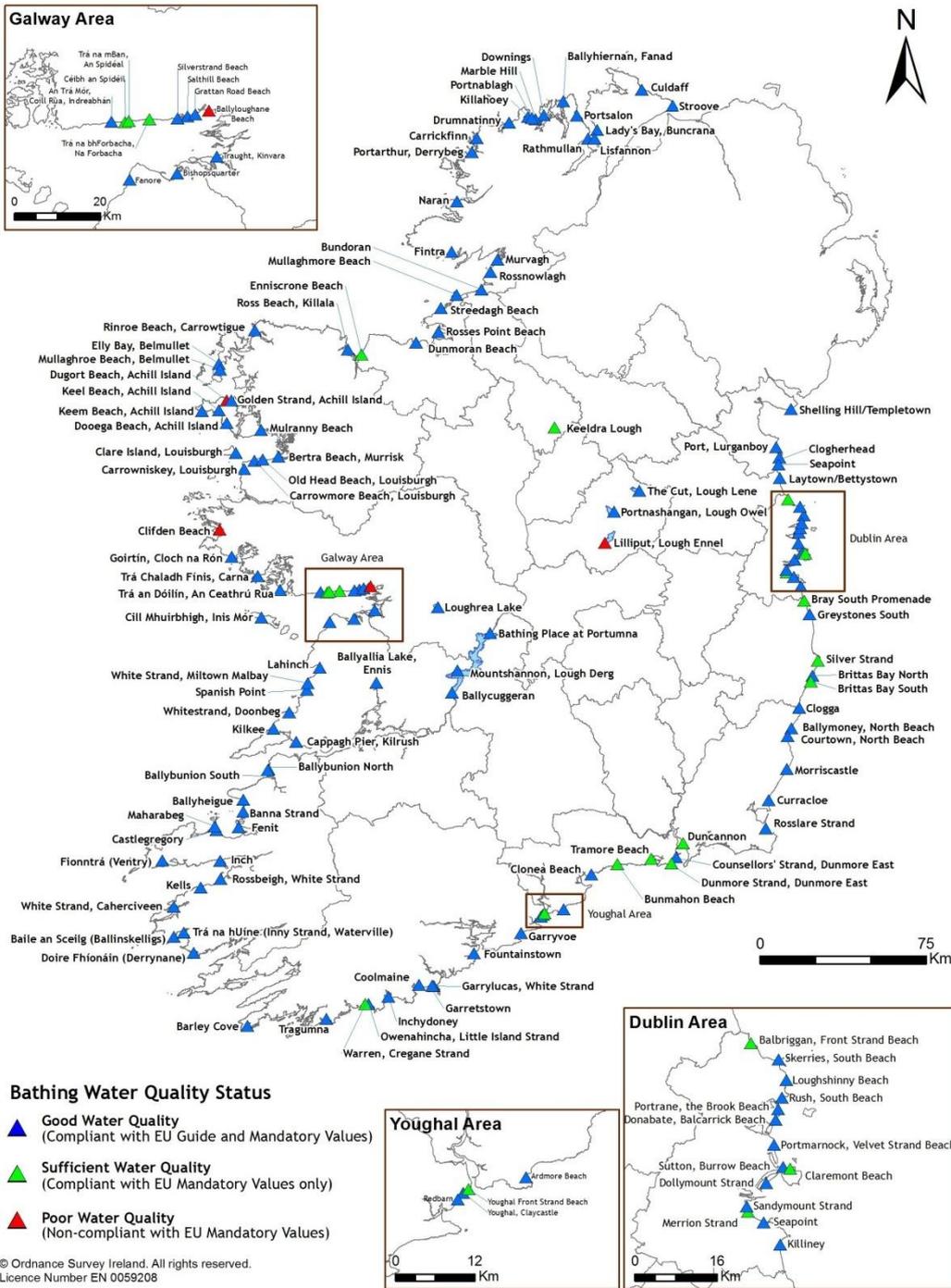


Source: EPA data, available from <http://gis.epa.ie/Envision/>

Bathing water quality (both coastal and inland) is monitored on an annual basis and is rising in status. In 2013, 84% of bathing waters were at 'good' status or above, compared to 67% in 2012. Only four bathing water sites failed to meet the minimum standards and were classified as 'poor' quality (see **Figure C.11**).²¹

²¹ Environmental Protection Agency, *The Quality of Bathing Water in Ireland: An Overview for the Year 2013* http://www.epa.ie/pubs/reports/water/bathing/bathing_water_report_2013.pdf (accessed 10/10/14)

Figure C.11 Bathing Water Quality, 2013



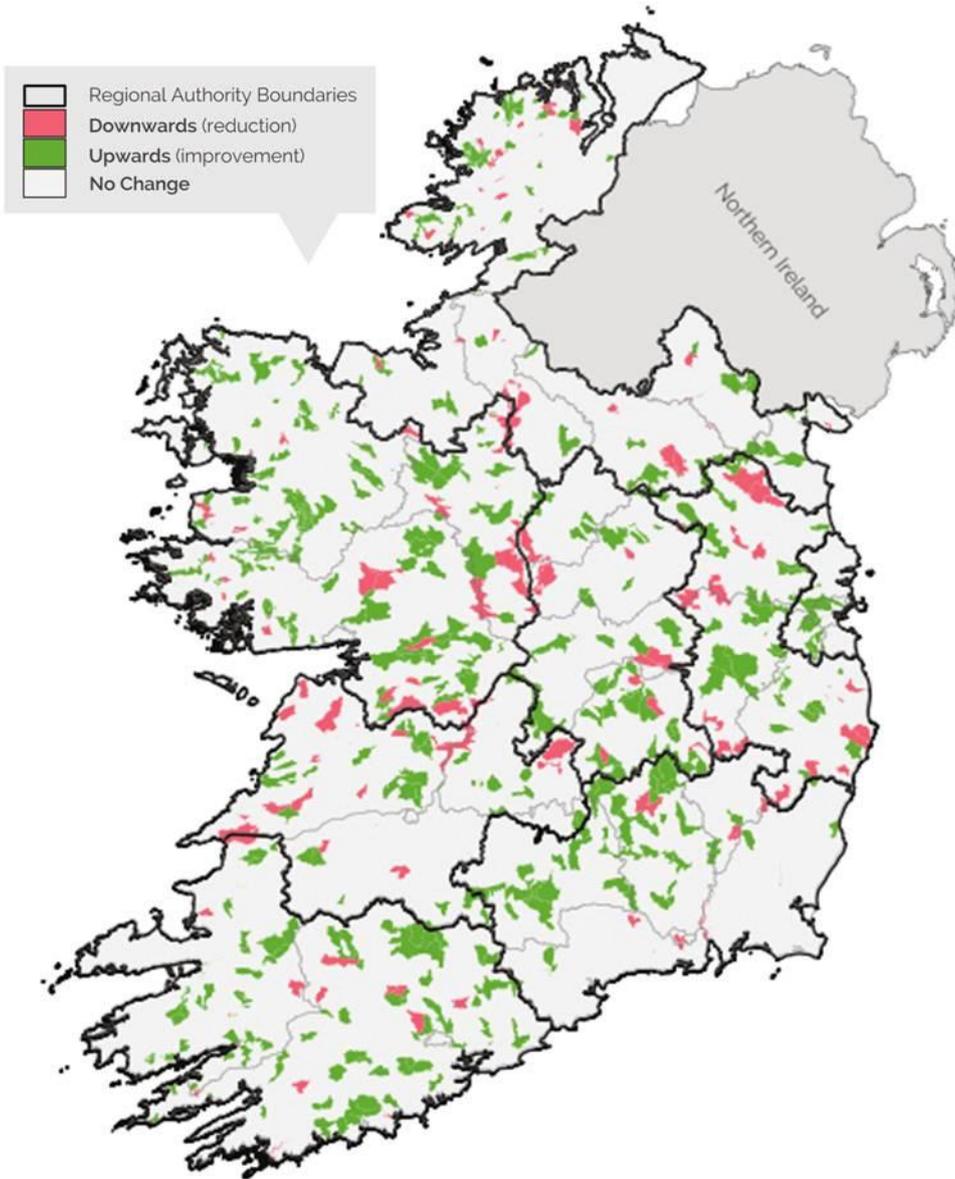
Source: EPA (2014) *The Quality of Bathing Water in Ireland – An Overview for the Year 2013*, available from http://www.epa.ie/pubs/reports/water/bathing/BathingWater_map.jpg

Future Trends

Water quality needs to keep improving across Ireland in order to meet the WFD objectives for 2015. River water quality has been in decline, albeit with a reduction in the length of most seriously polluted channel, with high-quality freshwater supporting species such as freshwater pearl mussels being particularly affected. Groundwater quality is variable but most recently showed a slight deterioration, which is at least partly attributed to variations in rainfall. Despite this variation, an underlying trend of improving status had been observed so it is likely that overall water quality will rise across future years. Lake water quality has remained fairly constant, while coastal and bathing water quality has been on the increase. Trends in Surface Water Status for the period 2009-2011 are shown in **Figure C.12**.

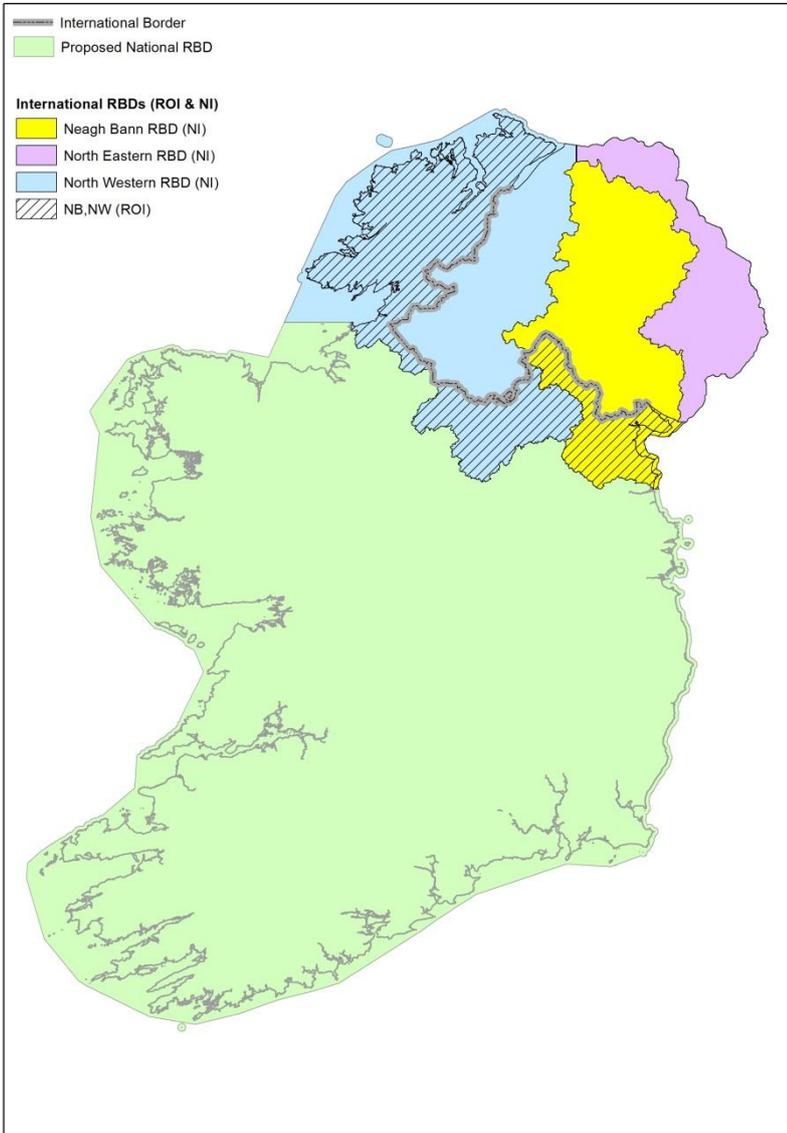
The implementation of the first cycle of River Basin Management Plans is ongoing and these support the management of water resource to achieve at least 'good' ecological status and to avoid deterioration in the status of any waters, in accordance with the WFD. The Minister for the Environment, Community and Local Government has put in place new governance structures and administrative arrangements for the implementation of a second cycle of River Basin Management Plans. The new arrangements will mean that a single national approach for the development of River Basin Management Plans will be implemented with specific administrative arrangements to coordinate requirements with Northern Ireland in relation to cross-border waters. The Eastern, South Eastern, South Western, Western and Shannon River Basin Districts will be merged to form one national River Basin District. In relation to the North Western and Neagh Bann International River Basin Districts, a single administrative area will be established in the Republic of Ireland portion of these two Districts for the purpose of coordinating their management with authorities in Northern Ireland (see **Figure C.13**).

Figure C.12 Trends in the Status of Surface Water Catchments for the period 2009-2011



Source: Reproduced from Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines (Regional Authorities of Ireland, 2014); data were sourced and adapted for this Regional Indicators Report from (a) status assessments carried out by the Environmental Protection Agency on behalf of the various River Basin Districts for their respective River Basin Management Plans; and (b) Surface water trends data for the period 2009 – 2011 (EPA, 2013)

Figure C.13 Proposed National River Basin District



Source: Department of the Environment, Community & Local Government (2014) *Timetable and Work Programme for the Development of the Second Cycle River Basin Management Plans*

The main contributors to poor water quality are large point sources such as wastewater treatment plants and diffuse sources, typically arising from agriculture, forestry and peat harvesting. Measures in the River Basin Management Plans aim to support the improvement of water body status through reducing the release of phosphorus, nitrogen and oxygen-depleting matter into waters, plus controlling water-borne pathogens and other harmful pollutants. Actions to control the physical shape of waterbodies and ensuring a sufficient volume of water in waterbodies are also planned to help maintain or improve water quality.

River water is expected to be a particular area of focus both in order to directly improve river quality but also due to the additional benefits to groundwater, lake and estuary waters as a result of a reduction in river pollution.

There may be new pressures on water resources and water quality in the future such as unconventional oil and gas exploration and production. To-date, no unconventional oil and gas exploration and production activities have taken place in Ireland although three temporary licenses permitting desk studies and preliminary assessment of shale gas potential have been granted.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to water which may be relevant to Irish Water's activities and the WSSP are:

- The need to help maintain and improve the status and quality of surface and ground waters including bathing waters;
- The need to help reverse the decline in the number of high-status waterbodies; and
- The need to reduce pollution from wastewater treatment works.

C.5 Air Quality and Noise

Baseline Characteristics

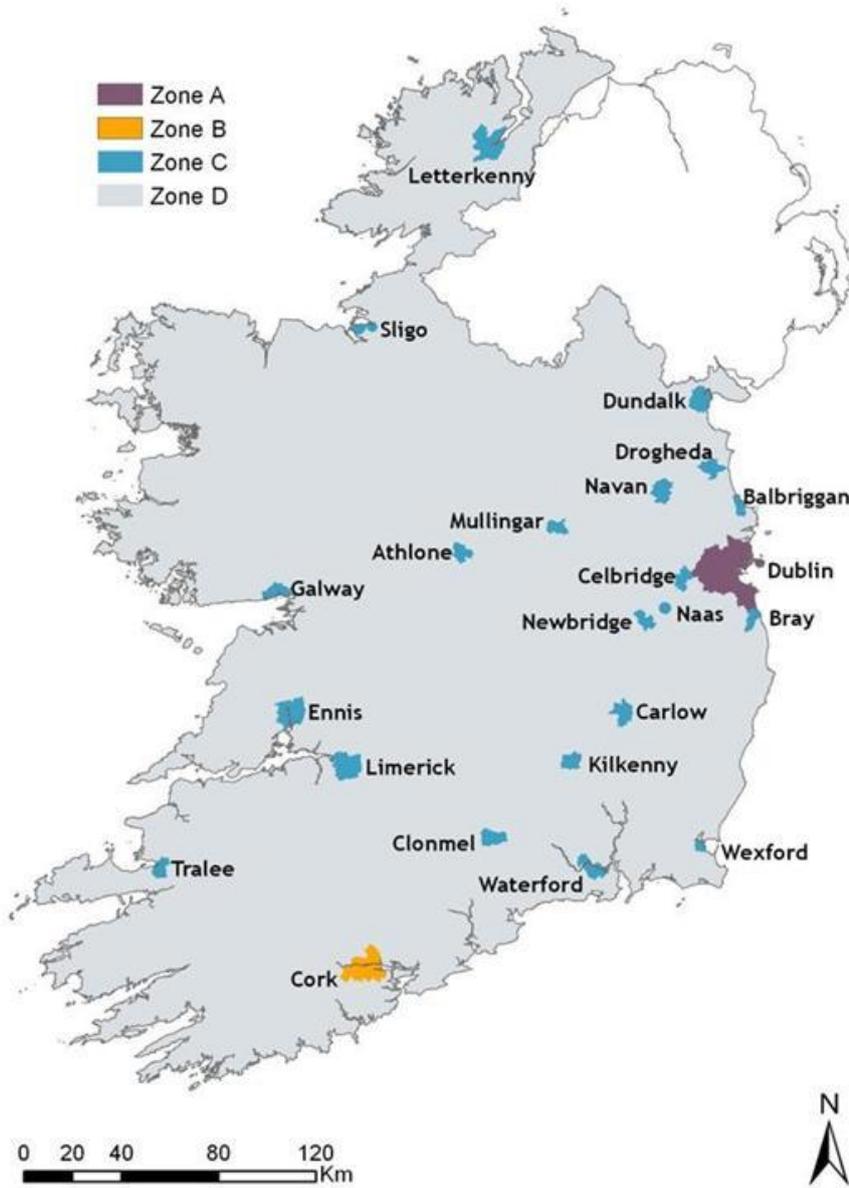
Air Quality

Poor air quality not only has potentially severe health impacts, it can also contribute towards acidification, eutrophication and damage to crops. In order to comply with European Directives relating to air quality, the EPA measures the levels of a number of atmospheric pollutants. For the purposes of monitoring in Ireland, four zones are defined in the Air Quality Standards Regulations 2002 (SI No. 271), as shown in **Figure C.14**. The main areas defined in each zone are:

- Zone A: Dublin Conurbation;
- Zone B: Cork Conurbation;
- Zone C: Other cities and large towns comprising 21 large towns in Ireland with a population >15,000; and
- Zone D: Rural Ireland, i.e. the remainder of the State - small towns and rural areas of the country - excluding Zones A, B and C.²²

²² Environmental Protection Agency, *Air Quality in Ireland 2012*
<http://www.epa.ie/pubs/reports/air/quality/Air%20Quality%20Report%202012.pdf> (accessed 13/10/14)

Figure C.14 Air Quality Zones in Ireland, 2012

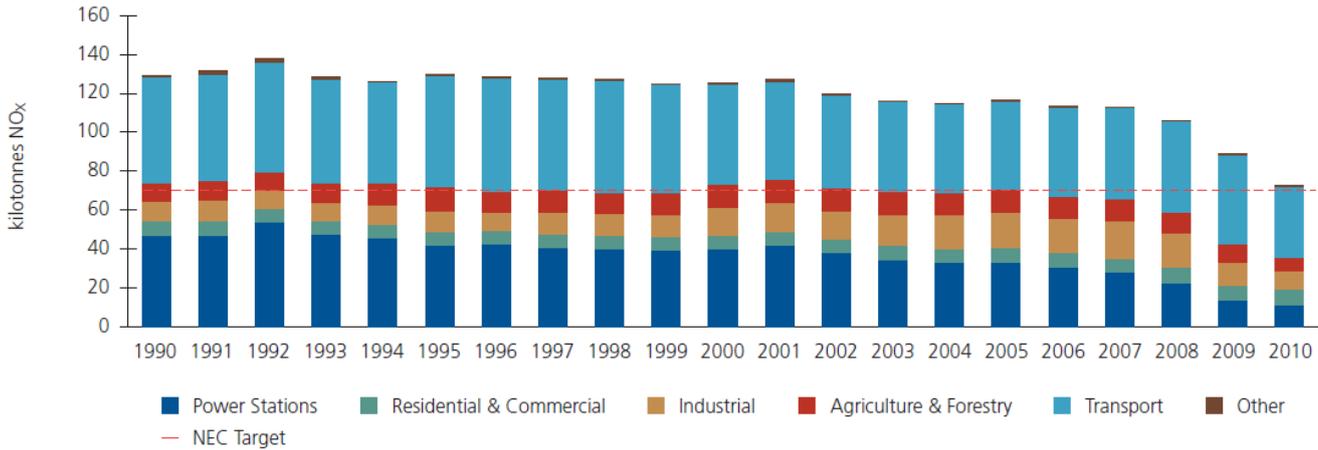


Source: Reproduced from EPA (2013) *Air Quality in Ireland 2012: Key Indicators of Ambient Air Quality*

Some of the key pollutants of concern include nitrogen oxides (NO_x), sulphur dioxide (SO₂), particulate matter (PM₁₀ and PM_{2.5}), volatile organic compounds (VOCs) and ammonia (NH₃). NO_x is harmful to health and can contribute to the formation of acid rain, and is predominantly emitted from vehicle exhausts and combustion sources.

NO_x levels in Ireland had remained relatively static from 1990 but there has been a recent notable reduction in recent years (see **Figure C.15**). Despite this decrease, cities such as Dublin and Cork have been exposed to higher NO_x levels as a result of traffic emissions.

Figure C.15 NO_x Emission Sources and Trends 1990–2010



Source: Reproduced from EPA (2012) *Ireland’s Environment 2012: Air Quality and Transboundary Air Emissions*

SO₂ deposition can result in the acidification of soils and water. Emissions have decreased significantly since 1990, with a reduction from 183 kilotonnes (kt) to 26 kt in 2010. This is as a result of desulphurisation of fuel oil, gasoline and diesel, and switches to lower sulphur fuels.

PM₁₀ and PM_{2.5} are fine airborne particles which can cause severe damage to the respiratory system. Domestic use of solid fuel and vehicle emissions have been the main sources of these pollutants, with an overall reduction in emissions in cities and towns due to improvements in vehicles. Burning bituminous coal is banned in large cities and towns which has also helped to reduce emissions of particulate matter, however smaller towns with limited alternative fuels still experience poorer air quality as a result of burning fuel.

VOC emissions typically arise from solvent use and transport. Emissions in Ireland have been steadily reducing since 1990. Ammonia levels have remained fairly static across the period from 1990 to 2010, with a slight rise prior to a decrease over more recent years. Ammonia is generated from the agricultural sector and can contribute to acid deposition.

The EPA’s *Air Quality in Ireland 2012* identifies that air quality in Ireland continues to be good and is among the best in Europe. Emissions ceilings are set for NO_x, SO₂, VOCs and ammonia through the EU National Emissions Ceiling Directive in order to help reduce transboundary pollution although in 2010, Ireland did not meet the ceiling for NO_x as a result of high road transport emissions (see **Figure C.15**). The other three ceiling limits were met.²³

²³ Environmental Protection Agency (2012) *Ireland’s Environment 2012: Air* http://www.epa.ie/media/00061_EPA_SoE12_Chp03.pdf (accessed 13/10/14)

Noise

The Environmental Noise Regulations (SI No. 140 of 2006) transpose into Irish law the EU Directive 2002/49/EC relating to the assessment and management of environmental noise, which is commonly referred to as the Environmental Noise Directive or END. The END defines a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise. The END does not set any limit value, nor does it prescribe the measures to be used in the action plans, which remain at the discretion of the competent authorities. Limit values are left to each member state. At this point in time, Ireland does not have any statutory noise limit values.

Future Trends

Air emissions are generally decreasing across Ireland although some notable areas still requiring further improvement. Levels of NO_x both in cities and smaller towns need to continue decrease to support health and environmental improvements. In cities, a decrease in vehicle use is necessary to help reduce emissions. Actions in the 2009-2020 transport policy *Smarter Travel - A Sustainable Transport Future* set out policies to help reduce vehicle use in cities through the promotion of more sustainable modes of transport. In smaller towns, burning solid fuels has contributed to high NO_x levels so action to make cleaner fuels accessible is required in order to reduce emissions, such as extension of the natural gas network.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to air quality and noise which may be relevant to Irish Water's activities and the WSSP are:

- The need to avoid detrimental impacts on air quality;
- The need to adopt fuel efficiency and minimise transport use; and
- The need to avoid causing noise nuisance.

C.6 Climatic Factors

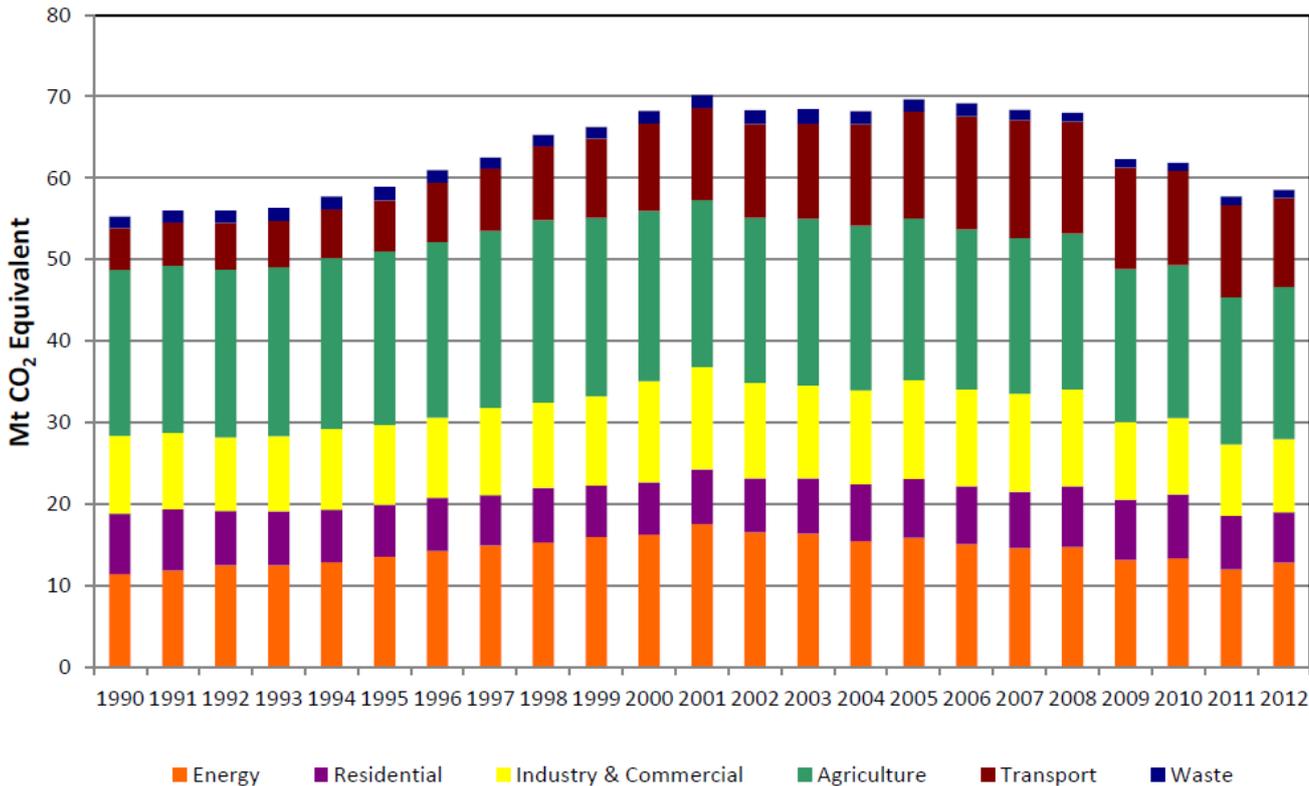
Baseline Characteristics

Climate change is a global issue facing all nations. Ireland has a role to play in reducing emissions of greenhouse gases, and may suffer potentially negative effects as a result of a changing climate.

There has been a substantial decrease in total Irish greenhouse gas emissions from 2008 (see **Figure C.16**), however that trend may now be in reverse with emissions in 2012 1.4% higher than in 2011 at 58.5 million tonnes carbon dioxide equivalent (Mt CO₂eq). Agriculture and energy accounted for the greatest contributions to greenhouse gas emissions in 2012, followed by industry and transport. The greatest year on year change for sectoral emissions came from the energy sector, which increased by 7% compared to 2011 as a result of a rise in

more carbon intensive fuels such as coal and peat for electricity generation. The residential sector also showed a large change from 2011, with a reduction of 6% as a result of warmer temperatures in 2012 and therefore lower heating demand.²⁴

Figure C.16 Trends in Greenhouse Gas Emissions, 1990-2012



Source: Reproduced from EPA (2014) *Ireland's Greenhouse Gas Emissions in 2012: Key Highlights*

Solid fuels and oil are more carbon intensive than other fuels such as natural gas. Oil consumption accounted for 45% of primary energy across all sectors in 2012, followed by natural gas which accounted for 30% of primary energy. When considering electricity, natural gas is the dominant electricity-generating fuel accounting for 49% of the input, despite the recent rises in use of coal and peat. Renewable energy such as wind and hydro accounted for 11.4% of total electricity generation in 2012.²⁵

There are regional differences across Ireland in the type of fuel used for domestic central heating, with oil use more prevalent for central heating in Ulster and the south east of Ireland, and solid fuels such as coal, peat and wood

²⁴ Environmental Protection Agency, Ireland's Greenhouse Gas Emissions in 2012
http://www.epa.ie/pubs/reports/air/airemissions/GHG_1990-2012_April_2014.pdf (accessed 13/10/14)

²⁵ Sustainable Energy Authority of Ireland, Energy in Ireland: Key Statistics 2013
http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_Key_Statistics/Energy-in-Ireland-Key-Statistics-2013.pdf (accessed 13/10/14)

pellets more common in the Midlands region. Only 34% of households across Ireland used natural gas in 2011, and this was focussed in cities and their suburbs.²⁶

Ireland has a range of national and international targets associated with greenhouse gas emissions reductions. The United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol has been one of the main international drivers for reductions in greenhouse gas emissions. Ireland's limit for total national emissions across the period 2008 – 2012 was 314.2 MtCO₂eq, representing a 13% reduction relative to 1990 levels. This total figure was met, with 308.5 MtCO₂eq released over the Kyoto period. However, when Ireland's allocation for emissions trading is taken into account, the remaining Irish emissions are 18.1 MtCO₂eq above the Kyoto threshold for the period.²⁴ Compliance with the Kyoto Protocol is still expected to be met through the use of unused EU Emissions Trading System allowances or carbon credits purchased by the State.²⁷ There are also national and EU targets associated with renewable energy. Renewable energy accounted for 19.6% of electricity consumption in 2012, which exceeded the national target of 15% for 2012 and an EU target of 13.2%.

Ireland's climate has already started to demonstrate changes. The average temperature in Ireland has increased by 0.7 °C between 1890 and 2007. This has been accompanied by a trend towards more intense and more frequent rainfall, a lengthening growing season and changes in the type of flora and fauna observed in Ireland.²⁷

Flood events can become more common in a changing climate as a result of changes in rainfall distribution, rising sea levels and more frequent storms. Flooding in Ireland is identified as being caused by:

- Rainfall runoff and flow attenuation processes, such as direct surface runoff and localised drainage issues;
- River flooding as a result of blockages, siltation and channel restriction, among other factors; and
- Seal level or coastal flooding, associated with inappropriate development, lack of flood defences and lack of warnings and preparedness.
- There are over 300 areas either at risk of or subject to periodic flooding across Ireland.²⁸

Future Trends

The EPA (2013) publication *Ireland's Greenhouse Gas Emission Projections 2012-2030* identifies that recent reductions in national greenhouse gas emissions have been as a direct result of the recent economic downturn and economic outlook for the future. The report also identifies that there continues to be a significant risk that Ireland will not meet its target for 2020 under the EU Effort Sharing Decision (20% reduction compared to 2005 emissions), with strong projected growth in emissions from transport and agriculture.

²⁶ Central Statistics Office, The Roof over our Heads

<http://www.cso.ie/en/media/csoie/census/documents/census2011profile4/Profile,4,The,Roof,over,our,Heads,Full,doc,sig,amended.pdf> (accessed 09/10/14)

²⁷ Environmental Protection Agency (2012) *Ireland's Environment 2012: Greenhouse Gases and Climate Change*

[http://www.epa.ie/media/00061_EPA_SoE12_Ch02\[1\].pdf](http://www.epa.ie/media/00061_EPA_SoE12_Ch02[1].pdf) (accessed 13/10/14)

²⁸ Office of Public Works, Report of the Flood Policy Review Group http://www.cfram.ie/pdfs-downloads/Flood_Policy_Review_Group.pdf (accessed 13/10/14)

Over the period 2011 – 2020, the following trends in emissions are expected:

- Transport emissions are projected to increase by 12 - 22% (representing the ‘worst case’ and ‘best case’ scenarios);
- Energy sector emissions, predominantly from power generation, are projected to rise between 1 – 11% by 2020 as a result of the increased use of coal for electricity generation;
- Agricultural emissions are projected to rise by 12% to 21 MtCO₂eq. This accounts for forecast animal numbers, crop areas and projected nitrogen fertiliser application;
- Residential emissions are projected to remain stable or decrease by up to 24% across the period, predominantly as a result of retrofit and improved Building Regulation standards, plus increased uptake of domestic renewable energy;
- Emissions from the industrial and commercial sector are projected to decrease by 4 – 16% through energy efficiency policies and measures; and
- Waste sector emissions are projected to reduce by 28% to 0.7 MtCO₂eq in 2020 through the diversion of biodegradable waste from landfill and increased methane capture.²⁹

In total across all sectors, this represents an increase in greenhouse gas emissions of 1 - 9% by 2020 compared to current levels.

A second Kyoto commitment period has been proposed but has not yet been ratified. Negotiations on a further international agreement on reducing greenhouse gas emissions are currently under way. At a European level, the EU target is for Ireland to reduce greenhouse gas emissions to 20% below a 2005 baseline by 2020, with annual limits each year from 2013.

