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Department of Housing, Local Government and Heritage

Research and Information on the Rural Water Sector

Volume 2: Output Report

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TERMINOLOGY

A full bibliography is not provided here as there are many terms and acronyms which are used only once. However, some key terms are in common use throughout this report are listed below. These are as follows:

- *Amalgamation* — the merging of two or more group water schemes through the physical connection of their networks
- *Bundle* — A collection of Group Water Schemes (DBO operated)
- *DBO* — Design, Build Operate
- *Department* — the Department of Housing, Local Government and Heritage and the Department under its various previous names
- *Drinking Water Regulations* — European Union (Drinking Water) Regulations 2014
- *DWWTS* — Domestic Waste Water Treatment Systems
- *EPA* — Environmental Protection Agency
- Exempted supply — A water supply which is not subject to the monitoring and reporting requirements of the Drinking Water Regulations (often referred to as an 'unregulated' supply)
- *GWS* — Group Water Scheme - a scheme providing a private supply of water to two or more houses by means of a common or shared source of supply and distribution system
- *HSE* — Health Service Executive
- *INR* — Initial Notification Record
- *MARWP* — Multi-annual Rural Water Programme
- *The Minister* — The Minister for Housing, Local Government and Heritage and the Department under its various previous names
- *NFGWS* — National Federation of Group Water Schemes
- *O&M* — Operation & Maintenance
- *PriGWS* — Private Group Water scheme (supplying treated water from its own source, treatment and distribution network)
- *PubGWS* — Public Source Group Water scheme (supplying treated water provided by Irish Water from its own distribution network)
- *Rationalisation* — merging the management entities of two or more group water schemes without physically connecting their networks
- RBMP — River Basin Management Plan
- *SPS* — Small Private supply
- *Taking in Charge* — The process where Irish Water take responsibility for the operation of a supply –typically a group water scheme - and the supply ceases to exist as a separate entity
- *THM* — Trihalomethane
- *VTEC* — Verocytotoxigenic Escherichia coli, a specific group of the bacterium Escherichia coli. The most common member of this group of bacteria in Ireland is E. coli O157.
- *The Working Group* — The Rural Water Working Group appointed by the Minister
- *WFD* — Water Framework Directive

SOURCE REFERENCES AND DATA

This document uses best available data at the time of writing. Source references to reports and data are either given in the text as they arise or as footnotes to the text, where considered appropriate. The Literature Review presented in Volume 1, in particular, contains a comprehensive review of the Rural Water Sector with extensive source references.

All of the data given in this report is the most recently available from referenced Census, surveys and reports etc. It is moment in time data that is constantly changing e.g., as populations increase, group water schemes are taken in charge or are amalgamated into other schemes etc.

Where figures and percentages stated and discussed in this report, they are appropriate rounded for both ease of reading while at the same time not losing necessary accuracy.

ACKNOWLEDGEMENTS

Successfully delivering government policy and water services investment requires close collaboration and meaningful two-way engagement with stakeholders to understand expectations and priorities. It ensures responsiveness and consistency in meeting expectations.

Collaboration between stakeholders is key to developing a world class service approach across both public and private water services in Ireland.

The Department places a strong emphasise on the critical role of Rural Water Sector stakeholders. The development of this document has been led by TOBIN on behalf of the Department, with the input of key stakeholders and consultees.

The consultees include experienced representatives from a broad range of organisations that have or share, either directly or indirectly, responsibilities for providing wholesome and clean drinking water that is safe and reliable for their consumers.

Over the period May to November 2021 a broad range of stakeholders were consulted with as part of this project. TOBIN and the Department would like to thank all of the consultees that contributed to the study, without whose input the study would not have been possible. These consultees were as listed below.

A range of local authorities that are considered representative of having large, medium and small involvement in rural water services:

- Cavan County Council
- Clare County Council
- Cork County Council
- Galway County Council
- Limerick County Council
- Mayo County Council
- Tipperary County Council
- Wexford County Council

The representative organisation for community-owned and community-run group water scheme sector in Ireland:

- National Federation of Group Water Schemes (NFGWS)

Representatives, provided by the NFGWS and agreed with the Department, of private (including DBO) and public group water schemes:

- Barraghy-Fermoyle GWS (County Cavan/ County Monaghan)
- Clanmaurice GWS (County Kerry)
- Cullohill GWS (County Laois)
- Kilmaley-Inagh GWS (County Clare)
- Loughrea Rural GWS (County Galway)

The various relevant functions of the EPA with drinking water and water in the environment oversight:

- EPA Drinking Water Inspectorate

- EPA National Inspection Programme (DWWTS)
- EPA Catchment Management Programme
- HSE Environmental Health
- HSE Public Health

Representative DBO service providers to the group water scheme sector:

- Coffey Water Ltd.
- Glan Agua Ltd.

This report recognises that some drinking water suppliers face a number of challenges to providing, in a timely and sustainable way that offers value for money, wholesome and clean drinking water that is safe and reliable for their consumers.

This report is intended to comprehensibly inform and assist the Rural Water Working Group to address, through its Terms of Reference, considering the optimal organisational form for the Rural Water Sector and to make recommendations to progressively resolve current issues in the Sector.

It is hoped that this report will strongly contribute to enabling the Working Group to develop recommendations for consideration by the Minister on the range of legislative requirements, governance, monitoring and investment that is needed to attain the sustainable future of the Rural Water Sector in the medium to long-term that will progressively resolve current issues to the benefit of our society as a whole.

EXECUTIVE SUMMARY

Project Scope

The scope of this project includes a review of the governance, supervision, funding and wider investment needs relating to the Rural Water Sector, the system of monitoring water quality in the Sector and how deficiencies are identified and responded to. The report is presented in two volumes:

- Volume 1 Literature Review
- Volume 2 Output Report (this report)

The Literature Review presented in Volume 1 contains a comprehensive review of the Rural Water Sector. This Output Report incorporates the outputs of the programme of consultation with the key stakeholders in the sector over a period of seven months in the latter half of 2021.

The purpose of this Output Report is to increase, in an impartial way, the stock of knowledge available to the Working Group established by the Minister to review the Rural Water Sector. It will inform and support the Working Group to assist it in addressing its Terms of Reference.

A snapshot of the population served by each type of water supply – public and private – is shown in the pie chart in Figure 1.1 in Chapter 1. The chart is a useful scale reference point when considering the issues raised in this report on rural water supply. It provides a contextual scale to the issues raised, reflecting proportionality for use of public monies to address the issues.

The population distribution in Ireland, coupled with multiple local authorities as water services authorities, and historically inadequate financing of water services by the State has left a fragmented water supply system. This has created a legacy of numerous public and private supplies compared to the situation in other EU countries.

The legacy places a significant financial burden for the funding capital and operational costs by the State. Higher than necessary water treatment plant and supply numbers nationally – public or private - means that a greater cost burden is being placed on the State as funder of water services. The benefits of economies of scale in this area are not being utilised to their fullest potential. This is explored in some detail in Chapter 1 to provide context for the issue.

Repeated annual EPA reports show that drinking water quality in private supplies lags behind that of public supplies. One in 20 PriGWS is failing to meet the main microbiological standard E.Coli. (Escherichia coli), compared to 1 in 200 for public water supplies. Compliance with *E. coli* standards for regulated PriGWS has remained relatively unchanged in recent years, at around 95%, which is poor when compared with the compliance levels achieved for public water supplies at 99.5%.

Figure 1.3 in Chapter 1, which covers the period from 2004 onwards, compares the level of compliance for the main microbiological standard (*E.coli*) for public water supplies and regulated PriGWS. The PriGWS sector showed steady improvement in the years up to 2010, with the rate of improvement reducing after that. From 2015 onwards there was no significant improvement.

Funding Needs of the Sector – Clarification on Scope

A point raised by some stakeholders is whether the future investment cost (regulatory, capital and operational) to the State as main funder can be estimated in this report for the Rural Water Sector. The aim of this report, however, is to focus on the actions required to improve and sustain rural water services by considering issues such as governance, supervision and monitoring water quality in the Sector.

