

November 2019



Irish Water

Investment Plan 2020 to 2024

Updated Investment Plan for CRU Review

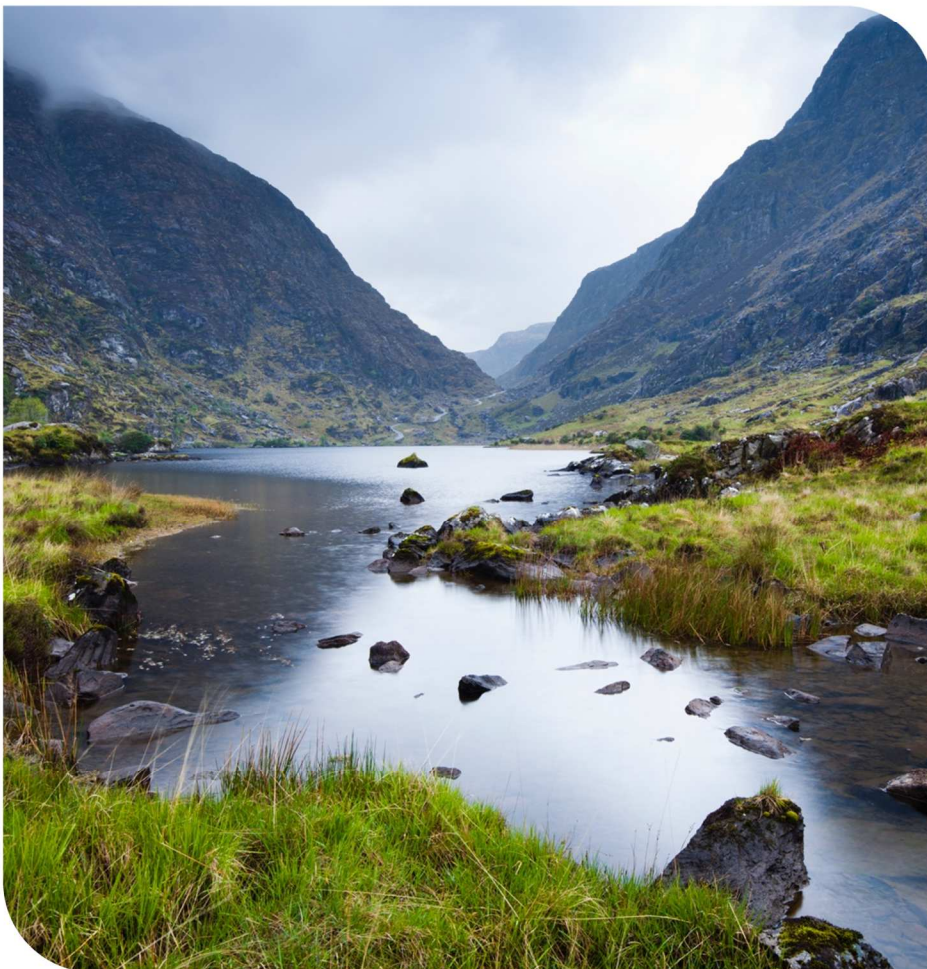


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1 Executive Summary

Overview

Irish Water (IW) aims to deliver improvements to water services throughout Ireland where they are needed most. Our primary function is to provide clean drinking water to customers and to treat and return wastewater safely to the environment. In providing these services we play a central role in enabling economic growth, protecting both the environment and the health and safety of our customers and the public.

This document is the IW Investment Plan 2020 to 2024 and has been prepared for submission to the Commission for Regulation of Utilities (CRU) as part of the Regulatory Control Period (RC3) 2020 to 2024.

A glossary of terms and abbreviations used in the document is included in Appendix 1.

Setting the context

IW's Investment Plan is a capital investment portfolio over a five year period. For ease of understanding we have prepared the report in individual sections. In Section 2 of this report we set out the legislative and regulatory framework for the preparation of the five-year Investment Plan.

In Section 3 we provide an overview of the plans and other documents that underpin the investment planning process and the preparation of the Investment Plan.

Key documents that influence the Investment Plan are:-

- The Water Services Policy Statement (WSPS), published by the Department of Housing, Planning and Local Government (DHPLG or Department) on 21 May 2018;
- The River Basin Management Plan (RBMP) for Ireland 2018 to 2021 published by the DHPLG in April 2018;
- The Water Services Strategic Plan (WSSP) published by IW in 2015.

The WSPS is a high level statement of Government policy which identifies key policy objectives for the delivery of water and wastewater services in Ireland over the period to 2025. There are three key themes identified in the WSPS:-

- **Quality** – Improving compliance with public health and environmental standards.
- **Conservation** – Prioritising resource management, abstraction control source protection, tackling leakage and encouraging behavioural change.
- **Future Proofing** – Ensuring water services investment decisions are aligned with the strategic aims of national planning and climate change policies.

As set out in legislation, IW has prepared a Strategic Funding Plan (SFP) which lays out costs, both operational and capital associated with the arrangements and measures that we propose to make to implement the policy objectives of the WSPS. The SFP was approved by the Minister for Housing, Planning and Local Government on 7 November 2018.

The RBMP sets out and seeks to implement supporting measures to improve water quality in over 70 water bodies on a prioritised basis.

The WSSP sets out the objectives of IW for the provision of water services over a period of 25 years and provides strategic direction to the preparation of Investment Plans during this time.

Other plans and programmes which have influenced the Investment Plan are also outlined in Section 3, including the National Planning Framework (NPF) to 2040 and National Development Plan (NDP) (for the period 2018 to 2027).

Consultation with our stakeholders

In Section 4 we outline the two stage consultation process that we have followed in the preparation of this Investment Plan. Stage 1 consultation was carried out with statutory consultees in March 2018. A summary of feedback received is included in Appendix 2A. The Stage 2 Consultation was carried out in July 2018 with a broader group of stakeholders on the Draft Investment Plan and feedback is summarised in Appendix 2B.

Investment Planning

Section 5 includes a description of our Service Measure Framework and the ten step methodology we have followed in preparing this Investment Plan. We have endeavoured to optimise investment decisions by prioritising the best possible service improvements, while maximising value-for-money.

Aligning our Plan to the WSPS Themes

This Investment Plan is in line with the Government's policy objectives as set out in the WSPS and RBMP and our strategic objectives as set out in the WSSP.

Section 6 of this document highlights the alignment between the Government's Policy Objectives and IW's Strategic Objectives for the delivery of water services in Ireland and how these are translated and grouped into Work Programmes for delivery.

A summary of the WSPS Themes and their alignment to IW's WSSP Strategic Objectives is shown in Table E.1.

We are continuing to invest in and prioritise the most urgently needed improvements in drinking water quality, leakage reduction, water availability, wastewater compliance, efficiencies and customer service.

Sections 7 to 9 of this plan set out our approach to how each WSPS policy theme is addressed and what each related Work Programme is targeted to achieve in the RC3 period 2020 to 2024.

Our Proposed Investment Portfolio

Section 10 of this document defines the Investment Plan against expenditure categories. All financial figures shown in the Investment Plan are shown in 2017 monies. The proposed Investment Portfolio by WSPS Policy Theme and WSSP Strategic Objective is also shown in Table E.1 below.

The proposed committed outcomes shown in Table E.2 overleaf represent our targets at the point in time corresponding to submission of the Investment Plan to the CRU.

WSPS Theme	WSSP Objective	2020 to 2024 €m's
Quality	Ensuring a Safe and Reliable Water Supply	698
	Provide Effective Management of Wastewater	1,687
Conservation	Ensuring a Safe and Reliable Water Supply	452
	Protect and Enhance the Environment	51
Future Proofing	Support Social and Economic Growth	637
	Greater Dublin Drainage Project	410
	Ensure a Safe and Reliable Water Supply	192
	Water Supply Project - Eastern and Midlands Region	293
	Invest in our Future	412
Total for Investment Plan		4,832

Table E.1 – Investment Portfolio by WSPS Policy Theme

Our Plan for Delivery

In tandem with the review process undertaken by the CRU for RC3, IW will commence a process of planning the delivery of the Investment Plan 2020-2024. This will validate the timelines, outputs and outcomes to be achieved. This validation process will take into account issues such as the supply chain capacity, design and procurement approaches, industry transformation initiatives and other resource constraints in the achievement of the targets and objectives identified in the Investment Plan.

It will also take into account other strategic documents such as the WSPS and the WSSP. This process is highlighted in Section 11 of this document.

Our Proposed Committed Outcomes

WSPS Theme	Key Metric	Unit	2024 Target
Quality	Reduction in risk of microbiological non-compliance	Reduction in the number of properties at risk	562,000
	Reduction in risk of THM non-compliance	Reduction in the number of properties at risk	132,000
	Compliance with lead standards	Number of lead services replaced	13,200
	Water Supply Zones (WSZ) on RAL	Number of WSZs remaining on RAL	2
	Agglomerations with no wastewater treatment	Number of agglomerations (outstanding)	2 (of 50)
	UWWTD Compliance (ECJ)	Number of agglomerations (outstanding)	2 (of 31)
	River Basin Management Plan Projects completed	Number of projects (completed)	207 (of 255)
Conservation	Net water savings in water supply network	Net water savings (MLD saved) over period 2020 to 2024	176
	Energy Efficiency	Reduction in energy consumption (GWh pa)	22
Future Proofing	Drinking water treatment capacity	Additional capacity provided (MLD)	46
	Wastewater treatment capacity	Additional capacity provided (PE)	1.2m

Table E2 – Proposed committed Outcomes for RC3 Investment Plan 2020 to 2024

Outputs Monitoring Group

Section 11 also highlights the internal and external monitoring of our delivery of the Investment Plan. IW will report progress on the delivery of our Investment Plan outcomes to the Minister on a quarterly basis through the Outputs Monitoring Group which includes key stakeholders (DHPLG, EPA, CRU and NewERA).

This group will agree a detailed set of metrics with which to track the delivery of our Strategic Funding Plan and Investment Plan outcomes over the RC3 period (2020 to 2024). A proposed set of Outcomes for consideration are shown in Table E.2.

Risks to Delivery

The successful delivery of our Investment Plan is subject to risks arising from multiple sources. Emerging needs, changes in the regulatory and policy landscape, financial and economic constraints may involve changes to our investment priorities and impact on the delivery of our committed outcomes. A change management process to provide governance of change during delivery will be agreed with the Outputs Monitoring Group.

Based on recent evidence, we also anticipate that construction inflation will exceed HICP index number over the course of RC3. The Society of Chartered Surveyors Ireland (SCSI) indicated that construction tender prices increased by 6.2% in 2017, with a further rise of 7% projected for 2018. This level of inflation is being driven by a significant uplift in construction activity and constraints on the availability of construction labour. Similar to any other entity managing a significant investment programme, IW is subject to these market pressures. The elevated rate of inflation represents a risk to the delivery of IW's investment programme and related outcomes.

2 Introduction

A long term investment perspective is required in order to strategically address the many deficiencies in IW's asset base. These deficiencies will take a number of investment cycles to rectify. IW's Investment Plan is our capital budgetary plan for the five year period from 2020 to 2024 (inclusive). It will set out where we prioritise investment to deliver the most urgently needed improvements in drinking water quality, leakage reduction, water availability, wastewater compliance, efficiencies and customer service.

This document outlines the projects and programmes of investment to meet these needs and forms the Investment Plan for submission to the CRU as part of RC3.

A glossary of terms and abbreviations used in the document is included in Appendix 1.

2.1 Purpose of the Investment Plan

The purpose of the Investment Plan is to set out the investment required in order to deliver on the strategic objectives identified in the Government's WSPS, IW's WSSP, the SFP and other key policy and strategic plans such as the River Basin Management Plan, the National Planning Framework and the National Adaptation Framework.

IW is required to prepare an Investment Plan under Section 34 of the Water Services (No. 2) Act 2013 which defines an investment plan as follows:

“An investment plan shall set out and particularise the investment in water services infrastructure that Irish Water considers necessary for the effective performance by it of its functions”.

The Investment Plan is one of a suite of documents which will be submitted to the CRU as part of the revenue control process RC3.

2.2 Our Legal Context

IW works within the legal context of the Water Services Acts 2007 to 2017. The following are particularly relevant to the preparation of our Investment Plan:

- The **Water Services (No. 2) Act 2013** sets out the functions and powers of the CRU as the economic regulator of IW. The making of an Investment Plan by IW is addressed under Section 34 of the Act.
- The **Water Services Act 2017** provides for a new approach to the funding of domestic water services. It includes the preparation of a WSPS by the Minister for Housing, Planning and Local Government and a SFP by IW.

2.3 Our Regulatory Framework

IW is regulated by the CRU as our independent economic regulator.¹

IW must submit an Investment Plan to the CRU. In preparing the Investment Plan for submission we must also take into account the CRU document, “Advice to the Minister on the Economic Regulatory Framework for the public water services sector in Ireland”, Reference CER/14/076, issued on 31 March 2014.

2.4 Our Previous Investment Plans

To date, IW has developed two Investment Plans.

- The first Investment Plan represented the establishment of IW and the transition of existing plans from the Local Authorities who delivered capital programmes that were overseen and largely funded by the Department of Environment, Community and Local Government (DECLG)². It covered the first revenue control period to the end of December 2016 under Interim Revenue Control 1 (IRC1), determined by the CRU paper (CER/14/746).
- The second Investment Plan represented the transition from bespoke LA initiated schemes to projects and programmes initiated by IW to achieve the objectives and targets under the WSSP. The second IW Investment Plan 2017 to 2021 was a five year plan and set outcomes and targets to be achieved by both 2018 and 2021 to meet the strategic objectives set out in the WSSP. This plan was part of our submission to the CRU under Interim Revenue Control 2 (IRC2) which covered the period January 2017 to December 2018. (Later extended to December 2019. This was determined by CRU Paper CER/16/342)³.

2.5 Water Investment to Q3 2018

Since 2014, IW has invested c.€2.6 billion in water services infrastructure. This has greatly improved both service levels to customers and the environment. Achievements to date include;

- Removal of Boil Water Notices for over 20,000 people that had been in place in 2014 for greater than 200 days;
- Removal of over 60,000 population from a Boil Water Notice that had been in place for over 30 days;
- Gross leakage reduction of 163 Ml/day at the end of September 2018;

¹ The Commission for Energy Regulation changed its name to the Commission for Regulation of Utilities on 2 October 2017.

² DECLG, the Department of Environment, Community and Local Government was renamed as the Department of Housing, Planning, Community and Local Government with effect from 23 July, 2016 and subsequently renamed as the Department of Housing, Planning and Local Government with effect from 1 August, 2017.

³ The CRU has subsequently extended the current revenue control (IRC2) by one year, so that it covers the period from 2017 to 2019. This means that the next revenue control (RC3) will start from January 2020 (Information Paper Reference CRU/17/332).

-
- Completion of work at 144 supplies on the EPA's Remedial Action List (RAL) at end of September 2018;
 - Removal of 105 schemes from the Priority Areas List (PAL) for wastewater since 2015⁴;
 - Commissioning of 39 new/upgraded water treatment plants;
 - Provision of wastewater treatment at 12 agglomerations previously discharging raw sewage;
 - Commissioning of 90 new/upgraded wastewater treatment plants; and
 - Delivery of nearly 1,400kms of new or rehabilitated watermains.

2.6 This Regulatory Period (RC3)

As per the CRU Information Paper CRU/17/332, the Investment Plan for the next regulatory period will be five years, 2020 to 2024 inclusive.

2.7 Updating the Investment Plan

IW's RC3 programme of c.€5.2bn capital investment represents the first five-year portfolio developed by IW and aligns with the Strategic Funding Plan (SFP) limits. This investment, across network and non-network assets, is guided by the overall framework provided in the Government's Water Services Policy Statement (WSPS) and IW's Water Services Strategic Plan (WSSP). The delivery of the RC3 Investment portfolio will be a key enabler of national policy objectives for water and wastewater services across the three WSPS themes of Quality, Conservation, and Future Proofing.

As with IRC1 and IRC2, the RC3 investment plan will be a dynamic portfolio of projects and programmes which will be monitored and reviewed by both IW and other stakeholders over the course of the five year period. This will ensure that it:

- continues to reflect the most urgent investment needs;
- captures any required scope changes to projects or programmes;
- responds to any emerging policy requirements; and
- takes account of any scheduling changes and revised scope and costings, as each programme and project moves from conceptual design to detailed planning and construction.

In managing the portfolio, IW will continue to prioritise the delivery of committed outcomes and outputs within the SFP funding constraints. IW's original RC3 Investment Plan was submitted to the CRU in November 2018. The plan submitted in November 2018 was prepared using a data baseline of Q1 2018, meaning that all assumptions concerning scope, costs and delivery schedule were dated end March 2018. The outcomes and outputs identified in the RC3 submission were also projections based on the March 2018 data.

As projects and programmes progressed in 2018 and into 2019, IW needed to update the portfolio to take account of statutory planning issues, land issues, procurement and

⁴ PAL is only in place with the EPA since 2015.

supply chain constraints, emerging investment needs, and project scope development. These updates have resulted in changes to the RC3 outcomes and outputs from those submitted to CRU in November 2018. However we will remain focused on achieving the outcomes and outputs listed in our RC3 consultation response document and this revised Investment Plan (or equivalent as a result of changes due to policy, environmental, emerging needs, planning and delivery issues).

3 Context and Background

3.1 Water Services Policy Statement (WSPS)

The Water Services Policy Statement (2018 - 2025) was published by the Department of Housing, Planning and Local Government on 21 May 2018, as required under the Water Services Act 2017.

It identifies high level objectives and priorities for the delivery of water and wastewater services over the period to 2025. It was prepared in line with the Water Services Acts to give clear direction to strategic planning and decision making on water and wastewater services in Ireland.

The principles, themes and specific policy objectives identified in the Government's WSPS are reflected in IW's Strategic Funding Plan (SFP). This is to be prepared and submitted to the Minister for Housing, Planning and Local Government. It was approved by the Minister on 7 November 2018. The SFP outlines how IW proposes to implement the objectives of its Water Services Strategic Plan. The SFP also outlines costs (operational and capital expenditure), and expected income.

This Investment Plan (2020 to 2024) reflects the capital expenditure elements of the SFP.

The WSPS identifies policy objectives set across the three **thematic areas** of:-

- Quality;
- Conservation; and
- Future Proofing.

The themes and policy objectives in the WSPS are seen as complementary to the strategic objectives that were set out in IW's Water Services Strategic Plan in 2015, which were:

- 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; and,
- Invest in our Future.

The themes and high level priority objectives in the WSPS are set out in Tables 3.1a to 3.1c. These are also aligned to IW's strategic objectives.

WSPS Theme of Quality – Priority Objectives	WSSP Strategic Objectives
Promote drinking water source protection for public drinking water supplies and undertake some 350 source risk assessments by the end of 2021 as set out in RBMP 2018-2021.	Ensure a Safe and Reliable Water Supply
Take the necessary corrective action to ensure appropriately treated, safe and reliable drinking water and eliminate any risk to a drinking water supply on the EPA Remedial Action List.	
Provide for on-going implementation of the National Lead Strategy to mitigate the health effects of lead in drinking water.	
Compliance with the requirements of UWWTD for qualifying urban areas.	Prove Effective Management of Wastewater
Protection of high status waters, designated shellfish and bathing waters and support improvements in water quality as set out in RBMP 2018-2021.	
Prioritise improvements in urban waste water collection systems to address growth and economic development, ensure continued environmental compliance and deliver water quality improvements identified in RBMP 2018-2021.	

Table 3.1a –WSPS Theme – Quality Priority Objectives and WSSP Strategic Objectives

WSPS Theme of Conservation – Priority Objectives	WSSP Strategic Objectives
Take a proactive approach in promoting awareness of the importance of water conservation in Ireland.	Ensure a Safe and Reliable Water Supply
Implement the necessary programmes and interventions to promote the efficient and sustainable use of water in order to achieve as a first step the leakage reduction targets identified in RBMP 2018-2021 with the ultimate aim of reducing leakage to sustainable economic levels.	
Completion of IW’s Water Resource Plan as a key cross-cutting element in ensuring water resource sustainability.	
Plan for future climate change challenges and contribute to the development of the National Adaptation Framework under the Climate Action and Low Carbon Development Act 2015 and Sectoral Adaptation Plans required by September 2019.	Protect and Enhance the Environment

Table 3.1b –WSPS Theme – Conservation Priority Objectives and WSSP Strategic Objectives

WSPS Theme of Future Proofing – Priority Objectives	WSSP Strategic Objectives
Ensure that growth in the five cities of Dublin, Cork, Galway, Limerick and Waterford together with the regional centres identified in in the NPF is supported by the provision of water services investment.	Support Social and Economic Growth
Support the growth of identified settlements where these are prioritised in development plan core strategies at a county/city level.	
Undertake detailed network and capacity assessments to support the provision of water services infrastructure to facilitate housing and economic development in priority towns and urban areas identified in Regional Spatial and Economic Strategies.	
Develop an asset management capability to ensure that the performance of assets is maintained and enhanced to the requisite standard and to achieve optimum balance of service risk and whole life cost.	Invest in our Future
Improve the quality and efficiency of services to customers in line with the performance standards for continuous improvement agreed with the CRU.	Ensure a Safe and Reliable Water Supply
Delivery of the strategic capital investment programme set out under the NDP over the period 2018-2027 to improve resilience in areas most vulnerable to a shortfall in water supply and wastewater services, such as the Greater Dublin Area.	
	Provide Effective Management of Wastewater

Table 3.1c –WSPS Theme – Future Proofing Priority Objectives and WSSP Strategic Objectives

3.2 Other Statutory Plans and Programmes

The Investment Plan 2020 to 2024 will be consistent with the following:

- The **National Planning Framework (NPF)** to 2040 and **National Development Plan (NDP)** (for period 2018 to 2027) published by the Government in February 2018 as part of Project Ireland 2040 as the overall national planning and infrastructural strategy.
- **River Basin Management Plan (RBMP)** published by the DHPLG in April 2018.
- **Connection Charging Policy** currently with the CRU for consultation.
- IW prepared and submitted to the Minister the **SFP** following the publication of the WSPS. The SFP was approved by the Minister on 7 November 2018.

The following will also be taken into account when available:

- At a regional level, the **Regional Spatial and Economic Strategies (RSES)** produced by the three regional assemblies and including their **Metropolitan Area Strategic Plans** for the five city areas.
- The updated **Core Strategies** of the individual city/county development plans at Local Authority level including their updating/review following the adoption of the RSESs.

The following documents and plans have been considered in the process of identification of needs during the development of the Investment Plan:

- Flood Risk Management Plans (29) published by OPW on 3 May 2018;
- Remedial Action List for Public Water Supplies published by the EPA;
- Priority Areas List for Wastewater published by the EPA;
- Action Plan for Jobs 2018 published by the Department of Business, Enterprise and Innovation in March 2018;
- National Adaptation Framework published by the Minister for Communications, Climate Action and Environment in January 2018;
- Ministerial Guidelines published under Section 28 of the Planning and Development Act, 2000, as amended, including the draft Water Services - Guidelines for Planning Authorities published for consultation in January 2018;
- Realising our Rural Potential: Action Plan for Rural Ireland published by the then Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs, in January 2017;
- Rebuilding Ireland, an Action Plan for Housing and Homelessness, published by the Minister for Housing, Planning, Community and Local Government in July 2016; and
- Food Harvest 2020 and Food Wise 2025, published by the Department of Agriculture, Food and the Marine.

3.3 Water Services Strategic Plan (WSSP)

Section 33 of the Water Services (No. 2) Act, 2013 requires IW to prepare a Water Services Strategic Plan (WSSP), setting out the objectives of IW in relation to the provision of water services over a period of 25 years.

The current WSSP was approved by the Minister for the Environment, Community and Local Government in October 2015. It details current and future challenges which affect the provision of water services and identifies the priorities to be tackled in the short and medium term. The draft WSSP was subjected to a Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) and included public consultation before being approved by the Minister. IW is committed to reviewing and updating the WSSP every 5 years at least.⁵

The relationships between the Investment Plan, WSSP and other plans are illustrated in Figure 3.1.

⁵ For more information on the WSSP please visit www.water.ie/projects-plans/our-plans/water-services-strategic-plan/

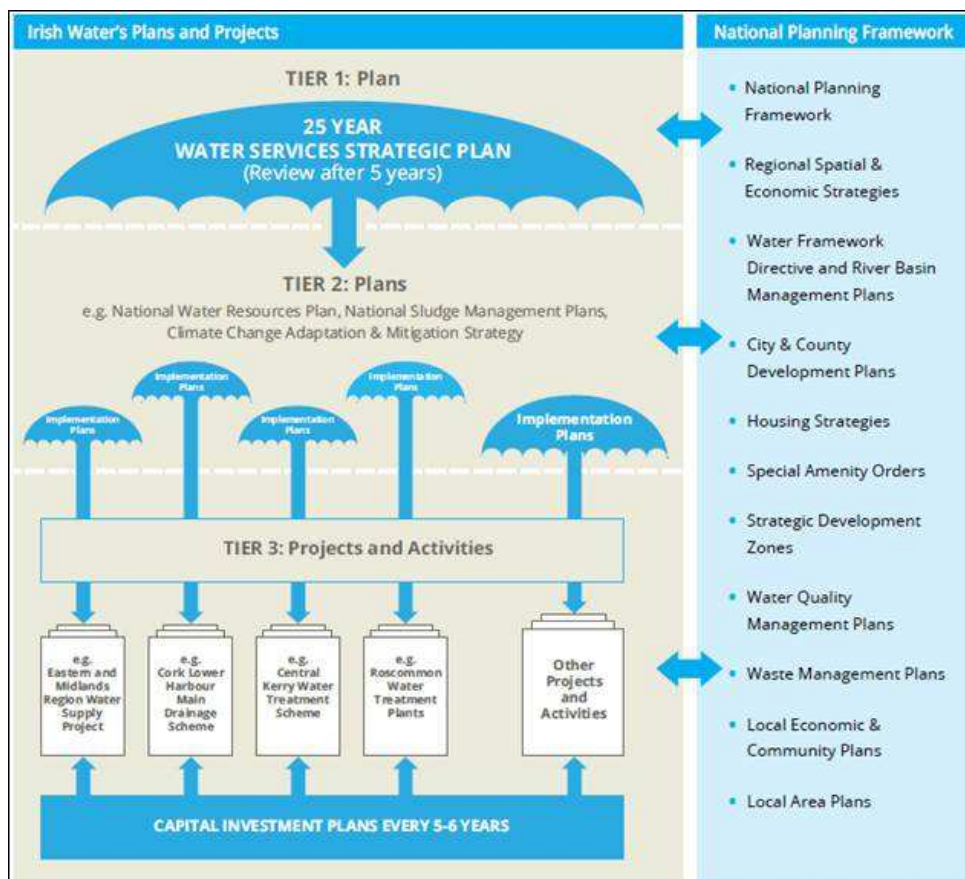


Figure 3.1 - Relationship of IW plans and projects⁶

IW is developing a range of more detailed implementation plans (Tier 2 Plans) to be consistent with the WSSP (Tier 1) and which will input to the preparation of the Investment Plan. The below list sets out relevant IW plans:

- National Wastewater Sludge Management Plan (NWSMP), available at www.water.ie/wastewater-sludge-management
- National Water Resources Plan (NWRP), details on the preparation of the plan are available at www.water.ie/nwrp
- Lead in Drinking Water Mitigation Plan (LDWMP), available at www.water.ie/lead
- IW Business Plan 2014-2021, available at www.water.ie/projects-plans/our-plans/irish-water-business-plan/

⁶ It should be noted that the listing of the documents on the right of the graphic is not intended to show a hierarchy of plans or an alignment of the plans with the IW Tier 1, Tier 2 and Tier 3 plans/projects

4 Stakeholder Engagement and Consultation

IW's strategic objectives as set out in the WSSP provide the framework for this five year investment plan. Extensive public and stakeholder engagement has taken place in preparing the WSSP through two rounds of public consultation, a Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) process.

In preparing the Investment Plan 2020-2024 for submission to the CRU, we have again engaged with stakeholders, focusing on a two stage specific engagement process. IW would like to thank all those who engaged with us during this consultation process. A very positive response was received from respondents who welcomed the opportunity to engage in the consultation process and make a submission on the Investment Plan.

4.1 Stage 1 Consultation on the Investment Plan

The first stage of stakeholder engagement asked for input on the methodology for the preparation of the Investment Plan. It was carried out by IW under Section 34(6) of the Water Services (No. 2) Act 2013.⁷ We consulted with the Environmental Protection Agency (EPA), the three Regional Assemblies and 31 Local Authorities, in their role as planning authorities.⁸

This consultation phase ran for over four weeks from 23 March to 25 April, 2018 and 21 submissions were received. Further details of the feedback received in the Stage 1 Consultation and IW's response are included in Appendix 2A.

4.2 Stage 2 Consultation on the Draft Investment Plan

The second stage of stakeholder engagement involved a wider group of stakeholders including the statutory consultees from Stage 1, representative bodies, environmental agencies, environmental groups and also government departments. We issued the Draft Investment Plan to stakeholders, welcomed feedback on all elements of the Draft Plan, and provided a list of questions as a practical guide for submission of responses to the document.

This consultation phase ran from Monday 18 June to Friday 20 July, 2018 and 26 submissions were received. Further details of the feedback to the Stage 2 Consultation and IW's response are in Appendix 2B of this document.

⁷ IW shall, before preparing an investment plan, consult with—

(a) the Agency,

(b) each regional body in respect of whose functional area the investment plan is likely to apply, and

(c) each planning authority in respect of whose functional area the investment plan is likely to apply.

⁸ Eastern & Midlands Regional Assembly; Northern & Western Regional Assembly and Southern Regional Assembly

5 Investment Planning Methodology and Prioritisation

5.1 Service Measure Framework

IW has developed a Service Measure Framework (SMF) to link the strategic objectives set out in the WSSP to the performance of our water and wastewater assets. The six strategic objectives set out in the WSSP are as follows:

- 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.

Following the publication of the WSPS in May 2018, we have also worked to align our Service Measure Framework with the three key themes of Quality, Conservation and Future Proofing. This alignment is set out in Section 6.

The SMF is used to inform IW about the underlying level of risk associated with our water treatment plants, wastewater treatment plants, our network and other infrastructure required to deliver water services. This allows us to forecast how these assets will perform into the future in order to achieve our objectives.

Through this approach we can:

1. Identify risk to the level of service we provide to our customers;
2. Define what improvements need to be made;
3. Quantify and cost ways we can reduce this risk; and
4. Group together asset needs and interventions into investment cases.⁹

5.2 Investment planning approach

This section sets out the ten-step methodology we use to translate asset needs into prioritised investment cases using our SMF, described in Section 5.1, to achieve our strategic objectives.

We have refined and further developed our approach to investment planning that was used in our Investment Plan 2017-2021. Since 2014, we have increased our knowledge and understanding of asset risk and performance through asset data capture and standard approaches to analysis across the asset base. This improved approach is used to assess each investment option based on its cost, risk reduction or benefits, and contribution to specific targets and objectives.

⁹ 'Interventions' in this context refers to actions that will directly or indirectly reduce risk to service delivery and may include projects or programmes to build new assets, capital maintenance of existing assets, operational and process changes or investigative works to provide the evidence or information on appropriate solutions to reduce risk to service.

The SMF allows an appropriate combination of interventions to be identified based on legislative, business, operational and financial constraints. It also supports us to:

- a. Deliver on the WSPS priorities;
- b. Deliver on the WSSP objectives, in the most efficient manner; and
- c. Monitor and report to stakeholders on the progress made against achieving these targets and objectives.