The national renewable energy target for 2020 is for renewable sources to account for 40% of electricity consumption. There is also an EU target under the EU Renewable Energy Directive for renewable energy to account of 16% of final energy use across electricity, transport and thermal energy by 2020. This stood at 7.1% in 2012.

To meet future targets, strong action is needed across all sectors to help reduce greenhouse gas emissions. A transition to a lower carbon economy with changes to the fuel mix and improved energy efficiency is necessary as emissions in Ireland will not remain depressed as the global economy starts to uplift and activity levels rise.

Ireland’s climate is expected to continue changing with increasing average temperatures and more extreme weather conditions. Across the period from 2021 – 2060, average temperatures are projected to rise by 1.25-1.5°C with the greatest rises forecast for the south-east and eastern Ireland during the summer. The distribution of rainfall across the year is also projected to change with summer precipitation expected to decrease by 10%, particularly in the south, and winter rainfall increasing by 10 – 25%. There are also projected rises in extreme rainfall and storm

²⁹Environmental Protection Agency, Ireland’s Greenhouse Gas Emissions Projections 2012-2020
http://www.epa.ie/pubs/reports/air/airemissions/EPA_GHG_Emission_Proj_pub_2013_FINAL.pdf (accessed 13/10/14)

events, partly due to the rising sea surface temperatures.³⁰ These changes are expected to have the following impacts:

- An increased likelihood of river and coastal flooding;
- Droughts, particularly in the east of the country;
- Changes in the types and distribution of species; and
- The possible extinction of vulnerable species.²⁷

This also has the potential to affect other factors such as water quality and crop growth. The built environment and infrastructure are also vulnerable to changing temperatures and increased flood risk.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to climatic factors which may be relevant to the WSSP are:

- The need to reduce emissions of greenhouse gases from Irish Water's activities;
- The need to take into account, and where possible mitigate for, the potential effects of climate change on water resources and infrastructure;
- The need to ensure the resilience of water supply and treatment infrastructure to the impacts of climate change; and
- The need to manage the impact of climate change on water resource availability.

C.7 Material Assets

Baseline Characteristics

Resources that are valued and that are intrinsic to specific places are called 'material assets'. The Draft Scoping Report defined material assets as including:

- Settlements;
- Drinking water infrastructure (see **Section C.8**);
- Wastewater infrastructure (see **Section C.8**);
- Waste;

³⁰ Community Climate Change Consortium for Ireland / Environmental Protection Agency, Climate Change: Regional Climate Model Predictions for Ireland http://www.epa.ie/pubs/reports/research/climate/EPA_climate_change_regional_models_ERTDI36.pdf (accessed 13/10/14)

- Archaeological and architectural heritage (see **Section C.9**); and
- Natural resources of economic value, such as air and water (see **Section C.4** and **Section C.5**) and non-renewable resources.

Many of the material assets listed above are addressed elsewhere in this chapter (see references provided). To avoid repetition, the remainder of this section focuses on settlements, waste and non-renewable resources.

Settlements

Dublin city and suburbs is the largest settlement in Ireland with a population of 1,111,000 in 2011. This is followed by the cities and suburbs of Cork (population of 199,000), Limerick (91,000), Galway (77,000) and Waterford (52,000). Across the country, these cities are the most urbanised areas. Overall, the urban population accounts for 62% of the total population of Ireland.³¹

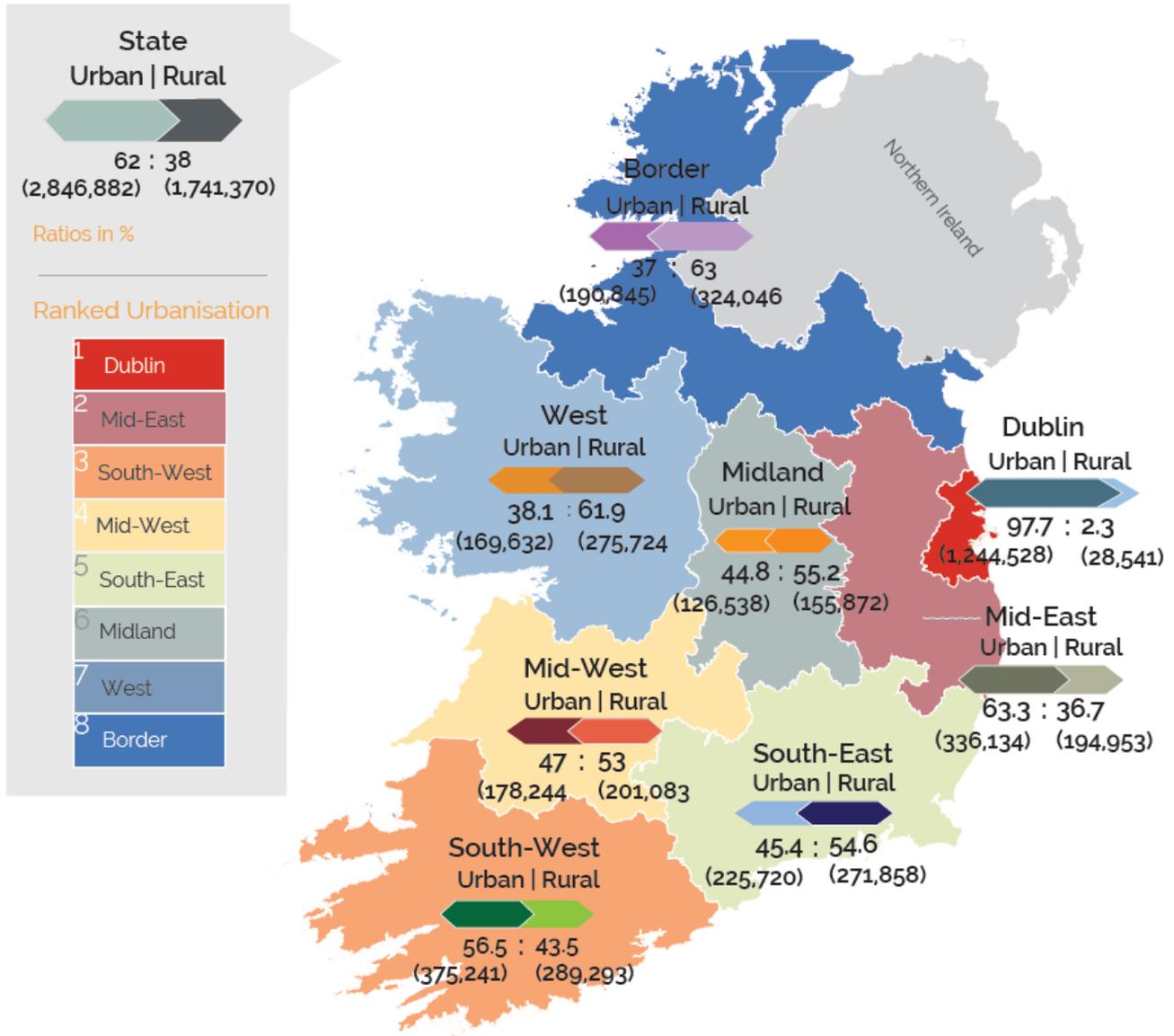
The north-west and west of Ireland has the greatest proportion of the population living in rural locations (see **Figure C.17**). The least urbanised counties are Leitrim, with only 10% of the county living in urban areas, followed by Galway County and Roscommon. In all regions, the urban population has increased between 2006 and 2011. The greatest urban growth was seen in the Midland region, which had a 3.6% rise in urban population, the Border region, with 2.2% urban growth, and the West region, which saw a rise of 1.9%.³²

³¹ Central Statistics Office, Town and Country

http://www.cso.ie/en/media/csoie/census/documents/census2011vol1andprofile1/Profile1_Town_and_Country_Entire_doc.pdf (accessed 14/10/14)

³² Regional Authorities of Ireland (2013) *Regional Indicators Report*

Figure C.17 Urban / Rural Ratio and Absolute Share for Each Region (ranked urbanisation is also shown)



Source: Reproduced from Regional Authorities of Ireland (2013) *Regional Indicators Report*

Waste

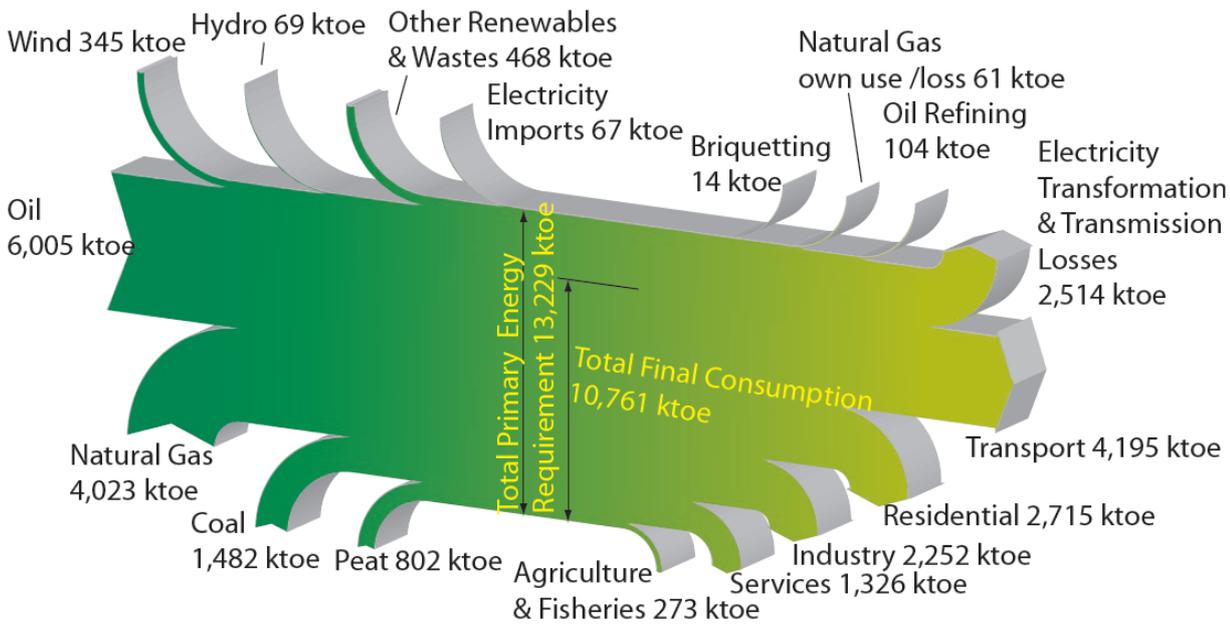
Ireland generates a total of 11.8 million tonnes of waste per year. Over half of this is industrial process waste (54%) such as mining and mineral processing and food and beverage processing waste. Construction and demolition waste is the next greatest contributor at 22% followed by household municipal waste (14%) and commercial municipal waste (10%).

The majority of Ireland’s waste is disposed of in landfill. There are 28 licensed landfill sites across the country, although capacity is not evenly distributed with Dublin and the north-west of Ireland currently having the least available capacity. Total capacity is approximately 18 million tonnes which represents 12 years of landfill waste.³³

Non-renewable Resources

The use of non-renewable resources in Ireland includes oil, natural gas, coal and peat. Solid fuels and oil are more carbon intensive than other fuels such as natural gas. Oil consumption accounted for 45% of primary energy across all sectors in 2012, followed by natural gas, which accounted for 30% of primary energy, coal at 11% and peat at 6%. Oil and natural gas use fell from 2011 to 2012, while coal and peat usage rose, principally as a result of their increased use in electricity generation. Natural gas remained the dominant electricity generating fuel in 2012, accounting for 49% of the input.³⁴

Figure C.18 Energy Balance for Ireland in 2012



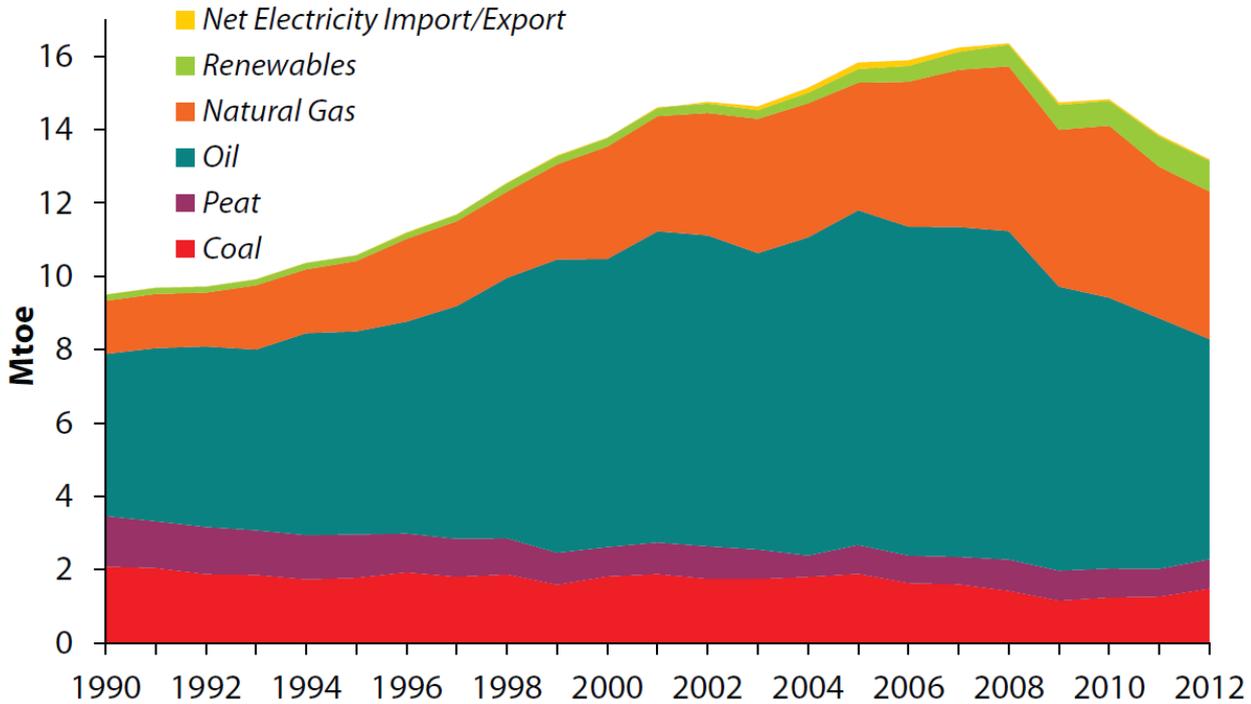
Source: Reproduced from Sustainable Energy Authority of Ireland (2013) *Energy in Ireland: Key Statistics 2013*

In general terms, the use of non-renewable energy sources has been in decline since a peak in 2008, as highlighted in **Figure C.19**.

³³ Environmental Protection Agency, Sustainable Resource Use, Consumption and Waste http://www.epa.ie/media/00061_EPA_SoE12_Ch05.pdf (accessed 14/10/14)

³⁴ Sustainable Energy Authority of Ireland, Energy in Ireland: Key Statistics 2013 http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_Key_Statistics/Energy-in-Ireland-Key-Statistics-2013.pdf (accessed 13/10/14)

Figure C.19 Total Primary Energy Requirement by Fuel 1990 – 2012



Source: Reproduced from Sustainable Energy Authority of Ireland (2013) *Energy in Ireland: Key Statistics 2013*

Future Trends

The general trend of increasing urbanisation is expected to continue. Large urban centres and hubs are expected to continue growing in significance as part of regional spatial development. Service efficiencies and the provision of infrastructure will improve and become increasingly sustainable as urban centres continue to grow. However, rural areas also make a strong contribution to the Irish economy and sense of character, so efforts to maintain rural communities are necessary to benefit the wider regions.

Per capita waste generation has been decreasing in Ireland and national policies for resource efficiency and waste reduction aim to continue reducing the generation of waste and diversion from landfill. Despite the more recent reductions in waste, estimates to 2025 forecast an overall increase in volume of municipal waste as a result of increased economic activity³⁵. It is likely that construction and demolition waste will rise in the future when large scale building and infrastructure projects take place following economic recovery.

There is a reliance on landfill within Ireland and 15 of the 28 landfill sites are estimated to fill their consented capacity within three years. Co-incineration of refuse fuels in industrial boilers and furnaces has increased, which would help divert waste from landfill if this continues to increase³⁵.

³⁵ Environmental Protection Agency, Sustainable Resource Use, Consumption and Waste
http://www.epa.ie/media/00061_EPA_SoE12_Ch05.pdf (accessed 14/10/14)

The peak in use of non-renewable resources coincides with the beginning of the global economic downturn, which may be responsible for the reduction in use from 2008. A downwards trend may continue to be observed through increasing use of renewable fuels and energy efficiency improvements, however an increase in economic activity may result in a future rise in the use of non-renewable resources. As noted in **Section 0** above, Ireland has a national renewable energy target for renewable sources to account for 40% of electricity consumption by 2020. There is also an EU target under the EU Renewable Energy Directive for renewable energy to account for 16% of final energy use across electricity, transport and thermal energy by 2020. These targets should help reduce the use of non-renewables and support a move towards renewable resources.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to material assets which may be relevant to the WSSP are:

- The need to account for the growth in urban populations across Ireland and their potential water and wastewater needs;
- The need to reduce waste generated from Irish Water's activities and the proportion of that waste which is sent to landfill; and
- The need to reduce the consumption of non-renewable resources related to Irish Water's activities through measures such as improved energy efficiency and enhanced uptake of renewable energy.

C.8 Water Services

Baseline Characteristics

Drinking Water Compliance

The public water systems supply drinking water for 82% of the population in Ireland. A further 7.4% are connected to a public or private group water scheme or small private supply and 10.6% are connected to private wells.³⁶

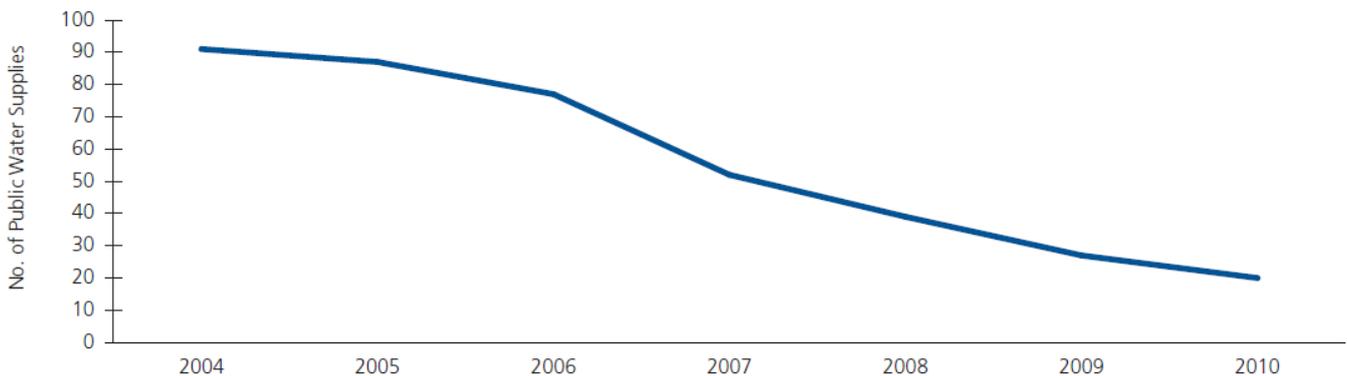
E. coli is one of the most important microbiological indicators for drinking water and its presence typically indicates either contamination of water supplies or inadequate treatment. In 2010, E. coli was found in 0.01% of public water supplies and has been showing an overall downwards trend since 2004 (see **Figure C.20**). Smaller group water supplies are typically lower quality with E. coli detected in 6.4% of supplies whilst the status of private wells is not monitored but are likely to be even more vulnerable to contamination and may not be safe to drink without treatment. In January 2014, when Irish Water took over responsibility for the delivery of water services from the local authorities, some 20,000 customers had Boil Water Notices due to potential contamination of supply³⁷. Vulnerable people, such as the elderly, very young, pregnant or those with a compromised immune

³⁶ Environmental Protection Agency, The Provision and Quality of Drinking Water in Ireland – A Report for the Year 2012, http://www.epa.ie/pubs/reports/water/drinking/Drinking%20Water%202012_web.pdf (accessed 10/10/14)

³⁷ Irish Water (2014) Water Services Strategic Plan: Issues Paper, July 2014

system, are most at risk from health hazards associated with water supplies. Contamination from the *Cryptosporidium* parasite is also a health concern in Ireland, although cases of the associated illness cryptosporidiosis have been declining from 2005 to 2010.³⁸

Figure C.20 Number of Public Water Supplies in which E. coli Was Detected in Compliance Monitoring at Least Once from 2004 to 2010



Source: Reproduced from EPA (2012) *Ireland's Environment 2012: Environment and Health*

Recent compliance in public water supply with chemical standards has declined slightly from 99.5% in 2011 to 99.3% in 2012, predominantly from trihalomethane breaches. This is expected to have arisen from increased rainfall through 2012. Reducing the levels of organic matter, optimising water treatment and minimising chlorination can all help reduce trihalomethane formation.

There are currently 322 surface water supplies in the country but only 179 of these have turbidity monitors after each filter which means there are potentially 143 surface water supplies without monitors in place. There are also over 400,000 individual septic tanks for homes that are not connected to wastewater infrastructure, representing 27.5% of households. If not properly located and maintained, septic tanks can cause pollution in local drinking water supplies.

The EPA's Remedial Action List for Drinking Water uses the following to prioritise drinking water supply issues:

- Water supply zones that have issued boil water notices or other restrictions;
- Water supply zones with water management issues identified as "High Risk" through the completion of Drinking Water Safety Plans.

Since 2008, 70% of supplies have been removed from the Remedial Action List of supplies of greatest concern, through disinfection for *E. coli*, barriers to the *Cryptosporidium* parasite, treatment for trihalomethanes and controls

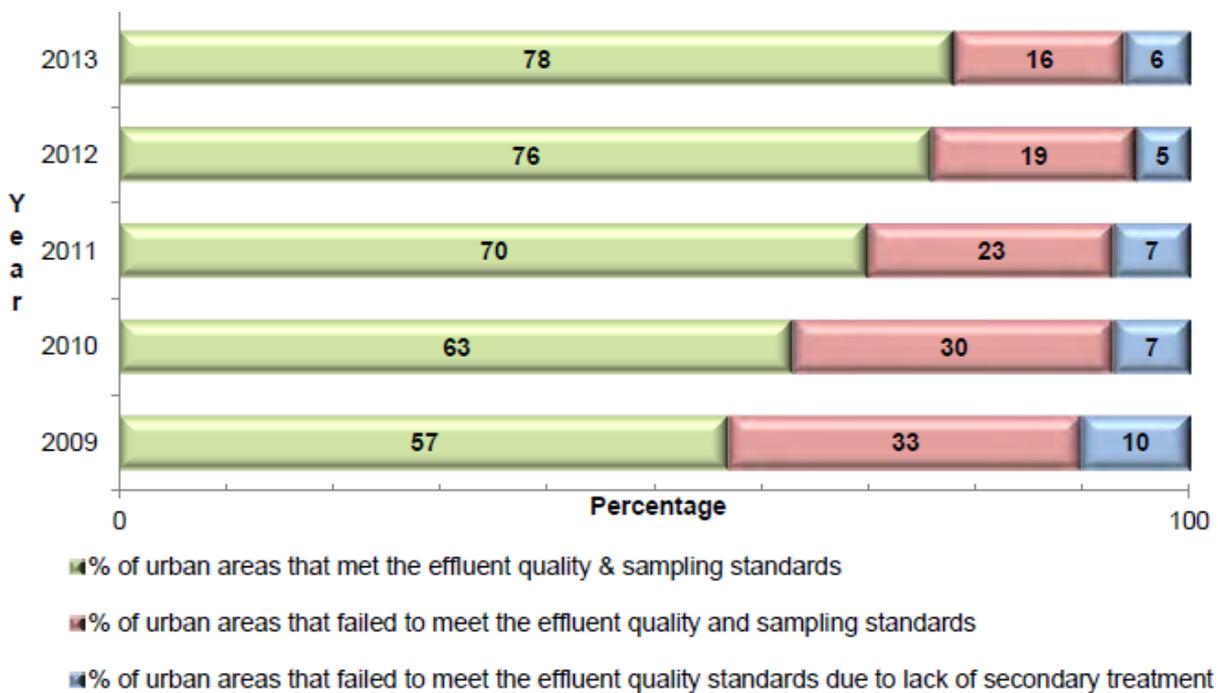
³⁸ Environmental Protection Agency, Environment and Health http://www.epa.ie/media/00061_EPA_SoE12_Ch09.pdf (accessed 10/10/14)

for managing aluminium and turbidity levels. A summary of the most recently available (Q3, 2014) EPA Remedial Action List (RAL) is available via <http://www.epa.ie/pubs/reports/water/drinking/Q3%202014%20RAL.pdf>.

Wastewater Compliance

Figure C.21 shows Urban Waste Water Treatment Directive compliance for all 162 larger urban areas in Ireland. It highlights that proportion of larger urban areas meeting quality and sampling standards has increased over the period 2009 to 2013 (from 57% in 2009 to 78% to 2013), although 16% failed to meet standards in 2013 whilst a further 6% failed to meet standards due to a lack of secondary treatment.

Figure C.21 Compliance of all 162 larger urban areas with the effluent quality and sampling standards in the 1991 Urban Waste Water Treatment Directive for the period 2009 to 2013



Source: Reproduced from EPA (2014) *Focus on Urban Waste Water Treatment in 2013*.

The EPA report “*Focus on Urban Waste Water Treatment 2013*” highlights a number of key findings in respect of wastewater treatment in Ireland for the 2013 period, including:

- nine large urban areas did not meet the European Union Directive requirement to provide secondary treatment;
- eight large urban areas did not comply with Directive requirements to provide infrastructure to reduce nutrients and did not meet nutrient quality standards;
- raw sewage was discharged from 44 areas;

- 49 waste water works were linked with river pollution, down from 56 in 2009;
- six seriously polluted river sites where pollution is caused by urban waste water discharges, down from nine in 2009; and
- wastewater discharges contributed to poor water quality status at 4 designated bathing waters in 2013.

The EPA report outlines a number of criteria to prioritise enforcement of wastewater treatment works, including if the plant is: causing serious pollution; impacting on bathing waters; there is no treatment or preliminary treatment provided; impacting on pearl mussel waters; impacting on shellfish waters; causing moderate or slight pollution; secondary/tertiary treatment required by the 1991 Directive; risk to drinking water, risk to estuarine or coastal waters and any other environmental pollution risk. A total of 38 larger urban areas are identified by the EPA that did not meet the standards for biochemical oxygen demand (BOD) and chemical oxygen demand (COD) and, where applicable, total phosphorus and total nitrogen,. These are listed at **Appendix E**.

River sites were identified from the national river monitoring programme where serious moderate or slight pollution is attributed, with a high degree of probability, to urban wastewater discharges. The EPA (2014) report “*The Quality of Bathing Water in Ireland – An Overview for the Year 2013*” also identifies four bathing water sites as being of poor status due to wastewater works. The EPA’s report identified further vulnerable bathing waters from pressures associated with six wastewater works. An additional bathing area, Stradbally Cove, Waterford (which is not a designated bathing area) was identified to the EPA by the HSE as having a public health risk to bathers from wastewater discharges.

Wastewater Capacities

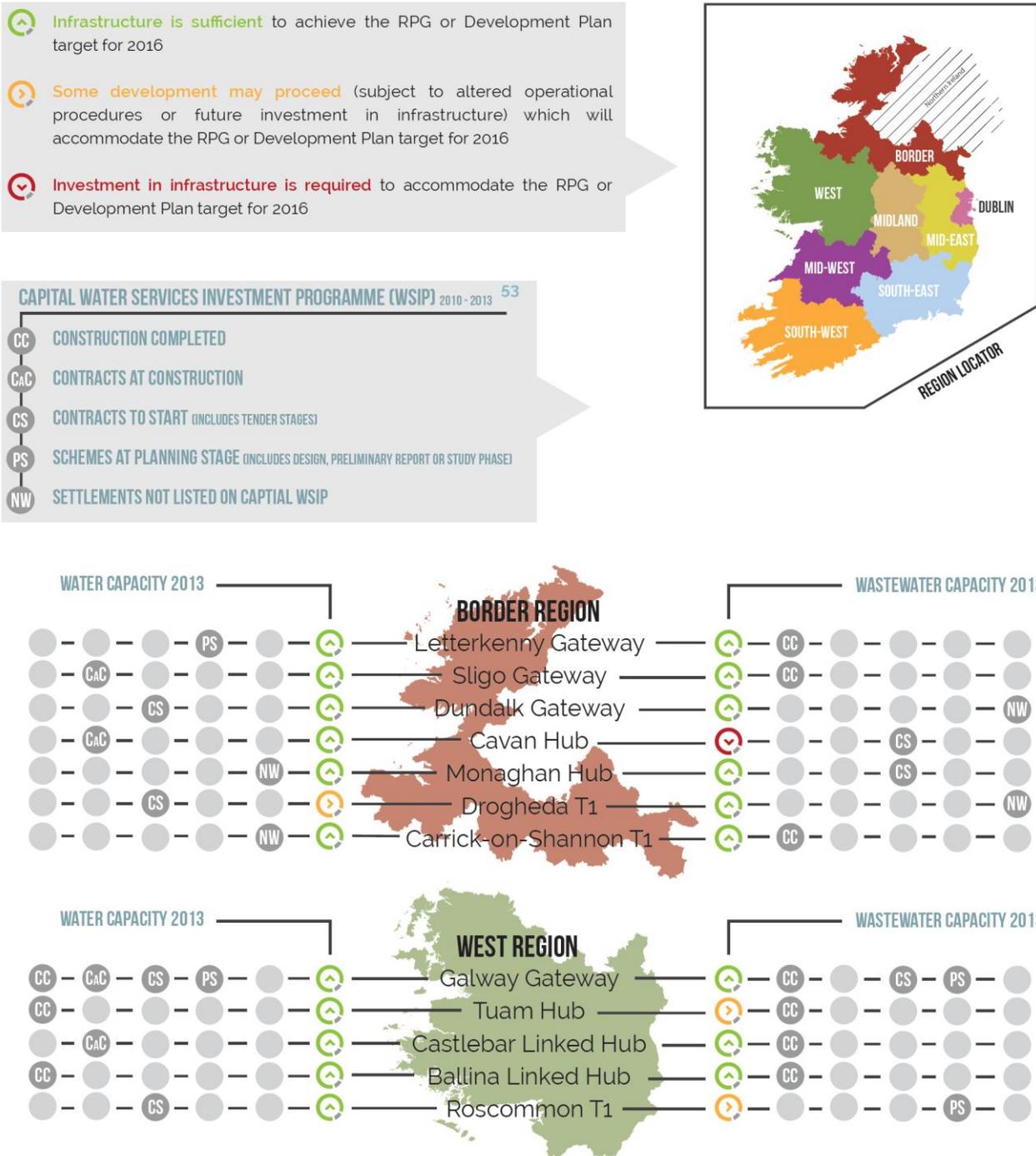
Information on water services capacities to accommodate 2016 Regional Planning Guidelines population targets and compliance with the Urban Waste Water Treatment Directive Discharge Licences in Regional Planning Guidelines Gateway Hub and Tier 1 settlements is provided in **Figures C.22 to C.25**³⁹. This information is taken from the Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines (Regional Authorities of Ireland, 2014) which was informed by local authorities and the 2013 EPA report “*Focus on Urban Waste Water Treatment 2011*”.

³⁹ It should be noted that:

-Water and wastewater information is provided for a specific point in time (October, 2013) and capacities can alter rapidly depending on development requirements. The 2013 EPA Urban Waste Water Treatment Directive dataset is not the most up-to-date published report on Urban Wastewater Directive Discharges, referring to 2011 data. It must also be noted that population figures are only one contributory factor to wastewater treatment plant loadings as industry and commercial sources also contribute significantly. In certain settlements there may also be seasonal changes in water and wastewater capacity requirements.