The output of the report will assist the Working Group in considering these wider decisions on sectoral needs which will then become the basis of considering investment needs for rural water services. This approach is taken, rather than estimating the quantum of investment costs in the void of the wider decisions being made on the scope of the capital investment priorities and requirements across all elements of rural water services, including domestic waste water treatment systems.

The Department uses various opportunities to consider overall capital funding needs for the Rural Water Programme eg. as part of the preparatory process for each new National Development Plan and again at the mid-term review of each Plan.

When launching new or updated grant schemes, the Department usually commits to undertake a review of each grant scheme at appropriate intervals. This ensures the continued alignment of these schemes with policy objectives.

Reflecting this approach, the Multi-annual Rural Water Programme is reviewed at the end/beginning of each cycle by the Working Group to advise the Minister on the scope and funding needs of the upcoming multi-annual programme. In a similar way the scope and funding needs of other measures such as the private wells grant and the septic tank grants are regularly assessed, expanded if appropriate, and improved.

It will be seen therefore that the issue of future investment costs is not a simple issue of arriving at a quantum. There are other processes in place to address evolving funding needs and their costs. The whole area of consideration of future investment costs is addressed in Chapter 1.

It is beyond the scope of this report to provide, with any certainty or confidence, an estimate of future costs of the funding needs. There are a number of reasons for this, including but not limited to:

- The preferred future water quality regulatory approach - status quo or other - has not been considered by the Rural Water Working Group at this point. However, any cost impact assessment is likely to show the benefits of a regulatory change to a more centralised model. These benefits would result from improvements in water quality in private supplies progressively outweighing the additional costs, if any, to the State. A more singular and centralised model would lead to better human health and quality of life outcomes for the rural communities availing of the rural water services, through more consistent application of regulations and enforcement.

- Similarly, the preferred future funding approach - status quo or other – under the Rural Water Programme has not been considered by the Rural Water Working Group at this point. Any cost impact assessment is likely to show benefits similar to those referenced on water quality regulation above.

- The scale of the PubGWS portion of the sector is reducing quickly as schemes are progressively being taken in charge (see Figure 1.2). This will impact considerably, from a Rural Water Programme perspective, on future capital and operational funding needs. The approach can,

with time, free up funding opportunities for other measures under the multi-annual programme.

- The PriGWS portion of the sector is consolidating i.e. some schemes are progressively being taken in charge while some are amalgamating into other schemes to become more sustainable entities (see Figure 1.2). These actions, which are supported by funding under the multi-annual programme on a value for money basis, will impact significantly on future capital and operational funding needs under the wider Rural Water Programme. The approach can, with time, free up funding opportunities for other measures under the multi-annual programme in particular.

- Funding under the grant schemes for private wells and septic tanks is demand led and uptake of grant funding is subject to the outcome of ongoing policy review and ongoing messaging by the key stakeholders, particularly local authorities, LAWPRO, HSE and EPA etc. The Department is currently undertaking, as part of an ongoing process, a review of these grant schemes to ensure their continued alignment with policy objectives. The review will involve undertaking a cost impact assessment.

- The DBO procurement model is used for a significant part of the PriGWS sector (with approximately 70% of households in this sector benefiting). The Department is currently undertaking a review of the model for future use by the sector. The review will provide an opportunity to inform the Department and the schemes concerned, on the costs that will emerge over the next decade as the current 20 operation and maintenance (O&M) contracts come to an end. The schemes concerned will require capital investment as part of their entry to new O&M contracts, amalgamation or taking in charge, whichever offers the highest value for money approach for investment by the State.

The current situation of hyperinflation (approximately 14% for 2022) for the construction industry in Ireland also complicates meaningful cost estimation. Additionally, from an operational cost perspective, the 2022 global energy crisis has led to cost estimating uncertainty on this front.

Furthermore, any desk-based estimate, if provided in this report, would need to be validated by piloting on representative sample surveys and/or examination of expenditure on existing projects.

Other emerging issues, impacting mostly on the group water scheme sector, are the new *Drinking Water Directive*, the *Water Environment (Abstractions and Associated Impoundments) Bill 2022*, recent EPA manuals *Water Treatment Manual: Filtration*[1] and the *Water Treatment Manual: Disinfection*[2]. It is difficult at this point to gauge the medium to long-term costs of for the sector of these developments.

Finally, it is worth noting that the consultation process, while it had mixed views on the grant support for private wells, did not reveal any indication of underfunding from an overall Rural Water Programme perspective.

[1] *Water Treatment Manual: Filtration,* EPA (2020). See at this link: https://www.epa.ie/publications/compliance--enforcement/drinking-water/advice--guidance/epa-water-treatment-manual-filtration.php

[2] *Water Treatment Manual: Disinfection*, EPA (2011). See at this link: https://www.epa.ie/publications/compliance--enforcement/drinking-water/advice--guidance/water-treatment-manual-disinfection.php

It is hoped that the above analysis of the multiple issues shows that it would be extremely difficult and challenging to meaningfully quantify the future estimated cost of funding the rural water services. However, it will be important for the Department to adequately monitor, on a continuous and ongoing basis, the individual and combined impacts of the above issues which are constantly changing and evolving.

DBO Contractor Operated GWS (Regulated)

The governance model put in place for DBO bundles in the mid-2000s was very successful in achieving its aims in terms of water quality improvements. The Working Group has agreed, in principle, to the continuation of the DBO contract model of delivery for the operation and maintenance of PriGWS where appropriate.

The quality of water produced under these DBO contracts is comparable to that in public supplies, reflecting the professional operation of the water treatment processes. There are still some challenges for this model and THM compliance is one that example that continues to be an issue for some schemes on DBO operated PriGWS. This is partly due to the hybrid operational model involved.

Non DBO Privately Sourced GWS (Regulated)

Progressive work that has been undertaken under successive multi-annual programmes to ensure microbiological compliance. However, many smaller non DBO PriGWS do not have the same level of protection against microbiological (eg cryptosporidium or giardia) and chemical (eg THMs, manganese or nitrate) water quality risks as larger private schemes or public schemes.

Although the water in the majority of regulated non-DBO PriGWS are probably safe to drink most of the time, some are at risk from contamination. This is particularly so if they depend on a surface water source, a vulnerable groundwater source that is surface influenced, inadequate treatment equipment in place, or have poor operation and management structures.

Publicly Sourced GWS (Regulated)

As these schemes receive their water from a public supply, water quality is broadly similar to that in the parent public scheme.

With taking in charge protocols established, giving a consistent national approach, and if the recent application trends continue, it is likely that most, and likely ultimately all, PubGWS will be taken in charge over time. This, coupled with the fact that no new PubGWS are being built, means that the number of households served by PubGWS will diminish over time.

Small Private Supplies

Small Private Supplies, serving a commercial or public activity, are relatively small in number and small in terms of the volume of water supplied and population served. However, they are a type of supply that many people going about their daily lives in rural areas encounter and this leaves Small Private Supplies particularly important from a public health perspective. In some cases, installed treatment facilities can be poor and there have been well documented examples of waterborne infection outbreaks in supplies serving creches.

Exempted Privately Sourced GWS

The EPA have consistently highlighted that the water quality performance of private water supplies lags behind that of public supplies. While the majority of *regulated* PriGWS achieve microbiological compliance, the situation with *exempted* supplies is far less certain. Ireland has the highest incidence of VTEC (Verocytotoxigenic Escherichia coli) in Europe and a high proportion of cases have been linked to contaminated private wells and PriGWS.

Household Supplies

Household supplies (mainly wells) lie outside the monitoring and reporting requirements of the Regulations, in terms of health risk they are at the mercy of the quality of construction of the well and land use practices in the catchment close to the well. Many VTEC infections have been reported as occurring in private household wells.

Domestic Wastewater Treatment Systems

It is estimated that some 30% of the total population is unsewered, which in a European context is high. The vast majority of DWWTS are septic tanks. The National Inspection Plan for DWWTS is targeted at areas where significant pressures exist. Lack of enforcement and close out of legacy issues is still an issue for rural waste water.