Our ten-step approach to investment planning is set out in following section and Figure 5.1 below.

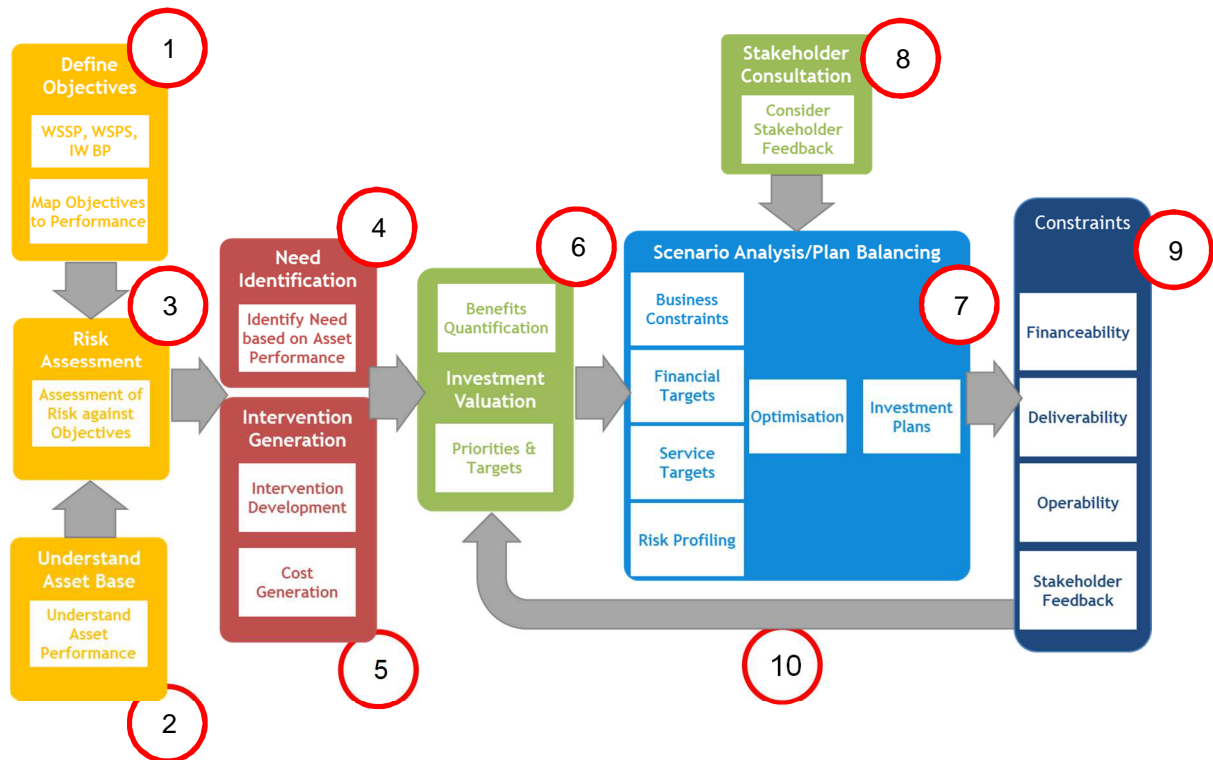


Figure 5.1 –Investment Planning Process

Based on the UK Water Industry Research (UKWIR) Common Framework for Expenditure Decision Making

5.3 Ten-step methodology

Step 1 – Define Objectives

This Investment Plan will contribute to the policy initiatives outlined in the WSPS and continue to contribute to the delivery of our defined WSSP targets.

Step 2 – Understanding the Performance of the Assets

A key advantage that IW is bringing to the water services sector is the ability to understand the water and wastewater assets and their performance at a national level. This is important in enabling us to determine how we will meet our objectives through a better understanding of the existing situation from a national perspective.

Step 3 – Risk Assessment

Once the dataset of asset performance is established (as far as possible based on the available information), we then begin a process of risk assessment to identify assets which are at significant risk of failure. These assets are then put forward to the next step of the process.

Step 4 – Needs Identification

This step then assesses why an asset is at risk of failing or has failed in terms of performance. This is identified at individual assets (e.g. Water Treatment Plants, Wastewater Treatment Plants) and the needs identification process sets out the range of solutions required to resolve or prevent these performance failures.

Step 5 – Intervention Generation

Interventions refer to actions that will reduce risk to service delivery and can include projects, programmes, maintenance, investigative works, or operational measures. Intervention generation includes scoping these actions to achieve our objectives and improve performance of our assets. During this step we identify a range of interventions to meet the investment needs for each asset.

Step 6 - Prioritisation

The next step is to prioritise the list of interventions. To do this, we use the SMF. Service Measures provide a consistent approach to articulate service risk and assess the value of interventions against each other. Each intervention is examined (in terms of service impact) against one or more of the service measures.

The approach prioritises investment based on risk reduction per euro invested. This allows decisions affecting different asset types to be made based on consistent criteria.

Step 7 – Initial Plan Balancing

This process involves assessing the prioritised list of interventions and how they achieve our objectives. The plan balancing approach allows budgetary constraints, asset performance, risk targets, and performance levels to be assessed, and the best combination of solutions to meet the constraints to be identified.

Step 8 - Consultation with Stakeholders

A key element in the investment planning approach is meaningful consultation and engagement with stakeholders. As part of the process we provided an overview of the output of the Initial Plan Balancing step (Step 7) in a Draft Investment Plan. This was issued to stakeholders as part of the Stage 2 consultation process, described in Section 4 and Appendix 2B.

Step 9 – Business Decision Making

The initial optimised list of interventions resulting from the initial plan balancing, in conjunction with feedback from the stakeholder consultation, was used as input into the business decision making process. This supported the finalisation of the Investment Plan for submission to CRU under the RC3 review process. Decision making by IW considers the initial plan balancing output and stakeholder feedback in order to validate

whether the proposed investments will meet the objectives and targets set out in the WSPS and WSSP.

Step 10 – Final Plan Balancing

Outputs from the business decision making process are incorporated into a further process of refinement at Final Plan Balancing stage. This ensures that the profile of projected investment on interventions fits within the expected funding constraints set out in the SFP, as well as other constraints (including deliverability, operability and further stakeholder feedback/input).

6 Link between Policy Objectives and to Work Programmes

In order to achieve our strategic outcomes, IW must consider and prioritise investment across our asset base. Investment to achieve similar improvements in service and reduction of risk in our asset base are grouped together in Work Programmes. This section sets out our approach to developing the Work Programmes.

The following tables (Tables 6.1 to 6.3) set out the link between our strategic objectives as set out in the WSSP and the specific aims under these objectives, the policy themes set out in the Water Services Policy Statement and the proposed service measures under our SMF. The tables also set out the Work Programmes to achieve the strategic objectives and aims. Table 6.1 sets this out for Quality, Table 6.2 for Conservation while Table 6.3 includes Future Proofing, the themes of the WSPS.

Quality – Ensure a Safe and Reliable Water Supply

WSPS Policy Objectives / Outcomes	WSSP Strategic Objectives	WSSP Strategic Aims	IW Service Measure	RC3 Work Programmes
Promote drinking water source protection for public drinking water supplies and undertake some 350 source risk assessments by the end of 2021 as set out in RBMP 2018-2021	Ensure a Safe and Reliable Water Supply	Manage the sustainability and quality of drinking water from source to tap to protect human health.	Drinking Water Quality (Microbiological)	Studies / Plans / Strategies - Drinking Water Quality
Take the necessary corrective action to ensure appropriately treated, safe and reliable drinking water and eliminate any risk to a drinking water supply on the EPA RAL				Drinking Water Quality (Microbiological) - Infrastructure Programme
				Drinking Water Quality (Microbiological) - Capital Programmes
				Major Projects Programme - Vartry Water Supply Scheme Upgrade
				RAL Projects Included in above programmes
			Drinking Water Quality (Chemical) - THM) - Infrastructure Programme	
			Drinking Water Quality (Chemical)	

Provide for on-going implementation of the National Lead Strategy to mitigate the health effects of lead in drinking water			Drinking Water Quality (Chemical)	Drinking Water Quality (Chemical - Lead) - Capital Programmes
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Table 6.1a – WSPS Quality Theme and Policy Objectives aligned to Work Programmes Water

Quality – Provide Effective Management of Wastewater

WSPS Policy Objectives / Outcomes	WSSP Strategic Objectives	WSSP Strategic Aims	IW Service Measure	RC3 Work Programmes
Compliance with the requirements of UWWTD for qualifying urban areas;	Provide Effective Management of Wastewater	Manage the operation of wastewater facilities in a manner that protects environmental quality.	Urban Wastewater Treatment Directive Compliance	Urban Wastewater Treatment Directive Programme (UWWTD) - Infrastructure Programme (Treatment and Networks) Urban Wastewater Treatment Directive Programme (UWWTD) - Major Projects Programme (Cork Lower Harbour and Ringsend WWTP)
Protection of high status waters, designated shellfish and bathing waters and support improvements in water quality as set out in RBMP 2018-2021			WW Discharge Authorisation Compliance	Wastewater Discharge Authorisation Programme - Infrastructure Programme Wastewater Discharge Authorisation Programme - Capital Programmes
Prioritise improvements in urban waste water collection systems to address growth and economic development, ensure continued environmental compliance and deliver water quality improvements identified in RBMP 2018-2021		Manage the availability and resilience of wastewater services now and into the future.	Property Sewer Flooding	Wastewater Collection Systems – Compliance Projects Wastewater Collection Systems – Strategic Networks Wastewater Collection Systems – UWWTD Programme Wastewater Collection Systems – Capital Programmes Wastewater Collection Systems – Studies /Plans/Strategies
			Urban Wastewater Treatment Directive Compliance	

Table 6.1b – WSPS Quality Theme and Policy Objectives aligned to Work Programmes - Wastewater

Conservation – Safe and Reliable Water Supply

WSPS Policy Objectives / Outcomes	WSSP Strategic Objectives	WSSP Strategic Aims	IW Service Measure	RC3 Work Programmes
Taking a proactive approach in promoting awareness of the importance of water conservation in Ireland	Ensure a Safe and Reliable Water Supply	Manage water supplies in an efficient and economic manner	Leakage	Promotional and awareness programmes (non Capital)
Implement the necessary programmes and interventions to promote the efficient and sustainable use of water in order to achieve as a first step the leakage reduction targets identified in RBMP 2018-2021 with the ultimate aim of reducing leakage to sustainable economic levels				Leakage Reduction Programme - Infrastructure Programmes
Completion of IW's Water Resource Plan as a key cross-cutting element in ensuring water resource sustainability.		Manage the availability, sustainability and reliability of water supply now and into the future	DW Quality (Microbiological) (Chemical) Interruptions to Supply	Studies / Plans / Strategies - Drinking Water Availability

Table 6.2a – WSPS Conservation Theme and Policy Objectives aligned to Work Programmes - Water

Conservation – Protect and Enhance the Environment

WSPS Policy Objectives / Outcomes	WSSP Strategic Objectives	WSSP Strategic Aims	IW Measure	Service	RC3 Work Programmes
Plan for future climate change challenges and contribute to the development of the National Adaptation Framework under the Climate Action and Low Carbon Development Act 2015 and Sectoral Adaptation Plans required by September 2019	Protect and Enhance the Environment	Ensure that IW services are delivered in a sustainable manner which contributes to the protection of the environment	WW Treatment Disposal	Sludge and	Capital Programmes - Energy Efficiency Sludge Management Programmes - Wastewater Sludge Management Programmes - Water
			DW Treatment Disposal	Sludge and	
			Energy Efficiency		

Table 6.2b – WSPS Conservation Theme and Policy Objectives aligned to Work Programmes - Environment

Future Proofing – Support Social and Economic Growth

WSPS Policy Objectives / Outcomes	WSSP Strategic Objectives	WSSP Strategic Aims	IW Measure	Service	RC3 Work Programmes
Ensure that growth in the five cities of Dublin, Cork, Galway, Limerick and Waterford together with the regional centres identified in in the NPF is supported by the provision of water services investment	Support Social and Economic Growth	Facilitate growth in line with national and regional economic and spatial planning policy	Facilitate Growth		Wastewater Growth Programmes - Infrastructure Programmes
Water Growth Programmes - Infrastructure Programmes					
Water and Wastewater Growth Programmes - Capital Programmes					
Support the growth of identified settlements where these are prioritised in development plan core strategies at a county/city level					
Undertake detailed network and capacity assessments to support the provision of water services infrastructure to facilitate housing and economic development in priority towns and urban areas identified in Regional Spatial and Economic Strategies					Network and Treatment Capacity Assessments Programme - Drainage Area Plans Programme - Water Network Modelling Programme

Table 6.3a – WSPS Future Proofing Theme and Policy Objectives aligned to Work Programmes – Growth

Future Proofing – Invest in Our Future / Safe & Reliable Water Supply / Effective Management of Wastewater

WSPS Policy Objectives / Outcomes	WSSP Strategic Objectives	WSSP Strategic Aims	IW Service Measure	RC3 Work Programmes
Develop an asset management capability to ensure that the performance of assets is maintained and enhanced to the requisite standard and to achieve optimum balance of service risk and whole life cost	Invest in Our Future	Manage our assets in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.	Service measures to be developed	Capital Maintenance Programmes Asset Intelligence Programmes HSQE Programmes Taking in Charge Programmes Telemetry Equipment Programmes
Improve the quality and efficiency of services to customers in line with the performance standards for continuous improvement agreed with the CRU	Ensure a Safe and Reliable Water Supply	Manage the availability, sustainability and reliability of water supply now and into the future	Water Pressure	Water Pressure Programme

<p>Delivery of the strategic capital investment programme set out under the NDP over the period 2018-2027 to improve resilience in areas most vulnerable to a shortfall in water supply and wastewater services, such as the Greater Dublin Area.</p>		<p>Invest in our assets while maintaining a sustainable balance between meeting customer needs, protecting the environment and supporting the economic development and growth.</p>	<p>Interruption to Supply</p>	<p>Water Resilience Programme</p> <p>Wastewater Resilience Programme</p>
	<p>Provide Effective Management of Wastewater</p>		<p>Facilitate Growth</p>	<p>Major Project Programme - Wastewater Growth</p> <p>- Greater Dublin Drainage Scheme</p>

Table 6.3b – WSPS Future Proofing Theme and Policy Objectives aligned to Work Programmes – Asset Management and Resilience

7 Addressing the Quality Theme

This section outlines the approach that IW has taken to consider and prioritise the various work programmes which address the WSPS theme of Quality for the RC3 regulatory period.

7.1 Quality – Ensuring a Safe and Reliable Water Supply

Safe and reliable water supplies are essential to public health as well as social and economic growth.

7.1.1 WSPS Policy Objectives:

- Promote drinking water source protection for public drinking water supplies and undertake some 350 source risk assessments by the end of 2021 as set out in RBMP 2018-2021
- Take the necessary corrective action to ensure appropriately treated, safe and reliable drinking water and eliminate any risk to a drinking water supply on the EPA RAL
- Provide for on-going implementation of the National Lead Strategy to mitigate the health effects of lead in drinking water

7.1.2 Background and Approach

IW currently operates 790 operational water treatment plants across the country. Water quality from some of these water treatment plants does not meet the current Drinking Water Quality Regulations due to microbiological contamination or exceedances of other water quality parameters. Many of these treatment plants take their water from small water sources which are vulnerable to contamination and the impacts of climate change. The water supply distribution networks typically operate as isolated systems which are not interconnected.

We also estimate that, nationally, we are losing approximately 45% of the water we treat due to leakage. A significant number of our customers' service pipes are made from lead which can in itself contribute to contamination of water by dissolving into the water.

The World Health Organisation (WHO) has promoted a risk based approach based on Drinking Water Safety Plans. These plans provide an integrated framework for operation and management of water supply systems. This approach involves an assessment of how particular risks can be managed by addressing the whole process of water supply from source to tap. In order to be effective, investment has to deliver **tangible** risk reduction in the shortest possible timeframe and in the most efficient and cost effective manner.

IW has developed a Barrier Approach to provide a set of performance indicators for our drinking water service. This information is combined with our Needs Identification and Drinking Water Safety Plan (DWSP) processes to monitor performance and optimise asset management decisions to maximise value from our assets.

For water treatment, compliance with the Drinking Water Regulations (S.I. No. 122 of 2014) for microbiological risk will be in the form of the following:

- Barrier 1 – adequate chlorination contact time to kill or inactivate bacteria, viruses, and other potentially harmful organisms in drinking water at the WTP;
- Barrier 2 – maintains water quality using chlorination by killing potentially harmful organisms that may get in water as it moves through pipes;
- Barriers 3 and/or 4 – appropriate levels of treatment to reduce high protozoa (e.g. Cryptosporidium) risk;
- Barriers 5 – adequate supply / demand balance to reduce Interruptions to Supply;
- Barrier 6 – specialised disinfection by-product (DBP) removal processes to ensure the removal of volatile THMs;
- Barrier 7 – adequate liquid and solid residual treatment and disposal to reduce pollution of the environment; and
- Barrier 8 – maintains physical/chemical parameters to within acceptable limits.

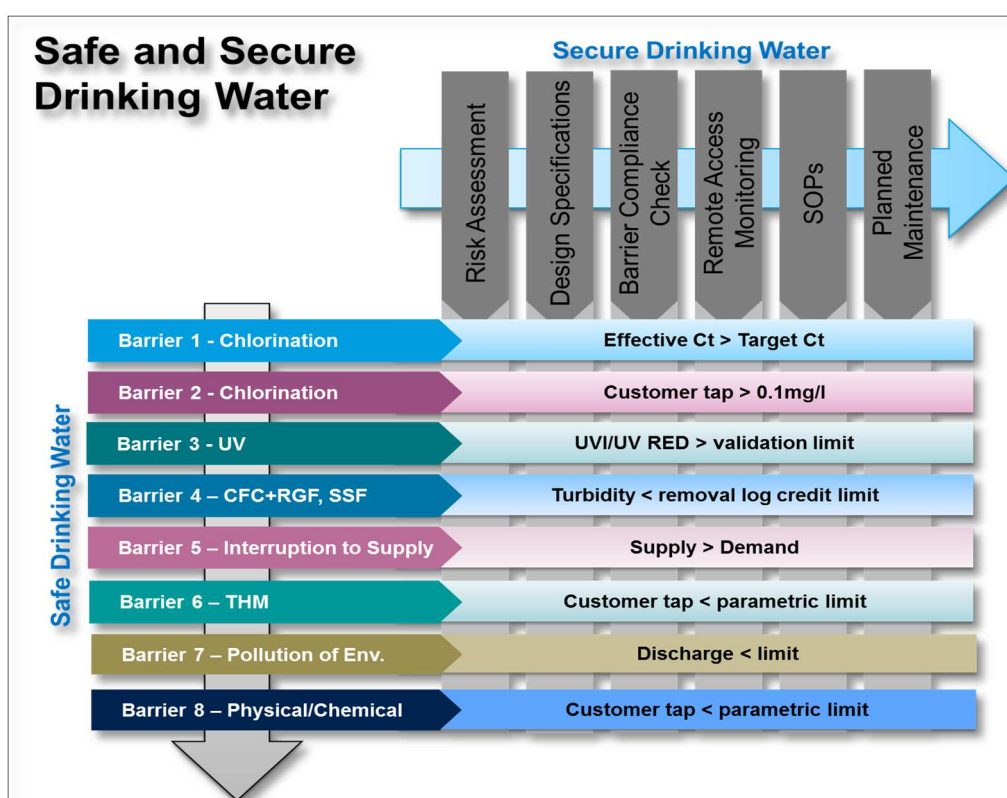


Figure 7.1 – IW Barrier Approach to Ensuring Safe and Reliable Water Supply

7.1.3 Source Protection and Risk Assessment

The starting point in the water cycle is the raw water source. For IW, source protection and risk assessment are the first WSPS policy objectives to be addressed. In order to guide and inform our decision-making process we have adopted the World Health Organisation’s DWSP’s concept and this coupled with effective asset management will allow us to effectively manage our asset base to ensure safe and secure drinking water.

The DWSP approach which the WHO defines as “*the use of a comprehensive risk assessment and risk management approach that encompasses all steps in water*”

supply from catchment to consumer” is used in order to ensure drinking water is both ‘safe’ and ‘secure’. A supply is deemed ‘safe’ if it meets the relevant standards at the tap and ‘secure’ if a management system is in place that identifies all potential risks and ensures that procedures are in place to manage these risks.

Source risk assessment is the first element of the DWSP and is critical to ensuring that the most appropriate raw waters are used and secondly that all the appropriate treatment barriers are in place to mitigate the risks identified in that water. These assessments also aid with the ongoing protection of our source waters and engagement with all other stakeholders in these areas.

7.1.3.1 Source Protection and Risk Assessment Work Programmes

Source Protection Plans are being progressed as part of the Drinking Water Safety Plan approach. This includes the following programmes targeted at developing a source to tap approach to managing risk:

- Source Improvement Programme;
- Source Protection Key Study (2020-2024);
- Drinking Water Safety Plans (2020-2024);
- National Raw Water Monitoring Project;
- Regularise Licencing for Existing Surface Water and Groundwater Sources (2020-2024); and
- Water Supply Above Ground Feasibility Studies.

7.1.4 Drinking Water Quality (Microbiological) Risk

Based on the assessments carried out by IW, a significant number of water supplies remain where the performance of the disinfection process does not meet the IW targets for Barriers 1 to 4 under all operating conditions. These sites have been prioritised for upgrade to ensure a safe and reliable water supply.

To reduce the microbiological risk, this category of investment will continue to upgrade chlorine and UV disinfection processes and coagulation processes. Where appropriate rationalisation will also be used, where investment in a more strategically important and resilient supply achieves the outcome more effectively and efficiently.

7.1.4.1 Drinking Water Quality (Microbiological) Work Programmes

Based on works carried out under the Investment Plan during IRC2, approximately half of the 790 operational water treatment plant sites will require disinfection upgrading works.

IW will continue the prioritisation of upgrades to chlorine and UV disinfection processes, coagulation processes and where possible rationalisation of supplies.

7.1.4.2 Drinking Water Quality (Microbiological) Infrastructure Programme

This work programme consists of large scale projects targeted at upgrade and/or rationalisation of water treatment plants to meet the required microbiological standards on a prioritised basis. This includes water supply zones on the EPA Remedial Action List as well as projects which are at risk of microbiological failure through lack of adequate barriers.

7.1.4.3 Drinking Water Quality (Microbiological) Capital Programmes

This work programme consists of sub-programmes of multi-site interventions targeted at reducing risk of non-compliance through the installation, upgrading and refurbishment of treatment process level equipment. It also includes rationalisation of smaller treatment plants through extensions of pipelines from neighbouring supply zones where this is economically viable.

Multiple sites will be targeted through the following programmes in the RC3 period:

- Coagulation, Flocculation, Clarification (CFC), Filtration, and Sludge Process Improvements (2020-2024);
- Chemical Management Improvements;
- Disinfection Programme (2020-2024) (includes National Chlorine Gas Replacement);
- Rationalisation Programme (2020-2024);
- Reservoir Refurbishment Programme; and
- Borehole Inspections.

Case Study 1 – Disinfection Programme

The Disinfection Programme is targeting the upgrading and standardisation of disinfection systems at multiple sites to minimise microbiological risk and risk of Boil Water Notices (BWNs). Based on work carried out to date approximately 50% of the 790 WTPs will require disinfection upgrade works.

The scope of the Disinfection Programme has increased to include for pH upgrade, chlorine gas replacement and installing switchover gear for emergency generators to ensure coordinated delivery of work and reduce the requirement for multiple site visits by different programmes of work.

The programme follows the principles below to ensure that it is fully aligned with the key objectives of minimising microbiological risk and risk of BWNs;

- Determine and target the highest risk WTPs by utilising the standard IW asset capability and performance assessment tools including the Pathogen Compliance Review (PCR), Contact Time (CT) calculations and Drinking Water Safety Plan (DWSP) risk assessment.
- Determine the optimum mitigation measure which is effective, safe and minimises TOTEX.
- Use standardised solutions based on IW Asset Management pillars - standards, specifications and policies. This enables standardised levels of process automation, performance monitoring and alarms, as set out in IW's Remote Asset Management (RAM) Policies.
- Combine similar works at a number sites within a region under the one contract to aid project management, standardisation and CAPEX reduction.
- Verify the effectiveness of the solution to deliver lasting business benefits.

Progress on the Disinfection Programme to date is shown below.

Programme	Output Unit	Progress to Q1 2018	Forecast to end 2019
Disinfection Programme (2017 – 2019)	No. of Sites Assessed	100	308
	No. of Sites commissioned	87	250
	No. of Cl gas decommissioned	4	18

Table 7.1 – Progress on the Disinfection Programme to end 2019

7.1.4.4 Drinking Water Quality (Microbiological) - Major Projects Programme

Vartry Water Supply

The Vartry Water Supply Scheme currently provides 14% of average daily demand in the Greater Dublin Water Supply Area (GDWSA), and supplies 200,000 domestic customers. It is a strategically important asset, as it is the sole drinking water supply to a large proportion of North Wicklow, and serves as the primary water supply for areas of Dún Laoghaire-Rathdown and South East Dublin. The original scheme was constructed between 1862 and 1868 and due to its age, condition and strategic importance, the scheme is in urgent need of capital investment.

The scheme has been identified as being at risk of failure to meet the requirements of the National Drinking Water Standards, and has been on the RAL since 2008. During key stakeholder engagement for the project, both the EPA and the Health Service Executive (HSE) have called for investment in these assets at the earliest opportunity.

Investment is broken down into three sub projects;

1. Vartry to Callowhill Pipeline Link: The existing tunnel is in danger of imminent collapse which would result in loss of supply to 100,000 customers. The Vartry to Callowhill Pipeline Link, which has been completed and has removed the risk associated with the collapse of the existing tunnel in addition to removing the risk of contamination due to water ingress in the tunnel.
2. Vartry Reservoir and Water Treatment Plant Upgrade: Construction of a new WTP to replace the existing slow sand filter beds and upgrade works to the existing reservoir and spillway.
3. New Covered Storage at Stillorgan Reservoir: Construction of a new 160ML covered storage reservoir at Stillorgan to ensure that the asset complies with current Drinking Water Standards.

7.1.5 Drinking Water Quality (Chemical) Risk

Many of IW's water treatment plants do not have the processes and modern control systems required to minimise chemical contaminants such as THMs and lead. The European Commission has commenced infringement proceedings against Ireland for non-compliance of THM parametric limits.

In 2015 the Government published the "National Strategy to Reduce Lead in Drinking Water". The main aim of this strategy is to ensure the protection of human health and achieve a solution to the issue of lead in drinking water. As the national public water utility, IW prepared the Lead in Drinking Water Mitigation Plan in order to address the risk of failure to comply with the drinking water quality standard for lead due to lead pipework serving properties connected to the public water network.

In addition to the microbiological treatment upgrades, described above, continued investment is required to improve the performance of chemical treatment through the installation of enhanced controls, pH adjustment, coagulation and filtration systems on a prioritised basis.

Based on IW's barrier approach, compliance with the Drinking Water Regulations (S.I. No. 122 of 2014) for chemical (THM and Lead) risk will be in the form of the following:

- Barrier 6 – appropriate treatment for the removal of THM precursors and/or THM removal.
- Barrier 8 – orthophosphate dosing at the WTP or local reservoir sites to prevent the solution of lead into water from lead pipework and/or public side lead service replacement.

7.1.5.1 Drinking Water Quality (Chemical) Work Programmes

These programmes will target investment to address both non-compliant sites and those at risk of becoming non-compliant within the RC3 investment period. Improvements to performance of chemical treatment through the installation of enhanced controls, pH adjustment, coagulation and filtration systems shall be on a prioritised basis.

7.1.5.2 Drinking Water Quality (Chemical – THM) Infrastructure Programme

This work programme consists of large scale projects targeted at upgrade and/or rationalisation of water treatment plants to meet the required chemical standards on a prioritised basis.

Case Study 2 – Drinking Water Quality (Remedial Action List)

The EPA's Remedial Action List is a register of public water supplies with the most serious deficiencies and known to be most at risk, where the EPA is requiring IW to take corrective action to ensure the safety and security of the supplies. The EPA has instructed IW to submit an action programme for the improvement of each of these water supplies and has initiated enforcement action where action programmes have not been prepared or implemented to the satisfaction of the EPA. This includes issuing legally binding Directions requiring specific work to be carried out to ensure the safety and security of a water supply.

The primary issues addressed to-date include disinfection of E. coli, barriers to Cryptosporidium, adequate treatment for trihalomethanes and operational controls for managing aluminium and turbidity levels.

In Q3 2013, there were 140 supplies remaining on the RAL. Since that time, 159 (to end of Q3 2019) have been removed by IW and 79 supplies have been added.

The majority of the remaining supplies are forecast to be removed from the RAL within the RC3 Period.

Case Study 2 – Remedial Action List

7.1.5.3 Drinking Water Quality (Chemical - Lead) Capital Programmes

This work programme will implement the Lead in Drinking Water Mitigation Plan to:

- Address the risk due to lead pipework serving properties connected to the public water network and; and
- Ensure compliance with the Drinking Water Regulations (S.I. No. 122 of 2014) through orthophosphate dosing at the WTP or local reservoir sites to prevent the dissolution of lead into water from lead pipework; and/or public side lead service replacement.

The objectives of the Lead Mitigation Plan will be targeted through the following programmes in the RC3 2020 to 2024 period, (i) Lead Improvement Processes (incl. Orthophosphate Dosing) and (ii) Lead Services (2020-2024).

7.1.6 Quality – Ensure a Safe and Reliable Water Supply Work Programmes

The Work Programmes and associated expenditure described in the preceding sections are listed in Table 7.2 below.

Work Programmes	Description	RC3 €m
Studies / Plans / Strategies - Drinking Water Quality	Key studies and development of plans targeted at developing a source to tap approach to managing risk.	14
Drinking Water Quality (Microbiological) – Infrastructure Programme	Large scale projects targeted at upgrade and/or rationalisation of water treatment plants to meet the required microbiological standards	128
Drinking Water Quality (Microbiological) – Capital Programmes	Programmes of multi-site interventions targeted at reducing risk on non compliance	221
Major Projects Programme • Vartry Upgrade	Major project targeted at upgrading the Vartry Water Supply Scheme.	66
Drinking Water Quality (Chemical - THM) - Infrastructure Programme	Large scale projects targeted at upgrade and/or rationalisation of water treatment plants to meet the required chemical (THM) standards.	206
Drinking Water Quality (Chemical - Lead) - Capital Programmes	Programme to implement the Lead in Drinking Water Mitigation Plan.	63
	Total	698

Table 7.2 - Ensure a Safe and Reliable Water Supply Work Programmes

7.1.7 Expected Outcomes for period 2020 to 2024

The expected outcomes to be delivered by the Ensure a Safe and Reliable Water Supply Work Programmes are shown in Table 7.3 below.

Outcome Measure	Units of Measure	Target End 2024
Reduction in risk of microbiological non-compliance	Reduction in the number of properties at risk	562,000
Reduction in risk of THM non-compliance	Reduction in the number of properties at risk	132,000
Compliance with lead standards	Number of lead services replaced	13,200
Water Supply Zones (WSZ) on RAL	Number of WSZs remaining on RAL	2

Table 7.3 - Ensure a Safe and Reliable Water Supply Outcomes

7.2 Quality – Providing Effective Management of Wastewater

The effective collection and treatment of wastewater prior to discharge back to the environment is essential to protect human health and the quality of the local environment. The capacity of wastewater treatment infrastructure must also be adequate to provide for population and economic growth.