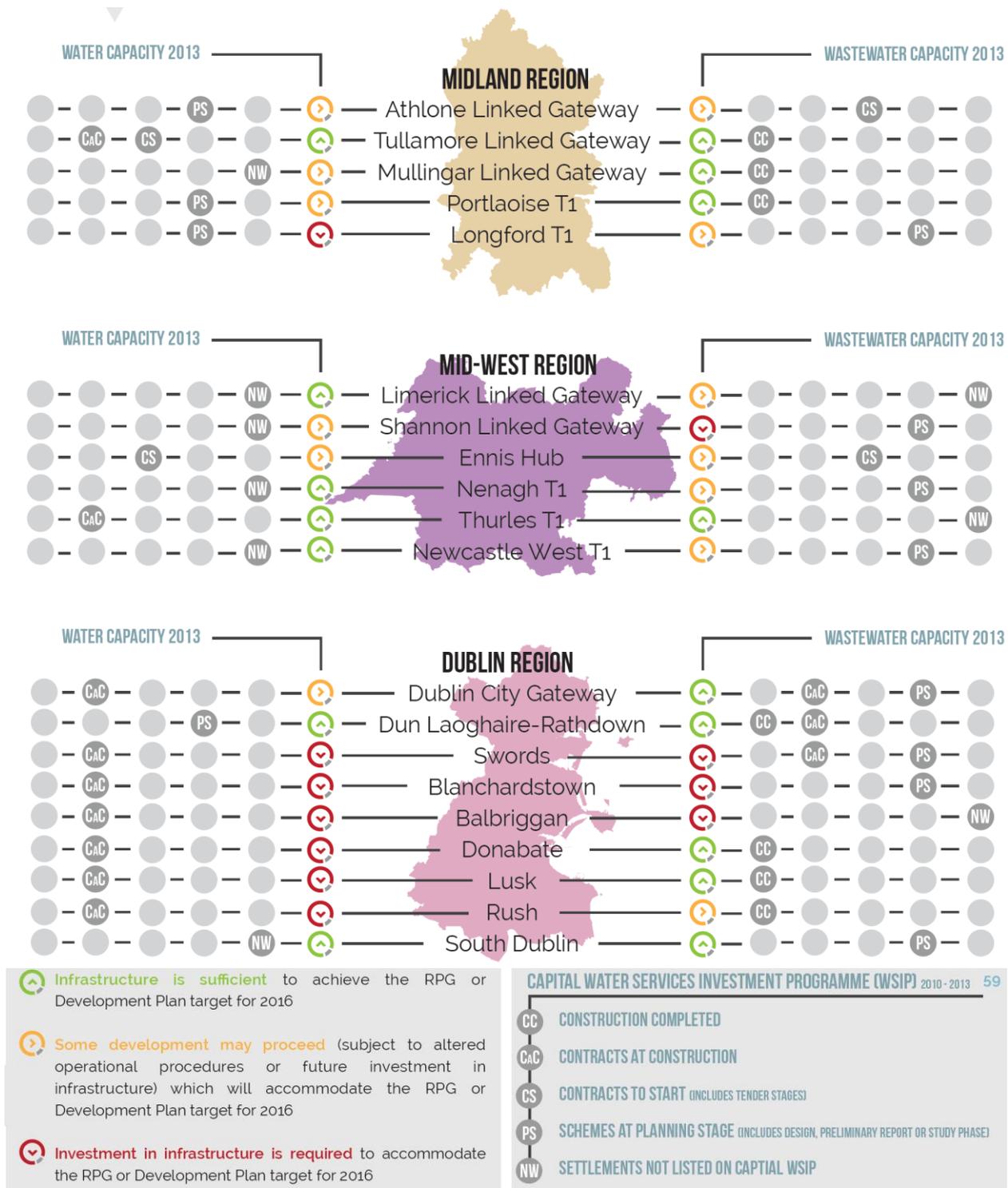
-While capacity and associated analysis is based on 2016 population targets, based on emerging population information, it is unlikely that these targets will be met.

Figure C.22 Water and Wastewater Capacities per Gateway, Hub and Tier 1 settlement Part 1



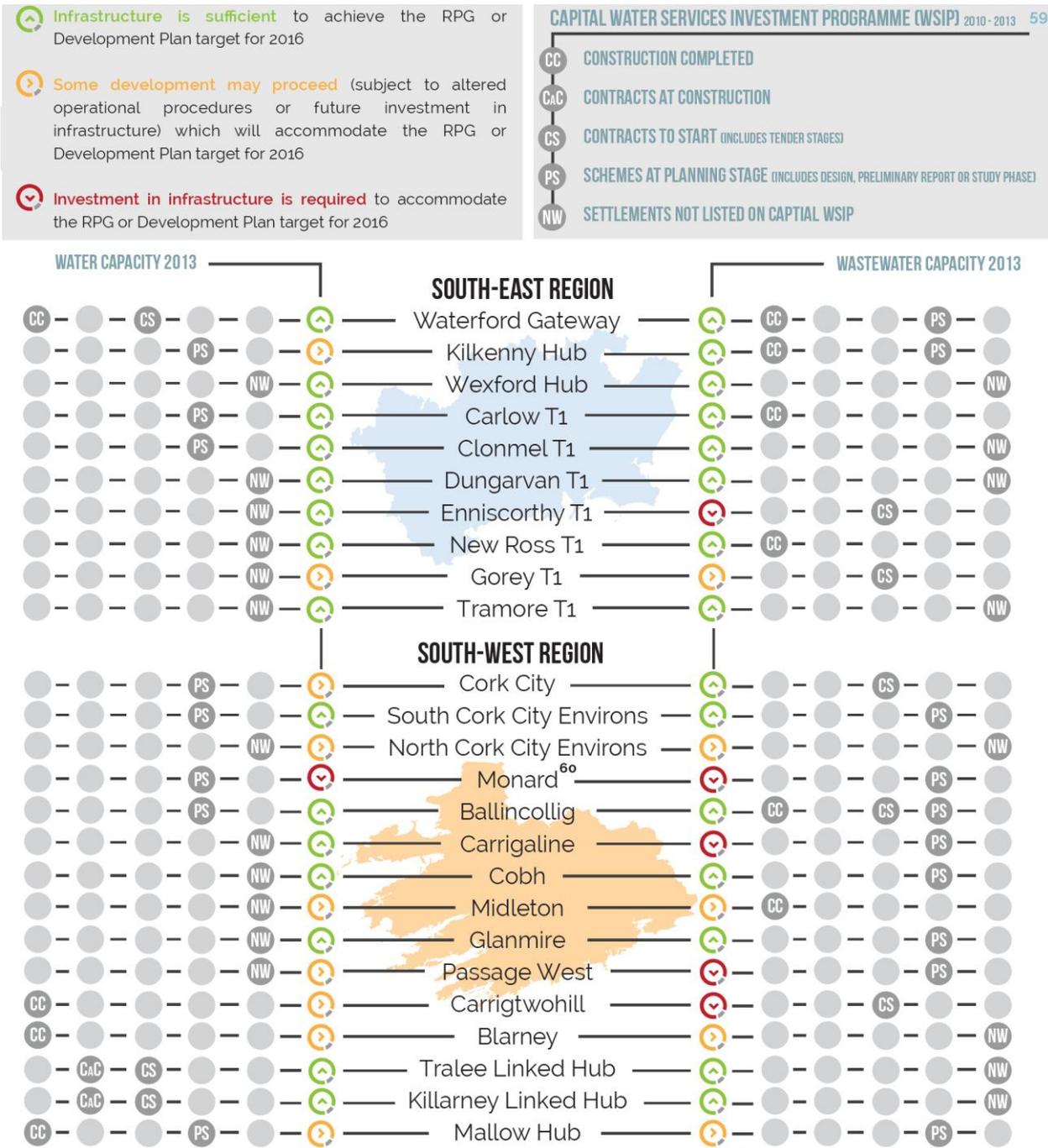
Source: Reproduced from Regional Authorities of Ireland (2014) *Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines*

Figure C.23 Water and Wastewater Capacities per Gateway, Hub and Tier 1 settlement Part 2



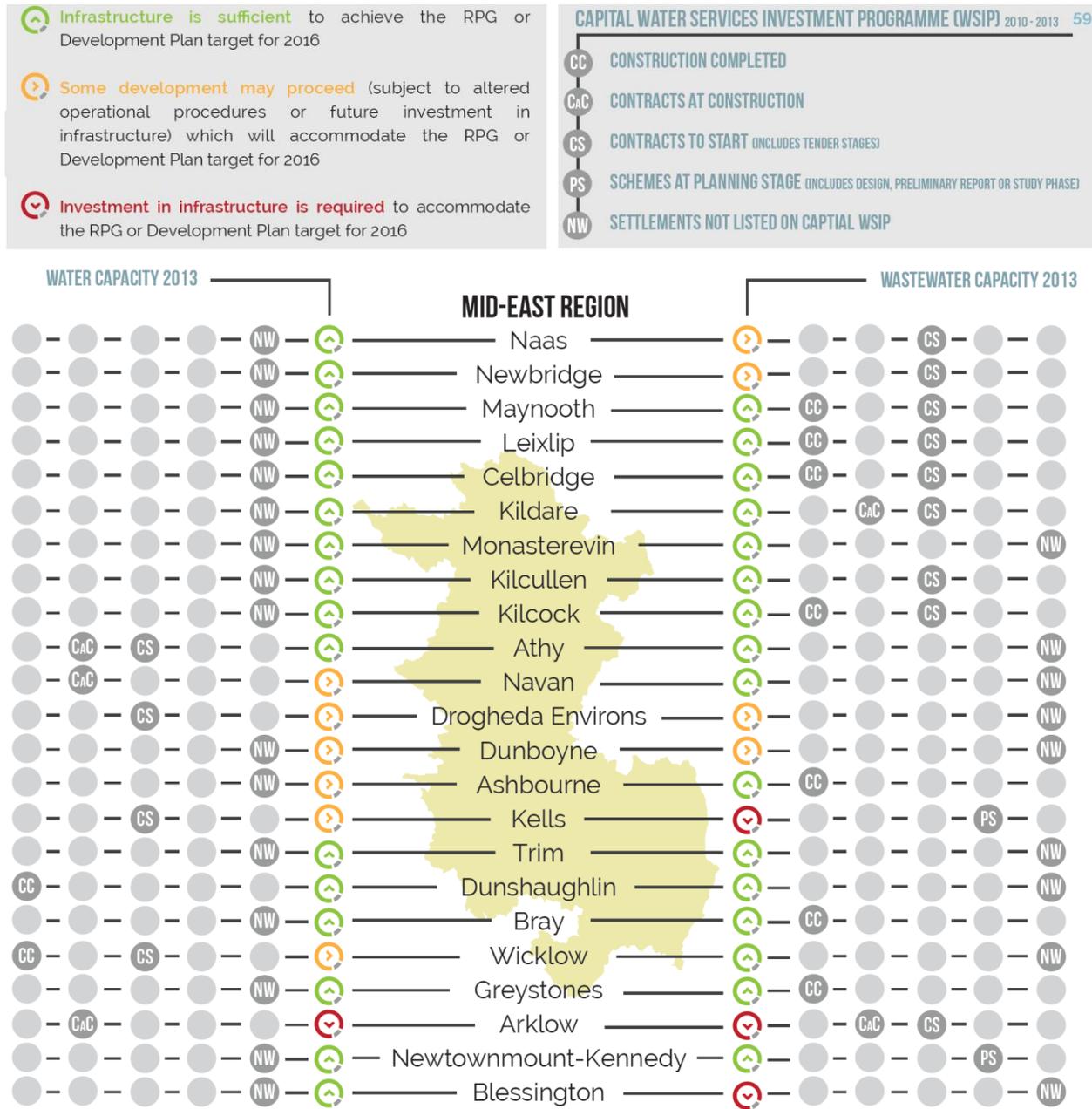
Source: Reproduced from Regional Authorities of Ireland (2014) *Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines*

Figure C.24 Water and Wastewater Capacities per Gateway, Hub and Tier 1 settlement Part 3



Source: Reproduced from Regional Authorities of Ireland (2014) *Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines*

Figure C.25 Water and Wastewater Capacities per Gateway, Hub and Tier 1 settlement Part 4

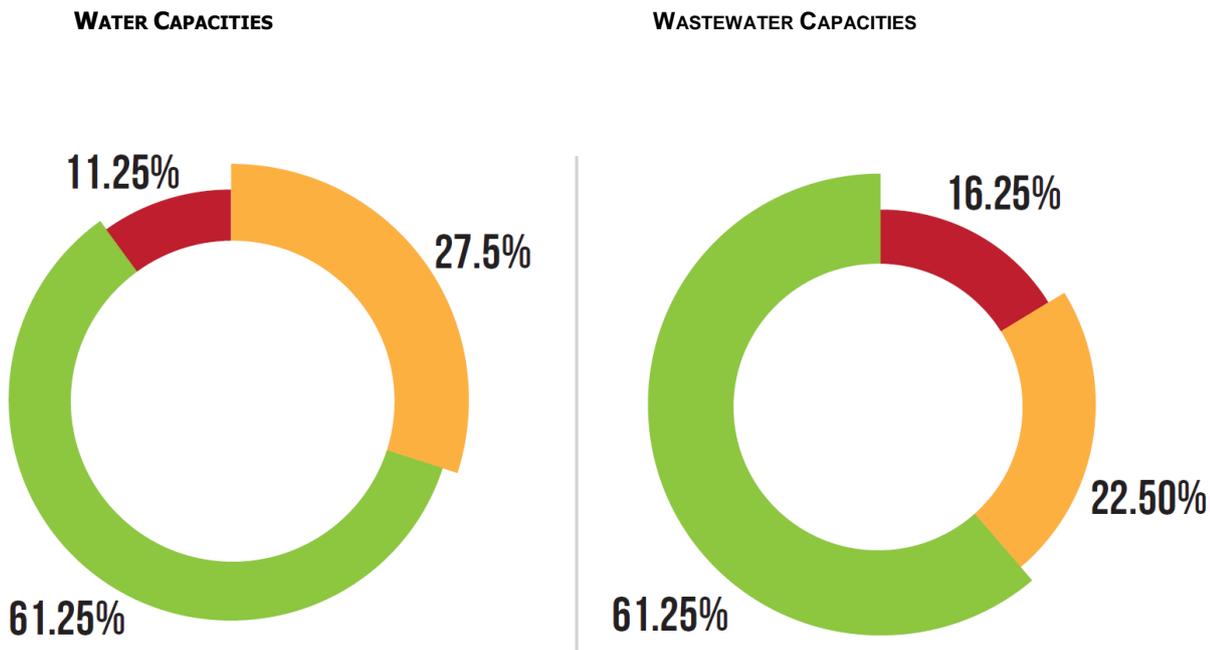


Source: Reproduced from Regional Authorities of Ireland (2014) *Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines*

Figure C.26 provides information for water and wastewater capacity for all Regional Planning Guidelines settlements. In terms of water capacity, it highlights that the majority of settlements (61.25%) have sufficient infrastructure to accommodate planned growth i.e. target population growth which is envisaged under the Regional Planning Guidelines or by the local authority. 27.5% of the settlements require infrastructure to accommodate the planned population target but it is important to note that some development can proceed and be accommodated.

However, for 11.25% of settlements it has been identified that planned development may not proceed due to infrastructural deficiencies in water capacity. With regard to wastewater capacity, meanwhile, 61.25% of settlements also have sufficient infrastructure to accommodate planned growth while 22.5% of settlements can accommodate some growth but require investment in infrastructure in order to achieve the planned population target. Planned development cannot proceed in 16.25% of settlements due to identified infrastructural deficiencies in wastewater treatment capacity.

Figure C.26 Water and Wastewater Capacities per Gateway, Hub and Tier 1 Settlement in all Regions



-  **Infrastructure is sufficient** to achieve the RPG or Development Plan target for 2016
-  **Some development may proceed** (subject to altered operational procedures or future investment in infrastructure) which will accommodate the RPG or Development Plan target for 2016
-  **Investment in infrastructure is required** to accommodate the RPG or Development Plan target for 2016

Source: Reproduced from Regional Authorities of Ireland (2014) *Regional Indicators Report Monitoring Framework for Implementation of the Regional Planning Guidelines*

Much of Ireland’s sewer network is over 100 years old and is therefore at risk of collapse which can lead to flooding and possible pollution incidents. Sewers in poor condition may also be subject to ground water ingress, which has a significant impact on sewer capacity. Further, many older sewers are combined sewers, meaning that they carry both foul sewage from properties and surface water arising from rainfall. During heavy rain, excess

flows discharge through Combined Sewer Overflow (CSOs) structures when the capacity of a sewer is exceeded or when blockages occur in networks. These discharges impact on the environment and water users.³⁷

There is a deficit of sludge management facilities nationally. Facilities are required to manage sludge generated by both water and wastewater treatment processes. The proper management of sludge presents a challenge to Irish Water in terms of identifying an appropriate management strategy and identifying options that can potentially generate revenue and reduce management costs. Particular challenges include maximising energy recovery in the short term and the development of sustainable products and channels for re-use of by-products in the medium term.³⁷

Future Trends

While the quality of drinking water has in general been improving, there have still been short term declines in quality which can pose risks to health and the environment. Further targeted action should help drinking water standards continue to improve although this may be hampered by weather events.

Urban wastewater discharges have also been improving as a result of investment into water services infrastructure, however wastewater discharges are still a key source of surface and coastal water pollution. High rainfall and unusual weather events can overwhelm treatment works and cause short term deterioration in discharge quality. Overall compliance with wastewater discharge limits has been improving but still needs further progress.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to water services which may be relevant to the WSSP are:

- The need to maintain or improve the quality of drinking water supplies;
- The need to improve standards of wastewater treatment and reduce pollution events; and
- The need to ensure sufficient water and wastewater capacity is available to meet demand.

C.9 Cultural Heritage

Baseline Characteristics

Archaeological Heritage

Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits, and underwater features. Archaeological sites may have no visible surface features, as the surface features of an archaeological site may have decayed completely or been deliberately removed, but archaeological deposits and features may survive beneath the surface.

Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning and Development Acts 2000-2014. A primary source of information for known archaeological features is the Record of Monuments and Places (RMP) which was established under the National Monuments Acts 1930 to 2004. The RMP is an inventory, put on a statutory basis by amendment to the National Monuments Act 1994, of sites and areas of archaeological significance. It records known upstanding archaeological monuments, the original location of destroyed monuments and the location of possible sites identified through documentary, cartographic and photographic research. The term ‘monument’ includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes.

There are two UNESCO World Heritage Sites in Ireland, Brú na Bóinne and Skellig Michael. Brú na Bóinne is located in eastern Ireland in County Meath and is a Neolithic site of passage tombs, stones and artwork. Skellig Michael is located 12 km off the south-west coast of Ireland. The island contains the remains of a monastery constructed between the sixth and eighth centuries. The monastery hosted a small community of monks and was later a pilgrimage site.

Further to these two sites, there is a Tentative List of sites intended for consideration as nominated World Heritage Sites. There are currently seven sites on this list which are: The Burren; Céide Fields and NW Mayo Boglands; the Monastic City of Clonmacnoise and its Cultural Landscape; the Historic City of Dublin; Early Medieval Monastic Sites; the Royal Sites of Ireland; and Western Stone Forts.⁴⁰

There are nearly 750 National Monuments or groups of monuments in State care. These range in age from the Neolithic period over 5,000 years ago to medieval castles and other monuments, through to more recent 20th century structures.⁴¹ A total of 19 Historic Properties are protected under State care. Further to this, records of over 138,800 archaeological monuments are held in the Archaeological Survey of Ireland Sites and Monuments Record, which forms the basis of the RMP. The record holds details of all known monuments pre-dating 1700, plus a selection of notable monuments from later dates.

Additional sites that are either undesignated or containing currently unknown archaeology are likely to exist across the country, however numbers for these assets are not known.

Architectural Heritage

The term architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 as meaning all structures and buildings together with their settings and attendant grounds, fixtures and fittings; groups of structures and buildings; and sites which are of historical, archaeological, artistic, cultural, scientific, social, or technical interest.

A primary source of information for known architectural heritage is the Record of Protected Structures (RPS) of every local authority which is legislated for under Section 51 of the Planning and Development Acts 2000-2014. Protected structures are defined by Section 2 of the Planning and Development Acts to mean “(a) a structure, or (b) a specified part of a structure, which is included in a record of protected structures, and, where that record so indicates, includes any specified feature which is within the attendant grounds of the structure...”

⁴⁰ World Heritage Ireland <http://www.worldheritageireland.ie/home/> (accessed 10/10/14)

⁴¹ Heritage Ireland, About Us <http://www.heritageireland.ie/en/info/aboutus/> (accessed 10/10/14)

Each local authority must include structures or parts of structures which form part of the architectural heritage and which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, and contributes towards the protection of architectural heritage. The protection of structures is extended beyond the building itself to also include the interior, land lying within the curtilage of the structure, and all fixtures and features of the structure. Protected structures must be maintained and not allowed to fall into disrepair. Planning permission is also required for works affecting the character of the structure. As of 2011, the Heritage Council estimated that there are approximately 39,400 protected structures across Ireland.

In addition to Protected Structures, the Planning and Development Acts 2000-2014 provide the legislative basis for the protection of areas known as Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures, whose character it is an objective to preserve in a Development Plan. These are numerous across Ireland, with 14 ACAs within Dublin city and 22 within Cork city alone.

Future Trends

It is likely that an increasing number of sites will have some form of archaeological or architectural protection. Tentative World Heritage Sites could be put forward for consideration and potential acceptance as UNESCO sites, and the Record of Monuments and Places and Record of Protected Structures may continue to grow. Without concerted conservation efforts, monuments and structures face a lack of maintenance and deterioration in condition, so action to continue protecting historic features is necessary.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to cultural heritage which may be relevant to the WSSP are:

- The need to contribute to the protection and enhancement of features and sites of archaeological importance and cultural heritage interest in relation to Irish Water activities;
- The need to help protect and enhance sites of architectural cultural heritage; and
- The need to help ensure the protection of unknown archaeology.

C.10 Landscape

Baseline Characteristics

Ireland is famous for its beautiful landscapes which vary from mountainous regions to river valleys and rugged agricultural land. The Irish landscape incorporates natural features as well as man-made features such as settlements, field boundaries and historic industrial works. Landscapes have great value to people as a cultural service, by finding beauty, tranquillity or aesthetic value and promoting social and mental wellbeing. There are

also physical benefits of the recreational ways of appreciating such landscapes (e.g. walking, climbing and cycling).

There are six National Parks in Ireland, five of which are located on the western coast. National Parks can be designated for a range of reasons, one of which is containing natural landscapes of great beauty. National Parks are protected areas where visitors are allowed to enter for inspirational, educational, cultural and recreational purposes. The six National Parks are:

- Ballycroy - 11,000 hectares of Atlantic blanket bog and mountainous, unspoilt wilderness;
- The Burren – a rocky limestone outcrop and grassland covering 1,500 hectares;
- Connemara – 3,000 hectares of scenic mountains, expanses of bogs, heaths, grasslands and woodlands;
- Glenveagh – an area of wilderness and forest in the Derryveagh Mountains, encompassing 16,000 hectares;
- Killarney – a 10,000 hectare expanse of rugged mountainous country, including lakes, woods and Ireland’s highest mountain range; and
- Wicklow Mountains – a mountain range extending across 20,000 hectares of County Wicklow on the eastern coast of Ireland.⁴²

There are also Areas of Special Amenity which are designated according to their outstanding natural beauty or special recreational value. These sites include the Liffey Valley, North Bull Island and Howth Head.

More broadly, areas which can be most sensitive to visual impacts include:

- Lands with an elevation of >200m;
- Forestry areas;
- Lands with a slope of >30 Degrees;
- Open landscapes like lakes and estuaries; and,
- Other natural land cover types.

Future Trends

There is currently a draft National Landscape Strategy for Ireland 2014-2024 which aims to establish actions and policies to manage and protect the landscape, strengthen community identity and ensure the landscape is valued. These policies should help protect the landscape from inappropriate development and decisions which do not

⁴² National Parks and Wildlife Service, National Parks www.npws.ie/nationalparks (accessed 14/10/14)

consider the vulnerability and value of the landscape. Landscape Character Assessments are also under way across the country to help enhance understanding of the type of landscapes and sensitivities.

There are no proposals for new National Parks, however additional Areas of Special Amenity may be proposed and designated by local authorities.

Key Environmental Issues Relevant to Irish Water's Activities and the Water Services Strategic Plan

The key environmental issues relating to landscape which may be relevant to the WSSP are:

- The need to contribute to the protection and enhancement of the landscape and natural beauty of Ireland including designated sites;
- The need to help protect and maintain the landscape distinctiveness across Ireland; and
- The need to help protect visual amenity.

Appendix D

Assessment Matrices

Key to the Assessment

Symbol	Likely Effect on the Strategic Environmental Objective
++	The strategies are likely to have a significant positive effect
+	The strategies are likely to have a positive effect
0	The strategies are likely to have a neutral effect
?	Effects are uncertain/there is insufficient information on which to determine effect*
-	The strategies are likely to have a negative effect
--	The strategies are likely to have a significant negative effect
+/-	The strategies are likely to have a mixed positive and negative effect
++/-	The strategies are likely to have a mixed significant positive and negative effect
+/--	The strategies are likely to have a mixed positive and significant negative effect
0/+	The strategies are likely to have a neutral or positive effect
0/-	The strategies are likely to have a neutral or negative effect

*Where a positive and/or negative effect has been awarded but the assessment has also identified uncertainties (for example, in respect of the number, type and location of future proposals which may come forward following the implementation of the WSSP), the strategies have been assessed as also having an uncertain effect and this is indicated through '?.'

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Objective: Ensure a Safe and Reliable Water Supply

Table D1 Effects of Strategies under WS1: Manage the Quality of Drinking Water from Source to Tap to Protect Human Health

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The strategies under WS1 broadly seek to enhance drinking water quality. These include the preparation and implementation of a National Water Resources Plan (Strategy WS1a), Drinking Water Safety Plans (Strategy WS1b) and Capital Investment Plans (Strategy WS1d) which together are expected to identify and target investment in the infrastructure needed to enhance water quality in Ireland.</p> <p>Improving water quality in Ireland is likely to require the implementation of a combination of measures including the upgrade of existing, and development of new, water supply and treatment infrastructure that is likely to be identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and, to a lesser degree, the Lead Compliance Strategy (Strategy WS1e) and as part of any strategies to address water quality issues (Strategy WS1f). Construction works associated with these infrastructure schemes may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new water treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of the National Water Resources Plan, Drinking Water Safety Plan, Capital Investment Plans and other strategies and informed (where appropriate) through Strategic Environmental Assessment and Appropriate Assessment (in accordance with the Habitats Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment. Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>Once infrastructure enhancements are operational, there may be the potential for positive effects on aquatic environments associated with, for example, improvements to discharges from water treatment works. Allied with the implementation of Drinking Water Safety Plans (Strategy WS1b) and the maintenance and monitoring of asset performance (Strategy WS1c), the strategies are expected to work with others to address issues at a catchment level such as diffuse pollution which affect water quality and aquatic biodiversity. Strategy WS1a seeks to ensure that abstraction for each water supply is sustainable and any impacts on biodiversity is acceptable. Positive effects in this respect may be significant particularly where future proposals benefit designated nature conservation assets and in this regard it is noted that other strategies contained in the draft WSSP (see for example, Strategy EN1a) seek to ensure that Irish Water services protect and enhance biodiversity.</p> <p>Strategy WS1c concerns the implementation of appropriate standard operational procedures for the optimal operation of treatment facilities, storage and networks. The development of standard procedures/regimes is expected to help ensure the quality of water</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>resources which may in-turn serve to protect and enhance biodiversity. The Strategy is also expected to facilitate the identification of assets for improvement, monitoring and the implementation of actions to protect water quality. In this context, Strategy WS1c states that strategies will be implemented to address biological and chemical water quality issues and that incident response plans will be prepared.</p> <p>Overall, the strategies under WS1 have been assessed as having a mixed positive and negative effect on Strategic Environmental Objective (SEO) 1. This reflects both the potential for adverse effects on biodiversity during the construction of any proposals identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and the expectation that such proposals will lead to longer term enhancements to the aquatic ecology during their subsequent operation. Notwithstanding, the exact magnitude of both positive and negative effects on this objective is uncertain and will depend on the number, type and location of future proposals which is currently unknown.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on biodiversity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of infrastructure proposals on biodiversity will be fully considered in the preparation of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies as well as at the project stage (as appropriate). It is assumed that the operation of measures identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies are currently unknown.
2. Protect and reduce risk to human health in undertaking water services	++/-	<p>Likely Significant Effects</p> <p>There is the potential that the construction of schemes identified, in particular, the National Water Resources Plan (Strategy WS1a), Drinking Water Safety Plans (Strategy WS1b) and Capital Investment Plans (Strategy WS1d) could have temporary and localised adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>As highlighted in the baseline analysis presented in Appendix C of the SEA Environmental Report, while the quality of drinking water has in general been improving in Ireland, there have still been short term declines which can pose risks to human health and the environment. Currently, around 20,000 customers are affected by boil notices in Ireland as a result of microbiological contamination of the water supplies. Strategies WS1a, WS1b and WS1d specifically seek to implement the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans to enhance water quality. Drinking Water Safety Plans, in particular, are intended to protect human health whilst ensuring good and safe water supply through minimising the risk of contamination of water sources, use of appropriate treatment processes and preventing contamination in the water distribution system. Drinking Water Safety Plans will categorise each water supply zone on the basis of risk, focusing on those with the greatest risk of water quality failure and will inform the development of the National Water Resource Plan in respect of where water sources should be abandoned or combined and also where treatment may be upgraded and centralised to meet water quality standards.</p> <p>Strategy WS1c concerns the implementation of appropriate standard operational procedures for the optimal operation of treatment facilities, storage and networks. The development of standard procedures/regimes allied with the identification of assets for improvement and monitoring is expected to protect water quality in Ireland. Strategy WS1e, meanwhile, seeks to implement a Lead Compliance Strategy to address plumbosolvency issues in the network. The World Health Organisation (WHO) has been advising on reductions in exposure to lead in recent years on the basis that prolonged exposure can lead to accumulation in the body with harmful health effects, especially in infants and unborn children. In consequence, a strategy to reduce the presence of lead in water supply is expected to have a positive effect on human health.</p> <p>Strategy WS1f relates to the preparation and implementation of strategies to manage other quality issues in water supplies, such as aesthetic quality. Aesthetic water quality issues are not generally expected to affect human health and in consequence, no significant effect on this objective is expected in this regard.</p> <p>The strategies under WS1 broadly seek to enhance drinking water quality and in consequence, have been assessed as having a significant positive effect on SEO 2, particularly given existing drinking water supply issues in Ireland. However, there is the potential for temporary, localised adverse effects on human health associated with any construction activity required to bring on-line infrastructure enhancements. Overall, the strategies under WS1 have therefore been assessed as having a mixed significant positive and minor negative effect on SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on human health as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. • It is assumed that the operation of measures identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations and Quality of Water

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Intended for Human Consumption Regulations.</p> <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	++	<p>Likely Significant Effects</p> <p>During the construction of infrastructure or proposals identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, Lead Compliance Strategy and water quality strategies there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on/in watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures).</p> <p>As identified in the baseline contained in Appendix C of the Environmental Report, the main contributors to poor water quality in Ireland are large point sources such as wastewater treatment plants and diffuse sources, typically arising from agriculture, forestry and peat harvesting. As set out under the assessment of WS1 strategies against SEO 1 and SEO 2, the implementation of the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans, together with strategies WS1c and WS1e, are expected to protect and enhance water quality in Ireland, facilitating the achievement of water body objectives under the Water Framework Directive (WFD). In this respect, other strategies contained in the draft WSSP specifically seek to ensure that Irish Water infrastructure contributes to the achievement of WFD objectives (see, for example, Strategy EN2b).</p> <p>Overall, the strategies under WS1 have been assessed as having a significant positive effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures) to avoid adverse impacts on water quality. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>The strategies under WS1 do not directly concern flood risk. However, there is the potential that investment proposals identified in the National Water Resources Plan (Strategy WS1a), Drinking Water Safety Plans (Strategy WS1b) Capital Investment Plans (Strategy WS1d), the Lead Compliance Strategy (Strategy WS1e) and water quality strategies (Strategy WS1f) could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through changes to storage, river channel modifications and any associated increase in impermeable areas).</p> <p>The location of future proposals is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water supply and treatment infrastructure to future flood risk. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change. There may also be the potential through addressing catchment management strategies as part of the preparation of the National Water Resources Plan for Irish Water to identify and support opportunities for flood alleviation/attenuation (for example, by allowing the temporary flooding of land).</p> <p>Strategy WS1c is not expected to have an effect on flood risk as it does not relate specifically to the delivery of new infrastructure.</p> <p>Whilst the location of future infrastructure proposals that may be delivered through the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and other strategies is unknown, on balance (and taking into account the mitigation that already exists), the effects of strategies under WS1 have been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk of other development located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of any future infrastructure is currently unknown.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The implementation of proposals identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and, to a lesser extent, the Lead Compliance Strategy and water quality strategies, will result in emissions to air including greenhouse gas emissions.</p> <p>Emissions to air are likely to be associated with the use of plant and HGV movements during construction as well as the operation of infrastructure such as water treatment works. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain, as locations are not specified (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities, the operation of infrastructure and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions. Depending on the scale and type of proposals, there is the potential for effects in this regard to be significant. However, there may be opportunities through the upgrade of existing and provision of new infrastructure to enhance energy efficiency (for example, through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies). In this respect, it is noted that other strategies in the draft WSSP (most notably EN1b) promote energy efficiency. Notwithstanding, it is assumed that there would be an overall net increase in greenhouse gas emissions in the short to medium term.</p> <p>As the location of future infrastructure proposals that may be delivered through the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and other strategies under this aim are unknown, the potential impact of climate change is uncertain. However, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>of water supply and treatment infrastructure to the effects of climate change. Further, it is expected that the provision of new water supply and treatment infrastructure may help to increase water supply/storage thereby providing greater resilience during periods of low rainfall. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Strategy WS1c is not expected to have an effect on this objective.</p> <p>Overall, the strategies under WS1 have been assessed as having a mixed positive and negative effect on SEO 5. This principally reflects the expectation that proposals arising from the implementation of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and, to a lesser extent, other strategies will result in increased emissions to air including greenhouse gas emissions in the short to medium term (although the magnitude of these effects is currently uncertain) but also the potential for longer term emissions reductions and increased resilience of Irish Water's services to the effects of climate change.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that air quality assessments would be undertaken at the project stage including as part of the EIA process (where necessary). It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity consumption from renewable sources. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of future proposals is unknown at this stage. The scale of emissions associated with future proposals is unknown at this stage.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	++	<p>Likely Significant Effects</p> <p>Strategies WS1a, WS1b and WS1d concern the implementation of the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans to enhance water quality which are in-turn expected to result in the upgrade of existing, and provision of new, water treatment and supply infrastructure. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect human health and the ecological status of water bodies through associated improvements to water quality.</p> <p>Through Strategy WS1c (including, for example, the development of standard operating procedures), it is expected that the operational performance of treatment facilities, storage and networks will be optimised. Strategy WS1e also seeks to implement a Lead Compliance Strategy to address plumbosolvency issues in the network.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
	+	<p>Strategy WS1f relates to the preparation and implementation of strategies to manage other quality issues in water supplies. Other water quality issues such as aesthetic issues are not generally expected to affect human health and in consequence, no significant effect on this objective is expected in this regard.</p> <p>Overall, the strategies under WS1 have been assessed as having a significant positive effect on SEO 6 which principally reflects the anticipated upgrade, and provision of new, water supply and wastewater infrastructure.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
7. Protect water as an economic resource	+	<p>Likely Significant Effects</p> <p>The strategies under WS1 do not relate specifically to the sustainable use of water and its protection as an economic resource. Notwithstanding, proposals arising from the implementation of the National Water Resources Plan (Strategy WS1a), Drinking Water Safety Plans (Strategy WS1b) and Capital Investment Plans (Strategy WS1d) as well as the standard operational procedures under Strategy WS1c, are expected to protect/enhance water sources and promote its more efficient use (for example, through the upgrade of existing infrastructure and monitoring of assets). Overall, this has been assessed as having a minor positive effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	?	<p>Likely Significant Effects</p> <p>Strategies WS1a, WS1b, WS1d and WS1f are expected to have an uncertain effect on this objective as the future location of proposals that may come forward as a result of the National Water Resources Plan (WS1a), Drinking Water Safety Plans (WS1b), Capital Investment Plans (WS1d) and other water quality strategies (WS1f) are unknown. Should proposals be located predominantly on greenfield sites of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the SEA Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective.</p> <p>There may be the potential, through addressing catchment management strategies as part of the preparation of the National Water</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Resources Plan, for Irish Water (indirectly) to address existing pressures on soil quality including, for example, soil erosion.</p> <p>Strategy WS1c is not expected to have an effect on this objective as it does not relate specifically to the delivery of new infrastructure.</p> <p>As any replacement of pipeline associated with the implementation of the Lead Compliance Strategy (Strategy WS1e), and those aspects of the National Water Resources Plan that address leakage, would involve replacing/repairing existing pipes where ground has already been disturbed, the likelihood of any detrimental effects on soil quality is expected to be minimal.</p> <p>Overall, the strategies under WS1 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of wording and/or strategies relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the operation of measures identified in the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and other water quality strategies will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of future proposals is unknown at this stage.
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	?	<p>Likely Significant Effects</p> <p>The enhancement of existing and development of new infrastructure arising from the implementation of the National Water Resources Plan (Strategy WS1a), Drinking Water Safety Plans (Strategy WS1b), Capital Investment Plans (Strategy WS1d) and, to a lesser extent, other water quality strategies (WS1f) could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether strategies WS1a, WS1b, WS1d and WS1f are likely to have adverse effects on this objective. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of these plans/strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part of the planning and EIA process (where required).</p> <p>Strategy WS1c is not expected to have an effect on this objective as it does not relate specifically to the delivery of new infrastructure.</p> <p>As any replacement of pipeline associated with the implementation of the Lead Compliance Strategy (Strategy WS1e), and those aspects of the National Water Resources Plan that address leakage, would involve replacing/repairing existing pipes where ground</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>has already been disturbed, the likelihood of any detrimental effects on buried heritage assets is expected to be minimal.</p> <p>As the location of future infrastructure proposals that may be delivered through the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies are unknown, the overall effect of strategies under WS1 has been assessed as uncertain at this stage.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the preparation of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, and other water quality strategies as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future infrastructure proposals which may be delivered as part of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans and other water quality strategies are currently unknown.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	-/?	<p>Likely Significant Effects</p> <p>The upgrade of existing, and provision of new, infrastructure following the implementation of the National Water Resources Plan (Strategy WS1a), Drinking Water Safety Plans (Strategy WS1b), Capital Investment Plans (Strategy WS1d) and, to a lesser extent, the Lead Compliance Strategy (Strategy WS1e) and other water quality strategies (WS1f) may result in adverse landscape impacts during both the construction and operational phases of facilities.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies (as appropriate). Similarly, at the project stage (Tier 3), landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>Strategy WS1c is not expected to have an effect on this objective as it does not relate specifically to the delivery of new infrastructure.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Overall, the strategies under WS1 have been assessed as having a minor negative effect on SEO 10. This reflects the likelihood that the construction and operation of proposals identified in the National Water Resources Plan, Drinking Water Safety Plans and Capital Investment Plans, in particular, will have some adverse impact on landscape and/or visual amenity. However, it is recognised that the magnitude of any effects is, to an extent, uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors. • At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. • Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of the National Water Resources Plan, Drinking Water Safety Plans, Capital Investment Plans, the Lead Compliance Strategy and other water quality strategies are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D2 Effects of Strategies under WS2: Manage the Availability and Reliability of Water Supply Now and into the Future