1.0 INTRODUCTION

1.1 Background

In April 2018, on foot of recommendations of a Joint Oireachtas Committee on the Future Funding of Domestic Water Services (JOC), the Minister established a Rural Water Working Group to conduct a review of the wider investment needs relating to rural water services.

The main purpose of the Working Group is to review the needs of the Rural Water Sector and recommend measures to ensure an equality of outcome between those who receive water services from Irish Water and non-Irish Water customers. This project includes research and information to support the review the Rural Water Sector by the Working Group.

The term *Rural Water Sector* is intended to refer to Rural Water Services together with all of the stakeholders and activities associated with the oversight, funding, delivery, and management of these services. Rural water services include:

- **Private water supplies**. These are all water supplies that provide water for human consumption and are not operated by Irish Water.
- **Private waste water treatment systems**. These are 'domestic type' waste water treatment systems that are not operated by Irish Water.

For the purposes of this report private water supplies are typically group water schemes and individual house wells (commonly called private wells) and Small Private Supplies (SPS). SPS are drinking water supplies serving a commercial or public activity such as hotels, B&Bs, community centres, pubs and restaurants, crèches and national schools. However, they sometimes also supply attached domestic residences or adjacent households.

In relation to private waste water treatment systems, the focus of the study is on 'domestic type' i.e. typically single household systems. Treatment systems for commercial or public activity, a relatively small group, are excluded as they do not meet the definition of 'domestic type' systems.

More significantly commercial and public activities are responsible for their own costs - capital and operational - of providing their water and waste water services. With no domestic dimension they are not funded under the Rural Water Programme.

There is another relatively small group of waste water treatment systems which could be potentially considered to be part of the Rural Water Sector, and which treats 'domestic type' waste water. These are Developer Provided Waster services Infrastructure (DPI).

DPI estates are a category of housing estate served by standalone water services infrastructure, provided by the developer of the estate. They are privately owned facilities. The infrastructure consists mostly of waste water treatment services, but a small number provide drinking water services for the estate. They are excluded from the scope of this study as they are covered by a separate Irish Water study and the earlier Department's National Taking in Charge Initiative (NTICI) report.

1.2 Scale of the Rural Water Sector (water supplies)

A snapshot of the population served by each type of water supply – public and private – is shown in Figure 1.1 below.

The chart is a useful scale reference point when considering the issues raised in this report on rural water supply. It provides a contextual scale to the issues raised, reflecting proportionality for use of public monies to address the issues. However, this must be carefully balanced with considerations of public health, environmental impact, and the availability of value for money alternatives.

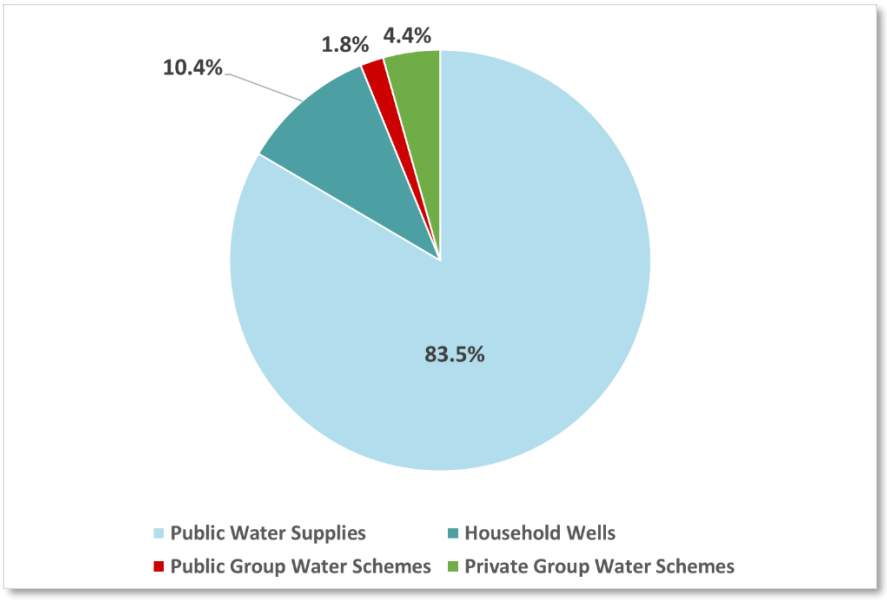


Figure 1.1 - Population Served by Water Supply Type in Ireland (Source: Annual EPA drinking water quality reports)

The EPA has reported on an annual basis, for almost two decades, on regulated water supplies, including on group water schemes. The data in their reports allows a comparison of progress nationally over this time. The first year of operation of the reporting obligations, under the then new Regulations for the former Drinking Water Directive, was 2014. The position then can be compared with that in 2019, the most recent comprehensive annual report available at the time of writing.

The population distribution in Ireland, coupled with multiple local authorities as water services authorities, and historically inadequate financing of water services by the State has left a fragmented water supply system. This has created a legacy of numerous public and private supplies each with their own water treatment plant (WTP) for a relatively small population compared to the situation in other EU countries.

The legacy of large numbers of water supplies - some with ongoing water quality issues - places a significant financial burden on the State to develop a world class service across both public and private water services in Ireland.

The EPA in its annual report *Drinking Water Report on Public Supplies 2014*, the first year of operation of Irish Water, noted that:

> *'Ireland has 973 public water supplies in comparison to Scotland's 290 supplies for a similar population size. Managing Ireland's water supplies is complex due to the number and variation in types of supply – geographical location, size, treatment processes, management, consumers, ownership issues, distribution networks and a historical lack of investment'.*[3]

Irish Water reported a slightly improved picture in its Business Plan in 2015[4] stating that they had in total 924 WTPs, in contrast to Scottish Water with 242 WTPs. The number of WTPs does not include the approximately 400 WTPs operated by regulated PriGWS at that time. By 2021 Irish Water reported a further reduced number of WTPs to 718[5] while Scottish Water had reduced numbers to 221 WTPs[6].

The same complexities apply with the group water sector and for the past two decades consolidation and size reduction has been a feature of the sector - for both PriGWS and PubGWS. However, in 2021 there were still approximately 380 WTPs operated by PriGWS.

From Figure 1.2 below it can be seen that in the period between 2004 and 2019 the number of, and population served by, regulated private group water schemes (PriGWS) and public group water schemes (PubGWS) has, in each case, halved. This trend in sector size reduction is due to a combination of the taking in charge and the amalgamation of schemes.

Rationalisation is also impacting by reducing scheme numbers (rationalised schemes become a single new entity), but the population served remains unchanged.

It is likely that the trend in size reduction or consolidation of the group water scheme sector overall will continue in coming years for a number of reasons. These include:

- over 50% of regulated PubGWS are included in the 2019-2019 funding cycle of the multi-rural water programme - this strong trend in the demand of PubGWS for taking in charge is expected to continue in the next multi-annual programme;
- the resolution of active PriGWS with water quality issues through their interconnection to the public mains and taking in charge or their amalgamation into another PriGWS where it is viable and value for money to do so;
- the resolution of PriGWS with or without water quality issues that do not have an active management structure through their interconnection to the public mains and taking in charge or amalgamation into another PriGWS where it is viable and offers value for money to do so; and

[3] *Drinking Water Report 2014*, EPA (2015). See at this link: https://www.water.ie/docs/Irish-Water-Business-Plan.pdf

[4] *Irish Water Business Plan - Transforming Water Services in Ireland to 2021*, Irish Water (2015). See at this link: https://www.water.ie/docs/Irish-Water-Business-Plan.pdf

[5] *Annual Report and Financial Statements 2021*, Irish Water (2022). See at this link: https://www.water.ie/about/model-publication-scheme/annual-reports-financial/

[6] *Annual Report and Account 2021/22 – Performance and Prospects,* Scottish Water (2022). See at this link: https://www.scottishwater.co.uk/help-and-resources/document-hub/key-publications/annual-reports

- the resolution of active PriGWS that wish to cease operating as a scheme through their interconnection to the public mains and taking in charge where it is viable and value for money to do so.