7.2.1 WSPS Policy Objectives:

- Compliance with the requirements of UWWTD for qualifying urban areas;
- Protection of high status waters, designated shellfish and bathing waters and support improvements in water quality as set out in RBMP 2018-2021; and
- Prioritise improvements in urban waste water collection systems to address growth and economic development, ensure continued environmental compliance and deliver water quality improvements identified in RBMP 2018-2021.

7.2.2 Background and Approach

The standards to which wastewater infrastructure must operate are set out in various national regulations, primarily the Urban Waste Water Treatment Regulations (which implement the Urban Waste Water Treatment Directive) and the Wastewater Discharge Authorisation Regulations. Under the Wastewater Discharge Authorisation Regulations, the EPA set controls on IW discharges based on their assessment of the requirements to meet various environmental water quality objectives. IW will also take account of the water body status objectives in the River Basin Management Plan.

IW will continue to invest in wastewater treatment and networks to meet these objectives on a prioritised basis. This will be done to gain maximum benefit from available funding by prioritising investment based on the following criteria:

-
- Non-compliance (current and projected) with UWWTD;
 - Untreated agglomerations;
 - Non-compliance with EPA discharge licences, prioritised on the basis of impacts on protected area water bodies (particularly fresh water pearl mussel sites, bathing waters or shellfish waters per protected areas for wastewater improvement list) and where IW assets are identified as being the sole significant pressure on water bodies at risk of not meeting their environmental objectives; and
 - Locations of repeat sewer flooding impacting customers.

7.2.3 Urban Wastewater Treatment Directive Compliance

IW will strive to ensure compliance with Articles 4 and 5 of the UWWT Directive and address both non-compliant sites and those at imminent risk of becoming non-compliant on a prioritised basis.

For wastewater treatment, compliance with the UWWT Directive is in the form of the following:

- Final effluent compliance;
- Appropriate treatment capacity to treat the collected load (includes providing treatment in the identified untreated agglomerations); and
- Appropriate level of treatment to achieve compliance with Article 4 and 5.

7.2.3.1 Urban Wastewater Treatment Directive Work Programmes

These programmes are targeted at achieving or maintaining UWWTD compliance and include:

- Agglomerations listed in the ECJ Case against Ireland;
- Agglomerations included in Table 1 of the River Basin Management Plan 2018 Appendix 1;
- Agglomerations with no treatment; and
- Agglomerations listed in the EPA Priority Areas for Improvement List.

7.2.3.2 Urban Wastewater Treatment Directive - Infrastructure Programme

This programme consists of large scale projects targeted at achieving UWWTD compliance at agglomerations through upgrading of wastewater treatment plants.

This programme includes agglomerations listed in the ECJ Case in relation to Articles 4 and 5 of the UWWTD and also includes locations where there is risk of non-compliance with Directive standards due to growth pressure.

7.2.3.3 Urban Wastewater Treatment Directive – Major Projects Programme

Ringsend WWTP Upgrade

The upgrade of the Ringsend WWTP will continue into the RC3 period where the capacity of the WWTP will be increased to cater for the growing population of the Dublin area. A planning application for strategic infrastructure development to An Bord Pleanála to further progress the upgrade works was submitted in June 2018. An Bord Pleanála granted planning permission for the project on 24th April 2019 and it has been confirmed that no judicial review proceedings were launched during the judicial review application period which has now expired. The application seeks permission for works required to facilitate the use of Aerobic Granular Sludge (AGS) technology, to omit the previously permitted long sea outfall tunnel, to upgrade the sludge treatment facilities at Ringsend and to provide for a Regional Biosolids Storage Facility in north Dublin.

The proposed Ringsend WWTP Upgrade Project includes the following elements:

- Additional secondary treatment capacity as approved by An Bord Pleanála in 2012;
- Proposed works to facilitate the use of AGS technology in the existing secondary treatment tanks, increasing the capacity to 2.4 million Population Equivalent (PE);
- Proposed exclusion of the previously permitted 9km undersea outfall tunnel;
- Proposed expansion of the plant's sludge treatment facilities to match the overall increase in wastewater treatment capacity;
- Proposed provision of a new phosphorous recovery process;
- Proposed provision of additional odour control facilities; and
- Proposed increase in the flow through the plant by c.20% thereby increasing the amount of wastewater that can be treated and reducing the level of storm overflows which occur during heavy rainfall events.



Figure 7.1 – Ringsend Wastewater Treatment Plant

To date, we advanced works to prepare the site, upgraded the odour treatment facilities, trialled and proved AGS technology and undertaken investigative works to inform the project.

In December 2017, a contractor was appointed to construct a new 470,000 PE capacity upgrade at the plant (as laid out in the 2012 planning approval). Works on this capacity upgrade are progressing to schedule and it is anticipated that we will achieve final effluent compliance for 2.1m PE by Q4 2022.

Cork Lower Harbour

Cork Harbour is the second largest natural harbour in the world. Untreated raw sewage has been discharging directly into the lower harbour for decades. Wastewater is collected from homes and businesses across the lower harbour area and undergoes no treatment before being discharged into the sea. This practice is in breach of national and European legislation and means Ireland is currently in contravention of the European Union Urban Wastewater Treatment Directive.

We are addressing this issue with a long-term investment in wastewater in Cork, as part of our national commitment to provide wastewater treatment at agglomerations previously discharging raw sewage by 2021.

The project consists of:

- A new wastewater treatment plant at Shanbally;
- 14 new pumping stations;
- 30kms of new sewers;
- Repairs to 25kms of old pipes; and
- A drilled crossing under the estuary

The towns of Crosshaven, Carrigaline and Shanbally were connected to the wastewater network for treatment in December 2016. On completion, the extensive upgrade to the sewer network will ensure that all wastewater from these towns, along with Passage West, Monkstown, Ringaskiddy, Glenbrook, Coolmore and Cobh will be transferred by new pipes and pumped to the new treatment plant, before safe discharge to the sea.

7.2.3.4 Urban Wastewater Treatment Directive – Studies/Plans/Strategies

This programme is targeted at developing a catchment management strategy, water quality modelling and monitoring studies and progressing INTERREG projects initiated during IRC2.

7.2.4 Wastewater Discharge Authorisation Compliance

Wastewater treatment projects will be advanced during the RC3 investment period to continue to address non-compliance with Waste Water Discharge Authorisations (WWDAs), and in particular those with wastewater discharge licences.

Projects will be prioritised on the basis of those that deliver the greatest environmental improvements, such as those impacting high status waters, designated shellfish and

bathing waters. They will also support improvements in water quality, as set out in the River Basin Management Plan 2018 – 2021.

7.2.4.1 Wastewater Discharge Authorisation Programme - Infrastructure Programme

This programme is targeted at addressing agglomerations which are non-compliant with the requirements of the Wastewater Discharge Authorisations. It consists of large scale projects involving wastewater treatment plant or network upgrades which are planned to be initiated, progressed or completed during the RC3 period.

Delivery of these projects will be reviewed at key governance milestones and prioritised accordingly as funding and delivery constraints are identified and managed.

7.2.4.2 Wastewater Discharge Authorisation Programme - Capital Programmes

This work programme consists of sub-programmes of multi-site interventions and condition assessments. These are targeted at reducing risk of non-compliance and improving asset performance through the installation, upgrading and refurbishment of treatment and network process level equipment.

Targeted interventions will be progressed through following programmes in the RC3 period (some of which are continuing on from the IRC2 period):

- Critical Sewer Survey Programme;
- Infiltration Reduction Programme;
- Inlet Works 2020-2024 Programme;
- IW initiated Licence Reviews;
- National Certificate Authorisation Programme (NCAP) (2020-2024);
- Network Odour Septicity Control;
- Network Survey & Monitoring;
- Phosphorus Removal 2020-2024 Programme;
- Secondary Treatment Optimisation 2020-2024 Programme;
- Storm Water Overflow (SWO) Surveying and Monitoring Programme;
- Wastewater Disinfection Programme (2020-2024);
- WW Imports 2020-2024 Programme;
- WWPS National Upgrade Programme;
- WWPS Telemetry Programme and
- WWTP Storm Water Management 2020-2024 Programme.

7.2.5 Wastewater Collection Systems

IW needs to make significant investment in the coming years in upgrading the national sewer network to achieve environmental compliance objectives, relieve sewer flooding impacting the public and provide capacity for growth. Given the scale of investment needed across the country, critical areas must be prioritised.

7.2.5.1 Wastewater Collection Systems – UWWTD Programme

This programme consists of large scale infrastructure projects targeted at achieving UWWTD compliance at agglomerations through upgrading of wastewater networks.

This programme includes agglomerations listed in the ECJ Case in relation to Article 3 of the Urban Wastewater Treatment Directive. These projects are listed below:

- Mallow;
- Enniscorthy;
- Roscommon;
- Athlone;
- Ringaskiddy, Crosshaven, Carrigaline – (Part of Cork Lower Harbour); and
- Upper Liffey Valley Sewerage Scheme 2A and 2B.

The following agglomerations are part of the Drainage Area Plan Programme, which is described under the Future Proofing theme as it also addresses provision for future growth.

- Cork City;
- Fermoy;
- Middleton;

7.2.5.2 Wastewater Collection Systems – Compliance Projects

It is recognised that a number of the wastewater collection systems are having a detrimental impact on the water bodies that receive discharges from the storm water overflows belonging to those collection systems. There is considerable investment required in order to upgrade the wastewater collection systems to ensure storm water overflows meet environmental objectives.

The Drainage Area Plan (DAP) Programme and Storm Water Overflow (SWO) Survey & Monitoring Programmes will enable the underperforming assets to be identified and the level of risk quantified. The DAP Programme hydraulic models will enable the identification of the most beneficial interventions to improve performance of the highest risk assets in order to achieve licence compliance.

Due to the overall scale of investment required nationally, the investment in interventions on wastewater collection systems will have to be focused on priority areas where environmental benefits can be maximised in an effective manner.

This work programme also includes upgrades to wastewater collection systems to improve asset performance and eliminate known flooding risks.

7.2.5.3 Wastewater Collection Systems – Strategic Networks Programme

Our cities and large urban centres rely on strategic elements of the collection system to transfer wastewater within the catchment. This transfer is either to the existing WWTPs, or in some cases, away from WWTPs that are near capacity to alternative WWTPs. The development of long terms plans, upgrading existing strategic networks, advancement of interventions to increase capacity and provision of new strategic network in our cities and large urban centres, is an objective of this Investment Plan.

The upgrade of strategic elements of the collection systems is also required to be advanced in order to facilitate predicted future growth and development, while ensuring environmental compliance requirements are met.

These projects are listed below.

-
- Galway East Strategic Networks
 - Grand Canal Tunnel Sewer Outfall Extension
 - Sutton PS Upgrade
 - Cork Strategic Networks
 - Dundalk East
 - 9B Sewer Reinforcement (Dublin)
 - Dodder Valley Sewer Reinforcement
 - North Fringe & North Dublin Diversion Sewer Reinforcement
 - West Pier West
 - West Pier East
 - Lower Liffey Valley

7.2.5.4 Wastewater Collection Systems – Capital Programmes

This work programme consists of multi-site interventions and the purpose of the programme is multifaceted. It includes understanding collection system condition and performance, determining root cause, quantifying risk and addressing issues such as property flooding, odour and septicity problems.

- Flood Protection Measures to reduce risk of property flooding using small scale interventions where there are incidents of repeat property flooding in localised areas.
- Infiltration Reduction to reduce the infiltration flow entering the wastewater collection systems to benefit performance of collection system and/or wastewater treatment plants.
- Growth Studies to implement concept design studies where there are possible network constraints and to understand the actual existing level of service.
- Critical Sewer Surveys to assess condition of the critical infrastructure elements of the collection systems. The purpose of the programme is to target the highest priority critical sewers.
- Odour/Septicity Control programme focused on addressing repeat customer complaints due to malodours from collection systems and to undertake septicity control measures where asset condition is deteriorating due to corrosive conditions within the network.
- Wastewater Pumping Station (WWPS) upgrades prioritised based on the outcome of a national programme of WWPS condition assessments of wastewater pumping stations.
- Network Survey and Monitoring to undertake localised investigations of sewer networks (i.e. CCTV Surveys, flow monitoring, and connectivity surveys) to determine root cause of problematic networks.
- Drainage Area Plans (DAPs) are essential for the effective management of wastewater collection systems, determining level of risk and for determining the optimum concept design solutions to achieve performance targets. See Section 9.1.3.5 for further details of the DAP programmes.
- SWO Surveying and Monitoring Programme. This programme commenced in IRC2. To survey and assess all known SWO not covered under DAP Programme and all associated discharge locations, to enable highest significance overflows to be identified for monitoring.

7.2.5.5 Wastewater Collection Systems – Capital Maintenance

Capital Maintenance programmes covering capital maintenance of collection system assets (sewers, rising mains and pumping stations) commenced in the IRC2 period. These programmes targeted the replacement of failing assets and interventions were/are prioritised based on outputs of a risk assessment process. The objective of the programme is to reduce the incidents of equipment failures, blockages, pipe collapses and the resultant flooding and pollution incidents.

Capital Maintenance programmes are discussed further in Section 9.3.4.

7.2.5.6 Wastewater Collection Systems – Studies / Plans / Strategies

The National Planning Framework sets out the targets for growth to 2040. It is important that wastewater collection network infrastructure plans and strategies are developed and updated. They need to set out, at a high level, the potential wastewater infrastructure requirements to service this predicted growth and development.

Case Study 3 – UWWTD Infringement Case against Ireland (ECJ)

The European Commission has initiated an Infringement Case against Ireland in the Court of Justice of the European Union in relation to obligations under the Urban Wastewater Treatment Directive.

Compliance with the requirements of the Urban Waste Water Treatment Directive is a very high priority for the Government and the Department has been working closely with IW in relation to the Infringement case.

Measures to ensure compliance are set out in the River Basin Management Plan for Ireland 2018-2021, which was published by the Minister in April 2018.

IW will undertake capital upgrades at 28 urban wastewater treatment plants to ensure that treatment levels fully comply with the requirements of the Directive.¹⁰

It is forecast that there will be 15 locations listed in the Infringement Case will be addressed by the end of 2019. Of the remaining 13 locations, 11 will be completed during the RC3 period (2020 to 2024).¹¹

Of the urban areas where works are required, the majority will be compliant by the end of the RC3 period, including Ringsend. This is the single largest WWTP in the country, accounting for some 41% of the total wastewater load. The two remaining agglomerations are Cork City and Midleton which are dependent on Drainage Area Plans to be completed to identify the required solutions.

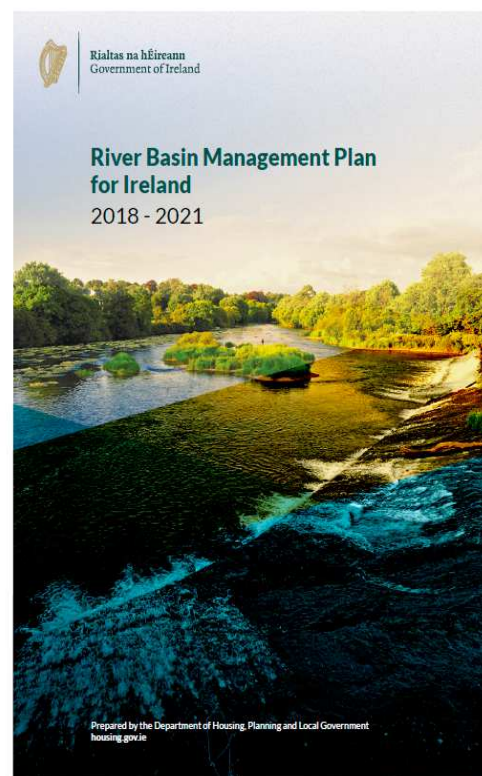
¹⁰ Reduced from 32 listed in the RBMP as agreed with EU commission in Q1 2018.

¹¹ Forecast as at Q3 2019.

Case Study 4 – River Basin Management Plan

The Government has published the River Basin Management Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027. Ireland is required to produce a RBMP under the Water Framework Directive (WFD).

IW's planned capital investment in the upgrading of wastewater treatment plants and collection systems will address the priorities set out in the River Basin Management Plan (RBMP). Appendix 1 of the RBMP lists the urban areas where capital works to upgrade water treatment plants are proposed in order to:



1. Achieve compliance with the Urban Waste Water Treatment Directive
2. Support the protection of protected areas (shellfish and bathing waters)
3. Support the protection of high-status waters
4. Support the prevention of deterioration and support targeted water-quality improvements

Although it will not be possible to address all urban wastewater pressures during the current IW capital investment cycle, these will be progressively dealt with by IW on a prioritised basis during future capital investment cycles within the framework of ongoing river basin management planning.

The 255 projects to upgrade wastewater treatment plants that are currently committed to are due to be completed by 2025. Appendix 1 of the RBMP gives the schedule from start date (project-approval date) through to project completion and handover.

Of the 255 already committed treatment plant projects, and a further 20 planned network upgrades, 116 will contribute to water quality improvements in 161 water bodies currently identified as being At Risk from urban wastewater pressures. The remaining 159 projects address expected growth needs in population centres and will contribute to preventing deterioration in water quality from pressures arising from future growth. The new wastewater projects to commence during the next investment period, 2020–2024, will contribute to further water quality improvements in the period after 2021.

7.2.6 Quality – Provide Effective Management of Wastewater Work Programmes

The Work Programmes described in Section 7.2 are listed in Table 7.4 below.

Work Programmes	Description	RC3 €m
Urban Wastewater Treatment Directive Programme (UWWTD) • Infrastructure Programme	Large scale projects targeted at achieving or maintaining UWWTD compliance.	712
UWWTD - Major Projects Programme • Cork Lower Harbour • Ringsend WWTP	Major projects targeted at:- • Capacity and compliance driven plant upgrade of Ringsend WWTP • Treatment/networks to Cork Lower Harbour to eliminate untreated discharges.	393
UWWTD Studies / Plans / Strategies	Key studies and development of plans targeted at developing catchment management strategies, water quality modelling and monitoring studies and progressing INTERREG projects.	29
Wastewater Discharge Authorisation Programme • Infrastructure Programme	Large scale projects targeted at addressing agglomerations which are non compliant with the Wastewater Discharge Authorisations.	95
Wastewater Discharge Authorisation Programme • Capital Programmes	Programmes of multi site interventions and condition assessments targeted at reducing risk of non compliance and improving asset performance	38
Wastewater Collection Systems • UWWTD Programme	Programme of large Scale WW Network projects targeted at UWWTD Compliance at locations agglomerations listed in Article 3 of the UWWTD.	165
Wastewater Collection System • Strategic Networks	Upgrade of strategic elements of the collection systems to facilitate future growth while ensuring environmental compliance requirements are met.	121
Wastewater Collection Systems • Compliance Programme	Programme targeted ensuring wastewater collection systems meet environmental objectives and eliminating known flooding risks.	95
Wastewater Collection Systems • Capital Programme	Programmes targeted at understanding collection system condition, performance, root cause, risk, property flooding, odour & septicity problems	39
Wastewater Collection Systems • Studies / Plans / Strategies	Key studies to improve asset condition and performance and provide long term strategic plans.	0
	Total	1,687

Table 7.4 – Provide Effective Management of Wastewater Work Programmes

7.2.7 Expected Outcomes for period 2020 to 2024

The expected outcomes to be delivered by the “Provide Effective Management of Wastewater Work Programmes” are shown in Table 7.5 below.

Outcome Measure	Units of Measure	Target End 2024
Agglomerations with no wastewater treatment	Number of agglomerations (outstanding)	2 (of 50)
UWWTD Compliance (ECJ)	Number of agglomerations (outstanding)	2 (of 31)
River Basin Management Plan Projects completed	Number of projects (completed)	207 (of 255)

Table 7.5 – Provide Effective Management of Wastewater Outcomes

8 Addressing the Conservation Theme

This section outlines the approach that IW has taken to consider and prioritise the various work programmes which address the WSPS theme of Conservation for the RC3 period.

8.1 Conservation – Ensure a Safe and Reliable Water Supply

IW manages c. 63,000km of water networks nationally and has assessed the performance of the networks using the international Infrastructure Leakage Index (ILI) methodology. We have found the performance to be poor by international standards. Investment is therefore required across a number of water savings programmes to drive down network losses, improve pressure, maintain headroom and support growth.

8.1.1 WSPS Policy Objectives:

- Take a proactive approach in promoting awareness of the importance of water conservation in Ireland.
- Implement the necessary programmes and interventions to promote the efficient and sustainable use of water in order to achieve, as a first step, the water savings identified in RBMP 2018-2021 with the ultimate aim of reducing leakage to sustainable economic levels.
- Completion of IW's Water Resource Plan as a key cross-cutting element in ensuring water resource sustainability.

8.1.2 Background and Approach

The conservation of water resources is a key principle of the WSPS. A key policy objective is to prioritise measures to reduce network leakage and encourage customer conservation and behavioural change.

The efficient and sustainable use of water is central to the River Basin Management Plan, which requires IW to implement water conservation measures to reduce high levels of network losses.

8.1.3 Leakage Reduction

The River Basin Management Plan requires IW to target water savings of 61 million cubic metres per annum by 2021 against the 2017 baseline. Investment is therefore required across a number of water savings programmes including Find and Fix, First Fix, Pressure Management and water main replacement.

IW is progressing the National Leakage Reduction Programme which targets resources at areas of highest leakage and lowest headroom across water networks.

8.1.3.1 Leakage Reduction Capital Programmes

This programme consists of a National Water Network Programme. This comprises several sub-programmes targeted at identifying and repairing leaks to reducing water loss, network rehabilitation and capital maintenance of network assets including:

- The Find and Fix programme to reduce water loss by identifying and repairing leaks in an efficient manner;

-
- The First Fix programme to reduce water losses by identifying and repairing leaks within private properties;
 - The Network Rehabilitation programme to replace worst performing pipes, reducing bursts and supply interruptions, as well as contributing to leakage reduction and pressure improvements;
 - Metering of unmetered non-domestic properties to identify and reduce unaccounted for water; and
 - The National Telemetry project which will deliver Ireland's first integrated Leakage Management System (LMS). This LMS will provide accurate and timely leakage information required to target and report on the effectiveness of leakage reduction activities.

8.1.3.2 Leakage Reduction Infrastructure Programmes

This programme is made up of a small number of county-wide water conservation projects that were initiated by Local Authorities prior to 2014 and continued into IRC1 and IRC2. These will be progressed to completion the RC3 period.

8.1.4 National Water Resources Plan

The majority of public water supplies in Ireland use surface water (rivers and lakes) as their source. These serve 81% of the population. Groundwater and springs, serve 12% and 7% of the population respectively. Many of these existing supplies are abstracting from sources that are environmentally unsustainable in the long term. Initial analysis indicates that a significant number of water supplies may have a supply demand deficit. The deficit relates to either insufficient water availability, or asset inadequate capacity to treat or distribute sufficient quantities of water to meet our customers demands over the short, medium and long term to a reasonable level of service.

IW is developing the first National Water Resources Plan (NWRP) that will outline how we move towards a sustainable, secure and reliable drinking water supply for everyone over the next 25 years whilst safeguarding our environment. IW recognises the need for a good quality, resilient water supply, for all its customers. The purpose of the NWRP is to provide a plan that will secure the availability of drinking water supplies across the country to meet current and growing future demands.

The NWRP will identify options to address supply demand balance issues in all water resource zones. It is envisaged that the solutions to address these issues will involve combinations of interventions on the supply side to ensure sustainable, reliable future sources of water. On the demand side solutions will be developed to reduce leakage and promote water conservation. These will both require significant investment.

8.1.4.1 NWRP Work Programmes

The following outlines the next steps identified from work to date on the NWRP for improving our knowledge base, identifying needs and developing interventions to achieve the plan objectives:

- Develop suitable knowledge of our water supplies, including level and flow monitoring in rivers, lakes and groundwater sources (with telemetry);
- Rollout technology to assess the components of supply and demand including; abstraction meters and Distribution Input meters;

-
- Develop models of our raw water resources;
 - Based on resource modelling, develop target operational models for all of our Water Resource Zones to ensure resilience and optimal operational profiles;
 - Set up internal structures to continuously monitor and update Supply Demand Balance Assessments;
 - Develop suitable KPIs to track resilience and levels of service, e.g. headroom and security of supply index;
 - Develop bands for Security of Supply Index (SOSI) reporting and roll out of options methodology for 535 Water Resource Zones;
 - Review current capital investment plan proposals and ensure suitability/resilience of current proposals; and
 - Develop programme appraisal for solutions to address supply demand balance issues, to go forward to future investment cycles.

These actions will be formulated into work programmes following completion of the overall NWRP document.

8.1.5 Conservation – Ensure a Safe and Reliable Water Supply Work Programmes

The Work Programmes described in Section 8.1 are listed in Table 8.1 below.

Work Programmes	Description	RC3 €m
Leakage (Water Network Management) – Capital Programmes	Programmes targeted at identifying and repairing leaks to reducing water loss, network rehabilitation and capital maintenance of network assets	
○ Find & Fix (2020-2024)	Active leakage control through finding and fixing leaks to reduce leakage within the network	162
○ First Fix Scheme (2020-2024)	Programme targeted at repair of domestic customer-side leaks, detected through a meter.	39
○ Mains Rehabilitation (2020-2024)	Programme targeted at providing security of supply in areas of the network where there are frequent bursts, and improved water quality where the condition of the main is causing water quality issues.	171
○ National Leakage Management Planning costs	Development and implementation of the National Leakage Management Programme targeted at leakage reduction and efficient management of the water network.	21
○ Metering of Unmetered/Undocumented Non Domestic Properties	Targeting small diameter non-domestic meter replacement which secures revenue and large non-domestic metering replacement.	50
Leakage Reduction – Infrastructure Programmes	Completion of water conservation projects that were initiated by Local Authorities prior to 2014 and continued in IRC1/IRC2	7
National Water Resources Plan – Studies/Plan/Strategies	Delivery of the National Water Resources Plan and completion of Water Resource Plans at WRZ level.	2
	Total	452

Table 8.1 – Ensure a Safe and Reliable Water Supply Work Programmes

8.1.6 Expected Outcomes for period 2020 to 2024

The expected outcomes to be delivered by the “Ensure a Safe and Reliable Water Supply Work Programmes” are shown in Table 8.2 below.

Outcome Measure	Units of Measure	Target End 2024
Net water savings in water supply network	Net water savings 2020-2024 (MLD saved)	176

Table 8.2 – Ensure a Safe and Reliable Water Supply Outcomes

8.2 Conservation – Protecting and Enhancing the Environment

8.2.1 WSPS Policy Objectives

- Plan for future climate change challenges and contribute to the development of the National Adaptation Framework under the Climate Action and Low Carbon Development Act 2015 and Sectoral Adaptation Plans required by September 2019.

8.2.2 Background and Approach

The drinking water and wastewater treatment process generates sludge, which requires further treatment prior to its reuse or disposal.

We estimate that the quantity of wastewater sludge generated will increase by more than 80% by 2040 as new and upgraded plants are completed to meet our wastewater treatment objectives.

This increase can be mitigated by the provision of anaerobic digestion and phosphorus recovery technologies which reduce the quantity of wastewater sludge for final re-use.

We are required to meet our obligations under the National Energy Efficiency Plan (2009 to 2020) whilst managing an increased base demand for energy due to compliance with higher treatment standards.

8.2.3 Sustainability and Climate Change

Sustainability and climate change are key considerations for our water resources and wastewater planning to ensure a resilient water service. Climate change will have a significant impact on water services in Ireland. Reduced rainfall combined with extra demand from a growing population and economy will put increased pressure on our water supplies. Our wastewater network and treatment plants will also be tested as we experience more significant storm events, rising sea levels and more intense rainfall leading to increasing likelihood of flooding.

We are implementing measures to adapt to future climate change and develop a resilient water and wastewater service, including climate change mitigation through reducing our emissions of carbon dioxide and other greenhouse gases.

Examples of the climate change adaptation measures we have implemented to date are:

- Drainage Area Plans – our DAP programme includes an allowance for additional capacity and resilience in all design options to take the impact of climate change into account;
- Flood protection – we have included a programme for protection of property from local flooding issues which are occurring more frequently due to climate change;
- Stormwater Management – programmes providing storage and retention of excess storm flows to wastewater treatment plants, to prevent discharge to the environment, are being sized to take climate change impacts into account;
- SWO Surveying and Monitoring – we are implementing programmes to monitor frequency of overflows to fully understand discharges from our sewer system to the environment and to implement preventative measures;
- National Water Resources Plan – the NWRP calls out the impact of climate change on providing a sustainable water supply within environmental constraints which will be taken forward into our investment planning approach; and
- All future asset upgrades will be designed and constructed in line with IW's sustainability policy requirements, which will include adaptation for the impact of climate change, as identified below.

These climate adaptation measures are accounted for in their primary work programmes. For example, Drainage Area Plans are accounted for under Future Proofing as they are primarily contributing to planning for growth and resilience of wastewater networks. Similarly, the National Water Resources Plan measures will be implemented as part of Quality and Future Proofing work programmes.

We are developing and implementing a strategy to meet our climate change policy commitments aligned with the National Adaptation Framework – Planning for a Climate Resilient Ireland.

The main impacts of climate change for IW are likely to be increased rainfall and storm intensity resulting in:

- Pluvial, fluvial and coastal flooding damaging our assets and impacting on raw water quality;
- Sewer flooding and increased combined sewer overflow spills leading to flooding of properties and causing negative environmental impacts in receiving waters; and
- Threat to security of water supply and wastewater collection arising from flooding impacting on our operations.

Reduced rainfall and drought resulting in:

- Lower river flows reducing the availability of water for abstraction and dilution capacity available for wastewater treatment;

-
- Reduced capacity to supply treated water and increased demand for water;
 - Changes in water quality classification;
 - Impacting on water and wastewater treatment costs; and
 - Increases in water temperature affecting treatability and assimilative capacity of waters.

Adaptation priorities for IW are:

- Assessment of the immediate risks arising from flooding and other weather-related incidents, such as drought, on our assets and operations and implementation of appropriate measures to reduce this risk in a structured manner;
- Development of an understanding of how climate change will impact on water availability, treatment processes, water and wastewater networks to inform the identification and implementation of measures to improve the resilience of services; and
- Development of Climate Vulnerability Assessment and Management standard to ensure future capital investment projects are climate change proofed.

IW has begun addressing these priorities including through collaboration with ICARUS (Irish Climate Analysis and Research Units), Maynooth University, on the identification of climate sensitive catchments. IW are currently developing a Climate Change Adaptation and Mitigation Strategy (CCAMS) document. Implementation of the strategy will involve collaboration across our business and with external parties to ensure effective implementation.

8.2.4 Wastewater Sludge

IW has developed the first National Wastewater Sludge Management Plan (NWSMP). The NWSMP outlines IW's 25 year strategy to ensure a nationwide standardised approach for managing wastewater sludge.

8.2.4.1 Sludge Management Programmes - Wastewater

These programmes are targeted at investment in wastewater sludge management facilities to meet the objectives of NWSMP.

A national programme of provision of Satellite Dewatering Centres has been identified based on the recommendations of the NWSMP. This will reduce the transportation of large volumes of liquid sludge from smaller WWTPs to facilitate efficient and traceable management of wastewater sludge.

The need for new and upgraded Sludge Hub Centres was identified in the NWSMP. These will provide efficient, sustainable treatment of sludge to meet NWSMP objectives.

8.2.5 Drinking Water Sludge Treatment

IW is developing a nationwide standard approach to the management of drinking water treatment sludge as part of the National Water Resources Plan.