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The strategies under WS2 broadly seek to secure water availability and water supply resilience now and into the future. The strategies are:</p> <ul style="list-style-type: none"> - Implementation of risk assessments for all water supply areas (Strategy WS2a); - Management of existing and planning new water resources with a regional view of needs and having regard to the objectives of WFD (Strategy WS2b); - Development of long-term sustainable water sources with resilience to climate change (Strategy WS2c); - Development of methodologies to build strategic resilience and network connectivity into resource planning (Strategy WS2d); - Manage future regulatory requirements for abstraction licencing, headroom in treatment facilities and population growth (Strategy WS2e); - Match water abstraction to availability and quality using surface water and groundwater sources (Strategy WS2f); and - Phased implementation of Regional Water Conservation Strategies (Strategy WS2g). <p>Implementation of the above strategies to maintain the uninterrupted water supply in Ireland now and into the future is likely to require the implementation of a combination of measures including the development of new water resources, building regional supplies, and water conservation measures. Construction works associated with the infrastructure schemes and projects may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new water treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species and habitats.</p> <p>It is expected that the potential for adverse effects on biodiversity and ecology of projects resulting from the strategies WS2b, WS2d, WS2e, WS2f and WS2g would be considered as part of the planning and Environmental Impact Assessment (EIA) process (where required). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>Once infrastructure enhancements are operational, there may be the potential for positive effects on aquatic environments associated with, for example, alleviation of demand on strained sources through water transfers and reduced leakage.</p> <p>Strategy WS2b includes the alignment of water resources planning with the requirements of WFD. Actions to protect and enhance the ecological status of water bodies are expected to help ensure the quality and quantity of water resources which may in-turn serve to protect and enhance biodiversity. This strategy will be supported by ensuring all new sources will be resilient to the effects of climate change, as advocated under Strategy WS2c.</p> <p>Overall, the strategies under WS2 have been assessed as having a mixed positive and negative effect on Strategic Environmental Objective (SEO) 1. This reflects the potential for adverse effects on biodiversity during the construction of any proposals identified in Strategies WS2b, WS2d, WS2e and WS2f combined with the expectation that such proposals will lead to longer term enhancements to the aquatic ecology through increasing resilience to climate change and population growth. Notwithstanding, the exact magnitude of both positive and negative effects on this objective is uncertain and will depend on the number, type and location of future proposals</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
	++/-	<p>which is currently unknown.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on biodiversity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of infrastructure proposals on biodiversity will be fully considered in the preparation of the strategies WS2b, WS2d, WS2e, WS2f and WS2g as well as at the project stage (as appropriate). It is assumed that the operation of strategies WS2b, WS2d, WS2e, WS2f and WS2g will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of the strategies WS2b, WS2d, WS2e, WS2f and WS2g are currently unknown.
2. Protect and reduce risk to human health in undertaking water services	++/-	<p>Likely Significant Effects</p> <p>There is the potential that the construction of schemes identified in the strategies WS2b, WS2d, WS2e, WS2f and WS2g could have temporary and localised adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>As highlighted in the baseline analysis presented in Appendix C of the SEA Environmental Report, Ireland's population is forecast to rise and tourism constitutes an important part of the economy. The strategy to implement risk assessments for all water supply areas (Strategy WS2a), the strategy to develop sources that are resilient to climate change impacts (Strategy WS2c), the strategy to build regional supplies into water resource planning (Strategy WS2d), as well as the strategies to account for impacts from population growth and to match abstraction with water availability (Strategies WS2e and WS2f), together with the strategy to address water conservation (Strategy WS2g) are expected to help develop a reliable water supply across the country by addressing both supply and demand. The strategies therefore support population growth and tourism through the provision of sufficient drinking water.</p> <p>Overall, the strategies under WS2 have therefore been assessed as having a mixed significant positive and minor negative effect on SEO 2.</p> <p>Mitigation</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on human health as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. It is assumed that the operation of Strategies WS2b, WS2d, WS2e, WS2f and WS2g will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations and Quality of Water Intended for Human Consumption Regulations. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>During the construction of infrastructure or proposals identified in Strategies WS2b, WS2d, WS2e, WS2f and WS2g there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures).</p> <p>As identified in the baseline contained in Appendix C of the SEA Environmental Report, there may be new pressures on water resources and water quality in the future, such as unconventional oil and gas exploration and production, although the likelihood of this is very uncertain at present. At the same time population growth is expected to lead to increased water demand. The implementation of the Regional Water Conservation Strategies (WS2g) is expected to reduce uneconomic water loss, thus alleviating pressure on sources drawing on WFD water bodies. The strategy to manage existing water resources and plan for new resources based on regional needs aims to be aligned with achieving the objectives of the WFD. In this respect, other strategies contained in the draft WSSP also specifically seek to ensure that Irish Water infrastructure contributes to the achievement of water body objectives (see, for example, Strategy EN2b).</p> <p>Overall, the strategies under WS2 have been assessed as having a minor positive effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures) to avoid adverse impacts on water quality. <p>Uncertainties</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> None.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	<p>0</p>	<p>Likely Significant Effects</p> <p>The strategies under WS2 do not directly concern flood risk. However, there is the potential that investment proposals identified in strategies WS2b, WS2d, WS2e and WS2f such as new water resources or pumping stations, could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff).</p> <p>The location of future proposals is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing and development of new infrastructure presents an opportunity to enhance the resilience of water infrastructure to future flood risk. The risk assessments for all supply areas under Strategy WS2a are expected to take into account the risk of interruption to supplies during times of flood, thus enabling appropriate measures to prepare for and protect infrastructure from flooding. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Strategy WS2g is expected to entail temporary excavations in order to access pipelines to address leakage. It is not expected that these works would have an effect on flood risk.</p> <p>Whilst the location of future infrastructure proposals that may be delivered through Strategies WS2b, WS2d, WS2e and WS2f is unknown, on balance (and taking into account the mitigation that already exists) the effects of strategies under WS2 have been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk of other developments located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. It is assumed that the risk assessments for all supply areas as advocated under Strategy WS2a would take into account the risk of interruption to supplies during times of flood. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of any future infrastructure is currently unknown.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The implementation of proposals identified in Strategies WS2b, WS2d, WS2e and WS2f will result in emissions to air including greenhouse gas emissions. Emissions to air are likely to be associated with the use of plant and HGV movements during construction as well as the operation of infrastructure such as water treatment works. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
treatment infrastructure to the effects of climate change		<p>air quality which is currently uncertain, as locations are not specified (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities, the operation of infrastructure and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions. Depending on the scale and type of proposals, there is the potential for effects in this regard to be significant. However, there may be opportunities through the upgrade of existing and provision of new infrastructure to enhance energy efficiency (for example, through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies). The actions to reduce leakage expected as part of the Water Conservation Strategies (WS2g) would result in less treated water being wasted and a reduction in treatment/pumping being required thus reducing energy requirements. In this respect, it is noted that other strategies in the draft WSSP (most notably EN1b and EN1c) promote energy efficiency. Notwithstanding, it is assumed that there would be an overall net increase in greenhouse gas emissions in the short to medium term.</p> <p>As the location of future infrastructure proposals that may be delivered through Strategies WS2b, WS2d, WS2e, WS2f and WS2g is unknown, the potential impact of climate change is uncertain. However, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water supply and treatment infrastructure to the effects of climate change. Further, it is expected that the upgrade of existing and provision of new water supply and treatment infrastructure may help to increase water supply/storage thereby providing greater resilience during periods of low rainfall.</p> <p>Strategies WS2c and WS2f specifically propagate resilience to climate change through the development of sustainable sources (Strategy WS2c), and matching water abstraction to availability and quality (Strategy WS2f). In this respect, it is noted that Strategy EN1c of the draft WSSP also seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Overall, the strategies under WS2 have been assessed as having a mixed positive and negative effect on SEO 5. This principally reflects the expectation that proposals arising from the implementation of Strategies WS2b, WS2d, WS2e, WS2f and WS2g will result in increased emissions to air including greenhouse gas emissions in the short to medium term (although the magnitude of these effects is currently uncertain) but also the potential for longer term emissions reductions and increased resilience of Irish Water's services to the effects of climate change.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording and/or measures relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that air quality assessments would be undertaken at the project stage including as part of the EIA process (where necessary). It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity consumption from renewable sources. <p>Uncertainties</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> The location of future proposals is unknown at this stage. The scale of emissions associated with future proposals is unknown at this stage.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	++	<p>Likely Significant Effects</p> <p>Strategies WS2a, WS2c, WS2d, WS2e, WS2f and WS2g aim to ensure a safe and reliable water supply and are in-turn expected to result in the upgrade of existing, and provision of new, water treatment and supply infrastructure. As highlighted under the assessment of these strategies against, SEO 2 and SEO 3, it is anticipated that this will help to protect human health through the provision of sufficient drinking water for a growing population and visitors to Ireland.</p> <p>The implementation of the Regional Water Conservation Strategies (WS2g) is expected to reduce uneconomic water loss through leakage control, thus alleviating pressure on sources drawing on WFD water bodies. The strategy to manage existing water resources and plan for new resources based on regional needs (Strategy WS2b) aims to have regard for achieving the objectives of the WFD. In consequence, the strategies under WS2 have been assessed as having a positive effect the ecological status of water bodies.</p> <p>Overall, a significant positive effect has been determined against SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
7. Protect water as an economic resource	+	<p>Likely Significant Effects</p> <p>Strategy WS2g promotes water efficiency through the preparation of Regional Water Conservation Strategies, which are expected to concern measures such as leakage and demand management. These strategies aim to reduce the overall supply by encouraging the sustainable use of water and its protection as an economic resource. A minor positive effect has therefore been determined on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals is unknown at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>Strategies WS2b, WS2d, WS2e and WS2f have been assessed as having an uncertain effect on this objective as the future locations of proposals that may come forward as a result of these strategies. Should proposals be located predominantly on greenfield sites of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the Environmental Report for further information on soil quality). Conversely, developments on brownfield sites would be likely to have a positive effect on this objective.</p> <p>Strategies WS2a and WS2c are not expected to have an effect on this objective as they do not relate specifically to the delivery of new infrastructure. While Strategy WS2g is likely to entail movement of previously disturbed ground, it can be expected that this will be in locations with current water infrastructure and that soils will be re-instated once works are completed.</p> <p>Overall, the strategies under WS2 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the operation of strategies under WS2 will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of future proposals is unknown at this stage.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The enhancement of existing and development of new, infrastructure arising from the implementation of Strategies WS2b, WS2d, WS2e and WS2f could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether Strategies WS2b, WS2d, WS2e and WS2f are likely to have adverse effects on this objective. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of the strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Construction related measures arising from the Regional Water Conservation Strategies (Strategy WS2g) are expected to involve leakage reduction and would be restricted to excavation of previously disturbed ground to access and repair leaking pipes. As such, there would be no effect on cultural heritage resources.</p> <p>As the location of future infrastructure proposals that may be delivered through strategies under WS2 are unknown, the overall effect has been assessed as uncertain at this stage.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the preparation of the strategies WS2b, WS2d, WS2e, WS2f and WS2g as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future infrastructure proposals which may be delivered as part of strategies WS2b, WS2d, WS2e, WS2f and WS2g are currently unknown.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	-/?	<p>Likely Significant Effects</p> <p>The upgrade of existing and provision of new infrastructure following the implementation of strategies WS2b, WS2d, WS2e and WS2f may result in adverse landscape impacts during both the construction and operational phases of facilities. Implementation of the Regional Water Conservation Strategies (Strategy WS2g) is expected to result only in temporary effects on landscape during construction on existing assets.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of strategies WS2b, WS2d, WS2e, WS2f and WS2g. Similarly, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>Overall, the strategies under WS2 have been assessed as having a minor negative effect on SEO 10. This reflects the likelihood that the construction and operation of proposals identified in the strategies WS2b, WS2d, WS2e, WS2f and WS2g will have some adverse</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>impact on landscape and/or visual amenity. However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors. • At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. • Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of Strategies WS2b, WS2d, WS2e, WS2f and WS2g as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of Strategies WS2b, WS2d, WS2e, WS2f and WS2g are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D3 Effects of Strategies under WS3: Manage the Affordability of Water Supplies

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The strategies under WS3 broadly seek to establish improved quality, reliability and affordability of water supplies in Ireland. The strategies include adoption of an asset management based approach to capital maintenance and capital investment (Strategy WS3a), optimising the unit cost of water supply through proper water resource and treatment planning (Strategy WS3b), water conservation strategies including demand management (Strategy WS3c), and the optimisation of capital and operational investment in water supply (Strategy WS3d). Together these strategies are expected to form the plan for ensuring a reliable and affordable water supply.</p> <p>Although adopting an asset management based approach on capital maintenance and capital investment (Strategy WS3a) and optimising capital and operational investments in water supply (Strategy WS3d) could indirectly stipulate measures resulting in construction, no direct impacts on biodiversity are expected.</p> <p>Minimising the unit costs of water treatment through water resource and treatment planning (Strategy WS3b) is likely to require the implementation of a combination of measures involving some level of construction, such as standardising water treatment and minimising treatment costs through maximising use of high quality water resources. The implementation of water conservation strategies will entail actions to reduce leakage and manage demand. Construction works associated with these infrastructure schemes may result in the permanent loss of habitat (for example under WS3b, as a development of new high quality water sources and land take associated with the construction of new water treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of the strategies and informed (where appropriate) through environmental assessment. Similarly, at the project stage, ecological impacts would be considered as part of the planning and Environmental Impact Assessment (EIA) process (where required). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment in accordance with the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>Water resource and treatment planning as part of Strategy WS3b is likely to lead to infrastructure improvements in wastewater treatment, which will have a beneficial effect on the biodiversity objective through the release of higher quality effluent to the environment. Once infrastructure enhancements are operational, there may also be the potential for positive effects on aquatic environments associated with, for example, alleviation of demand on strained sources through water conservation (Strategy WS3c).</p> <p>Overall, the strategies under WS3 have been assessed as having a mixed positive and negative/uncertain effect on SEO 1. This reflects the potential for adverse effects on biodiversity during the construction of any proposals identified in the water resource and treatment planning (Strategy WS3b) and the water conservation strategies (Strategy WS3c), and the potential benefits delivered by infrastructure improvements. The exact magnitude of negative effects on this objective is uncertain and will depend on the number, type and location of future proposals which is currently unknown.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on biodiversity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP).</p> <ul style="list-style-type: none"> Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> It has been assumed that optimisation of the unit cost of water supply through proper water resource planning could result in the development of new sources. It is assumed that effects of infrastructure proposals on biodiversity will be fully considered in the preparation of the strategies for ensuring water supply reliability and affordability as appropriate. It is assumed that the operation of strategies for ensuring water supply cost efficiency will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of the strategies for ensuring water supply cost efficiency are currently unknown.
2. Protect and reduce risk to human health in undertaking water services	+/-	<p>Likely Significant Effects</p> <p>There is the potential that the construction of schemes and projects through proper water resource and treatment planning (Strategy WS3b) and the strategy to implement water conservation strategies (Strategy WS3c) could have temporary and localised adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>Strategies WS3a and WS3d are concerned with the optimum investment of available funding to maximise asset performance and ensure the maximum return and customer benefit from investment. These strategies are expected to contribute to the affordability of water supply, which has a positive effect on human health through providing equal access to water.</p> <p>Overall, the strategies under WS3 have therefore been assessed as having a mixed minor positive and minor negative effect on SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on human health as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Consider providing greater specificity to how risks are identified, characterised and prioritised. Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors.

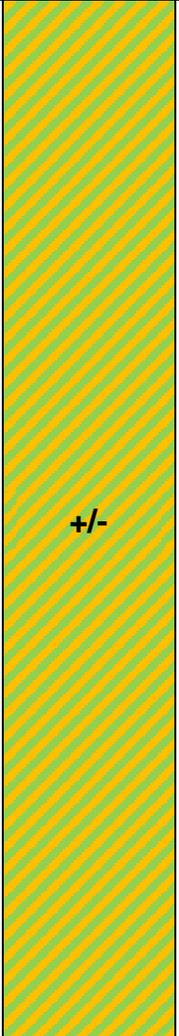
*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. It is assumed that the operation of water resource treatment planning and the water conservation strategies will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations and Quality of Water Intended for Human Consumption Regulations. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>During the construction of infrastructure or proposals identified as part of water resource and treatment planning (WS3b) and the water conservation strategies (WS3c), there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures).</p> <p>Water resource and treatment planning as part of Strategy WS3b is likely to result in improvements to wastewater treatment infrastructure. Higher quality discharge will result in water quality improvements of the receiving water bodies and downstream thereof. There may also be the potential for positive effects on WFD water bodies associated with, for example, the alleviation of pressure on strained sources through demand management (WS3c). A minor positive effect is therefore assessed from strategies WS3b and WS3c.</p> <p>It is expected that the potential for adverse effects on WFD water bodies would be identified and, where possible, addressed during the preparation of the strategies and informed (where appropriate) through environmental assessment. Similarly, at the project stage, ecological impacts would be considered as part of the planning and Environmental Impact Assessment (EIA) process (where required). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>As identified in the baseline contained in Appendix C of the SEA Environmental Report, there may be new pressures on water resources and water quality in the future, such as unconventional oil and gas exploration and production, although the likelihood of this is very uncertain at present. At the same time population growth is expected to lead to increased water demand. In this respect, other strategies contained in the draft WSSP specifically seek to ensure that Irish Water infrastructure contributes to the achievement of WFD objectives (see, for example, Strategy EN2b).</p> <p>Overall, the strategies under WS3 have been assessed as having a minor positive effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures) to avoid adverse impacts on water quality.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Uncertainties</p> <ul style="list-style-type: none"> None.
4. Minimise increases in flood risk resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>The strategies under WS3 do not directly concern flood risk. However, there is the potential that investment proposals identified as part of water resource and treatment planning for unit cost optimisation (WS3b) could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff).</p> <p>The location of future proposed infrastructure under WS3 is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water infrastructure to future flood risk. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Construction works arising from Strategy WS3c to reduce leakage would only entail temporary works to existing infrastructure, such as excavations of previously disturbed ground to access pipes; therefore no increase in flood risk is expected. Strategies WS3a and WS3d are not expected to have an effect on flood risk as they do not directly lead to work on infrastructure.</p> <p>Whilst the location of future infrastructure proposals that may be delivered is unknown, on balance (and taking into account the mitigation that already exists) the effects of strategies under WS3 have been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk of other development located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of any future infrastructure is currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>		<p>Likely Significant Effects</p> <p>Under aim WS3 the implementation of proposals implemented to optimise the unit cost of water supply (WS3b), and the water conservation strategy (Strategy WS3c) which is expected to involve leakage reductions could result in a short term increase of emissions to air including greenhouse gas emissions.</p> <p>Emissions to air are likely to be associated with the use of plant and HGV movements during construction. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain, as locations are not specified (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary). Construction activities and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions.</p> <p>Unit cost optimisation under Strategy WS3b may include the use of high quality water sources. Cost and energy savings can be achieved by using higher quality water in preference over lower quality water, because much less treatment is required. It has been assumed that this could include the development of new sources. High quality sources are more likely to be located further from agglomerations where most water is used. The use of these high quality sources, where they are far from the end user, in preference to closer, lower quality sources might result in higher energy costs and associated emissions from transporting water to the end user. However, there might be the opportunity to gravity feed to the treatment works and further on through the distribution network if the sources are located on higher ground. As the aim of this proposal is the reduction of energy usage, it is assumed that transport costs will be taken into account when allocating sources to achieve a net saving in energy and reduction in emissions.</p> <p>Overall the WS3 objective is to manage affordability of water supplies. Although energy saving measures are not explicitly included in the WS3 strategies, optimisation of investments and standardisation of processes are expected to lead to a long term increase in energy efficiency, driven by the associated cost benefits, and thus to lower emissions. Addressing leakage as part of the water conservation strategies would contribute to lowering the amount of water that is treated unnecessarily. It is therefore assumed that after a potential short term rise, there would be an overall net decrease in greenhouse gas emissions in the medium to long term. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Overall, the strategies under WS3 have been assessed as having generally positive effect on SEO 5. This principally reflects the expectation that, although strategies WS3b and WS3c could result in a short term increase in emissions to air including greenhouse gas emissions, overall the proposals arising from the WS3 strategies will result in decreased emissions the long term (although the magnitude of these effects is currently uncertain) and increase the resilience of Irish Water's services to the effects of climate change.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that air quality assessments would be undertaken at the project stage including as part of the EIA process (where

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>necessary).</p> <ul style="list-style-type: none"> It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity consumption from renewable sources. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of future proposals is unknown at this stage. The scale of emissions associated with future proposals is unknown at this stage.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	+	<p>Likely Significant Effects</p> <p>Actions under Strategy WS3b such as abstraction from high quality resources could theoretically impact on the quantity and consequently the quality of the water body from which abstraction takes place. However, licencing by the EPA would limit the abstraction to a volume that avoids negative effects on water bodies. Potential infrastructure improvements through proper water resource and treatment planning under Strategy WS3b would improve drinking and wastewater treatment. As assessed against SEO 2, these contributions to the delivery of safe drinking water and discharge of high quality effluent are both beneficial to human health. Strategies WS3a and WS3d are concerned with the optimum investment of available funding to maximise asset performance and ensure the maximum return and customer benefit from investment. These strategies are expected to contribute to the affordability of water supply, which has a positive effect on human health through providing equal access to water, thus achieving a minor positive effect against SEO 6.</p> <p>The improved quality of effluent will also benefit the WFD water bodies and therefore supports this assessment. There may also be the potential for positive effects on WFD water bodies associated with, for example, the alleviation of demand on strained sources through water conservation (WS3c).</p> <p>Overall, a minor positive effect has been determined against SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
7. Protect water as an economic resource	++	<p>Likely Significant Effects</p> <p>The strategies under WS3 promote the affordability of water supplies. Proposals arising from the implementation of the strategies are expected to result in a lower per unit cost of water. This is to be achieved through improved asset management (WS3a and WS3d), optimisation of the unit cost of water supply (WS3b) and implementation of water conservation strategies (WS3c). The provision of high quality, affordable drinking water is expected to support existing tourism and economic growth.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
	?	<p>Overall, the strategies under WS3 have been assessed as having a significant positive effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The scale and type of future proposals is unknown at this stage.
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	?	<p>Likely Significant Effects</p> <p>Strategy WS3b has been assessed as having an uncertain effect on this objective as unit cost optimisation is expected to involve rationalising the number of sources, standardising treatment processes and using high quality raw water sources. This is likely to result in some construction work that could affect soils. Although construction is assumed to be limited to existing infrastructure, there would be the potential for significant negative effects on this objective if proposals were to be located predominantly on greenfield sites of high agricultural land quality or peatland, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the Environmental Report for further information on soil quality). Using high quality raw water sources could lead to drying out of soils, which could have a significant negative effect particularly on peatlands.</p> <p>Water conservation strategies may include reductions in leakage (Strategy WS3c) which are likely to require excavations of previously disturbed ground only, thus not having an impact on soils. Strategies WS3a and WS3d are not expected to have an effect on this objective as they do not relate specifically to construction works.</p> <p>Overall, the strategies under WS3 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that the operation of Strategies WS3b and WS3c will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> • The location of future proposals is unknown at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>Strategies under the optimisation of the unit cost of water are expected to include the standardisation of treatment processes and the use of high quality raw water sources (WS3b), which could have adverse effects on cultural heritage assets. Effects are likely to be direct (for example, as a result of the damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the increase of abstraction results in reduced water levels or flows and affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether strategy WS3b is likely to have adverse effects on this objective. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of the other strategies under the water supply objective (so Regional Water Conservation Strategies), informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>Water conservation strategies may include reductions in leakage (Strategy WS3c) which are likely to require excavations of previously disturbed ground only, and thus any effect on cultural heritage would only be temporary. Strategies WS3a and WS3d are not expected to have an effect on this objective as they do not relate specifically to construction works.</p> <p>As the location of future infrastructure proposals that may be delivered through National Water Resources Management Plan are unknown, the overall effect of these strategies under WS3 has been assessed as uncertain at this stage.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the water conservation strategies as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future infrastructure proposals which may be delivered as part of the strategies WS3b and WS3c are currently unknown.
<p>10. Avoid damage to designated landscapes resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>Strategies such as the standardisation of treatment processes and the use of high quality raw water sources as part of unit cost optimisation (WS3b) and potential reductions in leakage through water conservation strategies (Strategy WS3c) may result in adverse landscape impacts temporarily during the construction phase and longer term impacts the case of increased abstractions resulting in reduced water levels or flows.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local</p>

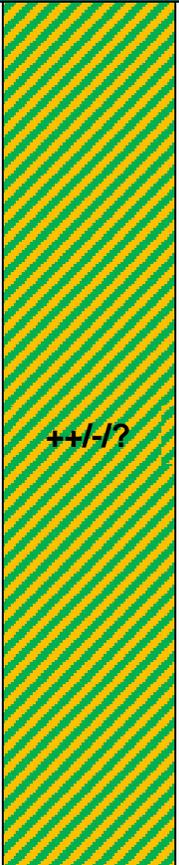
*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of other strategies under the water supply objective (for example, the Regional Water Conservation Strategies). Similarly, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>Strategies WS3a and WS3d are not expected to have an effect on this objective as they do not relate specifically to construction works.</p> <p>As the extent and location of future infrastructure proposals that may be delivered through strategies WS3b and WS3c are unknown at this stage, the overall effect of strategies under WS3 on SEO 10 has been assessed as uncertain at this stage. The magnitude of any effects will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for upgrading infrastructure, which could affect landscape, should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors. At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of strategies WS3b and WS3c as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of the Strategies WS3b and WS3c are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Objective: Provide Effective Management of Wastewater

Table D4 Effects of Strategies under WW1: Manage the Operation of Wastewater Facilities in a Manner that Protects Environmental Quality