Almost 50 medium to small sized regulated PriGWS (mostly non-DBO) are currently progressing to taking in charge under the MARWP with a further approximately 40 schemes amalgamating. There are others interested in, or encouraged to do so, under the upcoming MARWP.

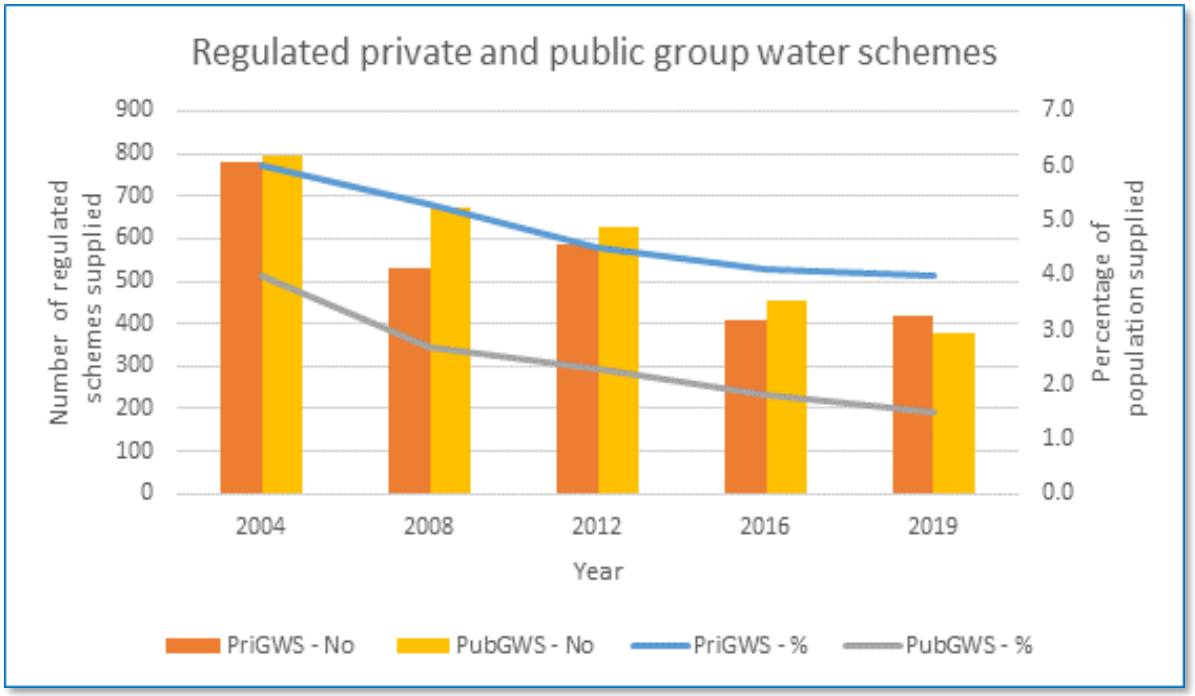


Figure 1.2 Size Reduction and/or Consolidation in the Regulated Private and Public Group Water Scheme sector

From the introduction of nationally agreed taking in charge procedures in 2016 Irish Water have, to the end of Q3 2022, taken in charge approximately 180 group water schemes, or on average 30 schemes per year. The schemes were mostly PubGWS – a mixture of regulated and unregulated supplies - many of them moribund. The process has benefited approximately 4,500 houses.

WTPs and water distribution networks come with a capital and operational cost, regardless of their size, output or complexity. They need electricity for motive power and chemicals for treatment. They require operational caretakers for maintenance and regular servicing and inspections. In addition, they require ongoing capital investment to keep the assets fit for purpose.

Higher than necessary WTPs and supply numbers nationally, both public and private, means that a greater cost burden is being placed on the State as the principal funder of water services. This is because the benefits of economies of scale in the area are not being utilised to their fullest potential. The value for money and affordability for the State of the continued operation of a large number of plants/supplies, where consolidation opportunities exist to reduce these numbers, is not justifiable in the long-term.

Progressively adopting a consolidation approach for public and private supplies where viable and value for money to do so also helps to mitigate the climate change crisis (more efficient use of energy, chemical and labour etc).

Local service demands, lack of spare capacity with in some public WTPs, geographic distances and available delivery resources mean that this situation cannot be remedied quickly. However, consolidation can be and is being resolved progressively. This consists of:

- Irish Water consolidating the number of its WTPs by interconnecting distribution networks and decommissioning sources and WTPs (termed rationalisation by Irish Water),
- The group water sector consolidating the number of its WTPs by interconnecting distribution networks and decommissioning sources and WTPs (termed *amalgamation* by the sector), and
- The group water sector consolidating the number of its WTPs by interconnecting distribution networks with Irish Water and decommissioning sources and WTPs (termed *taking in charge* by the sector).

The provision of water supply and waste water services generates substantial benefits for public health, the economy and the environment. Public health benefit values are highly location-specific (depending on the prevalence of water-related diseases e.g. VTEC or the condition of the supplying or receiving water bodies) and cannot be easily quantified.

There are opportunities to eliminate, by adopting the above approaches, some of the smaller plants and/or reservoirs and create a more streamlined group water scheme sector. In many cases the process of interconnection can offer added opportunistic benefits to a community that is wider than the existing scheme.

The added opportunistic benefits consist of allowing householders on private wells, that can be defective in some cases and is inferior to disinfected piped supply generally, to avail of a piped supply of good quality drinking water for the first time thus eliminating their dependence on their private well.

The full magnitude of these opportunistic benefits of a disinfected piped water supply goes beyond economic. Non-economic benefits that are difficult to quantify but that are of high value to the individuals concerned and society include dignity, social status, cleanliness and overall wellbeing. These benefits are frequently under-estimated.

Multiple consolidation opportunities will exist in some instances i.e. the interconnection of a series or chain of private and smaller public supplies. This requires a willingness for the group water scheme sector and Irish Water to work together.

In summary, for the group water scheme sector there is added expenditure on the State associated with some PriGWS. This includes the capital expenses required to build or upgrade and maintain WTPs and distribution networks, daily operating expenses due to power usage, treatment processes and trained operating caretaker requirements.

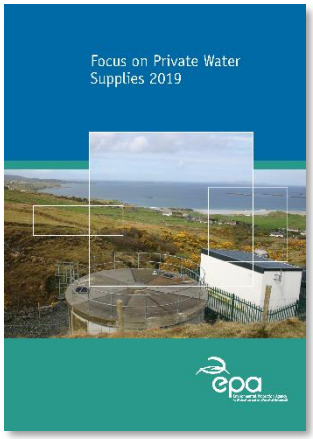
The group water scheme sector, led by the NFGWS, needs to proactively, for the benefits of society as a whole, take on board a consolidation (amalgamation and/or taking in charge) approach to ensure a more sustainable future and development of rural Ireland.

1.3 Water Quality and Historical Context

In 2002 the European Court of Justice found that Ireland had failed to fulfil its obligations under Articles 7(6), 18 and 19 of Directive 80/778/EEC, a previous Drinking Water Directive, for total and faecal coliform compliance (Case C316-00) in public and private water supplies. This led to the development of the Rural Water Programme, and from 2004 onwards a number of improvements were made to group water schemes directly arising from the ECJ case, including:

- Upgrades to over 140 treatment plants for 133 schemes through 17 DBO projects across 16 counties – this process is completed, no new DBO projects occurring at the present moment (see Table 2.1 below)
- The amalgamation of 121 group water schemes into 38 schemes – the amalgamation process for further schemes is ongoing
- Interconnection of 65 group schemes to the public mains, and take in charge – the interconnection and taking in charge process for further schemes is ongoing
- Interconnection of 118 group schemes to the public mains, while retaining group water scheme status – some subsequently opted to be taken in charge and for some other schemes the process is ongoing
- Upgrades to non DBO water treatment plants on over 200 GWS, mainly in respect of disinfection upgrades to groundwater sourced supplies – the upgrading process is ongoing.