The primary source of drinking water treatment sludge production is through the Coagulation, Flocculation and Clarification (CFC) process. IW currently operates

approximately 186 CFC water treatment plants. The purpose of the national approach is to provide an enduring, coherent plan to manage residuals from the water treatment process in an economical, environmentally acceptable and sustainable manner.

8.2.5.1 Sludge Management Programmes – Water

Upgrading of drinking water sludge treatment projects will be prioritised and advanced during the RC3 investment period. These will continue to deliver environmental improvements in parallel with other investments. These programmes will target preventing pollution in sensitive receiving waters, removing sites from the RAL and reducing on site pollution.

8.2.6 Energy Efficiency

IW is one of the largest energy users in the country.

In wastewater services, energy is used in pumping and aeration in the treatment processes. In water supply, pumping accounts for the largest proportion of energy use. The processing and transport of sludge from water and wastewater treatment facilities also has a significant energy consumption requirement.

Energy consumption in water and wastewater services will continue to increase in line with economic activity, population growth and the delivery of higher standards required to safeguard the prosperity and welfare of our customers, environment and economy.

IW's sustainable energy policy sets out our commitment and our objectives for improving energy efficiency and reducing our carbon emissions. Energy efficiency improvement is a key mitigation measure as part of our climate change policy.

8.2.6.1 Capital Programmes – Energy Efficiency

These programmes are targeted at further implementation of our sustainable energy policy and strategy through:

- Use of best practice standards and design guidance for new equipment and processes;
- Embedding Energy Efficiency Design (EED) into business decisions and operations, to ensure new and upgraded plant, equipment, buildings, and systems are designed, equipped, maintained and operated to a high level of energy performance;
- A focused energy programme for the replacement and improvement of existing large energy inefficient assets and development of renewable energy generation and use;
- Development of energy KPIs to monitor, track and enable energy performance;
- Continued energy training to improve energy efficiency;
- Increasing renewable energy through anaerobic digestion at Sludge Hub Centres;
- Reducing energy for sludge transport through Satellite Dewatering Centres;
- Demand reduction through water network loss reduction and wastewater infiltration reduction (where economically feasible); and
- Source control, reduction in WWTP and network overload caused by excessive discharges from non-domestic sources.

8.2.7 Conservation – Protect and Enhance the Environment Work Programmes

The Work Programmes described in Section 8.2 are listed in Table 8.3 below.

Work Programmes	Description	RC3 €m
Sludge Management Programmes - Wastewater	Programme targeted at wastewater sludge management facilities to meet the objectives of NWSMP.	19
Sludge Management Programmes – Water	Upgrading of drinking water sludge treatment as part of quality and capacity programmes.	Included in DW programmes
Capital Programmes – Energy Efficiency	Programmes targeting embedding Energy Efficiency Design and the replacement and improvement of existing large energy inefficient assets and development of renewable energy generation and use.	32
	Total	51

Table 8.3 – Protect and Enhance the Environment Work Programmes

8.2.8 Expected Outcomes for period 2020 to 2024

The expected outcomes to be delivered by the Protect and Enhance the Environment Work Programmes are shown in Table 8.4 below.

Outcome Measure	Units of Measure	Target End 2024
Energy Efficiency	Reduction in energy consumption (GWh pa)	22

Table 8.4 – Protect and Enhance the Environment Outcomes

9 Addressing the Future Proofing Theme

This section outlines the approach that IW has taken to consider and prioritise the various work programmes which address the WSPS theme of Future Proofing for the RC3 period.

9.1 Future Proofing – Supporting Social and Economic Growth

9.1.1 WSPS Policy Objectives

- Ensure that growth in the five cities of Dublin, Cork, Galway, Limerick and Waterford together with the regional centres identified in the NPF is supported by the provision of water services investment.
- Support the growth of identified settlements where these are prioritised in development plan core strategies at a county/city level.
- Undertake detailed network and capacity assessments to support the provision of water services infrastructure to facilitate housing and economic development in priority towns and urban areas identified in Regional Spatial and Economic Strategies.

9.1.2 Background and Approach

In preparing this Investment Plan, IW has adopted a tiered priority approach to supporting growth in accordance with government policy as identified in the NPF. The Regional Spatial and Economic Strategies (RSES) currently being prepared by the three Regional Assemblies will further identify regionally important settlements with population targets for these settlements and for county populations. The RSESs were available in 2019. Statutory core strategies of the individual LA development plans will be subsequently revised or amended to ensure their consistency with the adopted RSESs.

IW will review the proposed investments in this Investment Plan against the demand and population estimates when the updated core strategies are available and as project delivery timelines require.

9.1.3 Facilitating growth in line with national and regional economic and spatial planning policy

IW recognises that investment in water services is a key factor in enabling proper planning and sustainable development in the national, regional and local context. IW is proposing to invest in a range of programmes that will support this growth as identified in the appropriate national, regional and local level statutory plans as part of a balanced portfolio of investment across the three themes of the WSPS.

IW will ensure that the five cities and five regional centres identified in the NPF have the water supply and wastewater treatment capacity to allow them to grow. We will also endeavour to ensure that county towns and key regional growth settlements identified in the RSESs (when available) will have available water supply and wastewater treatment capacity to allow them to grow. This will be considered in budgeting for our wastewater treatment upgrade projects.

The Investment Plan includes specific programmes targeted at supporting social and economic growth in line with government policy and initiatives. These programmes are identified in the table below including the Local Infrastructure Housing Activation Fund (LIHAF) and Major Urban Housing Development (MUHD) sites.

In addition to specific growth programmes, many investments driven by quality objectives will include an allowance for growth in the sizing of the proposed assets.

Further information on the methodology for supporting growth and economic development is set out in Appendix 3 of this document.

All newly/modified connecting customers will be subject to entering a connection agreement in line with IW's new national connection policy (as approved by the CRU).

9.1.3.1 Facilitating Growth – Work Programmes

We have included a number of national programmes and projects targeted at providing for planned growth across the Investment Plan (more information is included in Appendix 3):

- Providing for growth capacity in major cities, large towns and county towns;
- Providing for growth in our asset upgrade projects delivered under the Quality and Conservation themes;
- Supporting growth through leakage reduction in areas where there is high leakage and increasing demand;
- Providing for growth through planning our water and wastewater networks
- Progressing Strategic Network Reinforcement Projects (included under Wastewater Collection Systems programmes);
- Continuing with the Network Extensions Programme from the IRC2 period;
- Supporting Government Initiatives such as the Local Infrastructure Housing Activation Fund (LIHAF) and the Multi-Unit Housing Development Strategy (MUHDS);
- Undertaking Local Network Reinforcement projects where driven by developer led initiatives;
- Up-sizing of Connection Assets where appropriate to meet future demand; and
- Working with LAs on infrastructure projects as part of the Small Towns and Villages Growth Programme.

9.1.3.2 Wastewater Growth Programme – Infrastructure Programme

This programme is targeted at providing additional wastewater treatment and network capacity at specific locations through WWTP upgrade projects, Local Network Reinforcement projects, Network Extensions and network upgrades to support approved LIHAF/MUHDS initiatives.

A full listing of this programme is provided in Appendix 4 of this document.

9.1.3.3 Water Growth Programme – Infrastructure Programme

This programme is targeted at providing additional water network capacity at specific locations through trunk main and pipeline upgrades, network extensions and network upgrades to support approved LIHAF/MUHDS initiatives.

A full listing of this programme is provided in Appendix 4.

9.1.3.4 Water and Wastewater Growth Programme – Capital Programmes

These Capital Programmes are targeted at identifying and planning for future network extensions and reinforcement “hotspot” projects, capturing synergies with other infrastructure projects where appropriate and providing for new connections for significant and standard connection types.

Also included under these work programmes are the Small Towns and Villages Programme for water and wastewater which will support the growth of identified settlements where these are prioritised in development plan core strategies at a county/city level.

A full listing of these programmes is provided in Appendix 4.

9.1.3.5 Network and Treatment Capacity Assessments Programme

IW’s DAP programme targets critical wastewater networks that require a detailed performance assessment and improvement strategy as a result of a number of factors including planned development growth, reported flooding issues and poor environmental performance.

A DAP entails a detailed assessment of a sewer system’s performance and condition. It investigates hydraulic, operational, structural and environmental performance for current, short-term (6 years) and long-term (25 years) development scenarios. The DAP outputs includes up-to-date asset information databases, detailed network hydraulic models, flooding and environmental performance reports, growth impact analysis, critical asset failure impact analysis. It will also develop a strategy proposal to achieve the desired levels of service for wastewater networks.

The water supply modelling programme will update and construct hydraulic water models for large urban areas, gateway towns and regional schemes. The programme will deliver updated hydraulic models between 2020 and 2024, comprising in the region of 27 WSZs with a total mains length of 6,400kms. These updated models will form an integral part of IW’s decision making process for planning, design and operation of the public water distribution systems nationally. They will also assist in driving down UFW and leakage in the distribution networks.

9.1.4 Future Proofing – Social and Economic Growth Work Programmes

The Work Programmes described in Section 9.1 are listed in Table 9.1 below.

Work Programmes	Description	RC3 €m
Wastewater Growth Programmes - Infrastructure Programmes	Specific Wastewater programmes including LIHAF/MUHDS schemes (or other Government housing initiatives), network extensions and reinforcement and growth driven upgrades.	208
Water Growth Programmes - Infrastructure Programmes	Specific Water programmes under LIHAF/MUHDS schemes, network extensions and reinforcement and growth driven upgrades.	154
Water and Wastewater Growth Programmes - Capital Programmes	Programmes for customer driven new connections, upsizing synergies resulting from extensions, reinforcements and third party driven works. Small towns and Villages Programmes	222
Network and Treatment Capacity Assessments Programme	Programmes targeted at developing tools to support investment and asset management decisions for water and wastewater networks (incl. DAPS).	53
	Total	637

Table 9.1 – Support Social and Economic Growth Work Programmes

9.1.5 Expected Outcomes for period 2020 to 2024

The expected outcomes to be delivered by the Social and Economic Growth Work Programmes are shown in Table 9.2 below.

Outcome Measure	Units of Measure	Target End 2024
Drinking water treatment capacity	Additional capacity provided (MLD)	46
Wastewater treatment capacity	Additional capacity provided (PE)	1.2m

Table 9.2 – Support Social and Economic Growth Outcomes

9.2 Future Proofing – Capacity and Resilience

9.2.1 WSPS Policy Objectives

- Improve the quality and efficiency of services to customers in line with the performance standards for continuous improvement agreed with the CRU.
- Delivery of the strategic capital investment programme set out under the NDP over the period 2018-2027 to improve resilience in areas most vulnerable to a shortfall in water supply and wastewater services, such as the Greater Dublin Area.

9.2.2 Background and Approach

IW recognises the need for a good quality, resilient water supply, for all our customers. The NWRP will identify sustainable, reliable future sources of water which will require significant investment to meet current and growing future demands. It is expected that the “Water Supply Project – Eastern and Midlands Region” will support national development with long term sustainable and reliable water supplies.

Wastewater capacity and resilience are being provided across the investment programme as a part of quality driven investment. In the Greater Dublin Area, additional capacity will be provided by the Greater Dublin Drainage project.

9.2.3 Interruptions to Supply

The Water Framework Directive requires Ireland to have a system in place for the registration and control of abstraction of water. The DHPLG commenced a Public Consultation process in August 2018 on the General Scheme of the Water Environment (Abstractions) Bill 2018, which will establish a regime for the control of abstractions.

Our Water Resource Zones are currently under pressure from over abstraction. IW will start to address the zones with the highest pressure from over abstraction of water by prioritising investment to deliver the greatest environmental improvements.

Our target is to provide 24 hour production capacity at all WTPs so as to accommodate projected demand needs. This will include a factor of safety to allow for periods of high demand.

9.2.3.1 Water Resilience Programme

This programme is targeted at reducing interruptions to supply and consists of large scale infrastructure projects to deliver critical trunk mains at specific locations and also capital programmes targeted at providing additional storage and resilience.

9.2.3.2 Major Projects Programme - Water Supply Project – Eastern and Midlands Region

A new water supply source is needed for IW’s Eastern and Midlands Region to deliver secure, reliable and sustainable long term water supplies to the area. In 2015 IW embarked on an extensive four-stage public consultation process to identify a suitable new source of water supply for the region. The project which has identified IW’s

preferred new water supply scheme is titled “Water Supply Project - Eastern and Midlands Region”.

The preferred scheme comprises the abstraction of water from Parteen Basin on the Lower River Shannon, with water treatment nearby at Birdhill, County Tipperary. Treated water would then be piped 170km to a new reservoir at Peamount in south County Dublin, connecting to the Greater Dublin network. Provision of treated water supplies to communities in North Tipperary, Offaly, Laois, Westmeath, Kildare, Meath and Wicklow is also enabled by the preferred scheme.

The project will be the first major comprehensive upgrade to Ireland’s water source infrastructure in the region in over 60 years. It will help to meet the domestic and commercial needs of over 40% of the population up to 2050 and beyond while delivering long-term social, economic and environmental benefits along the entire length of the pipeline.

9.2.4 Water Pressure

The efficient and sustainable use of water is central to the River Basin Management Plan, which requires IW to implement water conservation measures to reduce high levels of network losses.

9.2.4.1 Pressure Management Programme

The Pressure Management programme is targeted at reducing areas of high pressure reduce water loss in networks and tackling areas of persistent low pressure.

9.2.5 Major Project Programme – Provide Effective Management of Wastewater

The Greater Dublin Drainage (GDD) project is a strategic investment priority for IW and will form a key part of the wastewater network that is necessary to safeguard public health, protect the environment, provide resilience and support the sustainable growth of the Greater Dublin Area.

Continued population growth and increased commercial activity means the volume of wastewater generated in greater Dublin is projected to increase by more than 50% over the next 30 years. GDD will provide the additional treatment capacity required once the Ringsend facility reaches its maximum capacity in the mid-2020s.

The proposed GDD consists of:

- New 500,000 PE regional wastewater treatment facility and sludge hub centre at Clonshaugh, Dublin;
- Underground orbital sewer to divert the 9C sewer from Blanchardstown to Clonshaugh;
- New pumping station at Abbotstown;
- New sewer to divert part of the north fringe sewer to the new facility;
- Outfall pipeline to discharge the treated water to the Irish Sea; and
- Regional biosolids storage facility at Newtown, near Kilshane Cross.

9.2.6 Future Proofing – Capacity and Resilience

The Work Programmes described in Section 9.2 are listed in Table 9.3 below.

Work Programmes	Description	RC3 €m
Major Projects Programme – Water Supply Project – Eastern and Midlands Region	Major Project delivering a new water supply source for IW's Eastern and Midlands Region.	293
Major Project Programme – Greater Dublin Drainage Project	Major Project targeted at providing additional wastewater capacity for Dublin to support social and economic growth.	410
Water Resilience Programme	Programmes targeted at reducing interruptions to supply and increasing security of supply in water supply networks.	181
Pressure Management Programme	Targeted at reducing areas of high and low pressure.	11
	Total	895

Table 9.3 – Capacity and Resilience Work Programmes

9.2.7 Expected Outcomes for period 2020 to 2024

The outcomes to be delivered by the Greater Dublin Drainage Project are captured under the Future Proofing – Social and Economic Growth Work Programme as Additional Wastewater Treatment Capacity provided.

The outcomes associated with the 'Water Supply Project – Eastern and Midlands Region' are expected to be delivered beyond the 2024 period.

The remaining outcomes related to capacity and resilience can be quantified and added to the list of committed outcomes during the delivery period.

9.3 Future Proofing – Investing in our Future

9.3.1 WSPS Policy Objectives

- Develop an asset management capability to ensure that the performance of assets is maintained and enhanced to the requisite standard and to achieve optimum balance of service risk and whole life cost.

9.3.2 Background and Approach

Optimising the life of all existing assets is an essential part of Asset Management. This ensures we get the maximum value from our assets for our customers. Asset lifecycle management includes Strategy and Planning; Asset Management Decision Making; Asset Information; Lifecycle Delivery; Organisation and People; Risk and Review. The objectives of an asset management approach include:

- To maintain the current levels of service to our customers and the environment;
- To increase understanding and apply consistent approaches to management of the asset life cycle; and
- To ensure the safety, health and well-being of our employees, customers and the public.

9.3.3 Asset Management

Asset management describes how an organisation translates its objectives into asset-related decisions, plans and activities. This includes aspects such as leadership, policies and systems as well as management of the physical asset lifecycle. Asset Management incorporates all organisation activities as set out in the asset management conceptual model developed by the Institute of Asset Management (IAM).

Asset Management covers the overall approach, and instils a mind-set to enable an organisation to realise value from assets in the achievement of its objectives. Applying the asset management approach will deliver benefits to IW including;

1. Better **customer** outcomes;
2. **Safer** operations and services for staff and customers;
3. Whole **lifecycle** management of the assets;
4. Good asset **knowledge** informing our investment decisions; and
5. Better **planning** for environmental, sustainability and asset resilience.

The asset management approach is incorporated into our investment planning process and ensures we get the maximum value from our assets for our customers.

9.3.4 Capital Maintenance

Capital Maintenance is the replacement or refurbishment of existing assets with the objective of maintaining our existing levels of service to our customers and to the environment. In the planning and delivery of these works, we will identify and deliver the most cost-effective solution to maintain the existing service levels. Capital Maintenance programmes are required to cover the full asset base; water and wastewater, above and below ground assets.

The works to be delivered under the various capital maintenance programmes will contribute to our efforts to meet all of our strategic objectives.

9.3.4.1 Capital Maintenance Programmes

These programmes are targeted at maintaining existing network, treatment and metering assets in order to maintain levels of service to customers.

- Capital Maintenance Programmes
 - Water Above Ground
 - Water Below Ground (excluding Water Network Management programmes)
 - Wastewater Above Ground
 - Wastewater Below Ground

9.3.5 Health and Safety

All new investment identified in this Investment Plan will incorporate design elements in compliance with relevant health and safety legislation. In addition, we will continue investment in providing specific programmes to address Health and Safety issues at our sites and assets.

Both of these steps will ensure that all future investment complies with relevant health and safety legislation. This will ensure the safety, health and well-being of our employees, customers and the public.

9.3.5.1 Health and Safety Programmes

These programmes are targeted at addressing specific health, safety and welfare issues within the IW asset base.

- HSQE
- Legacy Offices
- Site Security Upgrades
- Site Welfare facilities

9.3.6 Other Programmes

9.3.6.1 Taking In Charge of Non IW Developed Assets

These programmes are targeted at the taking in charge of assets constructed by third parties such as developers, Group Water Schemes transferring to IW ownership, legacy estates and water supplies serving small numbers of houses (e.g. LA Housing schemes serving a small rural housing settlement).

9.3.6.2 Telemetry Programmes

This programme is targeted at providing telemetry outstation equipment at water and wastewater assets to connect to the National Telemetry System which is part of the Non Network Capex submission.

9.3.6.3 Innovation Programmes

This programme consists of projects and pilot studies aimed at developing innovative approaches and solutions to water and environmental issues through collaborative research and trials of new and emerging technologies.

9.3.7 Future Proofing – Invest in Our Future Work Programmes

The Work Programmes described in Section 9.3 are listed in Table 9.4 below.

Work Programmes	Description	RC3 €m
Asset Management Programmes	Programmes targeted at further developing the understanding and supporting data of the asset base.	69
Capital Maintenance Programmes <ul style="list-style-type: none"> • Water Above Ground • Water Below Ground (excluding Water Network Management programmes) • Wastewater Above Ground • Wastewater Below Ground 	Programmes are targeted at maintaining existing network, treatment and metering assets delivered through contractor led and operational resources.	242
HSQE Programmes	Programmes targeted at addressing specific health, safety and welfare issues including site security and welfare facilities.	46
Metering Programmes	Programme targeting renewal of bulk and non revenue water meters.	3
Taking in Charge Programmes	Programme targeted at Taking in Charge of:- <ul style="list-style-type: none"> • Developer Provided Infrastructure • Group Water Schemes • Legacy estates • Small Supplies 	43
Telemetry Programmes	Provision of telemetry equipment on sites in support of the National Telemetry Programme.	9
	Total	412

Table 9.4 – Invest in Our Future Work Programmes

10 Defining the Investment Portfolio

IW is focused on key deliverables that will bring our water infrastructure and services to an acceptable level, while supporting economic and social development as our economy continues to grow. We must focus on delivering a quality service to customers.

It is estimated that investment of close to €14 billion will be required by IW over the period 2018 to the mid-2030s, on a structured and phased basis, to meet these investment needs. This investment will be delivered in parallel with the continued transformation of water services to ensure:-

- consistent application of maintenance standards;
- achievement of significant operational changes and operating cost savings; and
- embedding of water conservation and sustainable water resource management into water policy.

IW has invested €2.25 billion in water services infrastructure between 2014 and 2017. IW will invest €8.8bn in the period 2018 to 2027, of which €5.2bn (network and non-network) will be in the RC3 period.¹²

10.1 Our Investment Portfolio

The portfolio of projects and programmes which forms this Investment Plan is outlined in the following sections. A list of these projects and programmes included in the portfolio are given in Appendix 4.

The base date for costing of interventions in the Investment Plan is 2017 and all sums in the tables in Section 10 are expressed in 2017 monies.

10.1.1 Investment Portfolio – Expenditure Categories

The Investment Portfolio (excluding Non-Network Capex) is set out in Table 10.1 and the pie chart in Fig. 10.1, broken out by WSPS theme and Fig 10.2 by WSSP Strategic Objective.

¹² Includes €0.3bn adjustment from 2017 Business Plan Submission. NDP figure is based on 2015 Business Plan numbers (€8.5bn for 2018 to 2027 period).

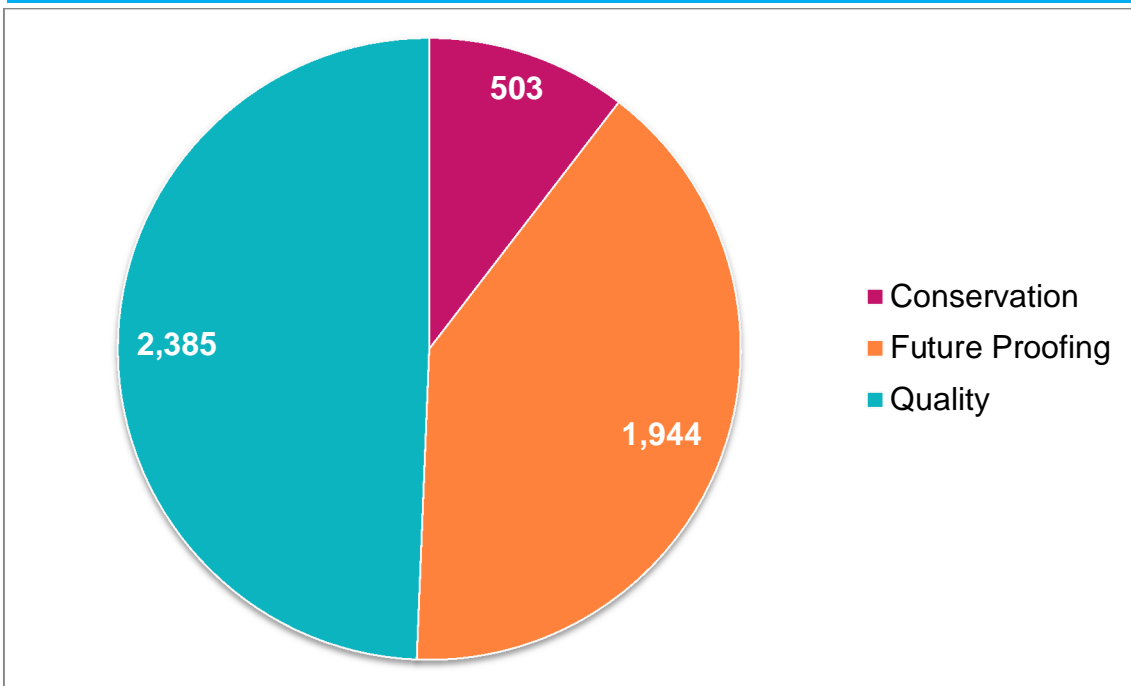


Figure 10.1 – Investment Portfolio by WSPS Themes (2017 Monies)

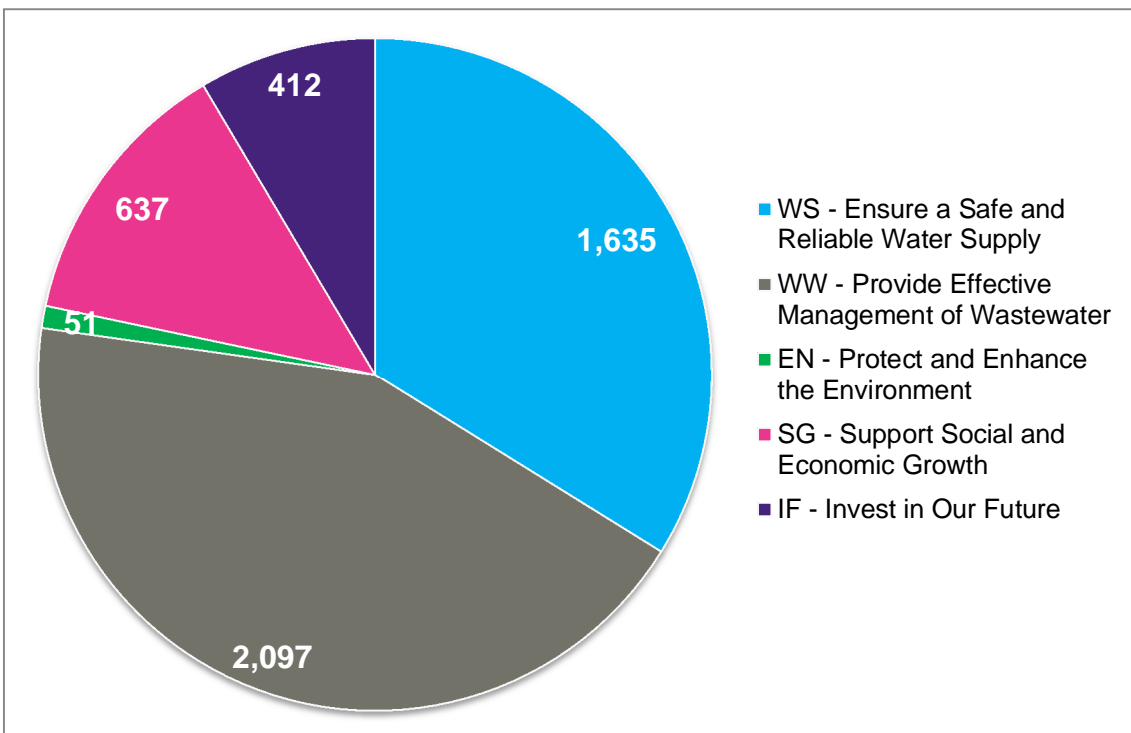


Figure 10.2 – Investment Portfolio by Strategic Objective (2017 Monies)

WSPS Theme	WSSP Objective	2020 to 2024 €m's
Quality	Ensuring a Safe and Reliable Water Supply	698
	Provide Effective Management of Wastewater	1,687
Conservation	Ensuring a Safe and Reliable Water Supply	452
	Protect and Enhance the Environment	51
Future Proofing	Support Social and Economic Growth	637
	Greater Dublin Drainage Project	410
	Ensure a Safe and Reliable Water Supply	192
	Water Supply Project - Eastern and Midlands Region	293
	Invest in our Future	412
	Total for Investment Plan	4,832

Table 10.1 – Investment Portfolio by WSPS Policy Theme and WSSP Strategic Objective

10.1.2 Policy Objective: Quality

This section outlines IW’s investment proposals to address the WSPS Policy theme of Quality.

WSPS Theme	WSSP Objective	Work Programmes	2020 to 2024 €m’s
Quality	Ensuring a Safe and Reliable Water Supply	Drinking Water Quality (Microbiological)	349
		Drinking Water Quality (Chemical – THM)	206
		Drinking Water Quality (Chemical – Lead)	63
		Major Projects <ul style="list-style-type: none"> • Vartry WTP 	66
		Drinking Water Quality – (Studies / Plans / Strategies)	14
	Provide Effective Management of Wastewater	Urban Wastewater Treatment Directive Programme	741
		Wastewater Discharge Authorisation Programme	133
		Wastewater Collection Systems	420
		Major Projects Programme <ul style="list-style-type: none"> • Ringsend • Cork Lower Harbour 	393
	Total for Quality Theme		

Table 10.2 – Quality Portfolio by Strategic Objective and Work Programme

10.1.3 Policy Objective: Conservation

This section outlines IW’s investment proposals to address the WSPS Policy theme of Conservation.

WSPS Theme	WSSP Objective	Work Programmes	2020 to 2024 €m’s
Conservation	Ensure a Safe and Reliable Water Supply	Leakage Reduction Programmes	450
		Drinking Water Availability Studies (NWRP)	2
	Protect and Enhance the Environment	Sludge Management Programmes	19
		Energy Efficiency Programmes	32
Total for Conservation Theme			503

Table 10.3 – Conservation Portfolio by Strategic Objective and Work Programme

10.1.4 Policy Objective: Future Proofing

This section outlines IW’s investment proposals to address the WSPS Policy theme of Future Proofing.

WSPS Theme	WSSP Objective	Work Programmes	2020 to 2024 €m’s
Future Proofing	Social and Economic Growth	Growth Programmes (Water and Wastewater)	584
		Network and Treatment Capacity Assessments Programme	53
	Ensure a Safe and Reliable Water Supply	Water Resilience Programmes	192
		Major Project Programme – Eastern and Midlands Water Supply Project	293
	Provide Effective Management of Wastewater	Major Project Programme – Greater Dublin Drainage	410
	Invest in our Future	Asset Intelligence, HSQE and Capital Maintenance Programmes	412
Total for Future Proofing Theme			1,944

Table 10.4– Future Proofing Portfolio by Strategic Objective and Work Programme

10.2 Our Investment Outcomes

10.2.1 Quantitative Outcomes

The proposed outcomes to be delivered by this Investment Plan are shown in Table 10.6 below. These outcomes account for approximately €2.7bn of the overall proposed spend of €4.8bn (excluding Non Network Capex). They can be quantified with key metrics and supported by data sources with a medium to high confidence grade.

WSPS Theme	Key Metric	Unit	2024 Target
Quality	Reduction in risk of microbiological non-compliance	Reduction in the number of properties at risk	562,000
	Reduction in risk of THM non-compliance	Reduction in the number of properties at risk	132,000
	Compliance with lead standards	Number of lead services replaced	13,200
	Water Supply Zones (WSZ) on RAL	Number of WSZs remaining on RAL	2
	Agglomerations with no wastewater treatment	Number of agglomerations (outstanding)	2 (of 50)
	UWWTD Compliance (ECJ)	Number of agglomerations (outstanding)	2 (of 31)
	River Basin Management Plan Projects completed	Number of projects (completed)	207 (of 255)
Conservation	Net water savings in water supply network	Net water savings (MLD saved) over the period 2020 to 2024	176
	Energy Efficiency	Reduction in energy consumption (GWh pa)	22
Future Proofing	Drinking water treatment capacity	Additional capacity provided (MLD)	46
	Wastewater treatment capacity	Additional capacity provided (PE)	1.2m

Table 10.5 – Updated Committed Outcomes for RC3 Investment Plan

10.2.2 Qualitative Outcomes

Further measures are available which can be described as qualitative. Qualitative outcomes cannot be fully forecast or quantified at the time of submission of this Investment Plan to the CRU. These measures will contribute to the overall outcomes achieved and will increase the amount of spend directly contributing to outcomes in the Investment Plan. Overall, these qualitative network outcomes account for c.€1.4bn of the Investment Plan total.