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>		<p>Likely Significant Effects</p> <p>The strategies under WW1 seek to manage the operation of wastewater facilities in a manner that protects the environment. These include preparing and implementing Irish Water's Wastewater Compliance Strategy to manage environmental water quality (Strategy WW1a), development of appropriate guidance and Standard Operating Procedures to enable optimal operation and maintenance of wastewater treatment and collection networks (Strategy WW1b), Capital Investment Plans to progressively achieve compliance on a prioritised basis (Strategy WW1c), and managing the wider potential environmental impacts associated with the construction and operation of wastewater systems (Strategy WW1d).</p> <p>The UWWTD concerns the collection, treatment and discharge of urban wastewater and the treatment and discharge of wastewater from certain industrial sectors. Its aim is to protect the environment from any adverse effects caused by the discharge of such waters.</p> <p>The draft WSSP states that Irish Water is currently starting from a position of non compliance against UWWTD with the EU Commission reporting Ireland's rate of compliance with the secondary treatment requirements of the Directive at 40%. It is expected that the implementation of a Wastewater Compliance Strategy as proposed in WW1a will have an overall significant positive effect on biodiversity. The actions set out in the Strategy would help achieve compliance with UWWTD resulting in the protection of the ecology of aquatic environments from the adverse effects of wastewater discharges.</p> <p>Combined Sewer Overflows (CSOs) currently represent one of Irish Water's greatest compliance risks. The overall effect of the implementation of a Wastewater Compliance Strategy in WW1a will depend on the actions set out in the Strategy (e.g. whether it includes the roll out of a new investment programme for CSOs). However, although the content of the proposed Strategy is currently unknown, the assumption is that this would at minimum ensure that Irish Water achieves compliance with the UWWTD which requires that pollution from these overflows is limited. This would therefore have overall significant positive impact on the ecology of aquatic environments as it would reduce the number of CSO spills.</p> <p>Strategy WW1b concerns the implementation of appropriate guidance and Standard Operational Procedures for the optimal operation and maintenance of treatment facilities and collection networks. The development of standard procedures/regimes is expected to assist in selection of equipment that will improve the reliability of Irish Water's assets and reduce the likelihood of pollution to the environment, including prevention of any adverse impact on biodiversity. Also, a consumer awareness programme can help educate consumers on good practices in relation to what may be flushed down toilets and the potential risk these items may have on wastewater networks resulting in fewer infringements.</p> <p>The scale of future capital investment resulting from the Wastewater Compliance Strategy (Strategy WW1a) and Capital Investment Plans (Strategy WW1c) is unknown at this stage and therefore the impact on biodiversity is uncertain. If construction occurs on an existing site, this may cause temporary disturbance to biodiversity on site. Effects on biodiversity could be significant where this strategy results in the development on new sites. This may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new wastewater treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). The impacts may also be significant where</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of the Capital Investment Plans and informed (where appropriate) through environmental assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these Capital Investment Plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment in accordance with the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Notwithstanding, the location of works that could follow the adoption of these investment plans is unknown at this stage.</p> <p>Once infrastructure enhancements are operational, there may be the potential for positive effects on aquatic environments associated with improvements to discharges from wastewater treatment works. As Capital Investment Plans are put in place to support achievement of UWWTD, this will have long term benefits from reducing the effects from wastewater pollution on designated sites. This overlap between Strategies WW1a and WW1c gives an overall mixed negative positive score, but with some uncertainties.</p> <p>Overall, the strategies under WW1 have been assessed as having a mixed significant positive and negative effect on SEO 1 but with some uncertainties. This reflects the potential for adverse effects on biodiversity during the construction of any proposals identified in the Capital Investment Plans but the expectation that such proposals will lead to longer term enhancements to the aquatic ecology through the achievement of compliance with the UWWTD. Notwithstanding, the exact magnitude of both positive and negative effects on this objective is uncertain and will depend on the number, type and location of future proposals which is currently unknown.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Specific construction related actions should be included under WW1d. • Scheme specific mitigation plans related to targeted capital investment may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that the Wastewater Compliance Strategy will comply with all regulations relevant to biodiversity. <p>Uncertainties</p> <ul style="list-style-type: none"> • The exact activities set out in the Wastewater Compliance Strategy and Capital Investment Plans are currently unknown. • The scale of future capital investment is unknown at this stage.
2. Protect and reduce risk to human health in undertaking water services	++/-	<p>Likely Significant Effects</p> <p>It is expected that the implementation of a Wastewater Compliance Strategy as proposed in Strategy WW1a will have an overall significant positive effect on the water quality of wastewater discharges and reduce public health risks from effluent discharges.</p> <p>The development of appropriate guidance and Standard Operational Procedures set out in WW1b will assist in the selection of equipment that will improve the reliability of Irish Water's assets and reduce the likelihood of pollution to the environment, including reducing public health risks from effluent discharges. Also, a consumer awareness programme could help educate householders and businesses on good practices in relation to what may be disposed of to sewer (so minimising disposal of household chemicals or</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>waste oils or items that may lead to blockages).</p> <p>There is the potential that any construction activity identified as a result of the Wastewater Compliance Strategy proposed in WW1a and the Capital Investment Plans set out in WW1c could have temporary localised adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant. Mitigation for these environmental risks is expected to be provided through the strategy set out in WW1d. Longer term, the achievement of the objectives of the UWWTD will result in significant positive effects. Therefore, Strategies WW1a and WW1c are assessed as having a mixed negative and significant positive effect but with some uncertainties.</p> <p>The management of wider environmental effects from the construction and maintenance of wastewater systems as set out in Strategy WW1d, which may include factors such as dust, noise and odour, will help to minimise emissions to air, and thus will have a significant positive impact against this objective.</p> <p>Overall, the strategies under WW1 have been assessed as having a mixed significant positive and negative effect on SEO 2, with temporary negative effects associated with construction activities as a consequence of either the Wastewater Compliance Strategy and/or the Capital Investment Plans and long term positive effects associated with their subsequent operation arising from a reduced public health risks from effluent discharges.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None identified. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that the Wastewater Compliance Strategy will comply with all regulations relevant to biodiversity. <p>Uncertainties</p> <ul style="list-style-type: none"> • The exact activities set out in the Wastewater Compliance Strategy and Capital Investment Plans are currently unknown. • The scale of future capital investment is unknown at this stage.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	++	<p>Likely Significant Effects</p> <p>It is expected that the implementation of a Wastewater Compliance Strategy as proposed in WW1a will have a significant positive effect as this will help achieve regulatory compliance, protecting the water environment from nutrients and/or nitrates present in wastewater where these substances have adverse impacts on the ecology of the water environment or abstraction source waters. This is also anticipated to support the reduction of CSO spills and prevent the deterioration of the quality of water bodies.</p> <p>The development of appropriate guidance and Standard Operational Procedures set out in WW1b will assist in selection of equipment that will improve the reliability of Irish Water's assets and reduce the likelihood of pollution to the environment, including preventing the deterioration of water bodies.</p> <p>There is the potential that construction activity identified as a result of targeted capital investment set out in WW1c may result in</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures). Longer term, the achievement of the objectives of the UWWTD will result in significant positive effects. Therefore, Strategy WW1c is assessed as having a mixed negative and significant positive effect but with some uncertainties.</p> <p>Overall, the strategies under WW1 have been assessed as having a significant positive effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None identified. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures). <p>Uncertainties</p> <ul style="list-style-type: none"> • The exact activities set out in the Wastewater Compliance Strategy and Capital Investment Plans are currently unknown.
4. Minimise increases in flood risk resulting from Irish Water's activities	+	<p>Likely Significant Effects</p> <p>It is expected that the management of wastewater including a reduction in CSO spills under WW1a combined with Strategy WW1c will increase resilience and have a positive effect in helping to reduce the risk of flooding. Storm water separation that could be proposed in WW1c will help to maximise the use of the existing capacity of Irish Water's assets as storm water takes up a significant amount of capacity of its sewerage network and WWTP's. The capacity of the existing sewerage system may also be increased through the use of integrated storm tanks to modulate flows and protect the sewer capacity.</p> <p>The development of appropriate guidance and Standard Operational Procedures set out in WW1b will assist in selection of equipment that will improve the reliability of Irish Water's assets and reduce the likelihood of pollution to the environment, including preventing the deterioration of water bodies. Also, public education and information campaigns could help educate householders and businesses on good practices in relation to what may be disposed of to sewer (so minimising disposal of household chemicals or waste oils or items that may lead to blockages).</p> <p>The location of future proposals of the Capital Investment Plans under WW1c is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water treatment infrastructure to future flood risk.</p> <p>Overall, the strategies under WW1 have been assessed as having a positive effect on SEO 4.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None identified. <p>Assumptions</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<ul style="list-style-type: none"> None <p>Uncertainties</p> <ul style="list-style-type: none"> The exact activities set out in the Wastewater Compliance Strategy and Capital Investment Plans are currently unknown.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p>++/-</p>	<p>Likely Significant Effects</p> <p>Strategy WW1b is not expected to have any notable direct effect on this objective.</p> <p>Targeted capital investment proposed in WW1c presents an opportunity to increase the resilience of wastewater treatment and disposal assets to the effects of climate change.</p> <p>There is the potential that any construction activity identified as a result of the Wastewater Compliance Strategy in WW1a and the Capital Investment Plans set out in WW1c may result in emissions to air including greenhouse gas emissions. Emissions to air are likely to be associated with the use of plant and HGV movements during construction. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities and the embodied carbon in materials used are likely to result in increased energy use and associated greenhouse gas emissions. The significance for effects in this regard will depend on the scale and type of capital investment. However, there may be opportunities through the upgrade and maintenance of existing assets to enhance energy efficiency. In this respect, it is noted that other strategies in the draft WSSP (most notably EN1b and EN1c) promote energy efficiency. Notwithstanding, it is assumed that there would be an overall net increase in greenhouse gas emissions in the short term.</p> <p>The management of wider environmental effects from the construction and maintenance of wastewater systems as set out in WW1d, which is assumed would include dust, noise and odour, will help to minimise emissions to air, and thus will have a significant positive impact against this objective.</p> <p>Overall, the strategies under WW1 have been assessed as having a mixed negative and significant positive effect on SEO 5, due to increased emissions to air including greenhouse gas emissions in the short to medium term (although the magnitude of these effects is currently uncertain) but also the potential for longer term emissions reductions and increased resilience of Irish Water's services to the effects of climate change.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). None identified. <p>Assumptions</p> <ul style="list-style-type: none"> None

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Uncertainties</p> <ul style="list-style-type: none"> The scale of emissions associated with future capital investment is unknown at this stage.
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies</p>	<p>++</p>	<p>Likely Significant Effects</p> <p>Strategies WW1a and WW1c include targeted capital investment to be progressively implemented to achieve compliance with UWWTD. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect public health and the ecological status of water bodies through associated improvements to quality of wastewater discharges. In consequence, WW1a and WW1c have been assessed as having a significant positive effect on this objective.</p> <p>Through Strategy WW1b it is expected that the operational performance of treatment facilities and networks will be optimised. This has been assessed as having a minor positive effect on this objective.</p> <p>The management of wider environmental effects from the construction and maintenance of wastewater systems as set out in WW1d, which is assumed would include dust, noise and odour, will help to minimise emissions to air. As highlighted under the assessment this strategy against SEO 2, it is anticipated that this will help to protect public health. In consequence, WW1d have been assessed as having a significant positive effect on this objective.</p> <p>Overall, the strategies under WW1 have been assessed as having a significant positive effect on SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None identified. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of future capital investment is unknown at this stage.
<p>7. Protect water as an economic resource</p>	<p>+</p>	<p>Likely Significant Effects</p> <p>The strategies under WW1 do not relate specifically to the sustainable use of water and its protection as an economic resource. Notwithstanding, proposals arising from the implementation of the Wastewater Compliance Strategy (WW1a) and the Capital Investment Plans (Strategy WW1c) are expected to protect/enhance water sources by increasing the quality of wastewater discharges and thus have a positive effect on this objective.</p> <p>The remaining strategies are expected to have a neutral effect against this objective.</p> <p>Overall, the strategies under WW1 have been assessed as having a minor positive effect on SEO 7.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None identified. <p>Assumptions</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The exact activities set out in the Capital Investment Plans are currently unknown.
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>Strategies WW1a and WW1c have been assessed as having an uncertain effect on this objective as the future location of proposals that may come forward as a result of the Wastewater Compliance Strategy (WW1a) and the Capital Investment Plans (WW1c) are unknown. Should scheme proposals be located predominantly on greenfield sites of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatland in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective.</p> <p>The remaining strategies are expected to have a neutral effect against this objective.</p> <p>Overall, the strategies under WW1 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the operation of the Capital Investment Plans will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future infrastructure proposals which may be delivered as part of the Capital Investment Plans are currently unknown.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The enhancement of existing and development of new infrastructure arising from the implementation of the Wastewater Compliance Strategy (WW1a) and the Capital Investment Plans (WW1c) could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether this strategy is likely to have</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>adverse effects on this objective. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of the Strategy and Capital Investment Plans, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>The remaining strategies are expected to have a neutral effect against this objective.</p> <p>Overall, the strategies under WW1 have been assessed as having an uncertain effect on SEO 9.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the preparation of Capital Investment Plans as well as at the project stage (as appropriate). <p>Uncertainties</p> <p>The number, type and location of future infrastructure proposals which may be delivered as part of the Capital Investment Plans are currently unknown.</p>
<p>10. Avoid damage to designated landscapes resulting from Irish Water's activities</p>	<p>-/?</p>	<p>Likely Significant Effects</p> <p>The upgrade of existing and provision of new infrastructure following the implementation of the Wastewater Compliance Strategy (WW1a) and the Capital Investment Plans (WW1c) may result in adverse landscape impacts during both the construction and operational phases of facilities.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of the Strategy and Capital Investment Plans. Similarly, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>The remaining strategies are expected to have a neutral effect against this objective.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Overall, the strategies under WW1 have been assessed as having a minor negative effect on SEO 10. However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors. • At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. • Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of Capital Investment Plans as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of the Capital Investment Plans are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D5 Effects of Strategies under WW2: Manage the Availability and Resilience of Wastewater Services Now and into the Future

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/-</p>	<p>Likely Significant Effects</p> <p>The strategies under WW2 seek to manage the availability and resilience of wastewater services in the short, medium and long term.</p> <p>The strategies include implementing risk assessments for all agglomerations in terms of short, medium and long term risks to customer service (Strategy WW2a), managing existing wastewater assets and plan for new assets based on short, medium and long term sustainability (Strategy WW2b), identifying properties at risk of flooding from combined sewers and implementing phased measures to reduce risk of combined sewer flooding of properties (Strategy WW2c) and identifying and managing critical wastewater assets to build resilience within the wastewater infrastructure (Strategy WW1d).</p> <p>The Urban Waste Water Treatment Directive defines an agglomeration as an area where the population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to an urban wastewater treatment plant or to a final discharge point. Irish Water has responsibility for the collection and treatment of wastewater from over 1,000 separate agglomerations. Ireland is currently on Formal Notice of an EU Infringement Case which requires improvements at 71 agglomerations. It is expected that in the short-term, a risk assessment for all agglomerations (Strategy WW2a) would help to assess compliance with the UWWTD which requires that sewage (domestic, industrial and rainwater run-off) is collected and conveyed to plants for secondary treatment, overflows are reduced and measures taken to limit pollution from CSOs. In the medium and long term, it is expected that a risk assessment will assess the sensitivity of the receiving environment to which the agglomerations discharge and will identify the potential risks associated with an agglomeration which may include the proximity to bathing waters, drinking water abstractions and shellfish waters etc. It is assumed that the measures put in place as a result of the risk assessment would help prevent damage to aquatic ecology and therefore have a positive impact against this objective.</p> <p>In the short term, Strategies WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. In the medium to long term, construction of new wastewater infrastructure and critical assets may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new wastewater treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that at the project stage, ecological impacts would be considered as part of the planning and Environmental Impact Assessment (EIA) process (where required). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment in accordance with the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>Once infrastructure enhancements are operational, there may be the potential for positive effects on aquatic environments associated with, for example, improvements to discharges from wastewater treatment works. For these reasons, Strategies WW2b and WW2d have been assessed as having a mixed negative and positive impact.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
	+/-	<p>It is expected that the strategy to identify and reduce the risk of combined sewer flooding of properties (Strategy WW2c) will have an overall positive effect on the quality of wastewater discharges. This will ultimately reduce the risk of polluting aquatic environments and prevent damage to biodiversity.</p> <p>Overall, the strategies under Strategy WW2 have been assessed as having a mixed positive and negative effect on SEO 1.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. • The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.
2. Protect and reduce risk to human health in undertaking water services	+/-	<p>Likely Significant Effects</p> <p>It is expected that in the short-term, a risk assessment for all agglomerations (Strategy WW2a) would help to assess compliance with the UWWTD which requires that sewage (domestic, industrial and rainwater run-off) is collected and conveyed to plants for secondary treatment, overflows are reduced and measures taken to limit pollution from CSOs. In the medium and long term, it is expected that a risk assessment will assess the sensitivity of the receiving environment to which the agglomerations discharge and will identify the potential risks associated with an agglomeration which may include the proximity to bathing waters, drinking water abstractions and shellfish waters etc. It is assumed that the measures put in place as a result of the risk assessment would help reduce the risk to human health and thus have a positive impact against this objective.</p> <p>In the short term, Strategies WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. In the medium to long term, construction works of new wastewater infrastructure and critical assets may result in temporary adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant. Mitigation for these environmental risks is expected to be provided through the strategy set out in WW1d.</p> <p>Lack of capital replacement in the past has led to the dilapidation of some critical wastewater assets, to the point that they are now at risk of imminent failure. Strategies WW2b and WW2d have been assessed as having a significant positive effect against this objective as Irish Water's infrastructure is necessary for the continued functioning of the country and for delivery of essential water services which, if lost or impaired, would have a major detrimental impact on public health.</p> <p>For these reasons, Strategies WW2b and WW2d have both been assessed as having a mixed significant positive and minor negative</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
	+/-	<p>impact on this objective.</p> <p>It is expected that the strategy to identify and reduce the risk of combined sewer flooding of properties (WW2c) will have an overall positive effect on the quality of wastewater discharges. This will ultimately reduce the risk of polluting aquatic environments and prevent damage to human health.</p> <p>Overall, the strategies under WW2 have been assessed as having a mixed minor positive and negative effect on SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. • The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+/-	<p>Likely Significant Effects</p> <p>It is expected that in the short-term, a risk assessment for all agglomerations (Strategy WW2a) would help to assess compliance with the UWWTD which requires that sewage (domestic, industrial and rainwater run-off) is collected and conveyed to plants for secondary treatment, overflows are reduced and measures taken to limit pollution from CSOs. In the medium and long term, it is expected that a risk assessment will assess the sensitivity of the receiving environment to which the agglomerations discharge and will identify the potential risks associated with an agglomeration which may include the proximity to bathing waters, drinking water abstractions and shellfish waters etc. It is assumed that the measures put in place as a result of the risk assessment would help protect the water environment from nutrients and/or nitrates present in wastewater where these substances have adverse impacts on the ecology of the water environment or abstraction source waters and thus have a positive impact against this objective.</p> <p>In the short term, Strategies WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. In the medium to long term, construction of new wastewater infrastructure and critical assets may result in contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on/in watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures).</p> <p>It is expected that the strategy to identify and reduce the risk of combined sewer flooding of properties (Strategy WW2c) will have an overall positive effect on the quality of wastewater discharges. This will ultimately reduce the risk of polluting aquatic environments and prevent deterioration of water bodies.</p> <p>Overall, the strategies under WW2 have been assessed as having a mixed positive and negative effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures). <p>Uncertainties</p> <ul style="list-style-type: none"> The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.
4. Minimise increases in flood risk resulting from Irish Water's activities	++	<p>Likely Significant Effects</p> <p>It is expected that a risk assessment for all agglomerations in Strategy WW2a would consider flood risk and protection of Irish Water's assets located within the agglomerations, as well as alternative water supplies and early warning systems. Furthermore, although storm water only sewers are the responsibility of the Local Authorities under legislation and are not considered within the WSSP, it is expected that a risk assessment for all agglomerations in Strategy WW2a would consider the risks associated with combined sewer overflows and their potential overload on the sewerage system and will result in measures to reduce this risk. For these reasons, Strategy WW2a has been assessed as having a positive impact as it is assumed measures would be put in place to mitigate any flood risks identified in the assessment.</p> <p>The location of future proposals for construction of new infrastructure and critical assets under Strategies WW2b and WW2d is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing and development of new infrastructure presents an opportunity to enhance the resilience of water treatment infrastructure to future flood risk.</p> <p>It is expected that the strategy to identify and reduce the risk of combined sewer flooding of properties (Strategy WW2c) will have a significant positive effect on this objective.</p> <p>Overall, the strategies under WW2 have been assessed as having a significant positive effect on SEO 4.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk of other development located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed measures would be put in place to mitigate any flood risks identified in the risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p>+/-</p>	<p>Likely Significant Effects</p> <p>Strategy WW2a is not expected to have any impact on minimising the contribution to climate change and emissions to air. The risk assessment of agglomeration is, however, expected to have an impact on increasing resilience water treatment infrastructure to the effects of climate change as it is assumed that it will assess the risks associated with combined sewer overflows and their potential overload on the sewerage system and that the resulting measures taken would help to reduce flood risk. The overall effect of Strategy WW2a has therefore been assessed as minor positive.</p> <p>In the short term, Strategies WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. However, there may be an opportunity for things to operate more efficiently which could result in a reduction in emissions.</p> <p>In the medium to long term, construction of new wastewater infrastructure and critical assets resulting from Strategy WW2b and Strategy WW2d will result in emissions to air including greenhouse gas emissions. Emissions to air are likely to be associated with the use of plant and HGV movements during construction as well as the operation of infrastructure such as water treatment works. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain, as locations are not specified (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities, the operation of infrastructure and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions. Depending on the scale and type of proposals, there is the potential for effects in this regard to be significant. However, there may be opportunities through the upgrade of existing and provision of new infrastructure to enhance energy efficiency (for example, through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies).</p> <p>As the purpose of Strategy WW2b and Strategy WW2d is to increase long-term sustainability and resilience of wastewater infrastructure, it is expected that this will include resilience to the effects of climate change, including flood protection of assets, alternative water supplies and early warning systems. For these reasons, Strategies WW2b and WW2d are assessed as having a mixed negative and positive effect against this objective.</p> <p>It is expected that the strategy to identify and reduce the risk of combined sewer flooding of properties (Strategy WW2c) will increase resilience to the effects of climate change, particularly around flood protection, which will have a positive impact against this objective.</p> <p>Overall, the strategies under WW2 have been assessed as having a mixed negative and positive effect on SEO 5.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that air quality assessments would be undertaken at the project stage including as part of the EIA process (where necessary). It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>consumption from renewable sources.</p> <p>Uncertainties</p> <ul style="list-style-type: none"> The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2c are currently unknown.
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies</p>	++	<p>Likely Significant Effects</p> <p>The effect of Strategy WW2a on this objective is uncertain as the outcome of the risk assessment is currently unknown.</p> <p>Strategies WW2b and WW2d concern the long-term sustainability and resilience of wastewater infrastructure which are in-turn expected to result in the upgrade of existing and provision of new wastewater infrastructure and critical assets. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect public human health and the ecological status of water bodies through associated improvements to quality of wastewater discharges. In consequence, Strategies WW2b and WW2c have been assessed as having a significantly positive effect on this objective.</p> <p>Strategy WW2c concerns the identification and reduction of the risk of combined sewer flooding of properties and will have an overall positive effect on the quality of wastewater discharges. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect public human health and the ecological status of water bodies through the reduced risk of polluting aquatic environments.</p> <p>Overall, the strategies under WW2 have been assessed as having a significantly positive effect on SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None <p>Assumptions</p> <ul style="list-style-type: none"> None <p>Uncertainties</p> <ul style="list-style-type: none"> The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.
<p>7. Protect water as an economic resource</p>	++	<p>Likely Significant Effects</p> <p>The effect of Strategy WW2a on this objective is uncertain as the outcome of the risk assessment is currently unknown.</p> <p>According to Irish Water's draft WSSP, lack of capital replacement in the past has led to the dilapidation of some critical wastewater assets, to the point that they are now at risk of imminent failure.</p> <p>Strategies WW2b and WW2d have been assessed as having a significant positive effect against this objective as Irish Water's infrastructure is necessary for the continued functioning of the country and for the delivery of essential water services which, if lost or impaired, would have a major detrimental impact on Ireland as a whole.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
	?	<p>Overall, the strategies under WW2 have been assessed as having a significant positive effect on SEO 7.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. • The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	?	<p>Likely Significant Effects</p> <p>The effect of Strategy WW2a on this objective is uncertain as the outcome of the risk assessment is currently unknown.</p> <p>In the short term, Strategies WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. In the medium to long term, Strategies WW2b and WW2d have been assessed as having an uncertain effect on this objective as the future locations of proposals are unknown. Should proposals be located predominantly on greenfield sites of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the SEA Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective.</p> <p>Strategy WW2c is assessed as having a neutral effect on this objective.</p> <p>Overall, the strategies under WW2 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. • The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2c are currently unknown.
<p>9. Avoid damage to cultural heritage resources resulting from</p>	?	<p>Likely Significant Effects</p> <p>The effect of Strategy WW2a on this objective is uncertain as the outcome of the risk assessment is currently unknown.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
Irish Water's activities		<p>In the short term, Strategy WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. In the medium to long term, the construction of new infrastructure and critical assets could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether this strategy is likely to have adverse effects on this objective. Notwithstanding, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>Strategy WW2c is assessed as having a neutral effect on this objective.</p> <p>Overall, the strategies under WW2 have been assessed as having an uncertain effect on SEO 9.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. • The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	-/?	<p>Likely Significant Effects</p> <p>The effect of Strategy WW2a on this objective is uncertain as the outcome of the risk assessment is currently unknown.</p> <p>In the short term, Strategies WW2b and WW2d are expected to have a limited impact on this objective as they deal with the management of existing wastewater infrastructure and critical assets. In the medium to long term, the construction of new infrastructure and critical assets could have adverse landscape impacts during both the construction and operational phases of facilities.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new infrastructure and critical assets could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that, at the project stage, landscape impacts would be considered as part the planning and EIA process (where</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>Strategy WW2c is assessed as having a neutral effect on this objective.</p> <p>Overall, the strategies under WW2 have been assessed as having a minor negative effect on SEO 10. However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The factors being assessed in the risk assessment for the short, medium and long-term are not detailed in the strategy. • The number, type and location of future proposals which may be delivered as part of Strategies WW2b and WW2d are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

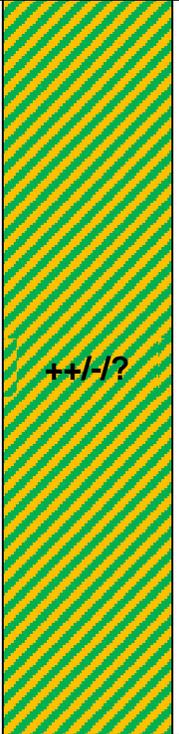
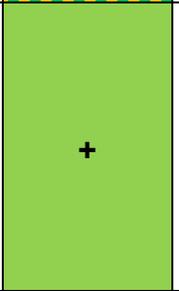
Table D6 Effects of Strategies under WW3: Manage the Affordability and Reliability of Wastewater Services

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The strategies under WW3 seek to manage the affordability and reliability of wastewater services.</p> <p>The strategies include adopting an asset management based approach to maintenance and capital investment (WW3a), developing and implementing strategies to minimise the unit costs of wastewater treatment (WW3b), optimising energy consumption in wastewater treatment plants and collection systems (WW3c), ensuring adequate governance and control of discharges to the sewer network, having regard for best practice and value (WW3d), engaging with regulators and stakeholders (WW3e) and optimising capital and operational investments in wastewater services (WW3f). The scale of future capital investment resulting from strategies WW3a and WW3d is unknown at this stage and therefore the impact on biodiversity is uncertain. If construction occurs on an existing site, this may cause temporary disturbance to biodiversity on site. Effects on biodiversity could be significant where this strategy results in the development on new sites. This may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new wastewater treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). The impacts may also be significant where development affects designated nature conservation sites and/or protected species. There is potential for wetland habitat creation which could be beneficial. Our assessment of these strategies is that in the short term this will result in potential significant negative effects during construction.</p> <p>It is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of the Capital Investment Plans and informed (where appropriate) through environmental assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment in accordance with the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>It is expected that the development of a Wastewater Source Control & Licensing Strategy (WW3d) will have a minor positive effect on biodiversity as this will help achieve compliance with UWWTD resulting in the protection of the ecology of aquatic environments from the adverse effects of wastewater discharges.</p> <p>Strategy WW3e could also include Irish Water's approach to participation in integrated catchment management planning initiatives with other stakeholders. It is expected that this would help to address issues such as diffuse pollution which affect aquatic biodiversity. Positive effects in this respect may be significant particularly where future proposals benefit designated nature conservation assets and in this regard it is noted that other strategies contained in the draft WSSP (see for example, Strategy EN1a) seek to ensure that Irish Water services protect and enhance biodiversity.</p> <p>The remaining strategies under WW3 are expected to have a neutral effect on biodiversity as they relate to cost minimisation.</p> <p>Overall, the strategies under WW3 have been assessed as having a mixed positive and negative effect on SEO 1 but with some uncertainties.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
	++/-?	<p>Mitigation</p> <ul style="list-style-type: none"> Scheme specific mitigation plans related to targeted capital investment may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> None <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of future capital investment is unknown at this stage.
2. Protect and reduce risk to human health in undertaking water services	++/-?	<p>Likely Significant Effects</p> <p>There is the potential that any construction activity identified as a result of Strategy WW3a could have temporary adverse effects on human health. Adverse effects may, in particular, include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant. Therefore, Strategy WW3a is assessed as having a mixed negative and significant positive effect but with some uncertainties.</p> <p>It is expected that the development of a Wastewater Source Control & Licensing Strategy (WW3d) will have an overall significant positive effect on the water quality of wastewater discharges and reduce public health risks from effluent discharges.</p> <p>The remaining strategies under WW3 are expected to have a neutral effect on human health as they relate to cost minimisation.</p> <p>Overall, the strategies under WW3 have been assessed as having a mixed negative and significant positive effect on SEO 2 but with some uncertainties.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Scheme specific mitigation plans related to targeted capital investment may be required at the project stage to ensure that any adverse effects on sensitive receptors are avoided or minimised with measures including early notification to aid planning, timing of and duration of activities, dust suppression and soil washes, use of temporary screening and acoustic baffles, and the provision of alternative routes for any associated vehicle movements (including consideration of timing and frequency of movements and existing levels of congestion). <p>Assumptions</p> <ul style="list-style-type: none"> None <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of future capital investment is unknown at this stage.

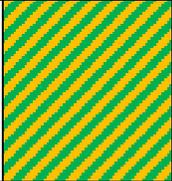
*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>		<p>Likely Significant Effects</p> <p>There is the potential that construction activity identified as a result of Strategy WW3a may result in contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures). Therefore, strategies WW3a and WW3d are assessed as having a mixed negative and significant positive effect but with some uncertainties.</p> <p>It is expected that the development of a Wastewater Source Control & Licensing Strategy (WW3d) will have a significant positive effect as this will help achieve regulatory compliance, protecting the water environment from nutrients and/or nitrates present in wastewater where these substances have adverse impacts on the ecology of the water environment or abstraction source waters.</p> <p>Irish Water's potential to participate in integrated catchment planning is noted under Strategy WW3e. This is expected to help ensure the coordination of action to enhance water quality in Ireland (for example, through collaborative working to reduce diffuse pollution) and will have a positive effect on this objective.</p> <p>The remaining strategies under WW3 are expected to have a neutral effect on water quality as they relate to cost minimisation.</p> <p>Overall, the strategies under WW3 have been assessed as having a mixed negative and significant positive effect on SEO 3 but with some uncertainties.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures). <p>Uncertainties</p> <ul style="list-style-type: none"> • None
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>		<p>Likely Significant Effects</p> <p>The location of future proposals of capital investment under Strategy WW3a Strategy WW3a is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant.</p> <p>It is expected that Strategy WW3d which includes the development of a Wastewater Source Control and Licencing Strategy may have benefits in terms of commercial discharges to CSOs which could have a positive effect in helping to reduce the risk of flooding as CSOs currently represent one of Irish Water's greatest compliance risks.</p> <p>The remaining strategies under WW3 are expected to have a neutral effect on flood risk as they relate to cost minimisation.</p> <p>Overall, the strategies under WW3 have been assessed as having a positive effect on SEO 4.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • None
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p>++/-</p>	<p>Likely Significant Effects</p> <p>There is the potential that any construction activity identified as a result of Strategy WW3a may result in emissions to air including greenhouse gas emissions. Emissions to air are likely to be associated with the use of plant and HGV movements during construction. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities and the embodied carbon in materials used are likely to result in increased energy use and associated greenhouse gas emissions. The significance for effects in this regard will depend on the scale and type of capital investment. However, there may be opportunities through the upgrade and maintenance of existing assets to enhance energy efficiency. In this respect, it is noted that other strategies in the draft WSSP (most notably Strategies EN1b and EN1c) promote energy efficiency. Notwithstanding, it is assumed that there would be an overall net increase in greenhouse gas emissions in the short term.</p> <p>In the longer term, adopting an asset based management approach to maintenance and capital investment in order to optimise asset life (Strategy WW3a) will result in a positive effect as it will increase the lifetime of existing assets, forgoing the embodied carbon from new assets. For these reasons, Strategies WW3a and WW3d are assessed as having a mixed positive and negative effect.</p> <p>Strategies WW3b is indirectly expected to minimise energy consumption, and hence carbon emissions as it is assumed that energy reduction measures will form part of a comprehensive cost minimisation strategy.</p> <p>Strategy WW3c, to optimise energy consumption in wastewater treatment plants and collection systems, will have a significant positive effect on this objective as this will result in a reduction in carbon emissions. Furthermore, more efficient, lower energy wastewater services, as envisaged in the Strategy WW3c is expected to be more resilient to the impact of climate change, resulting in a positive effect on this objective. In this respect, it is noted that Strategy WW2 of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Optimising capital and operational investments in wastewater services (Strategy WW3f) will result in a significant positive effect on this objective as it is expected that assets would operate more efficiently resulting in few emissions to air.</p> <p>Strategies WW3d and WW3e are assessed as having a neutral effect on this objective.</p> <p>Overall, the strategies under WW3 have been assessed as having a mixed significant positive and minor negative effect on SEO 5.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<p>Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP).</p> <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • The scale of emissions associated with future capital investment is unknown at this stage.
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies</p>	<p>++</p>	<p>Likely Significant Effects</p> <p>There is the potential that Strategy WW3a could be associated with future construction activities. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect public health and the ecological status of water bodies through associated improvements to quality of wastewater discharges. In consequence, Strategy WW3a has been assessed as having a significant positive effect on this objective.</p> <p>The remaining strategies under WW3 are assessed as having a neutral effect on this objective.</p> <p>Overall, the strategies under WW3 have been assessed as having a significant positive effect on SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The scale of future capital investment is unknown at this stage.
<p>7. Protect water as an economic resource</p>	<p>0</p>	<p>Likely Significant Effects</p> <p>The strategies under WW3 are not expected to have a notable effect on this objective.</p> <p>Overall, the strategies under WW3 have been assessed as having a neutral effect on SEO 7.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • None

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>Strategy WW3a has been assessed as having an uncertain effect on this objective as the future location of capital investment proposals that may come forward as a result of these strategies are unknown. Should scheme proposals be located predominantly on greenfield sites of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective. Mitigation against adverse environmental effects is also expected to be provided through other strategies such as WW1d and EN1.</p> <p>The remaining strategies under WW3 are assessed as having a neutral effect on this objective.</p> <p>Overall, the strategies under WW3 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> None <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of future capital investment is unknown at this stage.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The enhancement of existing and development of new infrastructure arising from Strategy WW3a could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether this strategy is likely to have adverse effects on this objective. Notwithstanding, it is expected that, at the project stage, heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>The remaining strategies under WW3 are not expected to have a notable effect on this objective.</p> <p>Overall, the strategies under WW3 have been assessed as having an uncertain effect on SEO 9.</p> <p>Mitigation</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<ul style="list-style-type: none"> Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the preparation of capital investment plans as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of future capital investment is unknown at this stage.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	-/?	<p>Likely Significant Effects</p> <p>The upgrade of existing and provision of new infrastructure arising from Strategy WW3a may result in adverse landscape impacts during both the construction and operational phases of facilities.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of the Strategies and Capital Investment Plans. Similarly, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>The remaining strategies under WW3 are not expected to have a notable effect on this objective.</p> <p>Overall, the strategies under WW3 have been assessed as having a minor negative effect on SEO 10. However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific strategy wording and/or strategies relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects *
		<ul style="list-style-type: none"> • At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. • Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of capital investment plans as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> • The scale of future capital investment is unknown at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Objective: Protect and Enhance the Environment

Table D7 Effects of Strategies under EN1: Ensure that Irish Water Services are Delivered in a Sustainable Manner that Contributes to the Protection of the Environment