As the judgement in C316-00 related specifically to microbial failures, much of the focus in the early days of the Rural Water Programme was, and remains, on supplies that were particularly vulnerable to microbiological non-compliance. This in particular occurred, and continues to focus, on those supplies that took their water from either surface water sources or shallow wells.



The Environmental Protection Agency (EPA) supervises the performance by Irish Water and each local authority functions, in particular monitoring, under the Regulations. The EPA produces annual reports that provide an overview of both the quality and enforcement activity concerning public and private water supplies.

The reports are based on the assessment of monitoring results reported to the EPA by Irish Water and the Local Authorities. The reports include information on the numbers of public and private supplies which are progressively reducing as some supplies integrate.

The most recent comprehensive annual EPA report on private supplies - *Focus on Private Water Supplies 2019* - examines PriGWS and SPS. The reports focus on regulated supplies only with some commentary on exempted supplies.

A separate report on public supplies includes PubGWS – the report *Drinking Water Quality in Public Supplies 2019* being the most recent comprehensive annual report available at the time of writing.

Local authorities, in their role as Supervisory Authority under the Regulations, are responsible for ensuring that all regulated private supplies meet their regulatory requirements. This includes the monitoring of compliance of these supplies, investigation where water quality standards are not met and taking enforcement action if appropriate.

Repeated annual EPA reports show that drinking water quality in private supplies lags behind that of public supplies. One in 20 PriGWS is failing to meet the main microbiological standard *E.Coli*. (Escherichia coli), compared to 1 in 200 for public water supplies. Compliance with *E. coli* standard for

regulated PriGWS has remained relatively unchanged in recent years, at around 95%, which is poor when compared with the compliance levels achieved for public water supplies at 99.5%.

Figure 1.3 below, which covers the period from 2004 onwards, compares the level of compliance for the main microbiological standard *E.Coli.* for public water supplies and private group water schemes (data taken from the annual EPA drinking water reports for public and private supplies).

The figure for microbiological compliance in the regulated PriGWS sector can be considered in three stages. Regulated PriGWS showed steady improvement in the years up to 2010. From 2010 to 2015 the rate of improvement reduced. From 2015 onwards there was some but no significant improvement and indeed deterioration in more recent years as highlighted in the figure.

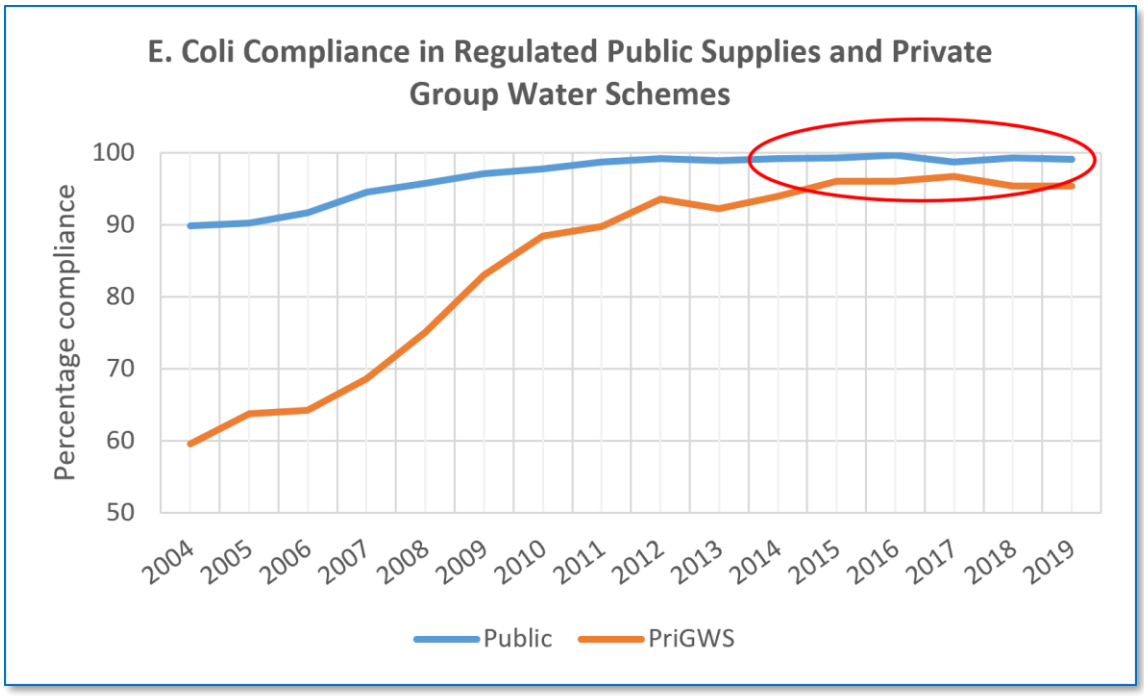


Figure 1.3 E.coli Compliance by Water Supply Type

A point raised by some stakeholders is whether the future cost (regulatory, capital and operational) to the State as main funder can be estimated for the Rural Water Sector.

The aim of this report is to review the wider investment needs for rural water services rather than estimate the quantum of its cost. The report aims to focus on the actions required to improve and sustain rural water services by considering issues such as governance, supervision and monitoring of the sector, in addition to capital investment priorities and requirements across all elements of rural water services, including domestic waste water treatment systems.

In their *Focus on Private Water Supplies Report 2019,* the EPA note that 108 private supplies failed to meet the microbiological standards in 2019. The E.Coli compliance rate for private supplies was 95.2% in 2019 (as has been in or around that level over the past number of years, as shown below). By way

of comparison, the equivalent figure in public supplies in 2020 was 99.96% (*Drinking Water Quality in Public Supplies 2020*).

The 108 private supplies that failed to meet the microbiological standards in 2019 included 88 Small Private Supplies (discussed in Chapter 6 of this report), meaning that 20 PriGWS failed to meet microbiological standards.

For these 20 schemes, the report said that '*failures in group schemes were due to a lack of operational disinfection infrastructure in four schemes, with temporary loss of power supply and management practices accounting for most of the other failures*'. It is important to note that the monitoring programme, which is based on a very limited number of samples, does not pick up on all failures and risks on these supplies.

This is very relevant to group water schemes which in many cases will, due to their small size, have less than a handful of samples taken and tested per year or no samples at all taken in the case of exempted supplies.

In 2002, after the European Commission sought the Court of Justice of the European Union (CJEU, then called the European Court of Justice), to declare that Ireland had failed to meet its obligations under a previous Drinking Water Directive, the CJEU subsequently made the declaration.

The declaration was made over microbiological contamination in several hundred of public and private water supplies, poor or no disinfection practices being the root cause. Ireland resolved the issue by 2010 when the Commission agreed to close the action that followed the declaration. The past twenty years has seen considerable improvement in water treatment, both public and private, in Ireland.

However, repeated EPA annual drinking water quality reports show that water quality in private supplies, including group water schemes, lags behind that of public supplies. The European Commission has again initiated proceedings to bring Ireland before the CJEU. The European Commission this time alleges that Ireland has failed to meet its obligations under the former Drinking Water Directive over a chemical parameter, specifically Total Trihalomethanes (TTHMs), in 30 water supplies (21 public and 9 PriGWS), with poor treatment practices or inadequate treatment infrastructure being the root cause.

Water supply treatment and distribution are never in a steady state and a controlled environment, each is different being a unique complex and highly technical activity that is varying at all times. This is even more so the case in the context of water supplies in Ireland with weather variability and high levels of organics, particularly for surface water supplies.

The relativity small size of group water schemes, with weak management in some cases, adds further challenges to the complexities of water supply. A water quality safety net for all supplies is a multi-barrier approach from source, through treatment and distribution to tap.

The multi-barrier approach recognises that all activities to deliver safe drinking water are interrelated, and only when working together seamlessly provide the solid foundation for an effective drinking water protection system. Those process are evolving with group water schemes but are still weak, particularly in the case of many smaller group water schemes.