1. Facilitate Growth (2020-2024):

The following Work Programmes contribute to the outcome of Facilitating Growth through the provision of additional capacity:

- a. Wastewater Growth Programmes - Infrastructure Programmes;
- b. Water Growth Programmes - Infrastructure Programmes;
- c. Water and Wastewater Growth Programmes - Capital Programmes; and
- d. Network and Treatment Capacity Assessments Programme:
 - i. Drainage Area Plans Programme;
 - ii. Water Network Modelling Programme.

2. Capital Maintenance (2020-2024)

The following Capital Maintenance Work Programmes contribute to various outcomes through the replacement of failed or failing assets:

- a. Water Above Ground;
- b. Water Below Ground (excluding Water Network Management programmes);
- c. Wastewater Above Ground; and
- d. Wastewater Below Ground.

These outcomes cannot be quantified at present as it is not known which asset will fail in advance. However they can be captured retrospectively after works are complete.

3. Drinking Water Chemical (2020-2024)

The following Work Programmes are contributing to the outcome of Reduction in risk of THM non-compliance and Compliance with lead standards and have not been included in the committed Outcomes:

- a. Drinking Water Quality (Chemical - THM) - Infrastructure Programme (projects addressing THM issues in addition to schemes listed in the RAL List for THMs); and
- b. Drinking Water Quality (Chemical - Lead) - Capital Programmes (Orthophosphate Dosing Programme).

4. Service Measure improvements (2020-2024)

Service measure improvements are also qualitative in nature, in that they cannot be fully forecast or quantified at the time of submission of this Investment Plan to the CRU. This expenditure, on areas such as Wastewater Discharge Authorisation compliance and addressing interruptions to supply, will contribute to the overall outcomes achieved.

10.2.3 Future Outcomes

In addition to the committed outcomes and the qualitative measures discussed above, there are outcomes to be delivered beyond the 2024 period. These are not identified as committed outcomes for the RC3 period.

11 Delivering the Investment Plan

11.1 Developing a Delivery Plan

This Investment Plan sets out the proposed investments and related outputs and outcomes for the RC3 investment period (2020 to 2024). These investments will be delivered by projects and programmes and managed through IW's internal governance process (See Section 11.3 for further details).

IW will undertake a process for planning the delivery of the Investment Plan which validate the timelines, spending profiles and the projected delivery of the outcomes and outputs associated with the investments.

This process will be undertaken following approval of the RC3 Investment Plan by the CRU as part of its RC3 determination.

11.1.1 Risks to Delivery of the Investment Plan Outcomes

As the investment programmes are rolled out, there will inevitably be challenges and occurrences that may impact delivery of the proposed investment during the period.

IW will monitor all of the programmes in terms of achievement of performance metrics against investment levels and flag any potential impacts arising in the delivery of the plan with external stakeholders. These risks are discussed below.

Emerging Needs and Risks

- National Water Resources Plan
 - Based on current information it is estimated that a significant number of water supplies may have a supply demand deficit.
 - There is a potential impact on projects and programmes currently in delivery and in this Investment Plan; this impact will be reviewed when there is more clarity on the findings and proposals of the NWRP.
- Leakage
 - The Leakage Management System is currently in development and will be rolled out across Ireland in 2018 and 2019.
 - Leakage data at a national level will be based on recorded values for the first time using a standard leakage calculation methodology.
 - Potential impact on the currently reported levels of leakage may have a knock on impact on investment priorities.
- Climate Change Adaptation and Mitigation
 - IW is developing and implementing a strategy to meet climate change policy commitments aligned with the National Adaptation Framework – Planning for a Climate Resilient Ireland.
 - The requirements of the strategy may have impacts on projects and programmes proposed or in delivery which could result in additional costs or delays.

-
- Actual growth rates different from assumptions
 - If growth assumptions in our investment planning approach differ from actual growth rates driven by development pressures, there may be an impact on investment priorities and projects in delivery.

Changes in Policy

- Abstraction licencing regime
 - Legislation is being introduced by the Government which will provide for the introduction of a regime for the control of the abstraction of water on a risk-based approach, as signalled in the River Basin Management Plan for Ireland 2018 - 2021 published in April 2018, in order to comply with Ireland's obligations under the Water Framework Directive. It will also update the regime for the abstraction of water for public water supply by IW. This may amplify the risk relating to the NWRP outlined above.
 - Critical projects such as the 'Water Supply Project - Eastern and Midlands Region' are dependent on the proposed legislation being enacted.
 - Requirements of the legislation may impact investment planning priorities. We will undertake to review the Investment Plan when the above legislation is finalised.
- WFD / River Basin Management Plan 2022-2027
 - Requirements of the 3rd cycle of River Basin Management Planning may impact in the 2022 to 2024 period as this planning cycle will commence before the end of 2021.
 - Wastewater Discharge Licenses will require review to align with the objectives and targets of the River Basin Management Plan. This review process will commence in 2019.
- Changes arising from Regional and Local Development Plans
 - As identified in Section 3, we will take into account the Regional Spatial and Economic Strategies (RSES) produced by the three regional assemblies and including their Metropolitan Area Strategic Plans for the five city areas and the updated Core Strategies of the individual city/county development plans at Local Authority level including their updating/review following the adoption of the RSESs.
 - Assumed growth rates (particularly increasing inflationary pressure) for projects in planning and delivery will need to be reviewed when these documents are finalised. This may result in some delays in delivery should material changes to scope be required.
 - We will undertake to review the Investment Plan when the above plans are finalised.

Regulatory Change

- Drinking Water Directive Revision
 - The European Commission adopted a proposal for a revised drinking water directive to improve the quality of drinking water and provide greater access and information to citizens.
 - Changes in drinking water parameters may have an impact on project designs and scope as assumed in the development of the Investment Plan which could impact delivery and planning timelines.

Delivery Risks

- Supply Chain capacity
 - The proposed levels of investment in the RC3 period are ramping up to the highest levels in the history of the water industry in Ireland and include significant projects such as WSP and GDD running in parallel with ambitious delivery programmes in water and wastewater.
 - The supply chain is currently experiencing unprecedented pressure for resources from increased activity in areas, such as housing and transport.
 - New players will be needed in the market and alternative approaches such as Early Contractor Engagement (ECE) will need to be developed to accommodate the increase in output required.
- Planning and Statutory Approvals
 - Risk of unforeseen planning refusals and complex stakeholder engagement may result in uncertainty around the estimated delivery dates for outcomes dependent on these processes.
 - Lough Talt is an example where an IROPI (Imperative Reasons of Overriding Public Interest) process is being advanced. This is following a decision by An Bord Pleanála to reject an IW appeal against a planning application refusal for an upgrade to a water treatment plant in Sligo.

Financial Risks

- Construction Inflation
 - Society of Chartered Surveyors Ireland estimate tender prices increased by c. 6.2% in 2017; to date in 2018 tender prices were 7% higher than a year ago.
 - Increased economic growth has likely contributed to this increased construction activity, therefore driving up tender prices at a rate higher than the broader inflation indices such as the Harmonised Index Of Consumer Prices.
 - Historically, tender prices appear to follow the same trends as GDP growth in Ireland; GDP growth has averaged over 5% in the last 5 years. In 2019 and 2020, the available evidence suggests that tender demand will continue to remain strong, with construction inflation expected to increase over the period.

11.1.2 Change Management

During delivery of the Investment Plan, there will be a need to make changes to the portfolio arising from the realisation of the risks outlined in Section 11.1.1.

IW has a Portfolio Balancing process in place as part of our internal governance procedures. A Capital Governance Board is tasked with reviewing the current state of the Investment Portfolio on a quarterly basis with respect to:

- Progress against achieving Investment Plan outcomes; and
- Progress against spend and delivery targets.

The Capital Governance Board will make a decision to:

- Include or exclude emerging issues/needs/risks in the Investment Plan;
- Agree the funding allocation of the emerging issue/need/risk; and
- Agree what projects and programmes should be amended, delayed or re-profiled by addition of new and emerging issue/need/risk.

Periodic review of the Investment Plan will be required to mitigate the risks to delivery identified above and re-balance with the most up to date information and assessment of emerging needs.

11.2 Delivering and Tracking Capital Efficiencies

IW's commitment to meeting the customer's needs in an economic and efficient manner continues through the delivery of cost effective solutions and optimisation of the existing asset base. Through increased investment we are improving the overall service levels to customers and in relation to efficiency we are moving in a positive direction to match that of international benchmarks.

A clear IW policy and suite of supporting documents centring on the methodology of capital efficiency identification, validation and reporting is entering draft stage. A capital baseline has been established which enables the recognition of efficiencies and their reporting through interventions that deliver the same output and outcomes for less investment.

There are five key areas and approaches that IW will utilise to achieve efficiencies and the latter four will be reported against. These areas are as follows:

- Optimisation of existing assets;
- Adoption of innovation;
- Development of standardisation;
- Leveraging procurement; and
- Implementation of value engineering.

11.2.1 Using asset management techniques to optimise existing assets

IW utilises the asset management conceptual model developed by the Institute of Asset Management (IAM) to manage assets, which includes the following elements:

- Strategy and Planning – activities required to develop, implement and improve Asset Management within an organisation.

- Asset Management Decision Making - enables the development of whole-life cost justified and optimised Asset Management Plans.
- Asset Information – informs decisions to be made on the assets and to all elements of the asset lifecycle.
- Lifecycle Delivery - implements the Asset Management Plans created in the Asset Management Strategy & Planning Group.
- Organisation and People - focused on assessing the capability of an organisation, its people and its supply chain to effectively implement all aspects of Asset Management.
- Risk and Review - risk assessment, risk management, review and audit of the organisation’s Asset Management System, ensuring that the continuous improvement loop is closed.



Figure 11.2 Asset Management: an Anatomy (2016)*

*The Institute of Asset Management (IAM) www.theiam.org

11.2.2 Innovative solutions to capital build/maintenance

Innovation is the application of new ideas resulting in increased value to customers and or increased productivity.

To achieve our innovation goals, we will:

- Undertake Research & Development (R&D) and Innovation activities that focus on the improvement of service outcomes including reliability, reduction of environmental impacts and enhancement of efficiency. This will lead to the development of new systems, solutions and services that address customer needs and statutory requirements;
- Monitor our operating environment to identify opportunities and challenges for IW and the need for innovation that will allow us to anticipate and deal with emergent challenges in an effective and efficient manner; and

-
- Support innovations that give added value to customers and contribute to the satisfaction of customers, employees and other stakeholders.

We are already implementing innovative practices in our delivery of water and wastewater services, such as the following examples of Innovation & Technology:

- Research and development of innovative solutions to increase wastewater treatment capacity;
- IW collaborated with a leading supplier to trial and verify the performance of a new technology to result in a solution for THM removal in drinking water
- Sludge Treatment Reed Beds (STRB) – a number of existing sludge drying beds have been retrofitted to STRB. We have developed specifications and are proceeding to trial in a number of locations with the ultimate aim of potential wide deployment within the asset base;
- Sludge thickening/dewatering for medium size WWTPs and WTPs – a number of pilots are being negotiated based on low operational expenditure (Opex) /low capital expenditure (Capex) technologies. The benefits of this include reductions in Opex (for example, a reduction in transport/energy costs, at reduced Capex); and
- Pressure sewer systems are being piloted as an innovative solution to provide a public collection system. This is currently being designed as part of the Gweedore Sewerage Scheme where the primary driver is technical constraints on constructing a conventional system due to topography, ground conditions and property dispersion.

There are ongoing investigations into alternative and innovative solutions in relation to both new projects and for the upgrade of existing plants and networks. Investment decisions will be based on solutions that provide the lowest whole-life cost, whilst also meeting our energy and carbon commitments.

11.2.3 Standardisation of assets and delivery

The standardisation of assets and the delivery of services will result in consistency across the country which will lead to reduced costs and improved service delivery to the customer. This will also provide greater clarity and support to designers and contractors, in the design, construction, operation, maintenance and decommissioning of assets.

Standardisation allows for capital efficiencies to be obtained through the repeatability of construction tasks and product delivery. Through approved manufacturing frameworks for mechanical and electrical equipment, an increase in quantities will be experienced and therefore a lowering in the overall unit cost of the assets achieved. The operation and maintenance of standardised assets will also be made more cost and time efficient while increasing levels of service through reduced down-time.

Off-site building of plant is another benefit of standardisation and increases safety, productivity, efficiency and value to the customer. These new approaches to traditional construction are being considered by IW and will deliver more certain outcomes, reduce risks and optimise the asset life through the development of ‘smarter’ assets.

11.2.4 Leveraging Procurement

IW, as a single national utility, is able to deliver efficiencies through procurement from its contracting strategy, national procurement frameworks and bundling of proposed works into programmes.

The utilisation of frameworks reduces procurement timelines and improves quality. Frameworks have been put in place by IW to drive efficiencies in procurement of frequently purchased services and works.

Early Contractor Engagement (ECE) including the involvement of contractors during the design phases of schemes is also a key enabler in procurement efficiencies.

11.2.5 Value engineering through workshops & delivery

IW has implemented, through structured workshop forums, a process of evaluating value engineering opportunities. This includes a systematic and organised approach to recognising capital reductions that deliver the outputs and outcomes at a lower cost. Value engineering options include the replacement of materials and processes with less expensive alternatives, while delivering the required outcomes and benefits. Value engineering does not reduce the cost at the expense of quality or lesser service levels.

11.2.6 Tracking Efficiencies

We have put in place improved mechanisms to effectively identify, record, monitor and report efficiencies across our capital investment activities. Efficiencies are recorded at each stage or Gate (from 1-3) when design or technology change is approved as the project is implemented and recorded at accounting period end. The efficiencies recorded are reviewed and verified at Gate 4. Efficiencies will be confirmed at Gate 5 based on the outcomes and outputs delivered by the project. Further details of this Gate process are provided in Section 11.3.1.

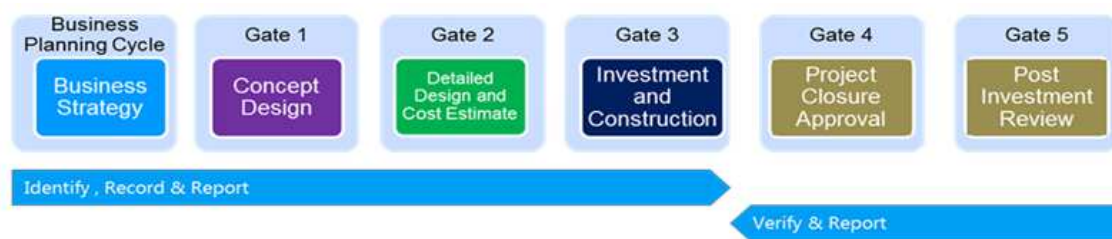


Figure 11.2 Efficiency tracking through Gate process

We are developing a Standard Operating Procedure (SOP) to track capex efficiencies. This SOP will provide a process for the management of savings, and include a collection of tools that will be used in the implementation of this process. It will also provide a set of rules that govern how opportunities are identified and efficiencies realised through initiatives.

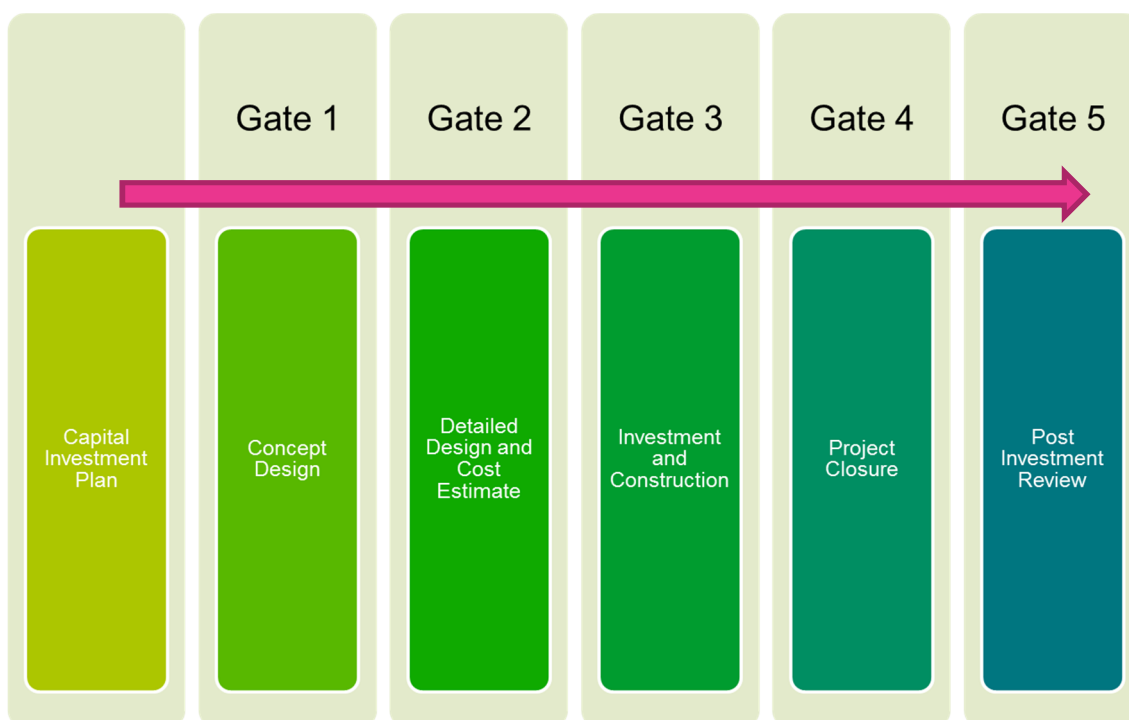
11.3 Monitoring and Evaluation of Investment Plan Delivery

It is crucial that the delivery of our Investment Plan is tracked internally and externally to show our customers, the CRU and other stakeholders that (a) we are making the best possible investment decisions in the drinking water and wastewater services, (b) we are steadily improving service delivery and (c) we are working towards meeting our RC3 target outcomes.

11.3.1 Internal Monitoring and Evaluation

IW has an established internal governance process to ensure projects and programmes of expenditure are being tracked and are delivering the required outputs. To achieve this, we have established the Water Investment Approval Committee (WIAC), to implement the governance process. WIAC has the ability to challenge any element of a project or programme put forward for review. Supporting the WIAC is the IW 'Gate' process, which consists of five mandatory review / approval points. The five Gates (Gates 1-5) cover the progressive approval of projects from design to post implementation, as illustrated in the figure below.

Figure 11.3 - Stages and Gates in the WIAC Process



11.3.2 External Monitoring and Evaluation

11.3.2.1 CRU Monitoring and Evaluation

IW will also be subject to external monitoring and evaluation of Investment Plan delivery. The CRU will undertake a review of the Investment Plan submitted as part of the RC3 process. As economic regulator the CRU will then set IW a specific revenue to support necessary, efficient investment in water and wastewater infrastructure. IW must then report on what it has delivered for the monies allowed by the CRU.

We recognise that an effective monitoring regime is important for the CRU to carry out its duties. We will expect to engage with the CRU during the RC3 review period on Capex Monitoring and how best reporting structures can be refined through the period to meet the needs of our key stakeholders.

11.3.2.2 Outputs Monitoring Group

External monitoring also includes the establishment of an Outputs Monitoring Group (OMG) which monitors capital expenditure and output delivery.

The DHPLG established an Output Monitoring Group (OMG) in 2018 to ensure that there is a common understanding of the outputs expected from investment by IW, while respecting the particular statutory roles of the participants in the group - IW, the CRU, the EPA and NewERA.

The OMG provides a forum to discuss any policy issues and change management issues arising with particular regard to the Water Services Policy Statement and River Basin Management Plan.

Detailed metrics will be necessary for the CRU to track the delivery of the Investment Plan over the lifetime of RC3. A new set of metrics will need to be jointly agreed by the key stakeholders (CRU, EPA, and DHPLG) in line with the WSPS. The high level metrics presented here are in draft format only and are intended to indicate the 2024 position but are subject to the on-going work of the OMG, and the CRU's recommendations on RC3.

The OMG will consider any issues arising for investment by IW, from annual EPA reports on both urban wastewater treatment and drinking water quality. The OMG will also consider any issues pertaining to investment arising from reports of the Water Advisory Body.

12 Submission to the CRU

IW was established in 2014 to take on the challenge of reforming how Ireland's water and wastewater services are delivered. Over the course of IRC1 and IRC2, much progress has been made. We have already delivered investment of over €2.6bn in the process of bringing our infrastructure toward an acceptable standard. We are making real savings in our cost base, bringing a national utility approach to effectively and efficiently delivering water and wastewater services.

IW has estimated that to fully address all of the deficiencies in our asset base will take a further €14bn of investment continued through several investment cycles.

This Investment Plan has been aligned to the Government's three policy themes of Quality, Conservation and Future Proofing as set out in the Water Service Policy Statement. The projected spend by Theme is shown below in Figure 12.1.

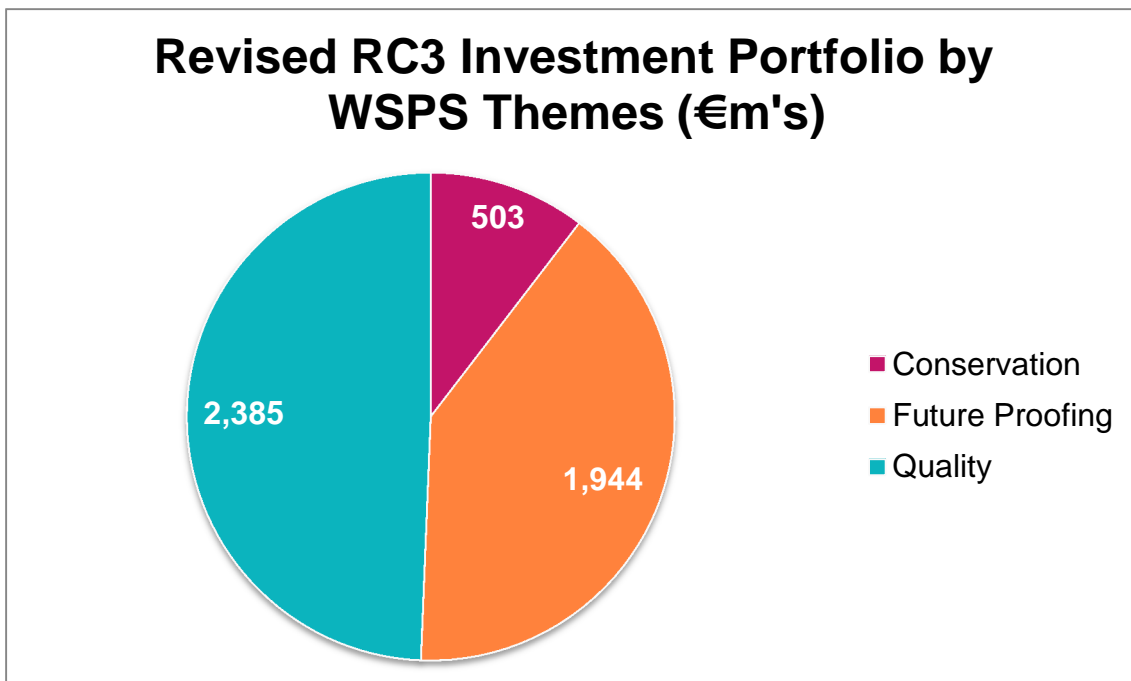


Figure 12.1 – Investment Portfolio by WSPS Themes (2017 Monies)

The Investment Portfolio presented in this plan is deliverable, operable and reflects the priorities of our stakeholders and customers to the greatest extent possible, within funding constraints.

By investing €4.8bn in the RC3 period, IW will greatly improve Ireland's drinking water and wastewater services. This will allow us to meet our customer needs in an economic and efficient manner and progress the Government's policy objectives as set out in the Water Services Policy Statement.

Appendix 1 Glossary of Terms and Abbreviations

Abbreviation	Description
AA	Appropriate Assessment
BOD	Biochemical Oxygen Demand
CAPEX	Capital Expenditure
CER	The Commission for Energy Regulation, changed its name to the Commission for Regulation of Utilities on 2 October 2017
CRU	The Commission for Regulation of Utilities
DAP	Drainage Area Plan
DECLG	Department of Environment, Community and Local Government, renamed as Department of Housing, Planning, Community and Local Government with effect from 23 July, 2016
DHPCLG	Department of Housing, Planning, Community and Local Government, renamed as Department of Housing, Planning and Local Government with effect from 01 August, 2017
DHPLG	Department of Housing, Planning and Local Government
DWSP	Drinking Water Safety Plan
ECJ	European Court of Justice
EPA	Environmental Protection Agency
IRC 1	Interim Revenue Control 1
IRC 2	Interim Revenue Control 2
LA	Local Authority
LIHAF	Local Infrastructure Housing Activation Fund
MUHDS	Major Urban Housing Development Sites
NDP	National Development Plan
NPF	National Planning Framework
NWRP	National Water Resources Plan
PE	Population Equivalent
RC3	Revenue Control 3

Abbreviation	Description
SOSI	Security of Supply Index
SEA	Strategic Environmental Assessment
SFP	Strategic Funding Plan
SMF	Service Measure Framework
THM	Trihalomethane
UWWTD	Urban Wastewater Treatment Directive
WFD	Water Framework Directive
WRZ	Water Resource Zone
WSPS	Water Services Policy Statement
WSSP	Water Services Strategic Plan
WTP	Water Treatment Plant
WW	Wastewater
WWTP	Wastewater Treatment Plant

Term	Description
Abstraction	The removal of water from a river, lake or groundwater usually with the use of a pump.
Asset	Infrastructure (e.g. buildings, treatment plants) and equipment (e.g. pumps, screens, treatment units, disinfection systems and control panels) controlled and operated by IW to deliver drinking water and wastewater services. We divide these into Below Ground Assets such as pipework and valves and Above Ground Assets such as treatment plants.
Catchment	The area of land where surface water from rainfall converges to a single point at a lower elevation, usually a point in a river, lake or an estuary. The catchment includes all drainage channels, tributaries (smaller streams) and floodplains.
Discharge	Treated effluent from a wastewater treatment plant which is returned to the water environment. This is usually from a pipe and outflow structure into a river or the sea.
Drainage Plan	Area A detailed plan for a drainage catchment that prioritises a list of interventions based on risk using an approach established in the Sewerage Rehabilitation Manual.
Drinking Water Regulations	European Union (Drinking Water) Regulations 2014 - S.I. No. 122 of 2014.
European Directive	A legal act of the European Union which requires member states to achieve a particular result. Examples are the Drinking Water Directive, Urban Wastewater Treatment Directive and the Water Framework Directive.
Groundwater	Water located beneath the ground surface in soil and rock pore spaces and fractures within rock formations.
Headroom	Spare capacity in water and wastewater infrastructure (treatment plants and networks) to cope with adverse weather conditions or unplanned incidents such as a break in a trunk main or equipment failures at a treatment plant.
Intervention	Actions that will directly or indirectly reduce risk to service delivery and may include projects or programmes to build new assets, capital maintenance of existing assets, operational and process changes or investigative works to provide the evidence or information on appropriate solutions to reduce risk to service.
Interim Revenue Control 2 (IRC2)	The second interim review of IW allowed revenues by CER (now CRU), initially covering the two-year period from 2017 to 2018. The CRU decided to extend the current revenue control (IRC2) by one year to cover the three year period from 2017 to 2019. [Reference CRU Information Paper CRU/17/332]

Investment Plan	An investment plan shall set out and particularise the investment in drinking water and wastewater services infrastructure that IW considers necessary for the effective performance by it of its functions
Minister	Reference to the Minister in this document means the Minister for Housing, Planning and Local Government unless stated otherwise.
Network	The interconnection of pipes and pumping stations used for the distribution of treated water and the collection of wastewater.
Network Development Plan	A high level plan showing how it is expected that a water or wastewater network will be extended and reinforced over a 25 year design horizon. The plan will address both compliance and growth requirements and will consider the likely spatial distribution and quantum of growth based on data from multiple sources including engagement with planning authorities and new connections data.
Population Equivalent (PE)	Wastewater treatment plants are described in terms of their designed treatment capacity, which is generally expressed as population equivalents (PE). This is a measurement of total organic biodegradable load, including industrial, institutional, commercial and domestic organic load, on a wastewater treatment plant, converted to the equivalent number of population equivalents (PE). One person is considered to generate 60g of BOD per day (BOD is the 5 day biochemical oxygen demand) and 1 PE is defined as being equivalent to 60g of BOD per day.
Portfolio	A set of programmes or projects grouped under a common theme and used as a basis for building up of the Investment Plan, summarising costs and for reporting on the execution of the Investment Plan.
Raw Water	Water abstracted for drinking water purposes before treatment.
Resilience	The ability of a system (e.g. water supply zone or wastewater network) to cope with change or stress. In a drinking water and wastewater services context stress to the system or network could result from increased demand, partial failure of operating plant, climate change or local contamination of water sources.
Revenue Control 3 (RC3)	The third revenue control period for IW allowed revenues determined by the CRU for the period 2020-2024.
Water Body	A defined section of river, lake or groundwater identified in the water body characterisation of the River Basin Management Plans developed under the Water Framework Directive.

Water Zone	Supply	The area supplied by an individual water supply scheme. This typically includes one or more abstractions (from a river, lake or groundwater), a treatment plant, storage in reservoirs and the distribution pipe network to deliver the water to each household or business.
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Appendix 2A - Stakeholder Engagement Feedback from Stage 1

The following section summarises the key themes raised by statutory stakeholders during the Stage 1 Consultation on the proposed methodology for the Investment Plan as well as IW's response to these.

The Stage 1 Consultation was carried out by IW under Section 34(6) of the Water Services (No. 2) Act 2013.¹³ We consulted with the Environmental Protection Agency (EPA), the three Regional Assemblies¹⁴ and 31 Local Authorities, in their role as planning authorities, as set out in the legislation.

This consultation phase ran for over four weeks from 23 March to 25 April, 2018 and 21 submissions were received.

Overall, respondents welcomed the opportunity to engage in the consultation process and make a submission on the preparation of the Investment Plan. IW would like to thank all of those who engaged with us during this statutory consultation.

Responses to Feedback Questions

While stakeholders were welcome to submit feedback on any aspect of the report during the Stage 1 Consultation, four specific feedback questions were asked in order to help guide and focus submissions as follows:

1. We have listed a number of plans, strategies and other documents in Section 3 of the Stage 1 consultation document that will input into preparing the Investment Plan. Is there any that we are missing?
2. In Section 4 of the Stage 1 consultation document we set out the Service Measure Framework we will use in our investment decision making. Do you have any comments on this?
3. Section 5 of the Stage 1 consultation document sets out our ten step approach to investment planning (including our methodology for supporting growth and economic development detailed in Appendix 3). Do you have any comments or suggestions on this approach?
4. An outline of the investment cases is presented in Section 6 of the Stage 1 consultation document. These will form the basis for the portfolios or categories that will be used to prepare the Investment Plan and which will be used for reporting on the delivery of the Investment Plan. Do you have any comments or suggestions on these investment cases?

The responses to these questions are set out below:

¹³ IW shall, before preparing an investment plan, consult with—

(a) the Agency,

(b) each regional body in respect of whose functional area the investment plan is likely to apply, and

(c) each planning authority in respect of whose functional area the investment plan is likely to apply.

¹⁴ Eastern & Midlands Regional Assembly; Northern & Western Regional Assembly and Southern Regional Assembly

Question 1: We have listed a number of plans, strategies and other documents in Section 3 of the Stage 1 consultation document that will input into preparing the Investment Plan. Is there any that we are missing?