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/?</p>	<p>Likely Significant Effects</p> <p>The strategies under EN1 aim to improve the sustainability of Irish Water's services and help to mitigate and adapt to climate change. The strategies include the implementation of a Sustainability Policy and Sustainability Framework (Strategy EN1a); preparation and implementation of a Sustainable Energy Strategy to improve energy efficiency and reduce energy use (Strategy EN1b); prepare and implement a climate change adaptation and mitigation strategy to support national objectives for climate change mitigation and ensure water services are resilient and can adapt to the effects of climate change (Strategy EN1c); to adopt a Green Procurement approach and drive efficient resource use (Strategy EN1d); and adherence to environmental and planning legislation in the development of water service assets (Strategy EN1e).</p> <p>The strategies are not expected to result in substantial construction work or new infrastructure which could have direct effects on local biodiversity. Implementation of EN1a will include consideration of habitats and wildlife as part of the Sustainability Policy and Sustainability Framework. This should promote measures to protect designated sites and habitats, and may indirectly contribute to their protection or enhancement. However, uncertainty around the exact nature of any sustainability actions to protect biodiversity is uncertain until the Framework is developed.</p> <p>Strategy EN1b may result in the installation or construction of renewable energy technologies to help meet energy reduction goals as part of the Sustainable Energy Strategy. While there is a possibility that this could result in minor disruption to local wildlife or habitats, it is assumed that ecological concerns would be taken into account while considering the siting of any new technology such that the overall effect would be negligible. The anticipated reduction in greenhouse gas emissions and therefore mitigation of climate change as a result of this strategy has the potential for a positive effect on habitats and species that are currently at risk from a changing climate, which was identified in the baseline analysis presented in Appendix C of the SEA Environmental Report as one of the key threats faced by biodiversity in Ireland. The extent of mitigation as a result of this strategy is currently uncertain.</p> <p>A strategy and actions to mitigate climate change as part of EN1c has the potential for a beneficial effect on biodiversity by helping to limit further changes to habitats, or improve their resilience as a result of the effects of climate change, such as changes in frequency and intensity of storm and drought events. The nature and extent of mitigation and associated positive effects is currently uncertain; however, could include reduced abstraction during periods of low flow and controlled release of waters from storage sites during periods of extended low flows. The strategy also aims to minimise the negative impacts of Irish Water operations on the environment, which should support the prevention of damage to protected sites and species. The improved resilience of Irish Water's assets to a changing climate is not expected to affect biodiversity.</p> <p>A Green Procurement approach that drives the efficient use of resources (including energy) EN1d may also have an indirect positive effect on biodiversity, as a result of reduced energy consumption and mitigation of climate change as above for EN1c, in addition to the potential for reduced chemical releases to the environment. The scale of the reduction and the nature of the substances are not known, but this could avoid damage to habitats and species, or support habitats or species recovering from adverse exposure to (accidental) chemical releases.</p> <p>Adherence to environmental and planning legislation under EN1e would help ensure the protection of biodiversity and habitats as per the regulatory requirements.</p> <p>Overall, these strategies are anticipated to have a positive effect on biodiversity; however, the nature and scale of any associated actions for</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>sustainability, climate change mitigation and resource efficiency are uncertain. The magnitude of any effects will depend on the commitments proposed by Irish Water in new strategies to be developed, and the extent to which these aims are met. This has resulted in the strategies being assessed as having a mixed minor positive and uncertain effect.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Ensure strong commitments to protecting biodiversity are made through the Habitats and Wildlife component of the Sustainability Policy and Sustainability Framework. • Ensure that renewable technology installations are not permitted in locations that would have a negative effect on biodiversity, or that any potential effects are mitigated. • The Climate Change Adaptation and Mitigation Strategy should include aims to reduce energy consumption and the release of greenhouse gases. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that ecological concerns will be taken into account while considering the siting of renewable energy installations. <p>Uncertainties</p> <ul style="list-style-type: none"> • The nature of measures to protect biodiversity in the Sustainability Policy and Sustainability Framework is uncertain. • The nature, scale and locations of potential renewable technology installations are uncertain. • The extent of climate change mitigation as a result of these strategies is uncertain. • The overall reduction in chemical discharges to the environment is not known.
2. Protect and reduce risk to human health in undertaking water services	+/?	<p>Likely Significant Effects</p> <p>The EN1 strategies have the potential for beneficial effects on human health as a result of sustainability and climate change actions. The protection of water resources and provision of support for the social and economic development of the country has the potential for a positive effect on human health through Strategy EN1a. The Sustainability Policy and Sustainability Framework will include human health and is expected to include measures with resulting health benefits. The nature of commitments in the Framework and the extent of implementation is not currently known, so an uncertain effect is also identified at this stage.</p> <p>Strategies EN1b-d each involve an element of climate change mitigation, either through implementation of a Climate Change Mitigation Strategy or aims to improve energy efficiency and reduce energy use <i>via</i> a Sustainable Energy Strategy and green procurement. These three strategies will therefore contribute to mitigating climate change and helping improve resilience to the effects of a changing climate. Some of the effects of climate change could have detrimental impacts on human health, such as water shortages, flood events and rising summer temperatures, although milder winters may also have the potential for fewer cold weather-related illnesses or deaths. Improving resilience to these effects would therefore be beneficial on human health. The extent of climate change mitigation and the benefits on health across Ireland as a result of these strategies is uncertain but is considered to have the potential for a positive effect.</p> <p>Strategy EN1c also includes the planned identification of actions to adapt to the changing climate. These actions are expected to improve the resilience of Irish Water's assets which would help maintain a safe and secure drinking water supply, with associated benefits for human health.</p> <p>The potential for reduced chemical use as a result of Strategy EN1d may also have positive effects on human health as a result of reduced chemical intake. This effect is not certain as the nature and scale of chemicals currently being consumed and their potential reduction is not known.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Compliance with environmental and planning legislation when developing water service assets (Strategy EN1e) is also anticipated to have beneficial effects on health through adherence to regulatory requirements for the protection of drinking water quality.</p> <p>Overall this has been assessed as having a mixed minor positive and uncertain effect. This is a result of the potential benefits to human health from the expected sustainability, climate change and mitigation measures and reduced chemical use, however the extent and nature of any actions is not certain.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Ensure strong commitments to protecting human health are made through the Health component of the Sustainability Policy and Sustainability Framework. • The Climate Change Adaptation and Mitigation Strategy should include aims to reduce energy consumption and the release of greenhouse gases. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that climate change adaptation measures will result in improvements to water supply continuity and quality in a changing climate. <p>Uncertainties</p> <ul style="list-style-type: none"> • The nature of commitments in the Sustainability Policy and Sustainability Framework and the extent of implementation is not known. • The extent of climate change mitigation and the benefits on health across Ireland as a result of these strategies is uncertain. • The type of chemicals consumed and potential reduction in human intake is uncertain.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	<p>++</p>	<p>Likely Significant Effects</p> <p>The strategies under EN1 may result in minor improvements to water quality. The Sustainability Policy and Sustainability Framework of Strategy EN1a are expected to help balance demand for water services with the need to protect water resources and the water environment. The effect is uncertain as it is not known what measures may be included and the extent of any associated water status improvements, however the potential for a minor positive effect is present.</p> <p>Strategy EN1c involves adaptation to climate change, which may include adapting to the effects of reduced rainfall on river flows available for abstraction and the effects of increased temperatures on the quality of raw water for abstraction and the assimilative capacity of receiving waters. This strategy could therefore help reduce stresses placed on water resources such as rivers in periods of low flow, and as a result improve water quality.</p> <p>The potential reduction in the use and quality of chemicals used as a result of strategies under Strategy EN1d may also support improvements to water quality if the substances currently have adverse effects. The nature and potential reduction of chemical use is not known, so the scale of improvement is uncertain.</p> <p>While mitigation of climate change associated with the implementation of a Sustainable Energy Strategy may result in benefits to water quality through the maintenance of water flows and dilution of pollutants, the effects are assumed to be negligible. Strategy EN1b has therefore been assessed as having a neutral effect against this objective.</p> <p>It is possible that the installation of renewable energy sources under Strategy EN1b could result in short term impacts on local water quality during any construction activities, however it is assumed that renewable technology would either not be sited in locations which may have a detrimental effect on water quality, or that best practice measures would be implemented to ensure no harm is caused. Any potential effects from installation are</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>therefore expected to be transient and negligible.</p> <p>Strategy EN1e has the potential to result in a significant positive effect on water quality through the adherence to regulatory requirements which are in place for the protection of groundwater and surface water quality, such as the Urban Waste Water Treatment Directive and the Water Framework Directive.</p> <p>As a result of regulatory compliance to improve water body status in addition to climate change adaptation measures and uncertain but potential reductions in discharges of substances, the strategies under EN1 have been assessed as having a significant positive effect against water quality.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Best practice measures should be implemented during the installation of renewable energy technologies to avoid detrimental effects on water quality. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that renewable technology would not be sited in locations which may have a detrimental effect on water quality. • It is assumed that the enhancement to water quality as a result of climate change mitigation arising from these strategies is negligible. <p>Uncertainties</p> <ul style="list-style-type: none"> • The nature of substances currently discharged and the potential reduction of chemical use is uncertain.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	<p>++</p>	<p>Likely Significant Effects</p> <p>Strategies EN1a, EN1b and EN1d are all expected to support the mitigation of climate change, through the Sustainability Policy, Sustainable Energy Strategy and resource efficiency actions. A reduction in greenhouse gas emissions will help to limit future effects of climate change, although will be dependent on concerted action across sectors and internationally. Climate change mitigation as a result of these strategies will therefore help to minimise increases in flood risk, as identified in the baseline analysis presented in Appendix C of the SEA Environmental Report. This has been assessed as a minor positive effect.</p> <p>Strategy EN1c is dedicated to climate change mitigation and would therefore support a reduction in flood risk. This strategy is expected to include actions to adapt to increased rainfall intensity and other effects of climate change, and is therefore expected to help reduce vulnerability to flood risk and avoid the impacts of flooding. A significant positive effect has therefore been determined against this objective.</p> <p>Under Irish planning legislation and associated guidance, there are requirements to avoid development in areas at risk of flooding, adopt flood risk management approaches and to incorporate flood risk assessment into planning applications. Adherence to this legislation would therefore result in a minor or significant positive effect against this objective, depending on the final outcome of development proposals.</p> <p>Overall, this has been assessed as a significant positive effect against this objective as a result of climate change mitigation and adaptation actions and flood risk minimisation through planning legislation.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that the Sustainability Policy and Sustainability Framework will include measures to help mitigate climate change.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> It is assumed that climate change adaptation measures will include actions to reduce vulnerability to flood risk. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p style="text-align: center;">++</p>	<p>Likely Significant Effects</p> <p>The strategies under EN1 are expected to make a significant contribution to climate change mitigation and adaptation.</p> <p>The Sustainability Policy and Sustainability Framework to be developed will include consideration of the changing climate and extreme weather events on water resources, which should support the enhancement of water supply resilience. Climate change is also one of the key Framework components, and it is assumed that actions to help reduce greenhouse gas emissions as a result of Irish Water activities will be included.</p> <p>Strategy EN1b includes increasing energy efficiency and reducing energy usage, and to use renewable energy sources where appropriate. These actions would all support a reduction in greenhouse gas emissions. Planned measures for energy management, the purchase of energy efficiency products and the design of new capital projects for energy efficiency mean that Strategy EN1d is also expected to make a significant contribution to reducing Irish Water's contribution to climate change.</p> <p>Climate change adaptation as part of Strategy EN1c is expected to significantly enhance the resilience of water supply and treatment infrastructure by assessing vulnerability and identifying adaptation actions. Strategy EN1c also involves supporting national climate change mitigation measures through the implementation of a Climate Change Adaptation and Mitigation Strategy, which will further contribute to reducing greenhouse gas emissions.</p> <p>A minor or significant positive effect is anticipated from adherence to environmental and planning legislation as part of Strategy EN1e, such as expected greenhouse gas emissions reductions through the proposed Climate Action and Low Carbon Development Bill and obligations under EU targets and international commitments. The scale of positive effect would be dependent on the Irish Water emissions reductions as a result of this legislation.</p> <p>Overall these strategies have been assessed as having a significant positive effect on climate change mitigation and adaptation.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Ensure strong commitments to reducing greenhouse gas emissions are made through the Climate Change component of the Sustainability Strategy and Sustainability Framework. The Climate Change Adaptation and Mitigation Strategy should include aims to reduce energy consumption and the release of greenhouse gases. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that actions to help minimise greenhouse gas emissions will be included in the Sustainability Strategy and Framework and Climate Change Adaptation and Mitigation Strategy. <p>Uncertainties</p> <ul style="list-style-type: none"> The extent of implementation of these strategies and overall reduction in greenhouse gas emissions is not certain.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies</p>	<p>0/+</p>	<p>Likely Significant Effects</p> <p>The strategies are not expected to directly result in new or upgraded water and wastewater management infrastructure, however indirect effects will arise that may result in positive effects against this objective.</p> <p>It is not known what measures would contribute to the Sustainability Policy and Sustainability Framework in Strategy EN1a or Climate Change Adaptation and Mitigation Strategy in Strategy EN1c, and whether any new or upgraded water infrastructure would be required as a result. While any new infrastructure would be expected to have beneficial effects on sustainability or climate change, the overall protection of human health and ecological status of water bodies as a result of the strategies is assumed to be minimal.</p> <p>Strategy EN1d includes a commitment to ensure that significant new capital projects are designed and optimised for energy performance; however, any effects on human health or ecological status of water bodies as a result are expected to be negligible. Strategy EN1e may also contribute towards ensuring that any new development will not have a detrimental environmental or health impact.</p> <p>Strategy EN1b is not expected to result in any upgraded or new water and wastewater infrastructure.</p> <p>The strategies under EN1 have been assessed as having a neutral or minor positive effect against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that protection of human health and water body status as a result of the strategies is negligible. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent and exact nature of any new or upgraded infrastructure as a result of the strategies is not known.
<p>7. Protect water as an economic resource</p>	<p>+/?</p>	<p>Likely Significant Effects</p> <p>The strategies under EN1 do not relate specifically to the sustainable use of water and its protection as an economic resource; however, some minor positive effects may arise.</p> <p>The actions which will contribute to the Sustainability Strategy and Sustainability Framework as part of Strategy EN1a are expected to include the need to protect water resources, and to include a component on Resource Efficiency. The nature of any actions and the extent of water resource protection is not currently known, but a positive effect may result from this strategy.</p> <p>Strategy EN1c includes the identification of actions to adapt to climate change, including the effects of reduced rainfall on river flows available for abstraction. This may lead to measures to improve water efficiency and reduce leakage, thus supporting the protection of water as an economic resource, however the nature and implementation of this is uncertain and would be linked to other strategies within the WSSP, such those concerning water supply and the provision of a National Water Resource Plan.</p> <p>Strategy EN1e may result in a contribution to the overall protection of water quality through compliance with environmental and planning legislation during water service asset development.</p> <p>No effects on water as an economic resource are anticipated from Strategies EN1b and EN1d.</p> <p>Overall this has been assessed as an uncertain but minor positive effect against this objective as a result of potential actions that may contribute to the protection of water as an economic resource.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Mitigation</p> <ul style="list-style-type: none"> The Sustainability Policy and Sustainability Framework should include actions to protect water as an economic resource and to improve water efficiency. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The extent of protection of water resources through climate change adaptation measures is uncertain.
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	<p>0</p>	<p>Likely Significant Effects</p> <p>The strategies under EN1 do not directly involve the construction of new infrastructure, with the exception of potential renewable energy assets. As such, effects on soil quality or soil management are not anticipated.</p> <p>It is not known what measures would contribute to the Sustainability Policy and Sustainability Framework in Strategy EN1a or climate change adaptation goals in Strategy EN1c, and whether any new infrastructure would be required to meet these aims. There is therefore the possibility for future impacts on soils; however, it is assumed that any proposals would be appropriately considered for soil management impacts such that any effects are considered to be neutral at this stage.</p> <p>Under Strategy EN1b, renewable energy installations may be constructed in greenfield or brownfield locations. This has the potential for conflicts with soil management; however, the type of renewable energy sources, installation locations and scale of infrastructure is unknown at this stage.</p> <p>Compliance with planning legislation for the development of water service assets means that soil quality is likely to be protected under Strategy EN1e as detrimental effects on soils may not be permitted.</p> <p>Strategy EN1d is not expected to have any effect on soil quality.</p> <p>The strategies under EN1 have therefore been assessed as having a neutral effect against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects on soil management would be considered and appropriately mitigated when the currently unknown sustainability and climate change adaptation actions are implemented. It is assumed that renewable installations would not be located on sites where there may be an effect on soils. <p>Uncertainties</p> <ul style="list-style-type: none"> It is uncertain what measures would contribute to the Sustainability Policy and Sustainability Framework in Strategy EN1a or climate change adaptation goals in Strategy EN1c. The type and scale of renewable energy infrastructure and installation locations is currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	+/?	<p>Likely Significant Effects</p> <p>EN1a is expected to include a component on Culture & Heritage in the new Sustainability Policy and Sustainability Framework. While it is not yet known what measures and actions may be put in place to help protect cultural heritage resources, it is likely that heritage assets may experience protection or enhancement as a result of Strategy EN1a compared to if it had not been in place. An uncertain but positive effect is therefore anticipated against this strategy, as the nature and extent of any protection is not known.</p> <p>It is possible that unknown archaeology could be encountered if any below-ground work took place during the installation of renewable energy technology, but this is not certain as the scale, type and location of any work is unknown, so the presence and sensitivity of cultural heritage assets cannot be determined. It is assumed that renewable energy sources would not be installed in locations which would have detrimental effects on any known cultural heritage assets or buildings.</p> <p>Strategy EN1e may result in the protection of cultural heritage resources through compliance with regulations in place to protect heritage assets.</p> <p>Strategies EN1c and EN1d are not expected to have any effect on cultural heritage resources.</p> <p>Overall this has been assessed as a minor positive effect with some uncertainty relating to the extent of protection of cultural heritage assets under the Sustainability Policy and the nature of impacts associated with renewable energy developments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> The Sustainability Policy and Sustainability Framework should include actions to protect cultural heritage resources. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that renewable energy sources would not be installed in locations which would have detrimental effects on any known cultural heritage assets or buildings. <p>Uncertainties</p> <ul style="list-style-type: none"> The actions to be implemented to protect cultural heritage under the Sustainability Policy and Sustainability Framework are uncertain. It is uncertain whether any unknown archaeology would be encountered during renewable energy installation.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>The strategies are not expected to have any direct landscape effects.</p> <p>It is not known what measures would comprise the Sustainability Policy and Sustainability Framework in Strategy EN1a, and whether any new infrastructure would be required to meet these aims. There is therefore the possibility for landscape effects; however, it is assumed that any proposals would be appropriately considered for landscape impacts such that any effects are considered at this stage to be neutral.</p> <p>Under Strategy EN1b, sources of renewable energy may be introduced into a landscape. These installations have the potential for negative landscape impacts; however, the type of renewable energy sources, installation locations and scale of infrastructure is currently unknown. It is assumed that renewable installations would not be located on sites where there may be an effect on sensitive or designated landscapes, and that appropriate visual mitigation would be considered in all other areas. As such, this is assumed to have a negligible effect on landscapes.</p> <p>It is possible that drought management actions as a result of Strategy EN1c could have temporary adverse effects on landscape. This may include the introduction of temporary pumping stations/diesel generators and transfer pipes across landscape. It is assumed that visual effects can be mitigated by pipeline routes following existing linear infrastructure. Neutral or minor negative effects on landscape may therefore arise, but with some</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>uncertainty over the nature, scale and location of possible effects.</p> <p>Strategy EN1e may result in the protection of designated landscapes through compliance with regulations in place to protect such landscapes.</p> <p>Strategy EN1d relating to Green Procurement and resource efficiency is not expected to have any effects on landscape.</p> <p>Overall, the effects on landscape as a result of strategies under EN1 are considered to be neutral.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that landscape effects would be considered and appropriately mitigated when new Sustainability Policy and Sustainability Framework actions are implemented. • It is assumed that landscape effects which may arise from climate change adaptation measures can generally be mitigated. <p>Uncertainties</p> <ul style="list-style-type: none"> • The type and scale of renewable energy infrastructure and installation locations is currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D8 Effects of Strategies under EN2: Operate our Water Services Infrastructure in a Manner that Facilitates the Achievement of Water Body Objectives under the Water Framework Directive

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/?</p>	<p>Likely Significant Effects</p> <p>The strategies under EN2 broadly aim to support improvements in the status of water bodies to meet the objectives of the Water Framework Directive (WFD). The strategies include actions to work effectively with other stakeholders to support a catchment based approach to water management (Strategy EN2a) and to ensure that Irish Water's operation of water and wastewater infrastructure facilitates water body objectives (Strategy EN2b).</p> <p>Both strategies aim to improve water quality which is expected to result in positive effects on aquatic environments. Strategy EN2a includes actions under River Basin Management Plans which should help address issues such as point source pollution from wastewater. Under EN2a, Irish Water have committed to work with other stakeholders in the development of catchment based assessments of receiving waters, identifying the impact of proposed operations and any associated environmental benefits. Such an approach should also help identify where damage to ecosystems may occur, so that preventative action can be taken. Benefits could be significant if water bodies are in a designated nature conservation area or provided habitats for protected species.</p> <p>It is possible that construction work may take place as a result of measures identified through the catchment initiatives, which has the potential for temporary disturbance to biodiversity or permanent loss of habitat. These effects could be significant if development affects designated nature conservation sites and/or protected species. However it is not currently certain whether any construction activities would take place, or the nature and locations of any potential work. As such, an uncertain effect has also been recorded along with a minor positive effect.</p> <p>Strategies under EN2b are expected to help address discharges from wastewater treatment works which will have a positive effect on water quality and aquatic biodiversity. Remedial actions to meet licence conditions will be prioritised in sensitive or protected areas, which should benefit species in those locations, and the maintenance of minimum water flows also has the potential for positive ecological effects. As this strategy focuses on improving existing infrastructure, significant construction work is not anticipated.</p> <p>Overall, these strategies have been assessed as having a minor positive effect on biodiversity due to improvements to water quality and aquatic ecosystems. An uncertain effect is present as a result of uncertainties around potential construction work which could result in negative effects on biodiversity, depending on the nature and location of activities.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of the catchment based approach are currently unknown.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	<p>+/?</p>	<p>Likely Significant Effects</p> <p>The strategies aim to improve the status of water bodies, which in some cases will involve the enhancement of the quality of drinking water supplies with associated benefits for human health. As highlighted in the baseline analysis presented in Appendix C of the SEA Environmental Report, while the quality of drinking water has in general been improving in Ireland, there have still been short term declines which can pose risks to health and the environment. Currently, around 20,000 customers are affected by boil notices in Ireland as a result of microbiological contamination of the water</p>

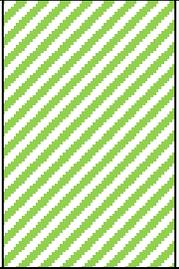
*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>supplies.</p> <p>Strategy EN2a is expected to include the identification of pressures on drinking water resources to ensure they are protected and to safeguard the quality and availability of drinking water sources. The associated improvements to drinking water quality are therefore expected to help protect human health.</p> <p>If construction activities take place to fulfil strategies under the planned catchment based approach, this could have temporary localised adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant, and are currently uncertain as it is not known whether and in what locations this type of activity may arise.</p> <p>Strategy EN2b does not directly relate to protection of drinking water resources; however, the management of water abstractions, reduced discharges and reductions in leakage to help ensure availability of supplies all have the potential for positive effects on drinking water quality and therefore safeguarding human health. However, the extent of these actions to improve drinking water quality and quantity is uncertain and the overall effect may be neutral for Strategy EN2b.</p> <p>Overall, the two strategies have been assessed as having the potential for a minor positive effect due to expected enhancements to drinking water quality and the associated benefits to human health, with some uncertainty over the nature of measures that may be incorporated in catchment based approaches.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of strategies relating to the avoidance of adverse effects on human health in catchment based approaches. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of the catchment based approach are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	<p>++</p>	<p>Likely Significant Effects</p> <p>Strategies EN2a and EN2b specifically seek to facilitate the achievement of water body objectives under the WFD through working with stakeholders on catchment based approaches and the operation of Irish Water infrastructure.</p> <p>As identified in the baseline contained in Appendix C of the SEA Environmental Report, the main contributors to poor water quality in Ireland are large point sources such as wastewater treatment plants and diffuse sources, typically arising from agriculture, forestry and peat harvesting. Both strategies will address these issues, with Strategy EN2a expected to address wastewater discharges and agriculture, as well as identify significant pressures on the water environment.</p> <p>Strategy EN2b specifically aims to improve wastewater treatment discharges which would contribute to improvements in water body quality and status, and to manage abstractions to avoid having a negative impact on water bodies.</p> <p>If construction work is required as part of Strategy EN2a, there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on/in watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures), although it is currently uncertain whether these activities would take place.</p> <p>Overall, the strategies are expected to have a significant effect on the protection and enhancement of water quality in Ireland with associated improvements to water body status as required under the WFD.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • If required, construction activities should be undertaken in accordance with relevant best practice pollution prevention guidance and appropriate mitigation implemented (such as dust suppression, spill containment and emergency response procedures) to avoid adverse impacts on water quality. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • It is uncertain whether construction activities would take place under Strategy EN2a.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	<p>0/+</p>	<p>Likely Significant Effects</p> <p>The strategies under EN2 do not directly concern flood risk. There is the potential that proposals identified as part of the catchment based approach (Strategy EN2a) could be located in areas of flood risk, however it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects are considered negligible at this stage.</p> <p>Catchment based approaches may lead to an overall increase in infiltration and increase in storage across the catchment, thus reducing storm runoff. This has the potential to reduce flood risk depending on the scale of reduced runoff, the location of improvements and previous flood risk status. A neutral or minor positive effect may therefore arise from this strategy, depending on the scale of reduced flood risk.</p> <p>There may also be the potential through the adoption of a catchment management approach for Irish Water to identify and support opportunities for flood alleviation/attenuation (for example, by allowing the temporary flooding of land).</p> <p>Overall, the strategies have been assessed as having a neutral or minor positive effect on this objective.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Mitigation</p> <ul style="list-style-type: none"> If required under these strategies, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk of other development located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The extent and location of any changes in flood risk under these strategies is not known.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p>+</p>	<p>Likely Significant Effects</p> <p>Strategy EN2a is not expected to minimise Irish Water's contribution to climate change or to affect the resilience of infrastructure.</p> <p>Reducing the volume of water abstracted to maintain minimum flows as part of Strategy EN2b, and therefore requiring treatment, would also result in reduced energy use (and greenhouse gas emissions) and emissions to air from operation of treatment works. Changes to the operation of Irish Water's infrastructure to help meet the WFD objectives may also involve improvements to reduce vulnerability to climate change; however, this is not currently certain.</p> <p>If construction work were to take place, emissions to air are likely to be associated with the use of plant and HGV movements, which may have an adverse effect on local air quality. Construction activities, the operation of infrastructure and the embedded carbon in materials and chemicals would also result in increased energy use and associated greenhouse gas emissions. The nature or extent of any possible work is not known, and depending on the scale and type of proposals, effects are not expected to be significant.</p> <p>Overall this has been assessed as a minor positive effect against this objective due to potential reductions in greenhouse gases and emissions to air as a result of Strategy EN2b.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> It is uncertain whether construction activities would take place as part of the strategies. The extent of Integrated Constructed Wetlands uptake and the associated emissions reduction is uncertain. It is not known whether changes to operation of Irish Water infrastructure would involve increased resilience to climate change.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies</p>	<p>+/?</p>	<p>Likely Significant Effects</p> <p>Strategy EN2a does not specifically relate to water and wastewater infrastructure, however strategies under the catchment based approach are expected to address urban wastewater and may result in new or upgraded infrastructure. Should infrastructure be improved, associated benefits to water body status would be expected as this is the aim of the EN2 strategies. The nature and extent of any infrastructure work is uncertain at this stage and the effect cannot be fully determined; however, it is expected to be positive should infrastructure be developed.</p> <p>Strategy EN2b specifically relates to the operation of existing water and wastewater infrastructure, and it is possible that upgrades and new infrastructure may be developed as a result. This is expected to have positive effects on human health and the ecological status of water bodies, as identified in SEO 2 and SEO 3. The extent of upgrades and new infrastructure is not certain; however, a minor positive effect is anticipated for the strategy.</p> <p>Overall a minor positive effect is expected, with some uncertainty relating to the nature and scale of infrastructure works arising under Strategy EN2a.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • It is uncertain whether new or upgraded infrastructure will arise from Strategy EN2a. • The extent of infrastructure upgrades or new infrastructure development as part of operational improvements in Strategy EN2b is not known.
<p>7. Protect water as an economic resource</p>	<p>+</p>	<p>Likely Significant Effects</p> <p>While both strategies under EN2 do not specifically relate to the sustainable use of water, the strategies are expected to help protect water as an economic resource.</p> <p>For both strategies, this includes improvements to water body status which would protect and enhance water sources. Strategy EN2a is expected to include the protection of drinking water resources from significant pressures, and safeguarding the quality and availability of drinking water sources through catchment based approaches. Strategy EN2b commits Irish Water to ensure that water abstractions will be managed sustainably and whilst this is primarily to minimise any impacts on water body status or use by other stakeholders this could help conserve water resources and promote efficient use.</p> <p>Overall, this has been assessed as having a minor positive effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent of reductions in volume of water abstracted is not known.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>Strategy EN2a has been assessed as having an uncertain effect on soils, as the nature of measures arising from the catchment based approach is not known. This could result in new infrastructure, which if located predominantly on greenfield sites of high agricultural land quality or peatland could result in the potential for negative effects on this objective, and conversely, developments on brownfield sites would be likely to have a positive effect on this objective. In addition, there may be opportunities for Irish Water to address existing pressures on soil quality including, for example, soil erosion through the catchment based approach. As it is not certain what specific actions will result from this strategy, an uncertain effect has been determined.</p> <p>Strategy EN2b may involve the upgrade or development of new infrastructure as part of the improved operation of Irish Water's water and wastewater infrastructure. Any new construction work may take place on existing operational sites which require improvement, which would have a positive effect on soil management. Should infrastructure be developed on greenfield land, this is likely to be in conflict with good soil management. There is therefore uncertainty over the nature of the effect as a result of this strategy.</p> <p>This has resulted in an overall uncertain effect against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Should new infrastructure be required, this should be located on brownfield (previously developed) land where possible. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The nature and location of future proposals is unknown at this stage.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The nature of actions to be implemented under Strategies EN2a and EN2b is currently uncertain. If new infrastructure is required, this could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether the strategies are likely to have adverse effects on this objective.</p> <p>Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified at the project stage and, where possible, addressed through the planning process and environmental assessment to avoid any significant effects.</p> <p>Overall the effect of these strategies has been assessed as uncertain against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Uncertainties</p> <ul style="list-style-type: none"> The nature and location of future proposals is unknown at this stage.
<p>10. Avoid damage to designated landscapes resulting from Irish Water's activities</p>	<p>-/?</p>	<p>Likely Significant Effects</p> <p>The nature of actions to be implemented under Strategies EN2a and EN2b is currently uncertain. If new infrastructure was required, this may result in adverse landscape impacts during both the construction and operational phases of facilities, depending on the nature and location of potential infrastructure.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the project stage as part the planning and EIA process (where required). However, the nature and location of works is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain and potentially negative.</p> <p>Actions such as the installation of Integrated Constructed Wetlands which could be required under Strategy EN2b as a wastewater treatment solution also have the potential for short term landscape impacts, however this may be considered to have neutral or beneficial impacts in the longer term. The overall scale and location of effects is not known and the effect is considered to be uncertain at this stage.</p> <p>Overall, these strategies have been assessed as having an uncertain but potentially minor negative effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors. At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The nature and location of future proposals is unknown at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D9 Effects of Strategies under EN3: Manage all our Residual Waste in a Sustainable Manner