In the context of the Drinking Water Regulations, the success of the multi-barrier approach depends on the various interrelated provisions in the Regulations. These are in particular:

- health-based standards,
- regular and reliable sampling and testing,

- quick response by all concerned to water quality issues, and
- strong regulatory action by the supervisory authority on water quality issues.

Group water schemes also need to have good operational management plans and training to support all of these efforts. Schemes also need to have a flexible approach to implementing sustainable improvement solutions. This may include solutions based on taking in charge or amalgamation/rationalisation where sustainable and value for money to do so.

1.4 Future Funding Needs of the Rural Water Sector

A point raised by some stakeholders is whether the future investment cost (regulatory, capital and operational) to the State as main funder can be estimated in this report for the Rural Water Sector. The aim of this report, however, is to focus on the actions required to improve and sustain rural water services by considering issues such as governance, supervision and monitoring water quality in the Sector.

The output of the report will assist the Working Group in considering these wider decisions on sectoral needs which will then become the basis of considering investment needs for rural water services. This approach is taken, rather than estimating the quantum of investment costs in the void of the wider decisions being made on the scope of the capital investment priorities and requirements across all elements of rural water services, including domestic waste water treatment systems.

The Department uses various opportunities to consider overall capital funding needs for the Rural Water Programme eg. as part of the preparatory process for each new National Development Plan and again at the mid-term review of each Plan.

When launching new or updated grant schemes, the Department usually commits to undertake a review of each grant scheme at appropriate intervals. This ensures the continued alignment of these schemes with policy objectives.

Reflecting this approach, the Multi-annual Rural Water Programme is reviewed at the end/beginning of each cycle by the Working Group to advise the Minister on the scope and funding needs of the upcoming multi-annual programme. In a similar way the scope and funding needs of other measures such as the private wells grant and the septic tank grants are regularly assessed, expanded if appropriate, and improved.

It will be seen therefore that the issue of future investment costs is not a simple issue of arriving at a quantum. There are other processes in place to address evolving funding needs and their costs. The whole area of consideration of future investment costs is addressed in Chapter 1.

It is beyond the scope of this report to provide, with any certainty or confidence, an estimate of future costs of the funding needs. There are a number of reasons for this, including but not limited to:

- The preferred future water quality regulatory approach - status quo or other - has not been considered by the Rural Water Working Group at this point. However, any cost impact assessment is likely to show the benefits of a regulatory change to a more centralised model. These benefits would result from improvements in water quality in private supplies progressively outweighing the additional costs, if any, to the State. A more singular and centralised model would lead to better human health and quality of life outcomes for the rural

communities availing of the rural water services, through more consistent application of regulations and enforcement.

- Similarly, the preferred future funding approach - status quo or other – under the Rural Water Programme has not been considered by the Rural Water Working Group at this point. Any cost impact assessment is likely to show benefits similar to those referenced on water quality regulation above.

- The scale of the PubGWS portion of the sector is reducing quickly as schemes are progressively being taken in charge (see Figure 1.2). This will impact considerably, from a Rural Water Programme perspective, on future capital and operational funding needs. The approach can, with time, free up funding opportunities for other measures under the multi-annual programme.

- The PriGWS portion of the sector is consolidating i.e. some schemes are progressively being taken in charge while some are amalgamating into other schemes to become more sustainable entities (see Figure 1.2). These actions, which are supported by funding under the multi-annual programme on a value for money basis, will impact significantly on future capital and operational funding needs under the wider Rural Water Programme. The approach can, with time, free up funding opportunities for other measures under the multi-annual programme in particular.

- Funding under the grant schemes for private wells and septic tanks is demand led and uptake of grant funding is subject to the outcome of ongoing policy review and ongoing messaging by the key stakeholders, particularly local authorities, LAWPRO, HSE and EPA etc. The Department is currently undertaking, as part of an ongoing process, a review of these grant schemes to ensure their continued alignment with policy objectives. The review will involve undertaking a cost impact assessment.

- The DBO procurement model is used for a significant part of the PriGWS sector (with approximately 70% of households in this sector benefiting). The Department is currently undertaking a review of the model for future use by the sector. The review will provide an opportunity to inform the Department and the schemes concerned, on the costs that will emerge over the next decade as the current 20 operation and maintenance (O&M) contracts come to an end. The schemes concerned will require capital investment as part of their entry to new O&M contracts, amalgamation or taking in charge, whichever offers the highest value for money approach for investment by the State.

The current situation of hyperinflation (approximately 14% for 2022) for the construction industry in Ireland also complicates meaningful cost estimation. Additionally, from an operational cost perspective, the 2022 global energy crisis has led to cost estimating uncertainty on this front.

Furthermore, any desk-based estimate, if provided in this report, would need to be validated by piloting on representative sample surveys and/or examination of expenditure on existing projects.

Other emerging issues, impacting mostly on the group water scheme sector, are the new *Drinking Water Directive*, the *Water Environment (Abstractions and Associated Impoundments) Bill 2022*,

recent EPA manuals *Water Treatment Manual: Filtration*[7] and the *Water Treatment Manual: Disinfection*[8]. It is difficult at this point to gauge the medium to long-term costs of for the sector of these developments.

Finally, it is worth noting that the consultation process, while it had mixed views on the grant support for private wells, did not reveal any indication of underfunding from an overall Rural Water Programme perspective.

It is hoped that the above analysis of the multiple issues shows that it would be extremely difficult and challenging to meaningfully quantify the future estimated cost of funding the rural water services. However, it will be important for the Department to adequately monitor, on a continuous and ongoing basis, the individual and combined impacts of the above issues which are constantly changing and evolving.

1.5 Project Scope and Report Structure

The project scope includes a review of the governance, supervision, funding, and wider investment needs relating to the Rural Water Sector, the system of monitoring water quality in the sector and how deficiencies are identified and responded to.

The project consists of two assignments. Assignment One is a literature review report focused on a national representation of the Rural Water Sector, while Assignment Two is a regional in-depth assessment of the Rural Water Sector.

The final report for the project is presented in two volumes:

- Volume 1 Literature Review
- Volume 2 Output Report (this report)

1.6 Purpose of the Output Report

The Literature Review presented in Volume 1 contains a comprehensive review of the rural water services sector, based on published information (up to September 2021). That report is a useful reference document for anyone wishing to understand the sector in terms of legislative requirements, governance, investment, and monitoring.

This report reflects on sector oversight, governance, funding, current issues and the strengths and weaknesses of the Rural Water Sector taking account of the Literature Review presented in Volume 1 and the work undertaken in Assignment 2 of the project, which comprised a programme of consultation with the key stakeholders in the sector over a period of 7 months.

[7] *Water Treatment Manual: Filtration,* EPA (2020). See at this link: https://www.epa.ie/publications/compliance--enforcement/drinking-water/advice--guidance/epa-water-treatment-manual-filtration.php

[8] *Water Treatment Manual: Disinfection*, EPA (2011). See at this link: https://www.epa.ie/publications/compliance--enforcement/drinking-water/advice--guidance/water-treatment-manual-disinfection.php

The purpose of the Output Report is to inform the Working Group and to assist it in addressing its Terms of Reference. It provides an overall assessment of the Rural Water Sector through a gap analysis that highlights some of the common themes arising from the consultation programme.

The Output Report has been kept succinct and avoids as much as possible large sections of text from the Literature Review, which is presented as a reference document in Volume 1 for those readers that wish to explore the sector in more detail.

The Output Report is based four themes:

- **Rural water supply themes (Chapters 2 to 7)**. Many of the issues raised and gaps identified are best discussed on the basis of supply type, as many issues are specific to a particular type of supply (eg. a private sourced GWS, a household well etc.)
- **Rural waste water themes (Chapter 8)**. This chapter contain issues raised that are specific to rural waste water, which mainly relates to Domestic Waste Water Treatment Systems (DWWTS).
- **Governance themes (Chapter 9)**. This chapter contain issues raised that can't generally be discussed by supply type, and include themes related to the roles of the various stakeholders in the sector such as Local Authorities, EPA, HSE, NFGWS etc.
- **Future challenges (Chapter 10)**. This chapter looks at issues which are not current but are likely to be relevant in the future for the sector.