A number of respondents identified additional plans, strategies and other documents, including:

- Planning and Development Act Section 28 Guidelines including Water Services Guidelines for Planning Authorities;
- Rebuilding Ireland Action Plan for Housing and Homelessness;
- Remedial Action List for Drinking Water;
- Priority Areas List for Wastewater;
- Harvest 2020; and
- Have due regard for emerging high level themes and principles of the WSPS.

IW Response:

Reports mentioned by stakeholders have been considered by IW. They have now been specifically referenced in this Investment Plan, where appropriate. It is clear that there is a broad range of strategies and policy needs, across planning, housing, public health, the environment, climate change etc, that IW must take account of in developing the Investment Plan. We have attempted to accommodate and balance these strategies and policy needs within this document.

The WSPS has since been published and this Draft Investment Plan demonstrates how the three themes of the WSPS are addressed. This Investment Plan aligns the WSPS Policy Objectives to the IW strategic objectives and aims, as outlined in the WSSP.

Question 2: In Section 4 of the Stage 1 consultation document we set out the Service Measure Framework we will use in our investment decision making. Do you have any comments on this?

A number of respondents suggested that Table 4.2c of the Stage 1 consultation document (which set out the link between our strategic objectives and the SMF) should be amended to include the various levels of the national planning framework, namely the NPF, Regional Spatial and Economic Strategies (RSES) and City and County Development Plans.

It was also suggested that the Investment Plan make reference to resilience from Climate Change, droughts, wetter weather, flooding of water and wastewater infrastructure, burst water mains or other infrastructure failures.

IW Response:

The section 6 tables in this Investment Plan reflect the feedback provided on the hierarchy of plans under the NPF.

This Investment Plan, in line with the WSSP objectives and the future proofing theme of the WSPS, directly and indirectly addresses climate change and resilience. For example, our National Water Resources Plan (NWRP) will set out how we intend to provide a safe, secure and reliable water supply to our customers for the next 25 years, without causing adverse impact on the environment. The key objectives of the NWRP include considering the impacts of climate change on Ireland's water resources and

developing a drought plan advising measures to be taken before and during drought events.

Question 3: Section 5 of the Stage 1 consultation document sets out our ten step approach to investment planning (including our methodology for supporting growth and economic development detailed in Appendix 2). Do you have any comments or suggestions on this approach?

Respondents questioned the suitability of the model outlined in the UK Water Industry Research (UKWIR) Common Framework for Expenditure Decision Making in Ireland.

Some respondents expressed the view that the methodology appears to favour development in the larger cities and towns to the detriment of smaller towns and villages.

It was also suggested that the methodology should outline the additional scoring provided for investments where the intervention addresses two or more measures.

IW Response

While IW has based the methodology on the UKWIR framework, the approach has been amended to take account of the operating conditions in Ireland and current asset data availability.

Section 5 and Appendix 4 of this Investment Plan now includes a broad range of interventions that address the needs of larger cities and towns in addition to smaller towns and villages, in accordance with the objectives of the NPF. It also tries to address smaller towns and villages in accordance with the objectives of the national planning framework. Our Investment Plan submitted to the CRU under RC3 must make best use of resources, while maximising value for money.

Question 4: An outline of the investment cases is presented in Section 6 of the Stage 1 consultation document. These will form the basis for the portfolios or categories that will be used to prepare the Investment Plan and which will be used for reporting on the delivery of the Investment Plan. Do you have any comments or suggestions on these investment cases?

Some Local Authorities identified specific water and wastewater treatment plants where they considered investments were required.

IW Response

Water and wastewater services are of critical importance to our society and economy. Despite the good work of the Local Authorities, decades of under-investment has resulted in many competing investment needs across water services. In a constrained funding environment, IW needs to understand and consider these views in order to ensure that we are appropriately balancing our available investment across competing areas.

This Investment Plan sets out both the methodology being implemented by IW on investment planning for RC3 and the portfolio of interventions proposed based on this methodology.

Responses to Specific Issues

Small Towns and Villages Growth Programme

A number of respondents considered that this programme was too restrictive. The main concern was that it seemed to be limited to settlements with a population of more than 500. Some respondents also suggested that it should apply to un-sewered villages.

IW Response

Regarding suggestions to use the Small Towns and Villages Growth Programme to provide wastewater capacity in un-sewered villages, it may be more appropriate to fund these from the Rural Regeneration and Development Fund of the NDP. IW as a regulated utility has funding constraints and needs to prioritise investment.

However, we are committed to working with stakeholders and to provide technical support to establish the most cost effective and robust solutions (for example, building a new plant in tandem with a housing development, replacing existing Developer Provided Infrastructure (private wastewater treatment systems in housing estates) or working with communities to develop collection systems). This topic is also addressed in the Stage 2 Consultation in Appendix 2B.

All connections made under the Small Towns and Villages Growth Programme will be subject to the IW Connection Charging Policy.

Alignment of the Investment Plan and the Planning System

A number of respondents sought clarity on how the Investment Plan would align with the RSES and core strategies of the County Development Plans given that the RSES and County Development Plans based on the RSES would not be published prior to completion of the Investment Plan.

IW Response

IW uses the best available information to develop the Investment Plan and will use a change process to adjust the delivery of the Investment Plan to take account of changing requirements during the implementation phase of the plan. The following is an extract from Appendix 3 of this document, which sets out the approach.

In addition, once the Regional Spatial and Economic Strategies are completed and the core strategies of the individual local authority development plans subsequently updated to ensure consistency, we will use an updated growth model (at the settlement level) to refine our plan further.

If any changes need to be made to the Investment Plan, after submission to the CRU, based on this new information, we will agree this process with the DHPLG and CRU.

Legacy Issues

A number of respondents suggested that the methodology should make provision for legacy issues including:

- Taking in charge of Group Water Schemes;
- Taking in charge of water services infrastructure in housing estates; and

-
- Addressing legacy issues in estates with Developer Provided Infrastructure.

IW Response

Our Investment Plan includes programmes for Taking in Charge of assets in connection with legacy issues such as residential estates, Group Water Schemes, Small Water Supplies and Developer Provided Infrastructure. These programmes will address these legacy issues on a prioritised basis following agreement on processes and protocols with relevant stakeholders.

Funding Mechanisms

A number of respondents proposed various funding arrangements on the provision of water services infrastructure to support development, including:

- Need for more IW/ Local Authority led funding, rather than relying solely on developer funding in future network extensions;
- Forward Planning Programme - due to the long timeframe required for the delivery of water and wastewater projects there is a need, through strategic planning, to identify and programme the delivery of water and wastewater projects beyond a single investment cycle; and
- Synergies and a greater potential for coordinated approaches between IW and Local Authorities in the provision and funding of water and wastewater infrastructure to support growth.

IW Response

Appendix 3 sets out the various initiatives proposed by IW to support growth during the RC3 regulatory period. This will be a continuation and enhancement of existing initiatives being progressed under IRC2 for the period 2017 to 2019. During the delivery of the Investment Plan 2020-2024, IW will also consider any new initiatives to support growth and will work with Local Authorities and developers to ensure that investment to support growth is optimised.

Communication of Programmes and Projects

A number of respondents suggested that a full list of projects and programmes should be included in the Investment Plan. It was recommended that projects prioritised under the Investment Plan are communicated to Planning Authorities as early as possible so that they can be included as stated relevant objectives in Municipal and County Development Plans, which will support the projects through the planning process.

IW Response

- A listing of Projects and Programmes is now included in Appendix 4 which sets out a provisional and list of projects and programmes based on the methodology as set out in this document and taking on board stakeholder feedback received to date. The projects and programmes listed are expected to be either commenced, progressed or completed during the 2020-2024 period. This list is continuously being refined and is subject to budget, technical and environmental constraints, as well as statutory approvals.

Appendix 2B - Stakeholder Engagement Feedback from Stage 2

The following section summarises the key themes raised by stakeholders during the Stage 2 Consultation on the Investment Plan as well as IW's response to these.

This consultation phase ran from Monday 18 June to Friday 20 July, 2018 and 26 submissions were received.

Overall, respondents welcomed the opportunity to engage in the consultation process and make a submission on the Investment Plan. IW would like to thank all of those who engaged with us during this consultation process.

Responses to Feedback Questions

While stakeholders were welcome to submit feedback on any aspect of the report during the Stage 2 Consultation, four specific feedback questions were asked in order to help guide and focus submissions as follows:

1. The alignment of the Water Services Policy Statement policy themes with our Strategic Objectives is presented in Section 5. Do you have any comments or suggestions on this?
2. An outline of the investment cases and associated outcome headings is presented in Section 6 (and Appendix 4). Do you have any comments or suggestions on these?
3. An Investment Portfolio is provided in Section 7. Do you have any comments or suggestions as to the make-up and balance of the funding allocation for each of the investment categories?
4. Our outline proposals for delivering investments in an efficient manner are included in Section 8. Do you have any comments on these?

The responses to these questions are set out below:

Question 1: The alignment of the Water Services Policy Statement policy themes with our Strategic Objectives is presented in Section 5. Do you have any comments or suggestions on this?

There was a view that the document needs to be much more closely aligned with the WSPS and needs to provide a clearer and tangible linkage between the WSPS objectives and the more detailed IW projects and programmes needed to deliver the outcomes from these objectives. IW should also ensure that the three WSPS themes, Quality, Conservation and Future Proofing are reflected in the tables throughout the document.

IW Response

IW has taken this feedback on board and updated the document to clearly show the links between WSPS and this Investment Plan. In this regard, Section 6 on Investment Cases in the Draft Plan has been re-structured into three sections, each covering one of the themes of the WSPS. The WSPS themes have also been reflected in the various Tables in the document, where appropriate.

Question 2: An outline of the investment cases and associated outcome headings is presented in Section 6 (and Appendix 4). Do you have any comments or suggestions on these?

Feedback from respondents on this question included the following:

- The targets and metrics in the Investment Plan should align and match those of the Outputs Monitoring Group e.g. Boil Water Notices should be listed as an outcome;
- Some of the programmes listed in Section 6 in the Draft Plan are due to be completed by end of 2019 e.g. National Disinfection Programme;
- There will be a move away from Remedial Action List to the use of Drinking Water Safety Plan risk assessments to track reduction of risk in water supplies and there should be a metric to capture this approach;
- There is an inconsistency between the metrics for THM (no. of properties at risk) and RAL (no. of schemes); and
- The prioritisation of the delivery of schemes should include consideration of improvements urgently required for compliance with the Habitats Directive.

IW Response

The targets and metrics included in this Investment Plan for submission to the CRU for review are aligned to those provided to the Outputs Monitoring Group for the RC3 period of RC3. They are based on measures for which we have quantifiable data and information to support reporting over the period. Further discussions will be held with the Outputs Monitoring Group on the development of appropriate measures to monitor progress and delivery of the Investment Plan for the 2020 to 2024 period in early 2019.

Many Capital Programmes such as the National Disinfection programme are planned to continue into the RC3 period. These programmes have ramped up delivery and will continue to address risks and issues across the asset base during the RC3 period.

The outcomes related to reduction in risk of non-compliance will capture the output of Drinking Water Safety Plan risk assessments. The risk metric for THM is measured in the number of properties at risk and reflects IW's assessment of whether the appropriate barriers are in place at that site. This is a different measure from the EPA Remedial Action List which reflects whether a scheme is on the list or not.

Impact on sensitive and designated areas is taken into consideration in the prioritisation and the delivery of schemes.

Question 3: A Investment Portfolio is provided in Section 7. Do you have any comments or suggestions as to the make-up and balance of the funding allocation for each of the investment categories?

Feedback from respondents on this question included the following:

- Acknowledgement that current programmes such as the disinfection programme and inlet works programme are delivering substantial improvements and support for the continued use of national programmes to improve drinking water and wastewater services. Request for provision of new programmes such as the phosphorus removal programme at wastewater treatment plants.

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- The proposed €483m for Social & Economic Growth does not appear to be adequate to address the ambitious growth targets set out in the National Planning Framework.
 - The importance of balanced regional development and attention to investment requirements in rural towns and villages.
 - The importance of ensuring that investment in conservation measures is significantly increased to and maintained at a level which adequately supports a long term, comprehensive and multi-faceted approach to water conservation measures in the context of reducing demand, securing sources and reservoirs, safeguarding treated water, improving water quality and future proofing.

IW Response

One of the significant changes made by IW in addressing the deficiencies in our asset base is the use of programmes targeted to address specific and priority needs. An example of this is the Disinfection Programme outlined in the case study in Section 7. It is proposed to continue with a number of these programmes under this Investment Plan and to introduce a number of new programmes.

Stakeholders have expressed differing views on how investment should be prioritised across the three themes of the WSPS namely Quality, Conservation and Future Proofing. In developing this Investment Plan, we have endeavoured to balance the available funding across the various investment needs identified in the preparation of the plan across the three themes of the WSPS.

In the investment portfolio for submission to the CRU, there is €586m allocated to specific Social and Economic Growth programmes. In addition, there is €454m allocated for the Greater Dublin Drainage project, €392m within the period allocated for the Water Supply Project for the Eastern and Midlands Region. Furthermore, quality driven investments will include an allowance for future growth in the design of these assets.

Question 4: Our outline proposals for delivering investments in an efficient manner are included in Section 8. Do you have any comments on these?

Feedback from respondents on this question included the following:

- IW's five-year and national approach to investment planning is a very welcome departure from the short-term and fragmented approach which bedevilled our water services for many decades;
- The importance of setting and adhering to deadlines in the context of delivering on capital infrastructure projects;
- It is essential to have a conveyor belt of projects at planning, design, procurement and construction stages over the lifetime of this proposed plan and future funding cycles; and
- Standardisation of assets is a good idea. This has obvious advantages for economies of scale, standardisation of procedures, training and plant operation and problem diagnosis, among others.

IW Response

IW welcomes the feedback received on delivering investments in an efficient manner and will take account of this in delivering the Investment Plan. It is acknowledged that there can be delays on projects which are outside of the control of IW, e.g. statutory planning. Our approach to delivery involves having sufficient projects progressing through design and planning to re-allocate funding in the case of delays to projects.

Responses to Specific Issues

Projects and Programmes as listed in Appendix 4 of the Investment Plan

While there was acknowledgement of a number of specific projects that were listed in the Draft Investment Plan, many of the LAs requested that specific additional projects be included in the Investment Plan.

There were a number of issues raised and suggestions on the provision of additional detail on the projects included in the Appendix:

- There are projects with completion dates prior to 2020;
- There are agglomerations on the EPAs Priority Area List and/or the RBMP that are not included in the current IRC2 Investment Plan or the RC3 Draft Investment Plan;
- Current status and timeframes should be provided outlining when the proposed works will be completed;
- Clarification on the scope of the projects should be provided;
- Agglomeration references should be provided in this Appendix or as supplementary information, where relevant;
- It is not possible to confirm if the scope of the projects will achieve the expected environmental outcomes; and
- Proposed capacity of the works should be included.

IW Response

IW prioritises investment decisions to ensure that we utilise available funding most effectively by making investments that deliver the biggest benefit while maximising value-for-money. The investment planning approach is based on optimising the portfolio of interventions that can be undertaken as part of this Investment Plan for the RC3 period. It will take a number of investment cycles to address the various deficiencies in the asset base.

A number of changes have been made to the information on projects to take account of the feedback received, including the following, where appropriate:

- Outline of the project scope included where available.
- Outcomes have been discussed further in Section 10.2.

There are a number of projects that are planned to be substantially complete by the end of 2019 that will have additional expenditure after 1 January 2020 that must be included within the Investment Plan 2020 to 2024. These projects have now been excluded from the project listing to avoid any confusion on the scope of this Investment Plan.

Methodology for Supporting Growth & Economic Development

In general the respondents welcomed the approach, including IW's commitment to the National Planning Framework and support for Government Initiatives such as the Local Infrastructure Housing Activation Fund (LIHAF) and Major Urban Housing Development Sites (MUHDS). Other feedback on this theme included the following:

- Recommendation that the definition of large towns to be >10,000 people should be omitted.
- The Investment Plan should also provide for economic growth, including Strategic Employment Zones, employment-focussed Strategic Development Zones and FDI projects.
- Recommendation that IW should include a reasonable estimate of the full cost and timeline of delivery of water services infrastructure to service Tier 2 zoned lands in accordance with Appendix 3 of the NPF.
- It would be beneficial if the IW Investment Plan 2020-2024 provided confident signals that growth, where identified in the NPF, will be supported.
- It was suggested that the draft plan be amended to make more specific reference to the benefit of synergies between the various funding mechanisms.

IW Response

Some changes have been made to Appendix 3 on the Methodology for Supporting Growth & Economic Development to take account of the feedback received.

Other changes have been made to Appendix 3 on the Methodology for Supporting Growth & Economic Development to take account of feedback on other themes addressed below, namely the Small Towns and Villages Growth Programme and Alignment with NPF, RSES and Core Strategies.

While the Investment Plan makes provision for supporting growth on a prioritised basis in line with the NPF, RSES (when available) and core strategies of county development plans at city/ county level, investment is not included in the Plan for provision of infrastructure to service non-domestic customers or potential customers at specific locations. Nevertheless, IW does support these activities through our Connection & Developer Services team in line with the applicable Connection Charging Policy. This includes network planning and it is our aim to provide an excellent service to support economic development on this basis.

Small Towns and Villages Growth Programme

Feedback from respondents on this theme included the following:

- Welcome for the clarification provided that the Programme was not restricted to agglomerations above 500 PE;
- Concern with the response given in the Draft Investment Plan on the use of Rural Regeneration Development Fund of the NDP to provide wastewater capacity in un-sewered villages;
- Respondents stated their view that the proposed funding allocation methodology, based on the wastewater treatment capacity register for plants above 500 PE, would not be fair to all counties as it doesn't consider capacity deficits in plants below 500 PE; and

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- The importance of balanced regional development and attention to investment requirements in rural towns and villages.

IW Response

We have considered again the question of whether the Small Towns & Villages Growth Programme should be open to funding water services infrastructure in un-sewered villages. Given the scale of investment required across the public water and wastewater systems under the WSPS themes of Quality, Conservation and Future Proofing, this will require significant levels of investment over multiple investment cycles.

Investment in providing water services infrastructure in un-sewered villages at relatively high unit cost per housing unit capacity would require equivalent reduction in investment for the above priority objectives. We therefore conclude that the Small Towns & Villages Growth Programme should be utilised to provide growth capacity in towns and villages which have IW infrastructure as set out in the revised Appendix 3 to this document. We are happy to support Local Authorities who wish to seek funding for un-sewered villages through the Rural Regeneration and Development Fund of the NDP.

We have taken on board the submissions in relation to the fairness of the proposed funding allocation methodology. We have now changed the methodology so that it will be based on the capacity register for all IW wastewater treatment plants and not just the plants over 500 PE. This will require us to complete additional work to establish the capacity register for plants of less than 500 PE. We are aiming to have this work completed in 2019.

Supporting Rural Development

One respondent made the point that there is no reference to the document: *Realising our Rural Potential: Action Plan for Rural Ireland (DAHRRGA, 2017)* in the Investment Plan. In particular Action No. 7 in the document which is to “increase delivery of small housing schemes in towns and villages as an alternative to one-off housing”.

IW Response

We believe that the above action has been addressed in the NPF (NPO 17b) and the NDP in order to provide serviced sites in small towns and villages. IW will work with the LAs and the relevant Government Departments to support the delivery of serviced sites as set out in the NPF and NDP.

Alignment with NPF, RSES and Core Strategies

While the commitment to review the Investment Plan following the adoption of the RSES and the subsequent review of City and County Developed Plans was welcomed, there was some concern that the timeframe for the Investment Plan does not align with the RSES. It was also suggested that the policy context and introductory sections should make explicit reference to the section on Future Proofing in the WSPS.

IW Response

IW has used best available information to determine the required investment to support housing and economic growth needs and sets out an approach to addressing the RSES and core strategies of the City and County Development Plans. A number of amendments have been made to the text in Appendix 3 Methodology for Supporting Growth and Economic Development to reflect the feedback received from our stakeholders.

Resilience / Climate Change

A number of respondents raised the issue of resilience and climate change, with some referencing recent extreme weather events, ex-Hurricane Ophelia, Storm Emma and the drought of Summer 2018. It was suggested that IW must consider in investment planning the need for more resilient water services infrastructure, capable of dealing with the more frequent extreme weather events that have occurred, and are likely to occur in future, because of climate change impacts.

IW Response

In line with a number of policy objectives under the Future Proofing Theme of the WSPS and objectives of the WSSP, IW is taking a number of direct and indirect measures to address resilience and climate change. For example, our National Water Resources Plan will set out how we intend to provide a safe, secure and reliable water supply to our customers for the next 25 years, without causing adverse impact on the environment. The key objectives of the NWRP include considering the impacts of climate change on Ireland's water resources and developing a drought plan advising measures to be taken before and during drought events.

Wastewater Capacity Registers

A number of respondents welcomed the development of the wastewater capacity registers. There were some suggestions for improvement e.g. establishing the register on a GIS platform and a recommendation that IW undertake additional risk assessments on the assimilative capacity of receiving waters under exceptional low flow conditions.

IW Response

IW has developed the wastewater capacity registers based on best available information and will update and upgrade over time to take account of changes and improvements in the data and assessments of load and impact.

Request to include additional documents in Section 3

A number of respondents suggested additional documents for inclusion in Section 3 of the Investment Plan including the following:

- Flood Risk Management Plans (29 No.) published by the OPW on 3 May, 2018;
- Realising our Rural Potential: The Action Plan for Rural Development, published in January 2017 and in particular Action 7, "Increase delivery of small housing schemes in towns and villages as an alternative to one-off housing";

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- The Policy Objectives set out in Section 3.5.2 of the WSPS also contain specific requirements in relation to the water and waste water services required to support implementation of the NPF/RSES. It was suggested that these objectives should be highlighted in the policy context and introductory sections of the Investment Plan;
 - Rebuilding Ireland Action Plan for Housing and Homelessness; and
 - It was suggested that the Investment Plan refer to the need for co-ordination and management of investment in infrastructure with new structures and agencies e.g. National Regeneration and Development Agency (NRDA).

IW Response

We have updated the background documents taken account of in preparation of the Investment Plan and in our reference in Section 3 to take account of feedback received. In setting out our approach to supporting growth and economic development, we outline our approach to leveraging various funding mechanisms to maximise the benefit from investments under this Investment Plan in supporting housing and economic development.

Water Sources and Catchment Management

Feedback from respondents in relation to Water Sources and Catchment Management included the following:

- Recommendation that IW should review all abstractions with the objective of ensuring their sustainability. It was suggested that some sources are at risk of failing to meet the water quality objectives of the WFD due to the pressure of over-abstraction.
- The development of a network of integrated and sustainable water sources capable of providing sufficient quantities of quality water to support domestic, commercial and agricultural needs.
- The deployment of new/alternative sources including the use of grey water and rainwater harvesting
- It was suggested that support for effective land use management plans within catchment areas to mitigate the risks of contamination occurring should dovetail and be in conjunction with the work to achieve EU Water Framework Directive compliance. On the other hand, some respondents were concerned that there is no reference to how pesticides will be dealt with in water supplies if catchment measures are not sufficient to ensure compliance.

IW Response

We have included details on the development of a National Water Resources Plan (NWRP) in Section 8. This will set out our plan for providing sustainable water sources to meet existing and future water supply needs.

IW is engaging with various stakeholders in the targeting of collaborative efforts to prevent the prevalence of pesticides in the catchment to ensure our customers receive high quality drinking water complying with the legally prescribed standard for pesticides. This includes our engagement with stakeholders via the National Pesticide and Drinking Water Action Group (NPDWAG). IW is taking a number of initiatives

focusing on catchment management, including a “Source to Tap” project in partnership with NI Water as part of an EU INTERREG programme.

Appendix 3 Methodology for Supporting Growth & Economic development

Investment in water services is a key factor in enabling proper planning and sustainable development in physical and economic terms and in national, regional and local contexts.

IW is proposing to invest in a range of projects and programmes that will support growth at national, regional and local levels.

IW will also play a key role in implementing Project Ireland 2040 which was published on the 16th February 2018 and incorporates the National Planning Framework and the National Development Plan.

IW supports on-going work in developing subsidiary level strategies to assist in implementing the NPF including the Regional Spatial and Economic Strategies (RSES), which will be finalised by Q1 2019 by the three Regional Assemblies as well as ongoing reviews of City / County Development Plans and Local Area Plans.

All newly/modified connecting customers will be subject to entering a connection agreement in line with IW's connection policy.

Growth model – providing for growth in our upgrade projects

Water and wastewater treatment upgrade projects included in the Investment Plan will include provision for growth. This will typically involve providing for a 10 year growth horizon together with target headroom.

Initial preparatory work for the Investment Plan has been developed based on population projections as set out in the Draft NPF up to 2040 and this further takes account of the NPF as published on 16 February 2018. In addition, once the Regional Spatial and Economic Strategies are completed and the core strategies of the individual local authority development plans subsequently updated to ensure consistency, we will use an updated growth model (at the settlement level) to refine our plan further.

If any changes need to be made to the Investment Plan, after submission to the CRU, based on this new information, we will agree this change process with the DHPLG and CRU.

Supporting growth through leakage reduction

Leakage reduction activities included in the Investment Plan will be prioritised to ensure, as far as possible, that growth capacity in water supply is available in the five cities and five regional centres identified in the NPF, together with the key growth settlements identified in the Regional Economic and Spatial Strategies (when available) and county towns.

IW will also prioritise leakage reduction in order to support towns currently experiencing high growth. We will also focus on settlements which are prioritised in development plan core strategies at county level.

Growth capacity in cities, large towns and county towns

IW will ensure that the five cities and five regional centres identified in the NPF have the water supply and wastewater treatment capacity to allow them to grow. We will also endeavour to ensure that all key growth settlements identified in the RSEs (when available) and county towns will have available water supply and wastewater treatment capacity to allow them to grow. This will be included in budgeting for our wastewater treatment upgrade projects as part of the development and implementation of the Investment Plan.

Providing for growth through planning our water and wastewater networks

IW will ensure that a budget is available to prepare both Network Development Plans and Drainage Area Plans (DAPs). Network Development Plans for both water and wastewater are important for growth in terms of identifying how we can extend and reinforce the networks in the future. In this way we can ensure that areas zoned for residential land, including Strategic Development Zones (SDZ), can be serviced by water and wastewater through forward planning over a long term 25 year horizon.

We will progress these plans in the coming years for all of the five cities and five regional centres identified in the NPF, together with the remaining large towns and county towns.

Drainage Area Plans (DAPs) are also key in providing a more detailed assessment of our wastewater networks and will be progressed at a number of these settlements.

These plans will provide a much better foundation for planning to support growth than has been available before now.

Strategic Network Reinforcement

Strategic Network Reinforcement projects included in RC3 will provide for growth capacity to large areas of cities or to entire settlements as well as addressing environmental compliance drivers (wastewater) and providing security of supply (water supply). These include carry over projects from IRC2 which will be completed and projects which will be progressed at concept and design stages through the RC3 period. Examples of these strategic projects include:

- The 9C Sewer Duplication which will provide growth capacity for a large area of North West Dublin as well as addressing environmental compliance drivers;
- The Merrion Gates to Sandymount Trunk Mains Replacement which will provide a secure water supply and growth capacity for Dublin City Centre including Docklands and Poolbeg West SDZs;
- The Carrigtohill to Midleton Trunk Watermain which will provide a secure water supply and growth capacity for Midleton; and
- The Galway Drainage Study which will progress concept and design stages to address strategic growth capacity for Galway City and Eastern Environs.

Network Extensions Programme

Provision will be included in the Investment Plan for completion of any Network Extension Initiative projects which carry over from the previous investment planning period, IRC2 (subject to timely progression). It is envisaged that future network

extension type projects, being promoted by the Local Authorities to open up priority residential development lands including SDZs, will require developer(s) commitment to core funding.¹⁵ IW will provide support through carrying out network forward planning in consultation with the Local Authorities and, where appropriate, funding the up-sizing of infrastructure.

Supporting Government Initiatives

The Local Infrastructure Housing Activation Fund (LIHAF) and Major Urban Housing Delivery (MUHDS) sites are Government initiatives to support housing delivery and complementing wider public policy as set out in the NPF in relation to securing compact urban development. IW is committed to funding water services infrastructure as necessary to support housing delivery on LIHAF approved sites and the MUHDS sites. IW will ensure that funding for these existing projects from the previous Investment Plan will continue.

Should any changes to our Investment Plan be required if additional Government initiatives are introduced, we will agree these changes with the DHPLG and CRU.

Local Network Reinforcement

The Investment Plan will include provision for IW to carry out studies and develop concept designs for local network reinforcement projects in development “hotspot” areas. This will help to ensure that IW can respond quickly and effectively to support housing development in areas of greatest need.

Developer Driven Infrastructure

Where a developer is funding infrastructure to connect their development to IW networks which may include network extensions and local network reinforcement, IW may decide to up-size the assets where it is prudent to do so.¹⁶

Supporting growth through working together with Local Authorities

In situations where Local Authorities are engaged in infrastructure projects in areas like housing or transport or other similar areas, a co-ordinated approach, subject to appropriate criteria, may be put in place in relevant cases between IW and the Local Authority to fund the provision of water services infrastructure to provide for future growth capacity.

Small Towns and Villages Growth Programme

In addition to growth investment described above, it is proposed that there will be a Small Towns & Villages Growth Programme which will support a number of the National Policy Objectives and National Strategic Outcomes under the NPF (e.g. development of a new rural settlement investment approach under National Strategic

¹⁵ Subject to the CRU's decision on IW's Proposed Connection Charging Policy, expected in 2018

¹⁶ As per footnote 14.

Outcome 9 of the NPF). The Small Towns & Villages Growth Programme is intended to provide WWTP and WTP growth capacity in smaller settlements which would not otherwise be provided for in the Investment Plan. We will work with Local Authorities across the country in ensuring that the investment is made appropriately in accordance with the relevant county development plan.

It is proposed that the overall national budget for this programme would be allocated between counties, based on the identified need (as set out below) and the demonstration of consistency with the relevant county development plan and its adopted core strategy.

The presence or absence of wastewater treatment capacity in a settlement is by far the greatest determinant of whether a settlement can grow or not (from a water services availability perspective). This is because:

- leakage reduction should be an option to address water supply capacity in most settlements; and
- network constraints (water or wastewater) would typically not impact the whole settlement.

The wastewater treatment capacity register will be used to identify all agglomerations which currently have IW wastewater treatment infrastructure and insufficient capacity to provide for projected growth over a 10-year horizon. The investment planning process and follow-on work will establish the capital cost (over and above the investment included in the plan) of providing wastewater treatment growth capacity for all of these settlements. This will be termed the “growth capex deficit”.

Given funding constraints, it will not be possible to address the full deficit in a single Investment Planning period. As a result, the capital expenditure which is determined to be available for the Small Towns & Villages Growth Programme will be allocated to each county based on its proportion of the identified “growth capex deficit”.

The capacity register is considered to be the best available data to carry out the above funding allocation methodology. This programme is intended to be available to provide growth capacity in smaller settlements including those which are less than 500 population.

Appendix 4 - Projects and Programmes

In preparing this Investment Plan, IW has optimised investment decisions by prioritising the best possible service improvements, while maximising value-for-money. IW as a regulated utility has funding constraints and needs to prioritise investment where it is needed most.

This section therefore sets out list of projects and programmes based on the methodology as set out in this document and taking on board stakeholder feedback received to date. The projects and programmes listed are expected to be either commenced, progressed or completed during the 2020-2024 period. This list is continuously being refined and is subject to budget, technical and environmental constraints, as well as statutory approvals.

This list is set out in our accompanying Business Planning Questionnaire submission to the CRU for RC3.