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>0/-</p>	<p>Likely Significant Effects</p> <p>The strategies under EN3 aim to improve waste management. Strategy EN3a involves the development and implementation of a Corporate Waste Management Strategy in order to minimise waste generation and promote the reuse and recycling of materials. Strategies EN3b and EN3c include the development and implementation of a National Wastewater Sludge Management Plan and a National Water Sludge Management Plan, respectively. The strategies are expected to incorporate the promotion of bioenergy generation and the beneficial reuse of sludge and recovery of constituents.</p> <p>Under Strategies EN3b, the generation of energy from sludge may take place at existing energy generation facilities. If new facilities are required, it is assumed that these would be accommodated within or adjacent to existing operational Irish Water sites as the sludge resource would be generated on site. As such, any construction works are considered unlikely to have a significant effect on biodiversity as there would be more limited potential for protected species within areas of developed water and wastewater infrastructure. It is assumed that ecological concerns would be taken into account while considering the siting of any bioenergy facilities and best practice construction methods used, such that the overall effect would be minor.</p> <p>The reuse of treated sludge as fertilizer and soil conditioner which is then applied to agricultural land has the potential for runoff to enter water courses or infiltrate groundwater resulting in water contamination, which could have negative effects on aquatic ecosystems and/or water based habitats. It is assumed that best practise for sludge spreading would be followed in order to minimise any contamination and impacts on ecosystems. A neutral or minor negative effect may therefore arise for Strategies EN3b.</p> <p>The implementation of a Corporate Waste Management Strategy to manage Irish Water waste streams within the organisation is not expected to have an effect on biodiversity.</p> <p>Overall, the strategies under EN3 have been assessed as having a mixed neutral and minor negative effect.</p> <p>Mitigation</p> <ul style="list-style-type: none"> The National Wastewater Sludge Management Plan and National Water Sludge Management Plan should include measures to ensure the protection of biodiversity, such as best practice construction of energy facilities or treated sludge spreading. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that any new bioenergy generation plant would be constructed on existing sites. It is assumed that best practice measures for treated sludge spreading would be followed. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of impact on ecosystems from sludge runoff and the sensitivity of receiving habitats are uncertain. The exact nature of actions within the sludge strategies and locations of implementation are currently unknown.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	<p>0/-</p>	<p>Likely Significant Effects</p> <p>Strategies EN3a-c are not anticipated to have direct benefits for human health.</p> <p>As part of Strategy EN3a, there may be indirect benefits from a reduction in the volume of waste that must be treated, for example by fewer waste carrier vehicle trips improving local air quality. However these effects on health as a result of the strategy are not expected to be material.</p> <p>Strategy EN3b may reduce the reliance on fossil fuel energy through bioenergy generation. This may subsequently make a minor contribution to</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
	-	<p>climate change mitigation, which could have potential associated health benefits.</p> <p>Alternative sludge management approaches such as the disposal of treated sludge to land could result in water contamination from runoff or infiltration of groundwater bodies, with potential health impacts if drinking water supplies were affected, and increased nuisance from increased vehicle trips and odour as a result of the delivery and spreading of sludge on agricultural sites. Additionally, the disposal of sludge to arable land has the potential to increase the concentration of heavy metals in the food chain. This could also have negative effects on health. It is assumed that any potential effects would be avoided through following the DECLG Code of Practice and would generally be mitigated through a range of treatment measures (including pasteurisation). There are also restrictions on sludge application under the Nitrates Action Programme, which set restrictions on application during certain times of year and weather conditions, and sets buffer zones for the distance to watercourses. These measures further help protect drinking water supplies from runoff.</p> <p>Overall, the effects on health arising from the strategies under EN3 have been assessed as neutral or minor negative.</p> <p>Mitigation</p> <ul style="list-style-type: none"> The National Wastewater Sludge Management Plan and National Water Sludge Management Plan should include measures to ensure the protection of drinking water supplies and the avoidance of nuisance. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that best practice measures for treated sludge spreading would be followed. <p>Uncertainties</p> <ul style="list-style-type: none"> The exact nature of actions within the sludge strategies and locations of implementation are currently unknown.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	-	<p>Likely Significant Effects</p> <p>The management of organisational waste as part of Strategy EN3a is not expected to have any effects on the status of water bodies.</p> <p>Diffuse pollution from agricultural sources was highlighted in the baseline analysis presented in Appendix C of the SEA Environmental Report as one of the main contributors to poor water quality in Ireland. The use of sludge as a soil enhancer or for disposal to land under Strategies EN3b has the potential to cause diffuse pollution through runoff to water courses and infiltration into groundwater bodies. This may result in a deterioration in water quality and affect the achievement of WFD objectives.</p> <p>Other expected actions relating to waste and sludge management are not expected to affect water quality.</p> <p>Overall the strategies have been assessed as having the potential for a minor negative effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Sludge application to land should follow best practice procedures (including the DECLG Code of Practice) in order to minimise runoff and impacts on water quality. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
4. Minimise increases in flood risk resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>The EN3 strategies address waste management and do not directly concern flood risk.</p> <p>It is possible that any new bioenergy infrastructure as part of the National Wastewater Sludge Strategy could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff). It is assumed that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant.</p> <p>The generation of bioenergy may also result in an overall reduction in greenhouse gas emissions if the use of fossil fuels declined as a result, which has the potential to help reduce future flood risk arising from a changing climate. However, the effect on flooding as a result of the strategy is considered negligible.</p> <p>Overall the effect on flood risk as a result of the strategies under EN3 has been assessed as neutral.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> • The location of any future infrastructure which may arise as a result of the National Wastewater Sludge Management Plan and National Water Sludge Management Plan is currently unknown.
5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change	+	<p>Likely Significant Effects</p> <p>The generation of bioenergy may result in an overall reduction in greenhouse gas emissions if the use of fossil fuels declined as a result, which would contribute to climate change mitigation. Strategy EN3b specifically includes the promotion of bioenergy generation in the National Wastewater Sludge Strategy, and this strategy would therefore be expected to have a positive effect on reducing Irish Water's contribution to climate change.</p> <p>A reduction in waste generation through resource efficiency and reuse of materials under Strategy EN3a would also contribute a small extent to the minimisation of greenhouse gas emissions through a decrease in the production of new items and a reduction in waste treatment, however the overall effect on climate change is considered negligible for this strategy.</p> <p>Strategy EN3c relating to management of water sludge is not anticipated to have a material effect on this objective, assuming that bioenergy generation is not a viable option for water sludge.</p> <p>Overall this has been assessed as a minor positive effect against this objective as a result of the potential reduction in greenhouse gas emissions from Strategies EN3a and EN3b.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that an increase in bioenergy generation as a result of these strategies will result in an overall reduction in greenhouse gas emissions.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> It is assumed that wastewater sludge will be used for bioenergy generation, while water sludge is assumed not to be viable for bioenergy generation due to the lower organic content. <p>Uncertainties</p> <ul style="list-style-type: none"> The extent of bioenergy generation as a result of the National Wastewater Sludge Management Plan and National Water Sludge Management Plan is not certain.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	0	<p>Likely Significant Effects</p> <p>The strategies are not expected to result in new or upgraded water and wastewater management infrastructure, with the exception of possible new bioenergy facilities under Strategies EN3b. The generation of bioenergy compared to other sludge disposal routes may have minor benefits on human health and water body status, but the effects as a result of infrastructure upgrades are considered negligible.</p> <p>The strategies under EN3 have been assessed as having a neutral effect against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that protection of human health and water body status as a result of the strategies is negligible. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
7. Protect water as an economic resource	0	<p>Likely Significant Effects</p> <p>The strategies under EN3 do not relate specifically to the sustainable use of water and its protection as an economic resource. Water efficiency measures and the protection of water resources are not expected under these strategies. This has been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils</p>	+	<p>Likely Significant Effects</p> <p>Sludge management activities under Strategies EN3b have the potential for beneficial effects on soil management if any treated sludge were used as a fertiliser, soil conditioner and soil enhancer. Sludge can be used as a more efficient and sustainable alternative to inorganic and mineral fertilisers, and improve soil condition. However there are restrictions on what types of land sludge can be spread on, depending on the pollutant and heavy metal concentrations of the sludge and any treatment and application needs to follow the DECLG Code of Practice. The scale of positive effects would therefore depend on the end use of the soil and appropriate sludge application. A negative effect could arise if the application restrictions are not adhered to.</p> <p>It is assumed that any new bioenergy infrastructure constructed as a result of these strategies would be installed on existing sites as the sludge resource would be generated on site, where possible. The loss of greenfield land is therefore not anticipated.</p> <p>Strategy EN3b is therefore expected to have positive effects on this objective.</p> <p>The promotion of the reduction, reuse and recycling of waste materials under Strategy EN3a is not expected to contribute towards soil management. A reduction in waste generation may ultimately result in reduced landfill requirements and therefore the associated protection of land quality by avoidance of new landfill infrastructure, but the overall effect of this strategy is considered neutral.</p> <p>Across the three strategies under EN3, this has been assessed as a minor positive effect against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that any new bioenergy infrastructure would be installed on existing Irish Water sites. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent of sludge reuse as a soil enhancer as a result of these strategies is uncertain.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>If new energy infrastructure is required through the promotion of bioenergy generation from sludge, it is assumed that this would be accommodated within or adjacent to existing operational Irish Water sites as the sludge resource would be generated on site. Construction work on existing sites is therefore assumed unlikely to encounter currently unknown archaeological assets.</p> <p>It is also assumed that bioenergy infrastructure would not be installed in locations which would have a detrimental effect on cultural heritage resources.</p> <p>Other sludge management actions such as use as a soil enhancer or disposal to land after suitable treatment and the organisation activities to manage waste generation are not expected to have any impacts on cultural heritage.</p> <p>The strategies under EN3 have therefore been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that any new bioenergy infrastructure would be developed on existing Irish Water sites, where possible and would avoid locations

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>which may affect local cultural heritage assets.</p> <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
<p>10. Avoid damage to designated landscapes resulting from Irish Water's activities</p>	<p>0</p>	<p>Likely Significant Effects</p> <p>Should the promotion of bioenergy under Strategy EN3b result in new infrastructure, it is assumed that these would be accommodated within or adjacent to existing operational Irish Water sites, as the sludge resource would be generated on site. Landscape effects are therefore not anticipated from this infrastructure due to the setting of an already developed site. It is assumed that additional or inappropriate development would not take place within designated landscape areas.</p> <p>Other sludge management strategies are not anticipated to have landscape impacts, nor are corporate waste management activities.</p> <p>As a result, this has been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that any new bioenergy infrastructure development would not take place within designated landscape areas, and would occur on existing Irish Water sites, where possible. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Objective: Support Social and Economic Growth

Table D10 Effects of Strategies under SG1: Support National, Regional and Local Economic and Spatial Planning Policy

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	+	<p>Likely Significant Effects</p> <p>SG1 includes only Strategy SG1a, which consists of working with national, regional and local bodies to anticipate and plan for future growth. The strategy is not directly concerned with the provision of infrastructure. Instead it concentrates on enabling better planning and pro-active engagement with planning bodies on all levels. This is to be achieved through working with the planning bodies in developing population projections to identify population growth and associated demand for water services to identify short, medium and long term requirements for water services and fulfilling Irish Water's role in the preparation of development plans. Strategy SG1a also aims to work with potential new industrial and commercial customers and key stakeholders such as IDA and Enterprise Ireland to provide a customer service in the new connection process.</p> <p>Engaging with authorities and water users early on in the planning process ensures that existing facilities will not be overstretched through new development and that new infrastructure or upgrades on water and wastewater treatment and conveyance can be planned for and undertaken in a timely manner. In turn environmental receptors are protected from pollution events resulting from discharge of inadequately treated wastewater. The location of works that could follow the adoption of these plans is unknown at this stage. Notwithstanding, a minor positive effect has therefore been determined from the proposals of SG1a on terrestrial, aquatic and soil biodiversity.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	++	<p>Likely Significant Effects</p> <p>Strategy SG1a consists of working with national, regional and local bodies to anticipate and plan for future growth. The strategy's objective to enable better planning and pro-actively engage with planning bodies on all levels is expected to ensure only such proposals for development come forward, which can be adequately supported by water services. As a result human health is enhanced by ensuring safe drinking water and wastewater disposal is available to users of new development. A significant positive effect has been assessed against SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Uncertainties</p> <ul style="list-style-type: none"> None.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>Irish Water's plans under SG1a, to be involved in the planning process from the start, means that Irish Water can ensure their existing facilities will not be overstretched through new development and that new infrastructure or upgrades on water and wastewater treatment and conveyance can be planned for and undertaken in a timely manner. This is likely to provide protection to water body quality and status of rivers, lakes, transitional and coastal waters as well as groundwaters in the vicinity of any new development. Although the location and extent of new development is unknown at this stage, a positive effect on SEO 3 has been assessed.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	+	<p>Likely Significant Effects</p> <p>The strategies under SG1 do not directly concern flood risk. However, there is the potential that proposals for new development and associated water service infrastructure identified through the planning process could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff). Although Strategy SG1a is not directly concerned with the construction of such infrastructure, the early engagement in the planning process provides the opportunity to identify alternative locations in a way that minimises any increase in flood risk and create resilience of water supply and treatment infrastructure to future flood risk. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Overall, a minor positive effect has been determined against SEO 4. This reflects the positive impact Irish Water can potentially exert on development during the planning stage with regards to minimising flood risk from new development and increasing resilience to installations.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change	0	<p>Likely Significant Effects</p> <p>Strategy SG1a is not expected to have an effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	++	<p>Likely Significant Effects</p> <p>As set out against SEO 2 and SEO3, Irish Water's engagement with planning processes for future growth is expected to benefit both human health and the ecological status of water bodies through steering development and providing safe drinking water and wastewater facilities in a timely manner. A significant positive effect has been assessed against SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
7. Protect water as an economic resource	0	<p>Likely Significant Effects</p> <p>The strategy under SG1 do not relate specifically to the sustainable use of water and its protection as an economic resource. This has therefore been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	0	<p>Likely Significant Effects</p> <p>Strategy SG1a consists of working with national, regional and local bodies to anticipate and plan for future growth. It is not expected that the provision of infrastructure is a direct consequence of this strategy. The effect on soils has therefore been assessed as neutral.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>Strategy SG1a consists of working with national, regional and local bodies to anticipate and plan for future growth. It is not expected that the provision of infrastructure is a direct consequence of this strategy, and thus no damages to cultural heritage would ensue. A neutral effect on SEO 9 has been determined.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>As Strategy SG1a consists of working with national, regional and local bodies to anticipate and plan for future growth, it is not expected that the provision of infrastructure is a direct consequence of this strategy. A neutral effect on landscapes has therefore been determined.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D11 Effects of Strategies under SG2: Facilitate Growth in line with National and Regional Economic and Spatial Planning Policy

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The strategies under SG2 broadly seek to facilitate growth by meeting demand for water services where and when they are needed. The strategies aim to</p> <ul style="list-style-type: none"> - Maximise capacity of existing assets through effective asset management and optimised operation (Strategy SG2a) to minimise the requirement for additional infrastructure; - Plan water service infrastructure at national, regional and river basin level (Strategy SG2b) to ensure water services are planned at strategic level and can be provided when needed in line with development plans; - Invest in the development of strategic networks and treatment works (Strategy SG2c) to meet projected demand for our water services; - Maintain appropriate headroom in strategic water services infrastructure (Strategy SG2d) to facilitate growth between investment periods; and - Provide a high quality customer service for new customers (Strategy SG2e) to promote Irish Water as a modern utility engaged with the needs of its customers. <p>Meeting the future demand for water services through planning infrastructure (Strategy SG2b), investing in networks and treatment works (Strategy SG2c) and maintaining appropriate headroom (Strategy SG2d) is likely to involve the management of existing assets and planning for an increase in capacity through upgrades and construction of new networks and treatment works.</p> <p>Construction works associated with the infrastructure schemes and projects may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new water treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of the strategies to plan infrastructure (Strategy SG2b), to invest in networks and treatment works (Strategy SG2c) and to maintain appropriate headroom (Strategy SG2d) and informed (where appropriate) through environmental assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment in accordance with the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>Once infrastructure enhancements are operational, there may be the potential for positive effects on aquatic environments associated with, for example, improvements in water quality through provision of adequate treatment of wastewater.</p> <p>Overall, the strategies under SG2 have been assessed as having a mixed positive and negative effect on SEO 1. This reflects the potential for adverse effects on biodiversity during the construction of any proposals identified in the strategies but the expectation that such proposals will also result in long term enhancements to the aquatic ecology. Notwithstanding, the exact magnitude of both positive and negative effects on this objective is uncertain and will depend on the number, type and location of future proposals which is currently unknown.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
	++/-	<p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on biodiversity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of infrastructure proposals on biodiversity will be fully considered in the preparation of strategies SG2b, SG2c and SG2d as well as at the project stage (as appropriate). It is assumed that the operation of Strategies SG2b, SG2c and SG2d will comply with all relevant regulations including, for example, the Biocidal Product Regulations. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of strategies SG2b, SG2c and SG2d are currently unknown.
2. Protect and reduce risk to human health in undertaking water services	++/-	<p>Likely Significant Effects</p> <p>There is the potential that the construction of schemes identified in the strategies to plan infrastructure (Strategy SG2b), to invest in networks and treatment works (Strategy SG2c) and to maintain appropriate headroom (Strategy SG2d) could have temporary adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>Ensuring new development receives timely and adequate water services by planning water services at a strategic level (Strategy SG2b), investing in the network and treatment works (Strategy SG2c) and maintaining appropriate headroom to facilitate growth between investment periods (Strategy SG2d) will protect and reduce risk to human health through the provision of safe drinking water and safe disposal and treatment of wastewater, resulting in a significant positive effect.</p> <p>The strategies under SG2 seek to meet the demand for water services where and when they are needed. They have thus been assessed as having a significant positive effect on SEO 2. However, there is the potential for temporary, localised adverse effects on human health associated with any construction activity required to bring on-line infrastructure enhancements. Overall, the strategies under SG2 have therefore been assessed as having a mixed significant positive and minor negative effect on SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on human health as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP).

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
		<ul style="list-style-type: none"> Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. It is assumed that the operation of Strategies SG2b, SG2c and SG2d will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations and Quality of Water Intended for Human Consumption Regulations. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+/-	<p>Likely Significant Effects</p> <p>During the construction of infrastructure or proposals identified in the strategies to plan infrastructure (Strategy SG2b), to invest in networks and treatment works (Strategy SG2c) and to maintain appropriate headroom (Strategy SG2d), there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures). In consequence, any adverse effects are not expected to be significant. In addition, Strategy SG2a to maximise the capacity of existing assets to minimise the requirement for additional infrastructure will help limit construction to locations where it is shown to be required.</p> <p>As identified in the baseline contained in Appendix C of the SEA Environmental Report, the main contributors to poor water quality in Ireland are large point sources such as wastewater treatment plants and diffuse sources, typically arising from agriculture, forestry and peat harvesting. New developments are likely to include greenfield sites that could be close to high quality water bodies. The provision of adequate wastewater treatment facilities for any new development will ensure that a growing population will not lead to a deterioration of water quality which is consistent with SEO 3. In some cases this will include the upgrade of existing wastewater treatment works and as such presents the opportunity to improve existing performance. A positive effect has therefore been determined in this respect.</p> <p>Overall, the strategies under SG2 have been assessed as having a mixed minor negative and positive effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on the water body status as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals should be located so as to minimise the potential for adverse effects on water bodies. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on water body status would be managed/mitigated where possible using best practice. It is assumed that the operation of strategies to plan infrastructure (Strategy SG2b), to invest in networks and treatment works (Strategy SG2c) and to maintain appropriate headroom (Strategy SG2d) will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
	/	<p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>The strategies under SG2 do not directly concern flood risk. However, there is the potential that investment proposals identified in these strategies to provide water services to new development could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff).</p> <p>The location of future proposals is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water supply and treatment infrastructure to future flood risk. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Whilst the location of future infrastructure proposals that may be delivered through the strategies under SG2 is unknown, on balance (and taking into account the mitigation that already exists) the effects of strategies under SG2 have been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk to other development located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of any future infrastructure is currently unknown.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	+/-/?	<p>Likely Significant Effects</p> <p>The implementation of proposals identified in the strategies to plan infrastructure (Strategy SG2b), to invest in networks and treatment works (Strategy SG2c) and to maintain appropriate headroom (Strategy SG2d) will result in emissions to air including greenhouse gas emissions.</p> <p>Emissions to air are likely to be associated with the use of plant and HGV movements during construction as well as the operation of infrastructure such as water treatment works. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain, as locations are not specified (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities, the operation of infrastructure and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions. Depending on the scale and type of proposals, there is the potential for effects in this regard to be significant. However, there may be opportunities through the upgrade of existing and provision of new infrastructure to enhance energy efficiency (for example, through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies). In this respect, it is noted that Strategy SG2a aims to minimise the requirement for additional infrastructure by maximising the capacity of existing assets and that other strategies in the draft WSSP (most notably Strategies EN1b and EN1c) directly promote energy efficiency. Notwithstanding, it is assumed that there would be an overall net increase in greenhouse gas emissions that could be significant.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
		<p>As the location of future infrastructure proposals that may be delivered through Strategies SG2b, SG2c and SG2d is unknown, the potential impact of climate change on the infrastructure is uncertain. However, the upgrade of existing, and development of new infrastructure presents an opportunity to enhance the resilience of water supply and treatment infrastructure to the effects of climate change. Further, it is expected that the provision of new water supply and treatment infrastructure may help to increase water supply/storage thereby providing greater resilience during periods of low rainfall. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Overall, the strategies under SG2 have been assessed as having a mixed positive and negative effect on SEO 5, recognising some uncertainties at this stage. This principally reflects the expectation that proposals arising from these strategies will result in increased emissions to air including greenhouse gas emissions (although the magnitude of these effects is currently uncertain) but also the potential for longer term emissions reductions and increased resilience of Irish Water's services to the effects of climate change.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that air quality assessments would be undertaken at the project stage including as part of the EIA process (where necessary). It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity consumption from renewable sources. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of future proposals is unknown at this stage. The scale of emissions associated with future proposals is unknown at this stage and depends on the projected growth of population and associated new development.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	++	<p>Likely Significant Effects</p> <p>The strategies under SG2 aim to enable Irish Water to meet the rising demand for water services. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect human health through the provision of safe drinking water and safe wastewater disposal. There is no expected effect on water bodies once construction of new facilities has been completed.</p> <p>Overall the strategies under SG2 have been assessed as having a significant positive effect on SEO 6 which principally reflects the anticipated upgrade, and provision of new, water supply and wastewater infrastructure.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
		<p>Uncertainties</p> <ul style="list-style-type: none"> None.
7. Protect water as an economic resource	0	<p>Likely Significant Effects</p> <p>The strategies under SG2 do not relate specifically to the sustainable use of water and its protection as an economic resource. The strategies are not currently expected to protect/enhance water sources and promote its more efficient use.</p> <p>Overall, this has been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	?	<p>Likely Significant Effects</p> <p>Strategy SG2b to plan infrastructure, Strategy SG2c to invest in networks and treatment works and Strategy SG2d to maintain appropriate headroom have been assessed as having an uncertain effect on this objective as the future location of proposals that may come forward as a result of these strategies are unknown. It is likely that proposals for new development will be located mostly on greenfield sites. If this land were of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the SEA Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective.</p> <p>The effect from Strategy SG2a to maximise the capacity of existing assets and from Strategy SG2e to provide a high quality customer service for new customers are not expected to affect soils.</p> <p>Overall, the strategies under SG2 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the operation of strategies to plan infrastructure (Strategy SG2b), to invest in networks and treatment works (Strategy SG2c) and to

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
		<p>maintain appropriate headroom (Strategy SG2d) will comply with all relevant regulations including, for example, the Biocidal Product Regulation.</p> <p>Uncertainties</p> <ul style="list-style-type: none"> The location and scale of future proposals is unknown at this stage.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The enhancement of existing, and development of new, infrastructure arising from the implementation of Strategy SG2b to plan infrastructure, of Strategy SG2c to invest in networks and treatment works and of Strategy SG2d to maintain appropriate headroom could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether Strategies SG2b, SG2c and SG2d are likely to have adverse effects on this objective. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of these strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>As the location of future infrastructure proposals that may be delivered through Strategies SG2b, SG2c and SG2d are unknown, the overall effect of strategies under WS1 has been assessed as uncertain at this stage.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the preparation of Strategy SG2b to plan infrastructure, of Strategy SG2c to invest in networks and treatment works and of Strategy SG2d to maintain appropriate headroom as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future infrastructure proposals which may be delivered as part of Strategies SG2b, SG2c and SG2d are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategy	Commentary on effects*
<p>10. Avoid damage to designated landscapes resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The upgrade of existing, and provision of new, infrastructure following the implementation of the Strategy SG2b to plan infrastructure, of Strategy SG2c to invest in networks and treatment works and of Strategy SG2d to maintain appropriate headroom may result in adverse landscape impacts during both the construction and operational phases of facilities.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of the Strategies SG2b, SG2c and SG2d. Similarly, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>Overall, the strategies under SG2 have been assessed as having an uncertain effect on SEO 10. This reflects the potential that the construction and operation of proposals identified in the strategies will have some adverse impact on landscape and/or visual amenity. However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals for the provision of new infrastructure should avoid locations within, or in close proximity to, designated landscapes or sensitive visual receptors. • At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. • Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of Strategies SG2b, SG2c and SG2d as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of Strategies SG2b, SG2c and SG2d are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D12 Effects of Strategies under SG3: Ensure that Water Services are provided in a Timely and Cost Effective Manner.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	<p>-/?</p>	<p>Likely Significant Effects</p> <p>The strategies under SG3 seek to ensure that water services are provided in a timely and cost effective manner. This is to be achieved through three individual strategies:</p> <ul style="list-style-type: none"> - Strategy SG3a consists of planning for water services infrastructure development to meet projected demand in a phased way to ensure that new assets are only constructed when demand has been realised; - Strategy SG3b aims to balance investment for growth in demand with affordability; and - Strategy SG3c concerns the operation of an equitable New Connections Charging Policy that ensures efficient service provision to new customers with full cost recovery on a least cost basis. <p>Ensuring that the future demand for water services is met in a timely and cost effective manner through Strategies SG3a, SG3b and SG3c is likely to include planning for an increase in capacity through upgrades and construction of new networks and treatment works. Although none of the strategies under SG3 result in the provision of new infrastructure themselves, they are directly concerned with how infrastructure provision should be dealt with and as such will influence construction.</p> <p>Construction works associated with the infrastructure schemes may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new water treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that the potential for adverse effects on biodiversity would be identified and, where possible, addressed during the preparation of the strategy to plan for water services infrastructure (Strategy SG3a), the strategy to balance investment for growth in demand with affordability (Strategy SG3b) and of the equitable New Connections Charging Policy (Strategy SG3c) and informed (where appropriate) through environmental assessment. Similarly, at the project stage, ecological impacts would be considered as part of the environmental permitting and planning application process (which may require Environmental Impact Assessment (EIA) depending on the scale and nature of development proposed). Any projects that come forward in these plans that could have an effect on a Natura 2000 site will also be subject to the requirements of Appropriate Assessment in accordance with the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), in conjunction with the Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage.</p> <p>Overall, the strategies under SG3 have been assessed as having a minor negative effect on SEO 1. This reflects the potential for adverse effects on biodiversity during the construction of any proposals identified in Strategies SG3a, SG3b and SG3c. Notwithstanding, the exact magnitude of negative effects on this objective is uncertain and will depend on the number, type and location of future proposals which is currently unknown.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on biodiversity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. • Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>localised effects on biodiversity minimised.</p> <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of infrastructure proposals on biodiversity will be fully considered in the preparation of Strategies SG3a, SG3b and SG3c as well as at the project stage (as appropriate). It is assumed that the operation of Strategies SG3a, SG3b and SG3c will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of Strategies SG3a, SG3b and SG3c are currently unknown.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	<p>++/-</p>	<p>Likely Significant Effects</p> <p>There is the potential that the construction of schemes following from the strategy to plan for water services infrastructure (Strategy SG3a), the strategy to balance investment for growth in demand with affordability (Strategy SG3b) and the strategy to operate an equitable New Connections Charging Policy (Strategy SG3c) aimed at ensuring that water services are provided in a timely and cost effective manner could have temporary adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>Ensuring new development receives timely and adequate water services will protect and reduce risk to human health through the provision of safe drinking water and safe disposal and treatment of wastewater, resulting in a significant positive effect.</p> <p>The strategies under SG3 seek to support growth through the timely and cost-efficient provision of water services. They have thus been assessed as having a significant positive effect on SEO 2. However, there is the potential for temporary, localised adverse effects on human health associated with any construction activity required to bring on-line infrastructure enhancements. Overall, the strategies under SG3 have therefore been assessed as having a mixed significant positive and minor negative effect on SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on human health as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. It is assumed that the operation of Strategies SG3a, SG3b and SG3c will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations and Quality of Water Intended for Human Consumption Regulations.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+/-	<p>Likely Significant Effects</p> <p>During the construction of infrastructure or proposals identified in schemes following from the strategy to plan for water services infrastructure (Strategy SG3a), the strategy to balance investment for growth in demand with affordability (Strategy SG3b) and the strategy to operate an equitable New Connections Charging Policy (Strategy SG3c) to ensure that water services are provided in a timely and cost effective manner, there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures). In consequence, any adverse effects are not expected to be significant.</p> <p>As identified in the baseline contained in Appendix C of the SEA Environmental Report, the main contributors to poor water quality in Ireland are large point sources such as wastewater treatment plants and diffuse sources, typically arising from agriculture, forestry and peat harvesting. New developments are likely to include greenfield sites that could be close to high quality water bodies. The provision of adequate wastewater treatment facilities for any new development will ensure that a growing population will not lead to a deterioration of water quality which is consistent with SEO 3. In some cases this will include the upgrade of existing WWTWs and as such presents the opportunity to improve existing performance. A positive effect has therefore been determined in this respect.</p> <p>Overall, the strategies under SG3 have been assessed as having a mixed minor negative and positive effect on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on the water body status as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals should be located so as to minimise the potential for adverse effects on water bodies. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on water body status would be managed/mitigated where possible using best practice. It is assumed that the operation of Strategy SG3a to plan for water services infrastructure, Strategy SG3b to balance investment for growth in demand with affordability and Strategy SG3c to operate an equitable New Connections Charging Policy will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	<p>0</p>	<p>Likely Significant Effects</p> <p>The strategies under SG3 do not directly concern flood risk. However, there is the potential that investment proposals arising from these strategies to provide water services to new development in a timely and cost effective manner could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff).</p> <p>The location of future proposal is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water supply and treatment infrastructure to future flood risk. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Whilst the location of future infrastructure proposals that may be delivered in relation to the strategies under SG3 is unknown, on balance (and taking into account the mitigation that already exists) the effects of the SG3 strategies have been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk to other development located downstream within a catchment. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of any future infrastructure is currently unknown.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	<p>+/-/?</p>	<p>Likely Significant Effects</p> <p>The implementation of proposals following from the strategies of SG3 to ensure that water services are provided in a timely and cost effective manner will result in emissions to air including greenhouse gas emissions.</p> <p>Emissions to air are likely to be associated with the use of plant and HGV movements during construction as well as the operation of infrastructure such as water treatment works. This may have an adverse effect on local air quality, the severity of which would be to a large extent dependent on the scale of the activity, the proximity of sensitive receptors and the existing air quality which is currently uncertain, as locations are not specified (although it is expected that assessments of air quality impacts would be undertaken at the project stage where appropriate/necessary).</p> <p>Construction activities, the operation of infrastructure and the embodied carbon in materials and chemicals are likely to result in increased energy use and associated greenhouse gas emissions. Depending on the scale and type of proposals, there is the potential for effects in this regard to be significant. However, there may be opportunities through the upgrade of existing and provision of new infrastructure to enhance energy efficiency (for example, through high quality design, the use of renewable energy sources and adoption of more energy efficient technologies). In this respect, it is noted that other strategies in the draft WSSP (most notably Strategies EN1b and EN1c) promote energy efficiency. Notwithstanding, it is assumed that there would be an overall net increase in greenhouse gas emissions that could be significant.</p> <p>As the location of future infrastructure proposals that may be delivered following implementation of Strategies SG3a, SG3b and SG3c is unknown, the potential impact of climate change on the infrastructure is uncertain. However, the upgrade of existing, and development of new infrastructure presents an opportunity to enhance the resilience of water supply and treatment infrastructure to the effects of climate change. Further, it is expected that the provision</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>of new water supply and treatment infrastructure may help to increase water supply/storage thereby providing greater resilience during periods of low rainfall. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Overall, the strategies under SG3 have been assessed as having a mixed positive and negative effect on SEO 5, recognising some uncertainties at this stage. This principally reflects the expectation that proposals arising from these strategies will result in increased emissions to air including greenhouse gas emissions (although the magnitude of these effects is currently uncertain) but also the potential for longer term emissions reductions and increased resilience of Irish Water's services to the effects of climate change.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on air quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Measures to reduce emissions to air during construction should be considered at the project stage including, for example, the use of low emission plant and dust suppression. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that air quality assessments would be undertaken at the project stage including as part of the EIA process (where necessary). It is assumed that the current electricity generation mix will substantially alter over the course of the WSSP becoming low carbon consistent with the Renewable Energy Action Plan which sets a national targets to be met by 2020 that 40% electricity consumption from renewable sources. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of future proposals is unknown at this stage. The scale of emissions associated with future proposals is unknown at this stage and depends on the projected growth of population and associated new development.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	++	<p>Likely Significant Effects</p> <p>Strategies SG3a, SG3b and SG3c concern the provision of water services to meet future demand in a timely and cost effective manner. As highlighted under the assessment of these strategies against SEO 2, it is anticipated that this will help to protect human health through the provision of safe drinking water and safe wastewater disposal. As demonstrated in the assessment against SEO1 and SEO3, there is no expected effect on water bodies once construction of new facilities has been completed.</p> <p>Overall Strategies SG3a, SG3b and SG3c have been assessed as having a significant positive effect on SEO 6 which principally reflects the anticipated upgrade, and provision of new, water supply and wastewater infrastructure.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> None.
7. Protect water as an economic resource	+	<p>Likely Significant Effects</p> <p>The strategies under SG3 are concerned with ensuring that water services are provided in a timely and cost effective manner. Strategy SG3b puts emphasis on the affordability of water services to customers, while Strategy SG3c seeks to recover the cost of connecting new developments to Irish Water networks from new customers. The cost of providing water services to new developments will therefore be incorporated into the planning of these developments, thus ensuring that the value of water and providing water services is protected. A minor positive effect has therefore been determined against SEO 7.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	?	<p>Likely Significant Effects</p> <p>Strategies SG3a, SG3b and SG3c have been assessed as having an uncertain effect on this objective as the future location of proposals that may come forward in relation to these strategies are unknown. It is likely that proposals for new development will be located mostly on greenfield sites. If this land were of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the SEA Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective.</p> <p>Overall, the strategies under SG3 have been assessed as having an uncertain effect on SEO 8.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on soil quality as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future infrastructure proposals should seek to make the best use of existing sites and/or be located on brownfield (previously developed) land. Where development on greenfield land is necessary, preference should be given to lower quality agricultural land. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the operation of SG3 strategies to ensure that water services are provided in a timely and cost effective manner will comply with all relevant regulations including, for example, the Biocidal Product Regulation.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Uncertainties</p> <ul style="list-style-type: none"> The location and scale of future proposals is unknown at this stage.
<p>9. Avoid damage to cultural heritage resources resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The enhancement of existing, and development of new, infrastructure arising from the implementation of the strategy to plan for water services infrastructure (Strategy SG3a), the strategy to balance investment for growth in demand with affordability (Strategy SG3b) and the strategy to operate an equitable New Connections Charging Policy (Strategy SG3c) to ensure that water services are provided in a timely and cost effective manner could have adverse effects on cultural heritage assets. Effects may be direct (for example, as a result of the loss of or damage to above or below ground cultural heritage assets during construction) or indirect (for example, where the presence of new above ground infrastructure affects the setting of assets) and could be particularly significant where development would have adverse impacts on designated assets such as National Monuments, Protected Structures or Architectural Conservation Areas. However, until the scale, type and location of future development and the presence/sensitivity or otherwise of cultural heritage assets in their vicinity is known, it is not possible to establish whether Strategies SG3a, SG3b and SG3c are likely to have adverse effects on this objective. Notwithstanding, it is expected that the potential for adverse effects on cultural heritage assets would be identified and, where possible, addressed during the preparation of these strategies, informed (where appropriate) through environmental assessment. Similarly, at the project stage, it is expected that heritage impacts would be considered as part the planning and EIA process (where required).</p> <p>As the location of future infrastructure proposals that may be delivered in relation to Strategies SG3a, SG3b and SG3c are unknown; therefore, the overall effect of strategies under SG3 has been assessed as uncertain at this stage.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on cultural heritage assets as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid locations of cultural heritage value. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of proposals on cultural heritage will be fully considered in the preparation of Strategy SG3a to plan for water services infrastructure, Strategy SG3b to balance investment for growth in demand with affordability and Strategy SG3c to operate an equitable New Connections Charging Policy as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future infrastructure proposals which may be delivered as part of Strategies SG3a, SG3b and SG3c are currently unknown.
<p>10. Avoid damage to designated landscapes resulting from Irish Water's activities</p>	<p>?</p>	<p>Likely Significant Effects</p> <p>The upgrade of existing, and provision of new, infrastructure following the implementation of the Strategies SG3a, SG3b and SG3c to ensure that water services are provided in a timely and cost effective manner may result in adverse landscape impacts during both the construction and operational phases of facilities.</p> <p>During construction, the presence of plant and machinery and HGV movements could have a temporary adverse impact on local landscape character whilst any associated loss of important landscape features such as trees or hedgerow could result in more permanent impacts. Following construction, the presence of new/upgraded above ground infrastructure in the landscape could have a permanent adverse impact on landscape character. Adverse effects</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>on landscape could be significant where works/new development are located within/in close proximity to sensitive or designated landscapes including, for example, National Parks or Areas of Special Amenity.</p> <p>The upgrade of existing, and provision of new, infrastructure could adversely affect visual amenity, particularly where above ground infrastructure is located in close proximity to residential or recreational receptors.</p> <p>It is expected that the potential for adverse effects on landscape and visual amenity would be identified and, where possible, addressed during the preparation of Strategies SG3a, SG3b and SG3c. Similarly, at the project stage, landscape impacts would be considered as part the planning and EIA process (where required). However, the location of works that could follow the adoption of these plans is unknown at this stage and therefore effects on landscape (including visual amenity) are uncertain.</p> <p>Overall, the strategies under SG3 have been assessed as having an uncertain effect on SEO 10. This reflects the potential that the construction and operation of proposals identified in the strategies will have some adverse impact on landscape and/or visual amenity. However, it is recognised that the magnitude of any effects is to an extent uncertain and will be dependent on the number, type, scale and location of future proposals as well as the landscape sensitivity of the receiving environments.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Consider the inclusion of specific wording relating to the avoidance of adverse effects on landscape and visual amenity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). • Where possible, future proposals for the provision of new infrastructure should avoid locations within or in close proximity to designated landscapes or sensitive visual receptors. • At the project stage, construction activity should be screened where possible so as to avoid/minimise adverse landscape/visual impacts. • Where possible, new above ground infrastructure should adopt high quality design principles with landscaping/screening measures utilised to minimise adverse landscape/visual amenity impacts. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that effects of proposals on landscape and visual amenity will be fully considered in the preparation of Strategies SG3a, SG3b and SG3c as well as at the project stage (as appropriate). <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of Strategies SG3a, SG3b and SG3c are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Objective: Invest in Our Future