1.7 Categories and Terminology Used for Private Water Supplies

As stated in Section 1.1, rural water services include **private water supplies**.

Private water supplies are supplies that are not run by Irish Water. They are mostly in rural areas and provide drinking water to people who are not connected to the public water mains. The water source for most private supplies is a spring or a well. Private supplies include group schemes; wells that provide water to public buildings and businesses in rural areas that do not have a public mains supply; and wells that people have drilled for their own homes.

The research undertaken during this study has highlighted a further broad range of terminology used to describe these private supplies. The term **Group Water Scheme** is commonly used, which is a private supply of water to two or more houses by means of a common or shared source of supply and distribution system.

The graphic below outlines the various types of private water schemes used throughout this report. Private Group Water Schemes (PriGWS) are schemes where the water is privately sourced, treated and distributed to the members (users) under the supervision or oversight of a Management Committee or Board. These are shown in green.

GWS that take their water from a Public Water Supplies (orange) are shown in blue (PubGWS).

Within both of these categories, some schemes are 'regulated' (black text) and some are 'exempt' (red text). Regulated PriGWS can be further subdivided into Non DBO operated and DBO operated.

Small Private Supplies (cyan) and Household Supplies (beige) are not Group Water Schemes but are separate categories of Private Water Supplies.

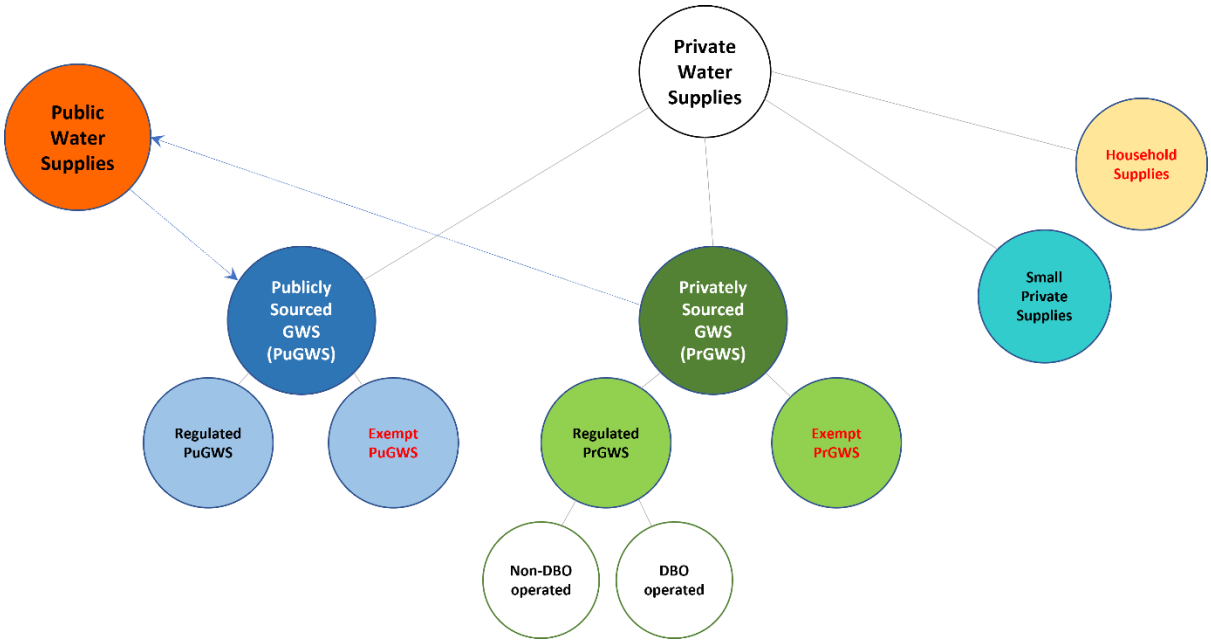


Figure 1.4 **Types of Private Water Supplies**

1.8 Capital and Operation Funding Currently Available under the Rural Water Programme

The *Joint Oireachtas Committee on the Future Funding of Domestic Water Services* recommended in its Final Report that *the principles of equity of treatment and equivalent financial support should be applied equally between households on public water supplies and those in Group Water Schemes (GWS), Group Sewerage Schemes (GSS), those using domestic waste water treatment systems (DWWTS) and individual domestic water supplies (IDWS).*

The Annual Subsidy for group water schemes is designed to support the day to day operational costs of schemes providing water to their domestic consumers. Following on from the JOC recommendations on domestic water charges, the subsidy was reviewed by the Department in consultation with NFGWS in 2017. An improved (made more streamlined) and increased annual subsidy came in to operation from January 2018.

Also following of from the JOC recommendations on domestic water charges, the capital grant schemes for domestic waste water treatment systems (DWWTS) and individual domestic water supplies (IDWS) were reviewed by the Department. This was undertaken in consultation with the various stakeholders in 2019/2020. An improved (expanded and made more streamlined) and increased grant scheme came in to operation for both in June 2020.

Prior to 2016 capital funding for Group Water Schemes and Group Sewerage Schemes was primarily based on an annual block grant system with some project targeted grants. The first Multi-annual Rural Water Programme was introduced in 2016 on a three year rolling cycle applying at first to some measures only. By 2019 capital funding had fully transitioned to be fully multi-annual based when the second Multi-annual Rural Water Programme was launched.

Each is of the capital grant schemes were examined and recommended by the Rural Water Working Group prior to their consideration and approval by the Minister and subsequent introduction.

The annual subsidy available to group water scheme - Subsidies, A, B and C - are discussed in detail in Volume 1. The capital funding grants are also discussed in more detail in Volume 1.

1.9 Water Resources Planning and Management

Ireland's water resource systems benefit the lives of people as direct consumers, society and the economy. It is essential to everything we do as a society, living and our health. Water is part of our everyday lives. Water is an increasingly critical issue at the forefront of global policy change with growing concerns about water as a renewable resource, its availability for a wide range of users, to maintain resilient biodiverse ecosystem and global issues relating to climate change.

Ireland is not a water stressed country. However, Ireland needs to operate its water supply network to optimise natural water resource and the economy. The services provided by such systems are multiple not just household needs. Recent droughts and storms have left some consumers with no water or reduced water supply. It included a water conservation order (hosepipe ban) by Irish Water for the first time in Ireland. These prolonged dry spells also impacted on some group water schemes.

At national public water supply level Irish Water is actively engaged in water resource planning and management. Their National Water Resources Plan identifies how they will provide a safe, sustainable,

secure and reliable water supply to their customers for now and into the future whilst safeguarding the environment.

Their National Water Resources Plan sets out how they will balance the supply and demand for drinking water over the short, medium and long term. It is a 25-year strategy to ensure that they have a safe, sustainable, secure and reliable drinking water supply for everyone.

In the National Water Resources Plan Irish Water summarise the needs across the 535 individual water supplies and identify the solutions to address these needs. Due to the large number of supplies in Ireland they deliver the process through four Regional Water Resources Plans.

1.10 Rural Water Strategic Plans

In the 2000s, soon after the introduction of the Rural Water Programme in 1998, the Department requested each rural local authority to prepare a *Rural Water Strategic Plan*. The Plans focused on both public and private rural water supply. The Plans were an early form of what are now termed Water Resource Plans by Irish Water.

The Rural Water Strategic Plans provided an opportunity to ensure a reasonably uniform, consistent and strategic approach to rural water services planning in rural areas. In the case of the group water scheme sector the Plans were drawn up in partnership with the sector and rural organisations.

The Department required (under Circular L10/99, June 1999) that the Rural Water Strategic Plans be developed in two stages. The first stage, a macro plan, developed a broad strategy for providing all rural areas within a water services authority area with a satisfactory water supply on the following basis:

- indicate how the rural areas will be served, whether by extensions of existing distribution networks - public or private - or from new sources of supply,
- be based on sound engineering and economic principles,
- make optimum use of existing distribution networks and resources, irrespective of whether these were public or privately (group water scheme) owned.