List of Projects

Project Name	Primary Asset Category	Local Authority Area	Project Description
Carlow WWTP	Wastewater Above Ground	Carlow	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Muinebheag & Leighlinbridge WWTP	Wastewater Above Ground	Carlow	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Tullow WWTP	Wastewater Above Ground	Carlow	Upgrade of the WWTP including improvements to town sewer network including the replacement of a critical siphon under the River Slaney along with a new pumping station to increase capacity and facilitate future growth.
Bailieborough WWTP	Wastewater Above Ground	Cavan	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Ballyjamesduff WWTP	Wastewater Above Ground	Cavan	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Cootehill WWTP	Wastewater Above Ground	Cavan	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Kingscourt WWTP	Wastewater Above Ground	Cavan	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Virginia WWTP	Wastewater Above Ground	Cavan	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Belturbet WSS & Swanlinbar WSS	Water Above Ground	Cavan	Upgrade to ensure a safe and sustainable water supply for the Customers of Belturbet WSS.
Ballyvaughan WWTP	Wastewater Above Ground	Clare	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Clareabbey WWTP	Wastewater Above Ground	Clare	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Clonroadmore WWTP	Wastewater Above Ground	Clare	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Kilfenora WWTP	Wastewater Above Ground	Clare	Provision for the WWTP protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Kilkee WWTP	Wastewater Above Ground	Clare	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Kilrush WWTP	Wastewater Above Ground	Clare	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Lahinch WWTP	Wastewater Above Ground	Clare	Provision for the WWTP to to protect the environment and quality of receiving water.
Liscannor WWTP	Wastewater Above Ground	Clare	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Newmarket-on-Fergus WWTP	Wastewater Above Ground	Clare	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Quin WWTP	Wastewater Above Ground	Clare	Provision of WWTP to protect environment and quality of receiving waters and facilitate growth.
Shannon WWTP Phase 2	Wastewater Above Ground	Clare	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Clarecastle WW Network	Wastewater Below Ground	Clare	Provision for the WW network to protect environment, increase capacity and facilitate future growth.
LIHAF/MUHDS Growth Programme (Wastewater) - Claireen, Ennis	Wastewater Below Ground	Clare	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Claireen, Ennis.
Ballycotton WWTP New Build	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Ballyvourney/Ballymakeera Sewerage Scheme WWTP	Wastewater Above Ground	Cork	Provision for the WWTP to to protect the environment and quality of receiving water, and increased capacity.
Bandon WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Boherbue WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Castlemartyr WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Castletownbere WWTP New Build	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Castletownsend WWTP	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Cloyne WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Coachford WWTP	Wastewater Above Ground	Cork	Provision for the WWTP protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Cork City WWTP	Wastewater Above Ground	Cork	Upgrade of the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Cork Lower Harbour - WWTP & Pumping Station DBO	Wastewater Above Ground	Cork	The Cork Lower Harbour Main Drainage Project aims to provide enhanced wastewater treatment through the development of a new wastewater treatment plant at Shanbally, Co. Cork. The project is important in terms of protecting the environment and facilitating for a growing population.
Cork Metropolitan Area Drainage Study	Wastewater Above Ground	Cork	Studies and strategy development for the Cork Metro Area.
Courtmacsherry / Timoleague Sewerage Scheme	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Dripsey WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Glengarriff Septic Tank	Wastewater Above Ground	Cork	Capacity upgrade to meet at least UWWTD requirements incorporating inlet, storm, primary, secondary or tertiary treatment, and sludge interventions.
Inchigeelagh WWTP	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Innishannon Sewerage Scheme (SLI) WWTP Upgrade	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Macroon WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Mallow WWTP	Wastewater Above Ground	Cork	Upgrade of the Mallow WWTP to protect environment and quality of receiving waters, address the capacity of the WWTP with a particular emphasis on nutrient removal and hydraulic capacity and facilitate future growth .
Midleton WWTP	Wastewater Above Ground	Cork	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Millstreet Sewerage Scheme WWTP	Wastewater Above Ground	Cork	Provision for WWTP to protect environment and quality of receiving waters, decommission end of life infrastructure and facilitate future growth.
Mitchelstown Sewerage Scheme - Network Upgrade and WWTP Inlet works	Wastewater Above Ground	Cork	Upgrade of Network and WWTP Inlet works to protect the environment and quality of receiving water, increase capacity and facilitate future growth.
Whitegate/Aghada WWTP New Build	Wastewater Above Ground	Cork	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Bandon Watermain and Sewer Network Upgrade	Wastewater Below Ground	Cork	Upgrade of WWTP and existing network to protect environment, increase capacity and facilitate future growth.
Cork City WW Network	Wastewater Below Ground	Cork	Scope of project to be informed by outcome of DAP. Primary objective is to focus on storm water overflow compliance, property flooding and provide for growth.
Dunmanway WW Network	Wastewater Below Ground	Cork	Scope of project to be informed by outcome of DAP. Primary objectives are to focus on Wastewater Discharge License compliance and provide for growth.
Fermoy WW Network	Wastewater Below Ground	Cork	Scope of project to be informed by outcome of DAP. Primary objectives are to focus on storm water overflow compliance and provide for growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Kinsale Outfall Extension	Wastewater Below Ground	Cork	Provision for relocation of the discharge point of the SWO outfall at Gibbons Quay in Kinsale, to below low water mark. As ordered by the Circuit Court.
Mallow Sewerage Scheme Network	Wastewater Below Ground	Cork	Upgrade of existing network to protect environment, increase capacity and facilitate future growth.
Midleton WW Network	Wastewater Below Ground	Cork	Scope of project to be informed by outcome of DAP. Primary objectives is to focus on storm water overflow compliance and provide for growth.
Network Extensions - Wastewater - Midleton	Wastewater Below Ground	Cork	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Cork City WSS - Upgrade of WTP	Water Above Ground	Cork	Provision of a 40MLD WTP for Cork City and environs to improve DW quality, security of supply and ensure a safe and reliable water supply.
Skibbereen Regional Water Supply Scheme Phase 4 Treatment & Storage & Network	Water Above Ground	Cork	Provision for RWSS, storage and upgrade to address DW quality (reduction in risk of THM Non-Compliance) and ensure a safe and reliable water supply.
Cork City Eastern Strategic Link	Water Below Ground	Cork	Upgrade and replacement of old watermains to alleviate pressure on Cork City WSS's Lee Road WTP. The project includes the replacement of numerous lead customer service connections and backyard shared lead services. The project also includes replacement and upsizing of the Strategic Trunk main from Shanakiel reservoir to Tivoli docks, to reduce risk of interruption to supply.
Cork City Water Supply Scheme - Upgrading Shanakiel Rising Main	Water Below Ground	Cork	Upgrade of rising main to facilitate growth. Some of the 4 no rising mains from the plant to the Shanakiel reservoirs are still in service from c.1850. The rising mains need replacement due to their age, condition and vulnerable

Project Name	Primary Asset Category	Local Authority Area	Project Description
			location(currently running beneath HSE buildings and at surface level in areas). There is a similar need for the replacement of the distribution mains from the reservoirs.
Corks City Water Supply Scheme Network (Wilton Lee Road Trunk Main)	Water Below Ground	Cork	Provision for interlinks of Cork City Water Supply Scheme Network to Cork County to improve water quality in the area.
Network Extensions - Wastewater - Whitechurch	Wastewater Below Ground	Cork City	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Ballybofey-Stranolar WWTP	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Buncrana WWTP	Wastewater Above Ground	Donegal	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Burtonport WWTP New Build	Wastewater Above Ground	Donegal	Provision of WWTP to protect environment and quality of receiving waters and facilitate growth.
Carrigart WWTP	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Coolatee WWTP	Wastewater Above Ground	Donegal	Provision of WWTP to address untreated discharge to River Foyle and to protect the environment and quality of receiving water and to facilitate growth.
Falcarragh WWTP	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Gweedore Sewerage Scheme Wastewater Treatment Plant	Wastewater Above Ground	Donegal	Provision of WWTP to protect environment and quality of receiving waters (Catheen River) and facilitate growth.
Kerrykeel WWTP New Build	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Kilcar WWTP	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Kilmacrennan SS (part of Donegal Towns and Villages Bundle)	Wastewater Above Ground	Donegal	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Milford, Ramelton and Rathmullan WWTP	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth. Previously receiving no treatment.
Moville WWTP	Wastewater Above Ground	Donegal	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Muff WWTP	Wastewater Above Ground	Donegal	Provision of WWTP to protect environment and quality of receiving waters and facilitate growth.
Buncrana WW Network	Wastewater Below Ground	Donegal	Provision for the WW network to protect environment, increase capacity and facilitate future growth.
Joe Bonnar Road, Letterkenny	Wastewater Below Ground	Donegal	Construction of a sewer along the existing Joe Bonnar Road in Letterkenny and the construction of a sewer and watermain along a proposed extension to the road.
Letterkenny Sewerage Scheme (Network) All contracts	Wastewater Below Ground	Donegal	Provision for wastewater infrastructure to address combined sewer deficiencies on the network to protect environment.
Milford WW Network	Wastewater Below Ground	Donegal	Scope of project to be informed by outcome of DAP. Primary objectives are to focus on storm water overflow compliance and provide for growth.
Ballyshannon Regional Water Supply Scheme Ph1 - New WTP and extension to Ballymagourty, Cashelard and Bundoran	Water Above Ground	Donegal	Provision for Ballyshannon RWSS to ensure a safe and reliable water supply in Ballyshannon, Rosstown, Ballintra and areas currently supplied by Cashelard WSS and Ballymagroarty WSS.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Lettermacaward RWSS and Killybegs RWSS	Water Above Ground	Donegal	Upgrade of the WTP to ensure a safe and reliable water supply
Letterkenny Contract 3	Water Above Ground	Donegal	Provision for the RWSS extension of the Pollan Dam WSS to Letterkenny WSS to ensure a safe and reliable water supply.
Owenteskna Water Supply Scheme - Upgrade of WTP	Water Above Ground	Donegal	Upgrade of the WTP to ensure a safe and reliable water supply
Donegal Countywide Watermain Rehabilitation Contract No.1	Water Below Ground	Donegal	Rehabilitation and replacement of watermain over seven water supply zones in Donegal and associated backyard services. The scheme will reduce the number of supply disruptions to Customers and also to decrease the rate of deterioration and leakage of our below ground water asset base.
Inishowen Regional Water Supply Scheme Trunk Mains	Water Below Ground	Donegal	Transfer water from the Pollan Dam WTP into the East Inishowen supply area to improve water quality in the area. This would enable water to be supplied into the Greencastle area from the East Inishowen WTP and allow for the decommissioning and rationalisation of the Greencastle WTP. The scheme will reduce the risk of THM non-compliance.
Letterkenny Contract 2A	Water Below Ground	Donegal	Rehabilitation of the Goldrum to Letterkenny Pipelines, to reduce risk of interruption to supply.
Greater Dublin Drainage Project	Wastewater Above Ground	Dublin	Provision for Greater Dublin Drainage(GDD) project to develop a new regional wastewater treatment facility and associated infrastructure to serve the growing population of Dublin and parts of the surrounding counties of Kildare and Meath.
Ringsend WWTP	Wastewater Above Ground	Dublin	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth

Project Name	Primary Asset Category	Local Authority Area	Project Description
Balbriggan Skerries Wastewater Treatment - Rush Road	Wastewater Below Ground	Dublin	Upgrade of existing infrastructure protect environment, increase capacity and facilitate future growth. The scheme includes demolition of current foul and storm water pump stations, construction of a new sump, storm overflow tank and control building.
Balbriggan/Skerries Phase 3 Loughshinny WW Network	Wastewater Below Ground	Dublin	Provision for the pumping station and rising main to transfer flow to Skerries to protect environment, increase capacity and facilitate future growth.
Blanchardstown Sewerage Scheme	Wastewater Below Ground	Dublin	Upgrade of existing network to enhance environmental compliance, increase capacity and facilitate future growth. The scheme includes the duplication of the existing 9C sewer and associated storage as part of the Blanchardstown Regional Drainage Scheme(BRDS) project.
Dun Laoghaire-Rathdown Sewerage Scheme Ph1 Contract 2 Network Upgrade Tunnel	Wastewater Below Ground	Dublin	Upgrade of part the wider drainage infrastructural requirements within the Dun Laoghaire local catchment to protect environment, increase capacity and facilitate future growth.
Greater Dublin Area Drainage Strategy	Wastewater Below Ground	Dublin	Provision for plans and strategies to be developed and updated which sets out at a high level the potential wastewater infrastructure requirements to service this predicted growth and development in the Greater Dublin Area.
Liffey Siphon (Rosie Hackett Bridge)	Wastewater Below Ground	Dublin	Rehabilitation of the Liffey Siphon located at the Rosie Hackett Bridge which is critical sewer and transfers flows from the north inner city to the southern interceptor sewer.
Liffey Siphon Refurbishment	Wastewater Below Ground	Dublin	The purpose of the contract is to conduct rehabilitation works on the existing Liffey siphons.
SDZ North Docklands Ancillary Water Services	Wastewater Below Ground	Dublin	Assessment of the existing infrastructure, recommendations and associated cost estimates for future servicing for the North Docklands Area.

Project Name	Primary Asset Category	Local Authority Area	Project Description
South Docklands SDZ Sewerage Scheme	Wastewater Below Ground	Dublin	Provision for sewerage scheme to facilitate development needs in the South Docklands Area. Development overseen by the Dublin Docklands Development Agency (DDDA).
Saggart Reservoir	Water Above Ground	Dublin	Provision for a 100 ML storage reservoir at Saggart to improve DW quality and ensure a safe and reliable water supply.
Vartry Regional Water Supply Scheme - Upgrade of WTP	Water Above Ground	Dublin	<p>The overriding purpose of the overall Vartry Water Supply Project is to secure the water supply in terms of quality and quantity, on a sustainable basis.</p> <p>The services required in relation to the Vartry Water Treatment Plant Upgrade are the identification and development of solutions to secure the sustainable and continuous supply of treated drinking water from Vartry Water Treatment Plant, in compliance with drinking water regulations including the impounding reservoir drawoff upgrade.</p> <p>The services required in relation to Vartry Tunnel are the development of a solution for replacement and decommissioning of the existing tunnel between Vartry and Callowhill.</p> <p>The services required in relation to the Stillorgan Reservoir are to review and update existing proposals for covered storage in one of the reservoir cells, and to identify and develop solutions to improve the security and operability of the reservoir asset by rationalising and upgrading the inlet and bypass trunk main infrastructure.</p>
Water Supply Project - East & Midlands Region	Water Above Ground	Dublin	The Water Supply Project (WSP) - Eastern and Midlands Region will represent the first major comprehensive upgrade of 'new source' infrastructure in over 60 years and will meet the domestic and commercial needs of over 40% of Ireland's population into the medium to long term future.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Balbriggan Water Supply Scheme Ph2 Jordanstown to Kilsough Trunk Main	Water Below Ground	Dublin	Upgrade the capacity of the trunk water supply system between Jordanstown Reservoir and Kilsough Reservoir providing security of supply to Balbriggan and facilitate future growth.
Ballycoolen Trunk Main (Ballycoolen/Kingstown)	Water Below Ground	Dublin	Provision for trunk main from Ballyhooley Reservoir to Kingstown to duplicate the existing 36" trunkmain. The project will increase capacity and facilitate future growth.
Old Connaught/Woodbrook Water Scheme	Water Below Ground	Dublin	Provision for strategic reservoir storage and associated watermains connections which will provide network resilience and flexibility to the designated supply which includes areas of Southeast Dublin and North Wicklow. The scheme will also facilitate future growth.
Peamount to Saggart Pump Station and Rising Main	Water Below Ground	Dublin	The project provides for security of supply for the Greater Dublin Area and will enable the transfer of treated water from Leixlip WTP to Saggart Reservoir and hence into Dublin City and South Dublin distribution network. In addition following the completion of the proposed East & Midlands Water Supply Project(WSP) it will enable the transfer of treated water from the Termination Point Reservoir to Saggart Reservoir and hence into Dublin City and South Dublin distribution network.
Swords Watermain Rehabilitation Scheme	Water Below Ground	Dublin	Rehabilitation of watermain in Swords. The scheme will reduce risk of interruption to supply.
Doldrum Bay Network	Wastewater Below Ground	Dublin City	Provision to cease flows into the Doldrum bay and reroute them via the Sutton Pump Station to be treated at Ringsend. Previously receiving no treatment.
LIHAF/MUHDS Growth Programme (Wastewater) - Poolbeg West SDZ, Dublin	Wastewater Below Ground	Dublin City	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Poolbeg West Strategic Development Zone, Dublin.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Network Extensions - Wastewater - Oscar Traynor Rd	Wastewater Below Ground	Dublin City	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Critical Trunk Main Rehab - Merrion Gates	Water Below Ground	Dublin City	Provision to facilitate growth in the Poolbeg SDZ, North Docklands SDZ and South Docklands SDZ. The scheme includes the upsizing of the CI main between Merrion gates and Sean Moore Road.
LIHAF/MUHDS Growth Programme (Water) - Balgriffin/Clongriffin, Dublin	Water Below Ground	Dublin City	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth.
LIHAF/MUHDS Growth Programme (Water) - Poolbeg West SDZ, Dublin	Water Below Ground	Dublin City	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth.
LIHAF/MUHDS Growth Programme (Water) - St. Michael's Estate, Dublin	Water Below Ground	Dublin City	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth.
LIHAF/MUHDS Growth Programme (Water) - St. Teresa's Garden, Dublin	Water Below Ground	Dublin City	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth.
Local Network Reinforcement Project DLRCC Lot A.	Wastewater Below Ground	Dun Laoghaire Rathdown	Provision for Local Network Reinforcement Project to facilitate future growth.
Network Extensions - Wastewater - Woodbrook Shanganagh	Wastewater Below Ground	Dun Laoghaire Rathdown	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Network Extensions - Water - Cherrywood (DLRCC)	Water Below Ground	Dun Laoghaire Rathdown	Programme to construct necessary water network extension infrastructure in order to facilitate growth. The Water Network Extension program aims to increase the reach of Irish Water's mains network across Ireland by focussing on a number of prioritised settlements chosen in collaboration with Local Authorities.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Network Extensions - Water - Woodbrook, Shanganagh (DLRCC)	Water Below Ground	Dun Laoghaire Rathdown	Programme to construct necessary water network extension infrastructure in order to facilitate growth. The Water Network Extension program aims to increase the reach of Irish Water's mains network across Ireland by focussing on a number of prioritised settlements chosen in collaboration with Local Authorities.
GDA Groundwater Augmentation Programme	Water Above Ground	Eastern/Midlands	Provision of infrastructure to augment the water supply to Navan, Mid Meath, East Meath and the GDA from new groundwater sources in Louth, Meath and Kildare.
Upgrade of Drinam PS and W & WW connection for 176 Res units	Wastewater Below Ground	Fingal	Upgrade of the Drinam Pump Station to cater for additional loading from a new development at Kettles Lane
Malahide WWTP	Wastewater Above Ground	Fingal	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Local Network Reinforcement Project Fingal Lot C.	Wastewater Below Ground	Fingal	Provision for Local Network Reinforcement Project to facilitate future growth.
Network Extensions - Wastewater - Donabate Road	Wastewater Below Ground	Fingal	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Howth Water Supply Scheme PH 3 & 2 Howth Water Supply Scheme PH 3 & 3	Water Above Ground	Fingal	Upgrade of existing trunk main supply from Dublin City's North Fringe at Baldoyle to Howth's Strategic Reservoir at Dungriffen and upgrade of associated pumping and disinfection infrastructure to improve DW quality.
Malahide Water Supply Scheme (SLI) Civil Works (Malahide Reservoir)	Water Above Ground	Fingal	Upgrade the capacity of the trunk water supply system between Swords and Malahide Reservoir providing DW quality and security of supply to Malahide and Portmarnock WSZ's.
Network Extensions - Water - Donabate Road	Water Below Ground	Fingal	Programme to construct necessary water network extension infrastructure in order to facilitate growth. The Water Network

Project Name	Primary Asset Category	Local Authority Area	Project Description
			Extension program aims to increase the reach of Irish Water's mains network across Ireland by focussing on a number of prioritised settlements chosen in collaboration with Local Authorities.
Ahascragh WWTP	Wastewater Above Ground	Galway	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Carraroe Waste Water Outfall	Wastewater Above Ground	Galway	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Galway East WWTP	Wastewater Above Ground	Galway	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Glenamaddy Sewerage Scheme	Wastewater Above Ground	Galway	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Roundstone WWTP and Network	Wastewater Above Ground	Galway	Provision for the WWTP and Network to to protect the environment and quality of receiving water., increase capacity and facilitate future growth.
Spiddal WWTP New Build	Wastewater Above Ground	Galway	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Athenry WW Network	Wastewater Below Ground	Galway	Upgrade of existing network to protect environment, increase capacity and facilitate future growth.
Ballinasloe WW Network Contract No. 2	Wastewater Below Ground	Galway	Upgrade of existing sewer and watermain network in Ballinasloe to protect environment, increase capacity and facilitate future growth in the town of Ballinasloe and its environs.
Galway City WW Network	Wastewater Below Ground	Galway	Scope of project to be informed by outcome of DAP. Primary objectives are to focus on storm water overflow compliance, property flooding and provide for growth.
Terryland WTP Provision of New Intake & Rising Main to West of City	Water Above Ground	Galway	Upgrade of critical assets within the Galway City Water Supply Scheme and Environs. Provision for WTP Intake, rising mains,

Project Name	Primary Asset Category	Local Authority Area	Project Description
			trunk and interconnecting mains and the Provision for additional storage to ensure a safe and reliable water supply.
Tuam Regional Water Supply Scheme Ext Ph 1 and Ph 2	Water Above Ground	Galway	Extension of the Tuam RWSS scheme to serve Loughrea Town, Craughwell and environs to ensure a safe and reliable water supply
Galway City Water Conservation	Water Below Ground	Galway	Rehabilitation and replacement of water mains to reduce risk of interruption to supply. This project will replace pipeline together with the works associated with the replacement of individual water service connections within the public water supply network. The project will also involve works to replace services connections to properties currently served by shared watermains in backyards and private property.
LIHAF/MUHDS Growth Programme (Wastewater) - Ardaun, Galway City	Wastewater Below Ground	Galway City	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Ardauna, Galway City.
Castlemaine WWTP Upgrade	Wastewater Above Ground	Kerry	Upgrade of the WWTP, Castlemaine collection system to protect the quality of the receiving waters and the environment, increase capacity and facilitate future growth.
Kenmare WWTP	Wastewater Above Ground	Kerry	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Baile Na nGall PSs & RMs Upgrades	Wastewater Below Ground	Kerry	An Mota and Baile Na nGall Pumping stations and rising mains require upgrades to reduce frequency of overflows to sensitive marine waters.
Kilcummin WW Network	Wastewater Below Ground	Kerry	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Celbridge Local Network	Wastewater Below Ground	Kildare	Provision for Local Network Reinforcement Project to facilitate future growth.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Reinforcement			
Leixlip Transfer Pipeline	Wastewater Below Ground	Kildare	Provision for wastewater transfer pipeline deficiencies to enhance environmental compliance. The scheme includes new rising main and gravity sewer to the Leixlip WWTP, new rising mains from the Leixlip WwTP to the 9C Sewer in Parslickstown and modifications to the existing Leixlip WWTP Pumping Station.
LIHAF/MUHDS Growth Programme (Wastewater) - East Maynooth, Co. Kildare	Wastewater Below Ground	Kildare	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in East Maynooth, Kildare
Lower Liffey Valley	Wastewater Below Ground	Kildare	Scope of project to be informed by outcome of DAP. Primary objective is to focus on storm water overflow compliance and provide for growth.
Maynooth Transfer Pipeline	Wastewater Below Ground	Kildare	Provision for increase in pass forward flow transfer capacity between Maynooth and Leixlip WWTP to protect environment and facilitate growth. To eliminate existing flows from Maynooth being pumped through an overloaded network in Leixlip.
Network Extensions - Wastewater - Boycetown Kilcock	Wastewater Below Ground	Kildare	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Network Extensions - Wastewater - Celbridge (Ballyoulster)	Wastewater Below Ground	Kildare	Provision of sewer extension to the wastewater network to facilitate growth.
Upper Liffey Valley Sewerage Scheme Phase 3 Contract 2A (Network)	Wastewater Below Ground	Kildare	Upgrade of existing network to protect environment, increase capacity and facilitate future growth. Includes diversion of an existing sewer in Newbridge to a new waste water pumping station, new pipelines and new pumping stations to the WWTP at Osberstown.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Upper Liffey Valley Sewerage Scheme	Wastewater Below Ground	Kildare	Upgrade of existing network to protect environment, increase capacity and facilitate future growth.
Bottleneck Project - Maynooth, Co. Kildare	Water Above Ground	Kildare	Removal of known water network constraints in order to facilitate growth in Maynooth
LIHAF/MUHDS Growth Programme (Water) - East Maynooth, Co Kildare	Water Below Ground	Kildare	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth.
Srowland Water Pumping Station and Trunk Main	Water Below Ground	Kildare	Provision for Pumping Station (WPS) and Trunk Main (TM) installation at Old Kilcullen to allow transfer of water between Srowland Water Supply Zone (WSZ) and Ballymore Eustace WSZ to avoid interruption to supply.
Network Extensions - Wastewater - Western (Kilkenny)	Wastewater Below Ground	Kilkenny	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Thomastown Water Supply Scheme - Extension to Inistioge Water Supply Scheme	Water Above Ground	Kilkenny	Extension of Thomastown Water Supply Scheme to Inistioge to address ensure a safe and reliable water supply.
Kilkenny RWSS - Upgrade of Troyswood WTP	Water Above Ground	Kilkenny	Upgrade of the Troyswood WTP, including new intake, pipeline and the decommissioning of the Radestown WTP. The scheme will reduce the risk of THM non-compliance and ensure a safe and reliable water supply.
Portlaoise WWTP	Wastewater Above Ground	Laois	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Drumshanbo WWTP	Wastewater Above Ground	Leitrim	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Manorhamilton WWTP	Wastewater Above Ground	Leitrim	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth

Project Name	Primary Asset Category	Local Authority Area	Project Description
North Leitrim Regional Water Supply Scheme - Upgrade of WTP and Extension Kiltyclogher	Water Above Ground	Leitrim	Regional Water Supply Scheme - Upgrade of WTP and Extension Kiltyclogher to ensure security of supply.
Adare WWTP	Wastewater Above Ground	Limerick City & County	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Castletroy WWTP	Wastewater Above Ground	Limerick City & County	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Dromcollagher WW Network Dromcollogher WWTP	Wastewater Above Ground	Limerick City & County	Provision for the WWTP and network to protect environment, increase capacity and facilitate future growth.
Foynes WWTP	Wastewater Above Ground	Limerick City & County	Provision for the WWTP to protect the environment and quality of receiving water., increase capacity and facilitate future growth.
Glin WWTP	Wastewater Above Ground	Limerick City & County	Provision for the WWTP to to protect the environment and quality of receiving water, increase capacity and facilitate future growth.
Limerick WWTP	Wastewater Above Ground	Limerick City & County	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Newcastle West WWTP	Wastewater Above Ground	Limerick City & County	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
LIHAF/MUHDS Growth Programme (Wastewater) - Mungret, Limerick	Wastewater Below Ground	Limerick City & County	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Mungret, Limerick.
Ballymahon WWTP	Wastewater Above Ground	Longford	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Edgeworthstown WWTP	Wastewater Above Ground	Longford	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth

Project Name	Primary Asset Category	Local Authority Area	Project Description
Longford Central Regional Water Supply Scheme Ph1 - Upgrade of WTP and extension to Lanesborough and Newtowncashel Water Supply Schemes	Water Above Ground	Longford	Upgrade of WTP and extension to Lanesborough and Newtowncashel Water Supply Schemes to ensure a safe and reliable water supply.
Ardee Sewerage Scheme Wastewater Treatment Plant Upgrade	Wastewater Above Ground	Louth	Upgrade of WWTP and existing network to to protect the environment and quality of receiving water. increase capacity and facilitate future growth.
Omeath Sewerage Scheme Wastewater Outfall	Wastewater Above Ground	Louth	Provision for WWTP and associated Infrastructure to to protect the environment and quality of receiving water, support the increase in local population and future growth in the area.
LIHAF/MUHDS Growth Programme (Wastewater) - Mount Avenue, Dundalk	Wastewater Below Ground	Louth	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Mount Avenue, Dundalk
Local Network Reinforcement Project Priority A Louth Lot D.	Wastewater Below Ground	Louth	Provision for Local Network Reinforcement Project to facilitate future growth.
St Helenas PS RM Assessment & Replacement (Dundalk)	Wastewater Below Ground	Louth	Assessment of the structural integrity of the rising main to determine the extent of replacement work required to prevent future structural failures.
Drogheda Regional Water Supply Scheme - Upgrade of WTP	Water Above Ground	Louth	Upgrade of WTP to address DW quality and reduce risk of THM non-compliance. Ensure a safe and reliable water supply.
Dundalk Water Supply Scheme - Upgrade of WTP	Water Above Ground	Louth	Upgrade of the WTP to ensure a safe and reliable water supply
Critical Trunk Main Rehab - Roughgrange to Staleen WTP Pipeline	Water Above Ground	Louth	Provision to eliminate the risk of supply interruption associated with the raw water mains supplying Staleen Water Treatment

Project Name	Primary Asset Category	Local Authority Area	Project Description
Replacement			Plant.
Charlestown Sewerage Scheme	Wastewater Above Ground	Mayo	Upgrade of the WWTP to protect environment and quality of receiving waters and and facilitate growth.
Claremorris WWTP	Wastewater Above Ground	Mayo	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Foxford Sewerage Scheme	Wastewater Above Ground	Mayo	Provision for the WWTP to protect environment and quality of receiving waters and and facilitate growth.
Killala Sewerage Scheme Network & WWTP	Wastewater Above Ground	Mayo	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Newport WWTP	Wastewater Above Ground	Mayo	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth. Support the protection of high quality status Water in Clew Bay.
Lough Mask RWSS - WTP	Water Above Ground	Mayo	Upgrade of the WTP to ensure a safe and reliable water supply
Enfield WWTP	Wastewater Above Ground	Meath	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Stamullen WWTP	Wastewater Above Ground	Meath	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
LIHAF/MUHDS Growth Programme (Wastewater) - Farganstown, Navan	Wastewater Below Ground	Meath	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Farganstown, Navan.
Bottleneck Project - Ashbourne	Water Above Ground	Meath	Provision for upgrade network infrastructure in order to facilitate growth in area.
Navan Mid Meath Programme	Water Above Ground	Meath	Provision of water infrastructure to deliver additional supply from Staleen Water Treatment Plant to Navan Mid Meath Water

Project Name	Primary Asset Category	Local Authority Area	Project Description
			Supply Scheme and East Meath Water Supply Scheme.
Navan Mid-Meath Regional Water Supply Scheme Ph8 - Upgrade of WTP Sludge Treatment	Water Above Ground	Meath	Upgrade of Navan Water Supply Scheme's primary Water Treatment Plant - Liscarton to ensure a safe and reliable water supply
CDS Ashbourne Water Mains (CUST16490)	Water Below Ground	Meath	Ensure a Safe and Reliable Water Supply
LIHAF/MUHDS Growth Programme (Water) - Farganstown, Navan	Water Below Ground	Meath	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth.
Meath Countywide Water Conservation Project: Watermains Rehabilitation	Water Below Ground	Meath	Rehabilitation and replacement of existing cast iron, asbestos cement and PVC watermains with polyethylene and ductile iron watermains including the replacement of associated meters, valves & fittings in Co. Meath: Kells, Oldcastle, Athboy, Piercetown, Navan, Slane, Trim, Gaulstown, Ratoath, Sutherland Lane, M1 Crossing Platin, Mornington, Rathmullen, Laytown, Duleek, Dunboyne to avoid interruption to supply. The project will also deliver the removal of lead backyard services. The project will also replace existing public side connections on the replacement main.
Carrickmacross WWTP	Wastewater Above Ground	Monaghan	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Lough Egish Regional Water Supply Scheme - Upgrade of WTP	Water Above Ground	Monaghan	Upgrade of the WTP to ensure a safe and reliable water supply
Regional Biosolids Storage Facility	Wastewater Above Ground	National	Biosolids Storage Facility to serve Dublin region.