Table D13 Effects of Strategies under IF1: Asset Management - Manage our Assets and Investments in Accordance with Best Practice Asset Management Principles to deliver a High Quality Secure and Sustainable Service at Lowest Cost

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	+/-	<p>Likely Significant Effects</p> <p>The strategies under IF1 broadly seek to optimise Asset Management within Irish Water to deliver a high quality secure and sustainable service at low cost. Strategy IF1a seeks to develop and implement an Asset Management System in order to optimise the balance between operational, maintenance and capital investment and thus achieve long term cost efficiencies. Long term asset strategies and implementation plans are to be developed under Strategy IF1b to further these efficiencies through rationalisation and interconnection of water supply zones. Lastly, the development of asset standards and improvements in supply chain management are proposed in Strategy IF1c.</p> <p>Strategy IF1b is expected to involve long term asset strategies and implementation plans which may entail construction of new and upgrade of existing infrastructure for rationalisation and interconnection of water supply zones. Associated construction works may result in the permanent loss of habitat (for example, as a result of land take associated with the construction of a new water treatment works) and/or cause temporary disturbance to biodiversity on and off site (for example, where pipeline works cross locations important for biodiversity). Effects on biodiversity could be significant where development affects designated nature conservation sites and/or protected species.</p> <p>It is expected that the potential for adverse effects on biodiversity and ecology of projects resulting from Strategy IF1b would be considered as part of the planning and Environmental Impact Assessment (EIA) process (where required). Notwithstanding, the location of works that could follow the adoption of these plans is unknown at this stage. This aspect of the IF1 strategies is assessed as having a negative effect. Once infrastructure enhancements are operational, a targeted management system for Irish Water's assets would facilitate identification of weak links in the water treatment chain. Achieving a lower cost per unit of treated water means that more water can be treated at the same cost. As a result, the water released into the environment will be of higher quality. The efficient management of Irish Water's assets and continuous improvement of system resilience is therefore expected to have a minor positive effect on aquatic biodiversity.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on biodiversity as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals for the provision of new infrastructure should avoid designated nature conservation sites. Scheme specific mitigation plans may be required at the project stage to ensure that any adverse effects on designated sites are avoided and localised effects on biodiversity minimised. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that effects of infrastructure proposals on biodiversity will be fully considered in the preparation of the strategies under IF1 as well as at the project stage (as appropriate).

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> It is assumed that the operation of strategies under IF1 will comply with all relevant regulations including, for example, the Biocidal Product Regulation. <p>Uncertainties</p> <ul style="list-style-type: none"> The extent and scale of water quality improvements that can be achieved through improved asset management are uncertain at this stage. The number, type and location of future proposals which may be delivered as part of the strategies under IF1 are currently unknown.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	+/-	<p>Likely Significant Effects</p> <p>There is the potential that the construction of schemes identified in the strategies under IF1 could have temporary and localised adverse effects on human health. Adverse effects may in particular include noise disturbance and air quality impacts associated with, for example, the use of plant and HGV movements. Construction activity may also temporarily affect recreational receptors which could have indirect adverse effects on human health (by reducing the opportunities for recreational activities). Whilst the potential for adverse effects on human health will depend on the scale and type of future proposals as well as their location (in respect of the proximity of sensitive receptors and baseline conditions such as air quality), works would be temporary and it is likely that impacts would be managed/mitigated where possible using best practice. In consequence, any adverse effects are not expected to be significant.</p> <p>Efficient Asset Management as advocated under the Strategies IF1a, IF1b and IF1c is expected to achieve long term cost savings that can be passed on to customers. This provides direct benefits to human health by ensuring access to affordable good quality water. A minor positive effect has therefore been determined.</p> <p>Overall, the strategies under IF1 have therefore been assessed as having a mixed positive and negative effect on SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> Consider the inclusion of specific wording relating to the avoidance of adverse effects on human health as a result of the upgrade to/construction of new infrastructure. Alternatively, this commitment could be made as part of any future Sustainability Policy and Sustainability Framework (as proposed under Strategy EN1a of the draft WSSP). Where possible, future proposals should be located so as to minimise the potential for adverse effects on human receptors. <p>Assumptions</p> <ul style="list-style-type: none"> It is assumed that the potential for construction activity to generate adverse effects on human health would be managed/mitigated where possible using best practice. It is assumed that the operation of strategies under IF1 will comply with all relevant regulations including, for example, the Biocidal Product Regulation, Drinking Water Quality Regulations and Quality of Water Intended for Human Consumption Regulations. It is assumed that cost savings through efficient asset management and improvements on standards will be passed on to the water customers. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale and type of future proposals as well as their location is unknown at this stage. The extent and scale at which cost savings can be expected are uncertain at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>During the construction of infrastructure or proposals identified in Strategy IF1b there is the potential for contaminants such as silt, soil, concrete or fuel oil to pollute watercourses, particularly given the expectation that some works are likely to be undertaken in close proximity to or on watercourses. However, it is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, spill containment and emergency response procedures).</p> <p>The strategies under IF1 to optimise Asset Management within Irish Water are expected to contribute to a lower cost per unit of treated water and in turn the ability to treat more water at the same cost. As a result the water released into the environment will be of higher quality. The efficient management of Irish Water's assets and continuous improvement of system resilience is therefore expected to prevent further deterioration of the status of water bodies and therefore have a minor positive effect on aquatic biodiversity overall.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that construction activities would be undertaken in accordance with relevant best practice pollution prevention guidance and that appropriate mitigation would be implemented (such as dust suppression, soil containment and emergency response procedures) to avoid adverse impacts on water quality. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent and scale of water quality improvements that can be achieved through improved asset management are uncertain at this stage.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>The strategies under IF1 do not directly concern flood risk. There is some scope for improvements of flood risk from new assets and resilience to existing assets through a unified approach of asset management. Proposals identified in the strategies under IF1, such as pumping stations to connect water supply zones, could be located in areas of flood risk and/or increase flood risk elsewhere (for example, through any associated increase in impermeable areas resulting in increased surface water runoff).</p> <p>The location of future proposals is currently unknown and in consequence, effects on flood risk are uncertain at this stage. However, it is expected that proposals (where necessary) would be subject to flood risk assessment such that effects would not be significant. Further, the upgrade of existing, and development of new, infrastructure presents an opportunity to enhance the resilience of water infrastructure to future flood risk. In this respect, it is noted that Strategy EN1c of the draft WSSP seeks to ensure the resilience of Irish Water's water services to the impacts of climate change.</p> <p>Whilst the location of future infrastructure proposals that may be delivered through Strategy IF1b is unknown, on balance (and taking into account the mitigation that already exists) the effects of strategies under IF1 have been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Where possible, new (and particularly vulnerable) infrastructure should be located so as to avoid areas of high flood risk. Where infrastructure is located in areas of flood risk, appropriate flood alleviation measures should be implemented. New infrastructure should not increase flood risk of other development located downstream within a catchment. <p>Assumptions</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> It is assumed that proposals (where necessary) would be subject to flood risk assessment. <p>Uncertainties</p> <ul style="list-style-type: none"> The location of any future infrastructure is currently unknown.
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	+/-	<p>Likely Significant Effects</p> <p>Although not specifically mentioned in the IF1 strategies, development of an asset management system (Strategy IF1a), of long term asset strategies (Strategy IF1b) and delivery of continuous improvement (Strategy IF1c) offer the scope to achieve energy savings, which in turn result in reduced emissions to air, including greenhouse gas emissions. It is likely that such savings will be achieved as they contribute to cost savings that are part of the strategies. The more efficient operation of water infrastructure also means an increased resilience to climate change. Although the scale of potential energy savings and associated reductions in emissions are unknown at this stage, a minor positive effect can be expected.</p> <p>At the same time the strategies under IF1 are likely to entail construction of new and upgrade of existing infrastructure, for example under long term asset strategies, e.g. for pumping and new connections between water supply zones. The construction and operation of new infrastructure will result in embodied carbon and will add to the current emissions to air including greenhouse gases. This aspect of the IF1 strategies is therefore assessed as having a negative effect.</p> <p>Overall, a mixed minor positive and minor negative has been determined against SEO 5. This reflects the potential for energy savings and associated reduction in emissions and resilience to climate change, balanced with the increase in emissions and embodied carbon attributed to construction and operation of new infrastructure.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The scale of emission reductions that can be achieved through improved asset management is uncertain at this stage.
<p>6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies</p>	+	<p>Likely Significant Effects</p> <p>Strategies IF1a, IF1b and IF1c concern the provision of improved asset management to deliver water services in a cost effective manner in the long term. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect human health through the provision of safe, affordable drinking water and wastewater disposal. Cost efficiencies on the wastewater treatment side are expected to positively impact on water quality and thus the status of receiving water bodies.</p> <p>Overall Strategies IF1a, IF1b and IF1c have been assessed as having a minor positive effect on SEO 6 which principally reflects the anticipated improvements in asset management and associated cost savings.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> It is assumed that cost savings through efficient asset management and improvements on standards will be passed on to the water customers. <p>Uncertainties</p> <ul style="list-style-type: none"> The extent and scale at which cost savings can be expected are uncertain at this stage.
7. Protect water as an economic resource	0	<p>Likely Significant Effects</p> <p>The strategies under IF1 do not relate specifically to the sustainable use of water and its protection as an economic resource. This has been assessed as having a neutral effect on this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	+/-/?	<p>Likely Significant Effects</p> <p>Strategies IF1a, IF1b and IF1c concern asset management on a strategic level, it is therefore not expected that the provision of infrastructure is a direct consequence of these strategies. However, the strategies could indirectly lead to construction associated with connecting water supply zones, rationalisation measures and implementation of innovative technology. The potential effect on soils is dependent on the individual schemes and their location, which are uncertain at this stage. Should proposals be located predominantly on greenfield sites of high agricultural land quality or peatland then there would be the potential for significant negative effects on this objective, particularly given that the total amount of agricultural land and peatlands in Ireland has decreased since 1990 (see the baseline analysis presented in Appendix C of the SEA Environmental Report for further information on soil quality). Conversely, developments on brownfield sites (for example, existing water treatment works) would be likely to have a positive effect on this objective.</p> <p>The overall effect on SEO 8 has therefore been assessed as uncertain, with the potential for both positive and negative effects.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> The number, type and location of future proposals which may be delivered as part of Asset Management Systems, long term Asset Strategies and the plan to deliver continuous improvement are currently unknown.
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	?	<p>Likely Significant Effects</p> <p>As Strategies IF1a, IF1b and IF1c concern asset management on a strategic level, however the provision of infrastructure could be a consequence of the long term asset strategies and implementation plans of Strategy IF1b. The potential for damage to cultural heritage resources is dependent on the individual</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>schemes and their location, which are uncertain at this stage. The effect on SEO 9 is therefore uncertain.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of Asset Management Systems, long term Asset Strategies and the plan to deliver continuous improvement are currently unknown.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	?	<p>Likely Significant Effects</p> <p>Although Strategies IF1a, IF1b and IF1c concern asset management on a strategic level; the provision of infrastructure could be a consequence of the long term asset strategies and implementation plans of Strategy IF1b. The potential for damage to designated landscapes is dependent on the individual schemes and their location, which are uncertain at this stage. The effect on SEO 10 is therefore uncertain.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The number, type and location of future proposals which may be delivered as part of Asset Management Systems, long term Asset Strategies and the plan to deliver continuous improvement are currently unknown.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D14 Effects of Strategies under IF2: Balanced Sustainable Investment - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	+	<p>Likely Significant Effects</p> <p>The strategies under IF2 aim to achieve balanced sustainable investment by investing in Irish Water assets while maintaining a sustainable balance between the interests of customers, the environment and the need to support the economic development and growth of the country. Irish Water seeks to collaborate with both customers (Strategy IF2a) to develop a balanced picture of customer concerns, issues and priorities, and with key stakeholders, including CER, EPA, HSE, DECLG, and regional and local authorities (Strategy IF2b), to achieve optimum investment outcomes for customers, the environment and the national economy. Strategy IF2c concerns the development and application of transparent investment criteria to determine investment priorities. Irish Water hereby aims to strike the balance between the interest of customers, the environment and the need to support the economic development and growth of the country as well as regional development.</p> <p>It is noted that the Environmental Protection Agency (EPA) is named as a key stakeholder in Strategy IF2b and the environment is set on par with customers and the economy when discussing optimum investment outcomes (Strategy IF2c), resulting in minor positive effects from these two strategies. However, it is recognised that, when faced with prioritising investment to address clean water issues (e.g. to address boil notices) or wastewater issues (to comply with UWWTD) in the short term, there is the potential for Irish Water to determine in favour of human health and therefore delay investment in strategies that would benefit biodiversity. Nevertheless overall a positive effect is determined on biodiversity.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	+	<p>Likely Significant Effects</p> <p>Stakeholder engagement, especially with household customers, as advocated under Strategy IF2a, will aim to take into account customers' views when making investment decisions. The topic of safe drinking water ensuring human health is expected to be important to both household and business customers. It is therefore assumed that safe drinking water would be prioritised and result in associated health benefits, scoring a minor positive effect on SEO 2. Strategy IF2c makes customer interests one of three major considerations alongside the environment and the need to support economic growth when making investment decisions. A minor positive score is awarded for Strategy IF2c.</p> <p>Overall a minor positive effect has been determined against SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>The strategies under IF2b to engage all stakeholders in investment decisions (including the EPA) are expected to give a voice to environmental concerns. This strengthens the case for preventing further deterioration of the status of water bodies resulting in a minor positive effect on the WFD objective. At the same time, environmental issues will be weighed against economic and customer satisfaction requirements (Strategy IF2c). Therefore on balance a minor positive effect has been determined on SEO 3.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>The strategies under IF2 do not directly concern flood risk and are not expected to have any influence on how flood risk is dealt with. A neutral effect has been determined against SEO 4.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change	0	<p>Likely Significant Effects</p> <p>The strategies under IF2 do not directly contribute to climate change and emissions to air. It can be expected that energy efficiency would be part of any investment strategy, driven by the associated cost savings. Notwithstanding, the effect is assumed to be small and therefore overall a neutral effect has been determined against SEO 5.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	+	<p>Likely Significant Effects</p> <p>Stakeholder engagement, especially with household customers, as advocated under Strategy IF2b, will aim to take into account customers' views when making investment decisions. It is expected that the provision of safe drinking water would be a priority for both household and business customers. Addressing issues with drinking water (e.g. areas with active boil notices) would result in health benefits. A minor positive effect has therefore been determined against SEO 2 for Strategy IF2b.</p> <p>Strategies IF2a, IF2b and IF2c concern the engagement of customers and stakeholders in the decision for future investments. As highlighted under the assessment of these strategies against SEO 1, SEO 2 and SEO 3, it is anticipated that this will help to protect human health through satisfying customers' expectations (Strategy IF2a). Taking into account environmental concerns when making investment decisions is expected to positively impact on water quality and thus the status of receiving water bodies (Strategies IF2b and IF2c).</p> <p>Overall the strategies under IF2 have been assessed as having a minor positive effect on SEO 6 which principally reflects the benefits to household customers and general consideration of environmental needs in decision making for future investment.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
7. Protect water as an economic resource	++	<p>Likely Significant Effects</p> <p>The strategies under IF2 are directly concerned with directing future investment in a way that results in maximum benefits to Irish Water's stakeholders, which include household, commercial and industrial customers, the environment and economic needs of the country. It recognises the imbalance between the need of investment and the available capital funding. The engagement with stakeholders (Strategies IF2a and IF2b) as well as the application of transparent investment prioritisation criteria (Strategy IF2c) is expected to contribute to determining the best use of the available financial resources, thus</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>ensuring that the provision of water services is protected as the economic resource it is. All three strategies have therefore been found to contribute significantly to the protection of water as an economic resource.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	0	<p>Likely Significant Effects</p> <p>Strategies IF2a, IF2b and IF2c concern stakeholder engagement. The environment is named as a key concern, but it is not expected that there would be direct consequence on soils from these strategies. The effect on soils has therefore been assessed as neutral.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>Strategies IF2a, IF2b and IF2c concern stakeholder engagement. No damage to cultural heritage resources are expected as a consequence from these strategies. The effect on SEO 9 has therefore been assessed as neutral.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>Strategies IF2a, IF2b and IF2c concern stakeholder engagement. The environment is named as a key concern, but it is not expected that there would be direct consequences on designated landscapes from these strategies. The effect on landscapes has therefore been assessed as neutral.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D15 Effects of Strategies under IF3: Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	+	<p>Likely Significant Effects</p> <p>The strategies under IF3 seek to establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes for our customers, the environment and the national economy. Strategy IF3a aims to transform the water industry in Ireland to an efficient water utility model within a regulated framework. This is to ensure that Irish Water can deliver the capital investment needed in order to achieve the required outcomes for the company's customers, the environment and the national economy. Strategy IF3b entails working with regulators to balance affordability with service standards taking into account regulatory requirements. Strategy IF3c provides for Irish Water's commitments to raise public awareness of the value of water and achievements delivered.</p> <p>A working funding model is the basis for any investment into Irish Water's assets and operations. It is fundamental that expenditure is compared to the expected outcome to achieve the maximum benefits for the stakeholders, including the environment. Due to the indirect positive effect Strategy IF3a has on the environment and biodiversity, a minor positive effect against SEO1 has been determined. Strategy IF3c may also result in minor indirect positive effects by raising awareness of the value of water, which may result in improved consumer water efficiency, reduced abstraction requirements and potential benefits to habitats.</p> <p>Strategy IF3b focuses on affordability to customers and achieving service standards and has no effect on biodiversity. Overall, a minor positive effect is scored against SEO 1.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	+	<p>Likely Significant Effects</p> <p>The sustainable funding model planned under Strategies IF3a, IF3b and IF3c is considered a pre-requisite to achieve water services of a good standard for household customers. As highlighted in the baseline analysis presented in Appendix C of the Environmental Report, while the quality of drinking water has in general been improving in Ireland, there have still been short term declines which can pose risks to health. Currently, around 20,000 customers are affected by boil water notices in Ireland as a result of microbiological contamination of the water supplies. Investment in treatment and supply infrastructure is urgently needed. The funding model propagated under Strategies IF3a, IF3b and IF3c is expected to enable the necessary capital investment. A minor positive effect is therefore scored against the human health objective.</p> <p>Water affordability, as advocated under Strategy IF3b, provides direct benefits to human health by ensuring cost is no barrier to accessing good quality water. However, until the founding of Irish Water as a national water company, the costs of water services were not transparent to customers (as they were included in rates, household charges and taxes). As a consequence, customers have viewed the introduction of any water charges as an additional (and in some cases unwanted) burden. Nevertheless, Strategy IF3b aims to maintain affordability of water services. A minor positive effect for the Strategy IF3b has therefore been determined.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Overall, a minor positive effect is scored against SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>Strategies IF3a, IF3b and IF3c, which will contribute to developing a sustainable funding model for Irish Water's operations, take into account environmental needs under Strategy IF3a and are expected to make the associated provisions. These will contribute to prevent the deterioration of the status of water bodies and therefore have a minor positive effect on aquatic biodiversity. Strategy IF3c may also result in minor indirect positive effects by raising awareness of the value of water, which may result in improved consumer water efficiency, reduced abstraction requirements and potential benefits to the quality of water bodies.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent and scale of water quality improvements that can be achieved through a sustainable funding model are uncertain at this stage.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>The strategies under IF3 do not directly concern flood risk and are not expected to have any influence on how flood risk is dealt with. A neutral effect has therefore been determined against SEO 4.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change	0	<p>Likely Significant Effects</p> <p>The strategies under IF3 do not directly contribute to climate change and emissions to air. It can be expected that energy efficiency would be part of any funding model, driven by the associated cost savings. There is also the potential for minor reductions in energy use resulting from reduced abstraction and water treatment, following improved public awareness of the value of water. Notwithstanding, the effect is assumed to be small and therefore overall a neutral effect has been determined against SEO 5.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The scale of emission reductions that can be achieved through the funding model is uncertain at this stage.
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	+	<p>Likely Significant Effects</p> <p>Strategies IF3a, IF3b and IF3c concern the provision of a sustainable funding model to deliver water services in a cost effective manner in the long term. As highlighted under the assessment of these strategies against SEO 2, capital investment is urgently needed to improve drinking water standards for many customers in Ireland. Strategy IF3a advocates the required funding model to enable these investments. A minor positive effect is therefore expected from this strategy on human health. The funding model will also take into account environmental needs and is expected to make the associated provisions. These will contribute to prevent the deterioration of the status of water bodies and therefore have a minor positive effect on water body status.</p> <p>Strategy IF3b is concerned with affordability for water customers, and as such has no effect on WFD water bodies. Although there were no direct and transparent water charges in Ireland for household customers before the founding of Irish Water (as the national water company), in the long term the proposed affordability aspect of the funding model is expected to ensure cost is no barrier to accessing good quality water. This will be supported by raising public awareness of the value of water as advocated under Strategy IF3c. Therefore a minor positive effect is expected on human health from Strategy IF3b.</p> <p>Overall the strategies under IF3 have been assessed as having a minor positive effect on SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
7. Protect water as an economic resource	+	<p>Likely Significant Effects</p> <p>The strategies under IF3 are directly concerned with establishing a funding model for Irish Water's operations, Strategy IF3b places affordability of water services at the heart of the funding model and Strategy IF3c advocates raising public awareness of the value of water. In carefully considering how Irish Water can deliver the required capital investment in order to achieve the required outcomes for its customers, the environment and the national economy,</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>the company demonstrates the economic value of water service provision. The strategies have therefore been afforded minor positive effects against SEO 7.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	0	<p>Likely Significant Effects</p> <p>Strategies IF3a, IF3b and IF3c concern the Irish Water Funding Model. It is not expected that the provision of infrastructure is a direct consequence of these strategies. The effect on soils has therefore been assessed as neutral.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>Strategies IF3a, IF3b and IF3c concern the Irish Water Funding Model. It is not expected that the provision of infrastructure is a direct consequence of these strategies. Damage to cultural heritage resources is therefore not expected and a neutral effect has been assessed.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	0	<p>Likely Significant Effects</p> <p>Strategies IF3a, IF3b and IF3c concern the Irish Water Funding Model. It is not expected that the provision of infrastructure is a direct consequence of these strategies. Damage to designated landscapes is therefore not expected and a neutral effect has been assessed.</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Table D16 Effects of Strategies under IF4: Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>1. Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities</p>	+	<p>Likely Significant Effects</p> <p>Aim IF4 contains three strategies, all of which are concerned with promoting research and innovative technical solutions so as to drive efficiencies. To achieve this aim Irish Water wants to actively pursue research and development in water services and track opportunities to develop and adopt new technologies, as advocated under Strategy IF4a. To facilitate this, the company seeks to engage effectively with universities, Institutes of Further Education, colleges and industry (Strategy IF4b). A knowledge management capability and an implementation process are to be developed under Strategy IF4c to maximise the delivery of beneficial innovative solutions and customer value options.</p> <p>These strategies do not directly concern the natural environment, although some benefits can be expected for biodiversity through the use of innovative technology in treatment and resulting improvements in water quality. A minor positive effect has been determined against SEO 1.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent and scale of water quality improvements that can be achieved through innovative technology are uncertain at this stage.
<p>2. Protect and reduce risk to human health in undertaking water services</p>	+	<p>Likely Significant Effects</p> <p>The research and development Strategy IF4a to promote the use of innovative technology and the development of knowledge management capability and implementation processes to maximise delivery of beneficial innovative solutions and customer value options under strategy IF4c are expected to drive cost efficiencies in Irish Water's operations. The resulting increased affordability of water services benefits human health by ensuring cost is no barrier to accessing good quality water. A minor positive effect has therefore been determined against SEO 2.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that cost efficiencies achieved through technologies promoted as a consequence of these strategies will be passed on to the consumer. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
<p>3. Prevent deterioration of the status of water bodies with regard to quality and quantity due to Irish Water activities and contribute towards the improvement of water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the Water Framework Directive</p>	+	<p>Likely Significant Effects</p> <p>Strategies IF4a, IF4b and IF4c promote research and innovative technical solutions so as to drive efficiencies and are not expected to have direct effects on the status of water bodies in Ireland. Some benefits can be expected through the use of innovative technology, for example in the treatment quality of water that is returned to the environment. A minor positive effect has therefore been scored against this objective.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • The extent and scale of water quality improvements that can be achieved through innovative technology are uncertain at this stage.
<p>4. Minimise increases in flood risk resulting from Irish Water's activities</p>	0	<p>Likely Significant Effects</p> <p>Strategies IF4a, IF4b and IF4c do not directly concern flood risk and are not expected to have any influence on how flood risk is dealt with. A neutral effect has been determined against SEO 4.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None
<p>5. Minimise contributions to climate change and emissions to air (including greenhouse gas emissions) as a result of Irish Water activities and ensure the resilience of water supply and treatment infrastructure to the effects of climate change</p>	+	<p>Likely Significant Effects</p> <p>Strategies IF4a, IF4b and IF4c do not directly contribute to climate change and emissions to air. Energy efficiencies might be achieved through the use of new, innovative technology. A minor positive effect has been determined against SEO 5.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • It is assumed that the promotion of innovative technical solutions will lead to some energy efficiencies in the delivery of water services. <p>Uncertainties</p> <ul style="list-style-type: none"> • The scale of emission reductions that can be achieved through the use of innovative technology is uncertain at this stage.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
6. Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies	+	<p>Likely Significant Effects</p> <p>Strategy IF4a consists of a research and development strategy to promote the use of innovative technology, while strategy IF4c promotes the development of Irish Water's knowledge management capability and implementation processes to maximise delivery of beneficial innovative solutions and customer value options. As highlighted under the assessment of these strategies against SEO 2, it is anticipated that these strategies will help to protect human health through the provision of safe, affordable drinking water and wastewater disposal at affordable prices, resulting in a minor positive effect on human health.</p> <p>While the strategies under IF4 have no direct effects on the status of water bodies in Ireland, some benefits can be expected through the use of innovative technology as identified in SEO 3. A minor positive effect was scored.</p> <p>Overall the strategies under IF4 have been assessed as having a minor positive effect on SEO 6.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
7. Protect water as an economic resource	+	<p>Likely Significant Effects</p> <p>The strategies under IF4 are directly concerned with pursuing research and development. This is expected to lead to cost benefits in the provision of water services (Strategy IF4a), while ensuring opportunities for innovation are fully exploited (Strategy IF4b) and that beneficial solutions and customer value options are maximised (Strategy IF4c). By investing in their knowledge management capability and engaging with academia and industry, Irish Water demonstrates their commitment to protecting water as an economic resource. The strategies have therefore been afforded minor positive effects against SEO 7.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • None. <p>Assumptions</p> <ul style="list-style-type: none"> • None. <p>Uncertainties</p> <ul style="list-style-type: none"> • None.
8. Avoid conflicts with, and contribute towards, where possible, the appropriate management of soils	0	<p>Likely Significant Effects</p> <p>Strategies IF4a, IF4b and IF4c concern the research and development in Irish Water with the aim of advancing technical solutions to drive efficiencies. It is not expected that the provision of infrastructure is a direct consequence of these strategies, and impacts on soils through other routes are unlikely. The effect on soils has therefore been assessed as neutral.</p> <p>Mitigation</p>

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Strategic Environmental Objective	Effect of the draft strategies	Commentary on effects*
		<ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
9. Avoid damage to cultural heritage resources resulting from Irish Water's activities	0	<p>Likely Significant Effects Strategies IF4a, IF4b and IF4c concern research and development and are therefore not expected to result in damage to cultural heritage assets.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.
10. Avoid damage to designated landscapes resulting from Irish Water's activities	0	<p>Likely Significant Effects Strategies IF4a, IF4b and IF4c concern research and development and are therefore not expected to result in adverse landscape and visual impacts.</p> <p>Mitigation</p> <ul style="list-style-type: none"> None. <p>Assumptions</p> <ul style="list-style-type: none"> None. <p>Uncertainties</p> <ul style="list-style-type: none"> None.

*Consideration of the likely significant effects includes short, medium and long-term effects, permanent and temporary effects, positive and negative effects, as appropriate.

Appendix E

Larger Urban Areas Not Meeting Urban Waste Water Treatment Directive Standards (2013)

Table E1 List of larger urban areas identified by the EPA which did not meet Directive standards in 2013 (as per the EPA report “Focus on Urban Waste Water Treatment 2013”)

Reg. No	Urban Area	County	Reg. No	Urban Area	County
D0085-01	Bailieborough	Cavan	D0159-01	Callan	Kilkenny
D0020-01	Cavan	Cavan	D0018-01	Kilkenny	Kilkenny
D0045-01	Shannon Town	Clare	D0001-01	Portlaoise	Laois
D0044-01	Carrigtohill	Cork	D0288-01	Rathdowney	Laois
D0204-01	Charleville	Cork	D0156-01	Abbeyleix	Laois
D0051-01	Clonakilty	Cork	D0153-01	Mountrath	Laois
D0054-01	Cobh	Cork	D0106-01	Kilmallock	Limerick
D0200-01	Rathcormac	Cork	D0019-01	Castletroy	Limerick
D0332-01	Millstreet	Cork	D0053-01	Dundalk	Louth
D0129-01	Passage-Monkstown	Cork	D0150-01	Manorhamilton	Leitrim
D0057-01	Ringaskiddy-Crosshaven-Carrigaline	Cork	D0131-01	Enfield	Meath
D0139-01	Youghal	Cork	D0059-01	Navan	Meath
D0033-01	Cork City	Cork City	D0262-01	Stamullen	Meath
D0130-01	Bundoran	Donegal	D0206-01	Clones	Monaghan
D0344-01	Convoy	Donegal	D0025-01	Roscrea	North Tipperary (Impact on Offaly)
D0011-01	Killybegs	Donegal	D0042-01	Monksland	Roscommon
D0034-01	Greater Dublin (Ringsend)	Dublin City	D0121-01	Boyle	Roscommon
D0198-01	Clifden	Galway	D0092-01	Tubbercurry	Sligo
D0194-01	Loughrea	Galway	D0006-01	Arklow	Wicklow