Project Name	Primary Asset Category	Local Authority Area	Project Description
National Programme for Interreg Projects	Wastewater Below Ground	National	The SWELL(Shared Waters Enhancement & Loughs Legacy) project's aim is to improve the water quality, within the shared waters of Carlingford Lough and Lough Foyle. Through strategic catchment investigations and modelling, the SWELL project is planned to deliver optimised, sustainable capital upgrades to wastewater assets and support future proofing and facilitate growth.
GDA RC3 - 25 year plan	Water Below Ground	National	Development of a plan to provide strategic water trunkmains to service inner city development and facilitate transfer from the East and Midlands Water Supply Project termination point to the GDA. Plan will duplicate and replace existing trunkmains on the South City arterial trunkmains, and provide a new trunkmain into Dublin City from Stillorgan Reservoir, as well as connecting to the North City high pressure main.
Edenderry WWTP	Wastewater Above Ground	Offaly	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Birr Water Supply Scheme - Upgrade of WTP and Additional Storage	Water Above Ground	Offaly	Upgrade of the WTP to ensure a safe and reliable water supply
Tullamore WSS	Water Above Ground	Offaly	Provision for WTP and new storage reservoir at Ardan(North Tullamore) and upgrade of existing at WTP at Clonaslee(South Tullamore). Both WTPs in combination supply all drinking water to Tullamore Co. Offaly and ensure a safe and reliable water supply.
Ballaghaderreen WWTP	Wastewater Above Ground	Roscommon	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Roscommon Sewerage Scheme	Wastewater Below Ground	Roscommon	Upgrade and rehabilitation of Sewer Network to reduce significant infiltration flows in the existing sewer and manholes to protect environment, increase capacity.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Boyle Water Supply Scheme - Extension to Grangemore Water Supply Scheme	Water Above Ground	Roscommon	Extension of Boyle WSS(Rockingham WTP) to Grangemore WSS(Cavetown WTP) and the decommissioning/rationalisation of Cavetown WTP to ensure a safe and reliable water supply.
Ballymote + Collooney WWTPs	Wastewater Above Ground	Sligo	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Collooney WWTP	Wastewater Above Ground	Sligo	Provision of Effective Management of Wastewater
Grange/Strandhill/Tubbercurry Sewerage Scheme WWTPs Upgrades	Wastewater Above Ground	Sligo	Upgrade of Grange, Tubbercurry, Strandhill and Ballinafad WTPs by Provision for increased capacity, new mechanical and electrical equipment and new process streams. The project will support the protection of DW quality, enhance environmental compliance, increase capacity and facilitate future growth.
Sligo & Environs Sewerage Scheme (G) Network (Rosses Point)	Wastewater Below Ground	Sligo	Upgrade of existing WWTP at Rosses Point to to protect the environment and quality of receiving water., increase capacity and facilitate future growth. The scheme will include the Provision for a new pumping station with storm water storage, and local network upgrades.
Foxes Den WTP Phase 2	Water Above Ground	Sligo	Upgrade of the WTP to ensure a safe and reliable water supply.
Lough Talt Regional Water Supply Scheme - Upgrade WTP	Water Above Ground	Sligo	Provision for new treatment facilities to ensure a safe and reliable water supply.
Sligo - Water Conservation	Water Below Ground	Sligo	Rehabilitation and replacement of distribution watermain pipeline to reduce risk of interruption to supply. The scope also includes the installation of 5km new trunk mains. The scope of the Sligo City Water Conservation Stage 3 Works - Phase 1 works involves the construction of approximately 9.82km of polyethylene and ductile iron pipework and associated fittings to supplement or

Project Name	Primary Asset Category	Local Authority Area	Project Description
			replace existing cast iron, AC, PE and uPVC watermains.
Dodder Valley Sewer Reinforcement	Wastewater Below Ground	South Dublin	Upgrade of the strategic flood sewer to provide for growth. Scope of project to be informed by outcome of DAP.
Local Network Reinforcement Project SDCC Lot B.	Wastewater Below Ground	South Dublin	Provision for Local Network Reinforcement Project to facilitate future growth.
Network Extensions - Wastewater - Clonburris	Wastewater Below Ground	South Dublin	Programme to construct necessary wastewater infrastructure to support LIHAF initiative in order to facilitate growth.
Network Extensions - Wastewater - Kilcarbery	Wastewater Below Ground	South Dublin	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Ballina WWTP	Wastewater Above Ground	Tipperary	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Cahir WWTP	Wastewater Above Ground	Tipperary	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Fethard WWTP	Wastewater Above Ground	Tipperary	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Nenagh New WWTP	Wastewater Above Ground	Tipperary	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Newport WWTP	Wastewater Above Ground	Tipperary	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Tipperary-Town WWTP	Wastewater Above Ground	Tipperary	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth.
Ardfinnan Regional Water Supply Scheme - New WTP and Additional	Water Above Ground	Tipperary	Upgrade of the Ballylooby WTP to ensure a safe and reliable water supply.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Storage			
Clonmel RWSS - RESERVOIR	Water Above Ground	Tipperary	Provide security of supply to the Northern Environs of Clonmel by providing reservoir storage to the supply area. The scheme will reduce the risk of microbiological non-compliance and ensure a safe and reliable water supply
Thurles Regional Water Supply Scheme - New WTP	Water Above Ground	Tipperary	Provision for new treatment facilities to ensure a safe and reliable water supply.
Waterford City WWTP (to G2)	Wastewater Above Ground	Waterford City & County	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Dungarvan Wastewater Network	Wastewater Below Ground	Waterford City & County	Scope of project to be informed by outcome of DAP. Primary objective is to focus on storm water overflow compliance and provide for growth.
LIHAF/MUHDS Growth Programme (Wastewater) - Gracedieu, Waterford	Wastewater Below Ground	Waterford City & County	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Gracedieu, Waterford
LIHAF/MUHDS Growth Programme (Wastewater) - Kilbarry, Waterford	Wastewater Below Ground	Waterford City & County	Programme to construct necessary wastewater infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Kilbarry, Waterford.
Ring/Helvick Water Supply Scheme - New Source, Reservoir and Network Contract	Water Above Ground	Waterford City & County	Ensure a Safe and Reliable Water Supply
LIHAF/Kilbarry Growth Programme - Kilbarry Waterford	Water Below Ground	Waterford City & County	Programme to construct necessary water infrastructure to support LIHAF and MUHDS initiatives in order to facilitate growth in Kilbarry, Waterford.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Athlone Main Drainage WWTW Upgrade C2	Wastewater Below Ground	Westmeath	Upgrade of existing network to protect environment, increase capacity and facilitate future growth. Includes tunnel sewer section from Golden Island to Abbey Road.
South Westmeath Regional Water Supply Scheme (Athlone and Mullingar)	Water Above Ground	Westmeath	Provision for WTP at Killinure Lough to address DW quality and decommission existing WTP at Custume Bridge. Including network linkages from Athlone WTP at Killinure Lough to both Athlone Storage sites and additional water transfer to Mullingar. Upgrade Mullingar WTP(Portloman on Lough Owel) to safe yield volumes with more Coagulation, Filtration and Clarification(CFC) process.
Duncannon WWTP	Wastewater Above Ground	Wexford	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Enniscorthy WWTP	Wastewater Above Ground	Wexford	Upgrade of WWTP to protect environment and quality of receiving waters and facilitate growth
Kilmore Quay Village and Environs Waste Water Outfall	Wastewater Above Ground	Wexford	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Enniscorthy Main Drainage	Wastewater Below Ground	Wexford	Upgrade of the foul collection network in the town of Enniscorthy, Co Wexford.
Wexford Town Distillery Road PS Upgrade - WW Network	Wastewater Below Ground	Wexford	Provision of infrastructure to facilitate growth and address existing capacity issues by increasing the capacity of the wastewater network entering the existing WWTP
Gorey Regional Water Supply Scheme Contract 4 (Water Treatment Plant, Reservoir & Pumping Station)	Water Above Ground	Wexford	Provision for WTP and upgrade to address DW quality and demand deficiencies associated with Ballyminaun, Upgrade Barnadown Pumping station, Interconnecting network and Provision for reservoir at Ballyminaun WTP. Additional decommissioning of Barnadown WTP, Kilmuckridge WTP, Ballykale WTPs and Coolishall WTPs.

Project Name	Primary Asset Category	Local Authority Area	Project Description
Wexford Town Watermain Rehabilitation and Gas Network	Water Below Ground	Wexford	Replacement of old watermains and water service connections including Provision for gas distribution network in Wexford Town to facility security of supply. The project is being progressed as a joint partnership between Irish Water and Gas Networks Ireland.
Arklow Sewerage Scheme Wastewater Treatment Plant - DBO	Wastewater Above Ground	Wicklow	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Avoca WWTP	Wastewater Above Ground	Wicklow	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth. Previously receiving no treatment.
Blessington WWTP	Wastewater Above Ground	Wicklow	Provision for the WWTP to protect environment and quality of receiving waters, increase capacity and facilitate future growth.
Network Extensions - Wastewater - Kiltarnan	Wastewater Below Ground	Wicklow	Programme to construct necessary wastewater network extension infrastructure in order to facilitate growth.
Wicklow Local Network Reinforcement	Wastewater Below Ground	Wicklow	Provision for Local Network Reinforcement Project to facilitate future growth.
West Wicklow Project - Dunlavin	Water Below Ground	Wicklow	New Watermains and Reservoir Upgrade

National Programmes

Programme Name	Programme Category	Programme Description
Asset Data Capture Project	National Programmes	The project will involve carrying out detailed surveys, assessments and recording of data for the above ground assets at approximately 650 of IW's principal water and wastewater facilities(excluding DBO sites).
Business Information Insights Project	National Programmes	The primary goal of this project will be improvements to evidence based decision making by improvements in data accessibility, quality and analysis for decision makers, improved data intelligence, improved cross function collaboration.
Catchment Management Strategy	National Programmes	The IW Catchment Management Strategy is to deliver a risk based approach to prioritise, plan and deliver interventions that may help deliver drinking water quality and environmental performance outcomes in a sustainable, cost-effective manner. This strategy will complement emerging national catchment management policy and regulatory developments with regards the Water Framework Directive and related.
Digitising Centre of Excellence	National Programmes	The Data Capture Project - GIS will proactively improve the quality & extent of information on below ground assets in IW's Asset Management Systems through the establishment of the Data Capture Centre of Excellence.
Energy Efficiency Programme	National Programmes	Improved energy efficiency via the upgrading, replacement and optimisation of inefficient plant and processes.
HSQE	National Programmes	Programme targeted at addressing specific health, safety and welfare issues within the IW asset base.
Invest to Save	National Programmes	Capital Investment across multiple projects to deliver OPEX savings.

Programme Name	Programme Category	Programme Description
IW initiated Licence Reviews	National Programmes	Licence reviews for the rationalisation of licence conditions including emission limit values , in order to deliver OPEX savings and CAPEX deferment.
Legacy Offices	National Programmes	Programme targeted at addressing specific health, safety and welfare issues within the IW asset base.
National Programme for INTERREG Projects	National Programmes	The SWELL(Shared Waters Enhancement & Loughs Legacy) project's aim is to improve the water quality, within the shared waters of Carlingford Lough and Lough Foyle. Through strategic catchment investigations and modelling, the SWELL project is planned to deliver optimised, sustainable capital upgrades to wastewater assets.
Planned Maintenance Survey	National Programmes	The Planned Maintenance Programme seeks to ensure that existing planned maintenance activities across all applicable installations are systemised via the Maximo Asset Management system.
Renewable Energy - Hydro programme	National Programmes	Identify and install hydro power on feasible sites to help decarbonise our energy usage and its contribution to climate change whilst also improving energy efficiency and future proofing the business.
Renewable Energy - PV - National Solar Energy Programme	National Programmes	Install PV solar energy across feasible IW assets to help decarbonise our energy usage and its contribution to climate change whilst also improving energy efficiency and future proofing the business.
Renewable Energy - Wind - National Microgeneration Programme	National Programmes	Identify and install wind turbines on feasible sites to help decarbonise our energy usage and its contribution to climate change whilst also improving energy efficiency and future proofing the business.
Site Security Upgrades	National Programmes	Programme targeted at addressing specific health, safety and welfare

Programme Name	Programme Category	Programme Description
		issues within the IW asset base.
Site Welfare facilities	National Programmes	Programme targeted at addressing specific health, safety and welfare issues within the IW asset base.
Taking in Charge - DPI in Residential Estates	National Programmes	Taking in charge of residential estates that are serviced by Developer Provided Infrastructure (DPI) in the form of their own wastewater /water treatment
Urban Waste Water Compliance Strategy	National Programmes	Development of Urban Wastewater Compliance Strategy.
Water Quality Modelling & Monitoring Programme	National Programmes	Programme of water quality modelling and monitoring studies to establish discharge impacts on coastal/transitional/river receiving waters using computer modelling approaches.
Capital Maintenance - Waste Water Above Ground	National Wastewater Programmes	Programme targeted at maintaining existing network, treatment and metering assets in order to maintain levels of service to customers.
Critical Sewer Survey Programme	National Wastewater Programmes	Critical Sewer Surveys to assess condition of the critical infrastructure elements of the collection systems. The purpose of the programme is to target the highest priority critical sewers.
CSO Monitoring and Survey	National Wastewater Programmes	Storm Water Overflow Surveying and Monitoring Programme. To survey and assess all known SWO not cover under DAP Programme and all associated discharge locations, to enable highest significance overflows to be identified for monitoring and protect environment.

Programme Name	Programme Category	Programme Description
Drainage Area Plan Programme	National Wastewater Programmes	Provision for DAPs and their hydraulic models to appraise the performance of the wastewater collection networks and determine solutions with respect to hydraulic, structural, operational and environmental performance criteria and to meet regulatory requirements.
Infiltration Reduction Programme	National Wastewater Programmes	The scope is to reduce the infiltration flow entering the wastewater collection systems to benefit performance of collection system and/or wastewater treatment plants.
Inlet Works Programme	National Wastewater Programmes	Provide inlet works for existing WWTPs to improve compliance, increase capacity and prolong operational life of the plant.
Local Internal Property Flooding Protection	National Wastewater Programmes	Flood Protection Measures to reduce risk of property flooding using small scale interventions where there are incidents of repeat property flooding in localised areas.
Local Network Reinforcement Hotspots - Studies/Concept Design	National Wastewater Programmes	Studies/concept design for wastewater network upgrades to facilitate growth.
National Certificate Authorisation Programme	National Wastewater Programmes	Provision for investment in smaller wastewater treatment plants(<500 PE) to support future proofing and facilitate growth.
Network Survey & Monitoring	National Wastewater Programmes	Localised investigations of sewer networks(i.e. CCTV Surveys, flow monitoring, and connectivity surveys) to determine root cause of problematic networks.
New Connections - Wastewater	National Wastewater Programmes	Provision of new wastewater network connections, nationally, for significant and standard connection types to facilitate growth.
Phosphorus Removal Programme	National Wastewater Programmes	To provide phosphorus removal capability at selected sites based on set

Programme Name	Programme Category	Programme Description
		criteria.
Provision of Telemetry Systems	National Wastewater Programmes	Programme targeted at providing telemetry outstation equipment at wastewater assets to connect to the National Telemetry System.
Resolving odour and noise	National Wastewater Programmes	Provision for programme to address Odour/Septicity control focused on addressing repeat customer complaints due to malodours from collection systems and to undertake septicity control measures where asset condition is deteriorating due to corrosive conditions within the network.
Sludge Hub-Satellites	National Wastewater Programmes	Upgrade of identified satellites to receive and treat sludge from their respective hinterlands.
Sludge National Programme	National Wastewater Programmes	Provision for appropriate sludge management capabilities at WWTPs in order to bring sites into compliance or reduce risk of non-compliance.
Small Towns and Villages Programme (Wastewater)	National Wastewater Programmes	Programme for wastewater which will support the growth of identified settlements where these are prioritised in development plan core strategies at a county/city level.
Taking in Charge -Residential Estates Waste Water Infrastructure (Initial Works)	National Wastewater Programmes	Taking in charge of wastewater network in residential estates nationally that have yet to be Taken in Charge by the Planning Authorities in accordance with Section 180 of the Planning and Development Act 2000(as amended).
Upsizing/Synergies - Connection Assets (Extensions and Reinforcement)	National Wastewater Programmes	Wastewater network upsizing synergies resulting from extensions, reinforcements and third party driven works.
Upsizing/Synergies - LA prioritised Network Extensions and Reinforcement	National Wastewater Programmes	Wastewater network upsizing synergies resulting from extensions, reinforcements and third party driven works.

Programme Name	Programme Category	Programme Description
Upsizing/Synergies - LA Roads	National Wastewater Programmes	Wastewater network upsizing synergies resulting from extensions, reinforcements and third party driven works.
Wastewater Above Ground Telemetry Programme	National Wastewater Programmes	Provision to upgrade existing systems or provide new telemetry systems on existing WWTP sites.
Wastewater Automation Programme	National Wastewater Programmes	Provision for automation and control equipment on sites with Activated Sludge treatment. The scheme will increase efficiency, reduce operational requirements, reduce risk of non-compliance and contribute towards standardised interfaces.
Wastewater Below Ground Capital Maintenance	National Wastewater Programmes	Provision for Capital Maintenance programmes covering capital maintenance of collection system assets (sewers, rising mains and pumping stations). These programmes target the replacement of failing assets and interventions are prioritised based on outputs of a risk assessment process. The programme will reduce the incidents of equipment failures, blockages, pipe collapses and the resultant flooding and pollution incidents.
Wastewater Disinfection Programme	National Wastewater Programmes	Provision to upgrade and standardise of disinfection systems at multiple sites to improve quality of discharges from WWTPs into sensitive receiving waters to protect the environment and quality of receiving water.
WW Imports Programme	National Wastewater Programmes	Wastewater Imports 2020-2024 Programme to provide specific inlet works infrastructure to cater for the importation of tinkered wastewaters.
WWPS National Upgrade Programme	National Wastewater Programmes	Upgrades prioritised based on the outcome of a national programme of condition assessments of wastewater pumping stations.

Programme Name	Programme Category	Programme Description
WWTP Storm Water Management Programme	National Wastewater Programmes	Provide appropriate storm water management facilities at existing WWTPs to improve compliance, increase capacity and prolong operational life of the plant.
Borehole Inspections	National Water Programmes	Inspection of existing boreholes to determine current condition to ensure a safe and reliable water supply.
Capital Maintenance - Water Supply Above Ground	National Water Programmes	Programme targeted at maintaining existing network, treatment and metering assets in order to maintain levels of service to customers.
Capital Maintenance - Water Supply Below Ground	National Water Programmes	Programme targeted at maintaining existing network, treatment and metering assets in order to maintain levels of service to customers.
Capital Maintenance of Domestic Meters	National Water Programmes	Provision for low level reactive maintenance of domestic meters and scheduled compliance testing.
CFC Process Improvements	National Water Programmes	Upgrade of the WTP's to ensure a safe and reliable water supply.
Chemical Management Improvements	National Water Programmes	Programme to address handling and storage of chemicals on site which has resulted in failed/failing assets, which pose a major risk to the business. This programme will mitigate the risk by upgrading chemical handling and storage assets.
Disinfection Programme	National Water Programmes	Provision to upgrade and standardise of disinfection systems at multiple sites to minimise microbiological risk and ensure a safe and reliable water supply.
Distribution Inflow (D.I.) Meters - Capital Replacement	National Water Programmes	Planned Replacement of the key outflow meter leaving Water Treatment Plants/Reservoirs.

Programme Name	Programme Category	Programme Description
DMA Establishment	National Water Programmes	Provision to ensure DMAs are fully functioning and identifying and targeting the worst performing areas of the network.
Drinking Water Safety Plans	National Water Programmes	Provision for Drinking Water Safety Plans (DWSP) to protect human health by managing risks to water quality based on a whole catchment approach to risk management. To ensure a safe and reliable water supply.
Filtration Process Improvements	National Water Programmes	Programme to cover filtration process improvements at Water Treatment Plants nationally
Find & Fix	National Water Programmes	Provision for active leakage control through finding and fixing leaks to effectively reduce network leakage.
First Fix Programme	National Water Programmes	Provision for free repair of domestic customer-side leaks, detected through water meters.
Generator Ready (Resilience & DSU)	National Water Programmes	Loss of electricity supply impacts IW to achieve its objectives. To reduce this risk, the proposal is to install new switchgear and ensure security of supply.
Group Water Scheme (GWS) Bulk Meters	National Water Programmes	Replacement of Group Water Supply (GWS) Bulk Meters.
Large Non Domestic Meters - Capital Replacement	National Water Programmes	Programme targeting renewal of bulk and non domestic water meters.
Lead Improvement Processes	National Water Programmes	Provision of New/Upgraded processes at Water Treatment Plants / Service Reservoirs to reduce impact of lead in water to ensure a safe and reliable water supply.

Programme Name	Programme Category	Programme Description
Local Network Reinforcement Hotspots - Studies/Concept Design	National Water Programmes	Studies/concept design for WW Network upgrades to facilitate growth.
Mains Renewal (Rehab)	National Water Programmes	Provide leakage reduction and security of supply in areas of the network with frequent bursts, and improving condition of the main to improve the water quality.
Metering of Multi Unit Developments (Apartments)	National Water Programmes	Programme targeting metering of multi-unit apartments .
Metering of Unmetered/Undocumented Non Domestic Properties	National Water Programmes	Programme targeting renewal of bulk and non domestic water meters.
National Chlorine Gas Replacement Programme	National Water Programmes	The objective of this programme is to reduce risk presented by the use of chlorine gas by progressively reducing the number of sites using chlorine.
National Lead Programme	National Water Programmes	Provision for the replacement of lead services for to ensure a safe and reliable water supply.
National Raw Water Monitoring Project	National Water Programmes	Advance investigation project to collect critical raw water quality data, taking into account the scale of contamination, including seasonal events/variations. Data facilitates the selection of the preferred option to address water quality and supply/demand deficits.
National Water Resources Plan	National Water Programmes	The National Water Resources Plan(NWRP) will define how IW will balance the needs of its customers and regulators in terms of a good quality and resilient water supply, delivered on the basis of environmentally sound principles, whilst maintaining maximum affordability.

Programme Name	Programme Category	Programme Description
Network Extensions - Water	National Water Programmes	The Water Network Extension program aims to increase the reach of IW's mains network across Ireland by focusing on a number of prioritised settlements chosen in collaboration with Local Authorities in order to facilitate growth.
New Connections - Water	National Water Programmes	Provision of new water network connections, nationally, for significant and standard connection types to facilitate growth.
Pressure Management	National Water Programmes	Provision to reduce the occurrence of bursts and volume of water lost through leakage, by proper pressure management. Pressure will be measured at critical points in the network to determine if pressure management is required.
Provision of new Non Revenue Meters	National Water Programmes	Programme includes the provision of new District Meter Area (DMA) Meters on schemes to optimise leakage reduction approach and also includes for meter requirements arising from the taking in charge of Group Water Schemes.
Rationalisation Programme	National Water Programmes	Programme includes for rationalising a number of under performing WTPs by laying a watermain connection to a neighbouring plant, where strategic investment achieves the outcome more efficiently.
Regularise Licencing for Existing Surface Water and Groundwater Sources	National Water Programmes	Programme to obtain water abstraction licences for all water sources. Each application will require key information(e.g. yield, abstraction impact) to demonstrate that abstractions are sustainable and that environmental impacts are minimised. This programme is a key enabler in the completion of licence applications.

Programme Name	Programme Category	Programme Description
Reservoir Refurbishment Programme	National Water Programmes	This programme is aimed at establishing an on-going programme of local inspections to determine the issues and subsequently running programmes of work based off the findings in order to appropriately upgrade IW's structural water storage assets.
Service Reservoirs Inspections and Associated Interventions	National Water Programmes	Provision for Service Reservoir Inspections and Cleaning. Includes for drain down, cleaning, inspection and refurbishment of reservoir to ensure security of supply.
Small Non Domestic Meters - Capital Replacement	National Water Programmes	Programme targeting renewal of bulk and non domestic water meters.
Small Towns and Villages Programme (Water)	National Water Programmes	Programme for water which will support the growth of identified settlements where these are prioritised in development plan core strategies at a county/city level.
Source Protection Key Study	National Water Programmes	IW has over 700 groundwater sources. The Zone of Contribution(ZOC) is the land area that contributes to a well or spring. This study will utilise an algorithm, developed by the Geological Survey of Ireland, to map the ZOCs of groundwater sources to ensure a safe and reliable water supply.
Source Protection Programme	National Water Programmes	Provision for source water protection works to minimise contamination to abstracted water and increase capacity.
Taking in Charge - Group Water Schemes	National Water Programmes	IW(IW) is co-operating with, local authorities nationally in the taking into charge of Group Water Schemes (GWS) following procedures agreed with the Department of Housing, Planning, Community and Local Government (DHPCLG) and other stakeholders.

Programme Name	Programme Category	Programme Description
Taking in Charge - Residential Estates Water Infrastructure (Initial Works)	National Water Programmes	Taking in charge of watermains network in residential estates nationally that have yet to be Taken in Charge by the Planning Authorities in accordance with Section 180 of the Planning and Development Act 2000(as amended).
Taking in Charge - Small Water Supplies	National Water Programmes	Taking into charge of small water supplies that are not exempted supplies under the Drinking Water Regulations SI No 122 of 2014
Telemetry - Dataloggers/Monitoring Systems	National Water Programmes	Replacement of telemetry dataloggers/monitoring systems which are used for both operational, billing and water conservation purposes.
Treated Water Storage Programme	National Water Programmes	Programme aimed at local inspections to determine structural defects and works at water storage assets to avoid interruption to supply.
Upsizing/Synergies - Connection Assets (Extensions and Reinforcement)	National Water Programmes	Water network upsizing synergies resulting from extensions, reinforcements and third party driven works to facilitate growth.
Upsizing/Synergies - LA prioritised Network Extensions and Reinforcement	National Water Programmes	Water network upsizing synergies resulting from extensions, reinforcements and third party driven works.
Upsizing/Synergies - LA Roads	National Water Programmes	Water network upsizing synergies resulting from extensions, reinforcements and third party driven works.
Water Network Hydraulic Modelling	National Water Programmes	Programme for Building, calibration, updating of hydraulic models for specific water supply schemes. The output from these models will assist in addressing growth potential, water conservation, pressure management, identification of bottle necks and facilitate growth.
Water Provision for Growth Programme	National Water Programmes	Removal of known water network constraints in order to facilitate growth.

Programme Name	Programme Category	Programme Description
Water Supply Above Ground Conceptual Design Studies	National Water Programmes	Programme targeted at Conceptual Design Studies for Water Treatment Plants
Water Supply Below Ground Conceptual Design Studies	National Water Programmes	Conceptual Design Studies for Water network below ground infrastructure.
WSP BC to Navan WSS (Connection 6A Phase 1)	National Water Programmes	Provision of multiple watermains and construction of service reservoir to address Interruption to Supply(24h Storage) issues in Meath and Louth areas.
WTP Sludge Treatment Programme	National Water Programmes	This programme will deliver a sustainable sludge treatment system for each of the existing sludge producing water treatment plants.

Appendix 5 – Updated Proposed Outcomes

WSPS Theme	Key Metric	Unit	2024 Target
Quality	Reduction in risk of microbiological non-compliance	Reduction in the number of properties at risk	562,000
	Reduction in risk of THM non-compliance	Reduction in the number of properties at risk	132,000
	Compliance with lead standards	Number of lead services replaced	13,200
	Water Supply Zones (WSZ) on RAL	Number of WSZs remaining on RAL	2
	Agglomerations with no wastewater treatment	Number of agglomerations (outstanding)	2 (of 50)
	UWWTD Compliance (ECJ)	Number of agglomerations (outstanding)	2 (of 31)
	River Basin Management Plan Projects completed	Number of projects (completed)	211 (of 255)
Conservation	Net water savings in water supply network	Net water savings (MLD saved) over the period 2020 to 2024	176
	Energy Efficiency	Reduction in energy consumption (GWh pa)	22
Future Proofing	Drinking water treatment capacity	Additional capacity provided (MLD)	46
	Wastewater treatment capacity	Additional capacity provided (PE)	1.2m

Table A5.1 – Committed Outcomes for RC3

Current Key Metric	Key Metric	Definition
Reduction in risk of microbiological non-compliance	Improvement in asset performance to reduce current and future microbiological non-compliance	Investment in the provision of required assets to reduce the risk of microbiological non compliance (achieved by 2020–2024 programmes and infrastructure carryover)
Reduction in risk of THM non-compliance	Improvement in asset performance to reduce current and future THM non-compliance	Investment in the provision of required assets to reduce the risk of THM non compliance (achieved by 2020 – 2024 programmes and infrastructure carryover)
Removal of a scheme from EPA RAL	Removal of Water Supply Zones from EPA RAL	Removal of Water Supply Zones (WSZs) from EPA Remedial Action List (RAL). The starting point list of WSZs is based on the list included in the Q4 2014 RAL register.
Net water savings in water supply network	Net water savings (MLD saved) over the period 2020 to 2024	Net water savings; quantified in mega-litres per day at WTP level including both public side and private side leakage (Unaccounted For Water).
Reduction in risk of lead non-compliance (cumulative)	Reduction in risk of lead non-compliance	Replacement of lead services.
Agglomerations with no wastewater treatment	Reduction in agglomerations with no wastewater treatment	Provision of appropriate treatment to an agglomeration which previously had no treatment or preliminary treatment only.
UWWTD Compliance (ECJ)	Urban Wastewater Treatment Directive (UWWTD) Compliance (ECJ)	Facilitating achievement of UWWTD compliance by means of completing works at an agglomeration listed on the ECJ case against Ireland in relation to non-compliance with UWWTD
RBMP 2018 – 2021	Completions of works at an agglomeration listed in Appendix 1 of the River Basin Management Plan (RBMP) 2018 – 2021;	<p>Completion of a Wastewater Treatment Upgrade included in RBMP 2018 – 2021 under the headings of:</p> <ul style="list-style-type: none"> • Upgrades Being Undertaken to Support Compliance with the Requirements of the Urban Waste Water Treatment Directive • Upgrades Being Undertaken to Support Compliance with the Requirements of Protected Areas • Upgrades Being Undertaken to Support the Protection of High-Status Waters • Other Scheduled Wastewater Treatment Plant Upgrades
Energy Efficiency Improvement	Energy Efficiency Improvement	Improved energy efficiency via the upgrading, replacement and optimisation of inefficient plant and processes achieved by energy efficiency 2020 – 2024

		programme
Additional wastewater treatment capacity	Additional wastewater treatment capacity	Provide additional wastewater treatment capacity in line with national, regional and local economic and spatial planning policy.
Additional water supply capacity	Additional water supply capacity	Provide additional water supply capacity in line with national, regional and local economic and spatial planning policy.

Table A5.2 – Committed Outcome Definitions

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Gas
Networks
Ireland