A Guidance Manual, developed for preparation of the Rural Water Strategic Plans, set out the procedures to be followed. The guidance manual for the first stage plans included:

- an overview of the policy and objectives behind the requirement for the plans,
- the arrangements for adoption and implementation of the plans,
- a detailed guide to data collection, compilation and entry to databases,
- a guide to mapping and fieldwork investigation.

The first stage plans were be compiled in consultation with the group water sector and other rural interests. County Monitoring Committees, or less formal arrangements, were used to agree and adopt the first stage plan.

A second stage plan, a micro plan, addressed the detailed planning of individual public water supply projects and group water schemes needs. These second stage plans, Rural Water Strategic Plans, give effect to the overall strategy as set out in the first stage plan. The strategy set out in the first stage

plan was agreed by all relevant stakeholders before the process moved on to the second stage – the Rural Water Strategic Plan.

The main elements in the plans were:

- Assessment of the primary needs of the consumers.
- Assessment at high level of existing infrastructure, to determine its overall condition, identification of deficiencies.
- Offer of effective solutions that can be achieved by consolidation (taking in charge or amalgamation) and water conservation.
- Preparation of cost estimates for recommended proposals.
- Propose a prioritised investment strategy.

In the interim period since Rural Water Strategic Plans were prepared in the 2000s local authorities have used their Plan to good effect. Based on the guidance and recommendations in the Plan local authorities have encouraged taking in charge or amalgamation of PriGWS and PubGWS. From Figure 1.2 it can be seen that in the period from the mid 2000s the number of, and population served by regulated PriGWS and PubGWS has halved. Some local authorities now have few schemes or, in some cases, none.

The potential benefits of a Rural Water Strategic Plan to the Rural Water Sector are as strong today as they were in the 2000s. The benefits of a Rural Water Strategic Plan for each rural local authority include:

- It identifies on an objective way the most sustainable solution for a group water scheme to enable it to plan its future (standalone, taking in charge or amalgamation).
- It identifies in an objective way to the local authority the most sustainable solution for each group water scheme in its area thus enabling better forward planning of the multi-annual programme.
- They would allow Irish Water to better coordinate rural water with its National Water Resources Plan (for schemes where the most sustainable solution is taking in charge or enable small unsustainable Irish Water schemes to be supplied by a PriGWS or interconnected to a more sustainable public supply via a PubGWS).
- They will allow the Department to better consider the next review of the Water Services Policy Statement.
- They will allow the Department to better consider future funding needs in the context of the National Development Plan. and
- They will better facilitate the Department to implement policy for rural water generally.

The process today of preparing Rural Water Strategic Plans would be considerably more straightforward task than in the 2000s. The original Plans looked at rural public supplies as well as regulated PriGWS and PubGWS. Responsibility for public water services passed to Irish Water in January 2014. As outlined above the numbers of regulated PriGWS and PubGWS is now greatly reduced.

In summary, a Rural Water Strategic Plan provides a comprehensive, costed and strategically objective approach for the development of rural water services in local authority areas. Therefore, this report will raise, in a number of chapters, the importance of Rural Water Strategic Plans.

1.11 Private Water Supplies Regulations (UK) Approach

The provision of safe and clean water to consumers who receive their water from a private supply is vital to health and wellbeing. The standards and principles of regulation are the same for both public and private supplies and therefore the expectation should be that the level of quality should be the same. This however is not the case.

It has been clear for some considerable time in annual EPA reports that small private or community supplies are more often of a poorer quality. This is evidenced by the relative numbers of indicators of faecal pollution when compared to the public mains supply (Figure 1.3).

A key principle of the current and new Drinking Water Directive is *risk assessment* and its mitigation. This involves taking a 'whole water supply system' approach for the lifetime of a water supply (including its operation). The risk mitigation approach is particularly strongly reflected in the UK Drinking Water Regulations for private supplies, most particularly the regulations in England, Northern Ireland and Wales. Each nation has separate drinking water quality regulations for public and private supplies.

The Drinking Water Inspectorate (DWI) for England and Wales had a similar role to the EPA In Ireland including oversight of local authority enforcement of regulations for private water supplies. The DWI have stated:

> *'Risk assessments are fundamental in identifying risks, and how these might be observed, managed and controlled though a plan to protect public health. This helps users become better informed to manage supplies safely and, where necessary, carry out improvements to mitigate any risks identified to water quality''. (Source: Report on Private Supplies in England and Wales for 2020)*

Point of compliance sampling remains an important requirement of the Regulations as a method of monitoring as a measure of efficacy following a risk assessment, or more widely as a measure of general improvement (or otherwise) of an intervention strategy.

In recent years the Regulations for private supplies for the three nations have moved beyond just a simplistic compliance-based philosophy focussing on the point of use. This approach has recognised that random and occasional sampling and analysis alone cannot provide assurance about the safety of private water supplies, particularly smaller supplies, at all times.

The Regulations have advanced from the compliance-based methodology of occasional point of compliance monitoring (typically a kitchen tap in a representative user premises), to minimise the dependency on a sample which may be taken infrequent and serve little purpose as an assurance to the supply being safe and secure on an ongoing basis. Key features of the current UK Private Supplies Regulations are risk assessment and mitigation.

One of the key requirements of the Regulations in the three nations is to carry out a risk assessment, including on exempted supplies. This excludes single households, unless requested by the householder or part of commercial or public activity. The purpose of the risk assessment is to establish whether the drinking water supply is a potential risk to human health. This whole system approach considers the supply from source to tap for the lifetime of a private water supply, including its operation.

Proactive risk assessment to identify the risks (potential failures of standards and risks to human health) and to act to control those risks on a lifetime basis through a multi-barrier approach from source to tap, is now firmly embedded in the Tegulations in these nations.

Under the Private Supplies Regulations in the three nations, the quality regulator must risk-assess all shared private supplies (single houses excepted unless they are part of commercial or public activity). Authorities must carry out a risk assessment on a single dwelling if requested by the owners or occupiers.

The risk assessment must establish whether there is a risk of supplying water that is a potential danger to human health. The assessment must be updated every five years, or earlier if the risk to human health dictates. The Regulations adopt a similar threshold approach to Ireland for water quality monitoring. However, authorities in the three nations must monitor all private supplies every five years and more frequently if the risk assessment shows this to be necessary.

Additionally, a new private water supply must not be brought into use until the regulatory authority is satisfied, based on a risk assessment, that the supply does not constitute a potential danger to human health. The authority also has other duties under the Regulations including enforcement.

The Northern Ireland regulations take a similar approach to those in England and Wales. However, in this case the quality regulator is the Department of Agriculture, Environment and Rural Affairs (carried out on their behalf by the Drinking Water Inspectorate), while in in England and Wales it is the local authorities. Notably, the quality regulator may enter into an arrangement for any competent person to, on a priority basis, carry out risk assessments on its behalf.

In Ireland, there are clear difficulties in effecting compliance on private water supplies, and in particular on exempted supplies who do not seek out intervention when they are directed to do so. The critical issue is the protection of the health of users from the action or inaction of providers. Without a robust risk assessment and enforcement ethos, improvement of the water quality standard in private water supplies, to at least that in public supplies, will not happen.

Risk assessments are a proactive approach to identify the risks, which are often visible to the trained and competent assessor, resulting in simple action to put a method of control in place or more extensive actions across a range of capital intervention options.

There are clear public health benefits from a proportionate risk assessment model similar to that used in the UK regulations. The model of risk assessment in the three UK nations is an important feature to consider when looking at the future approach in this country to managing private supplies, particularly for exempted supplies.

While there is a financial cost associated with doing risk assessments (chargeable to the supply), to counterbalance this there are potential cost savings to consumers on the supplies, and to broader society, through better human health and well-being, through identification and mitigation of risks. The UK experience is that costs are reduced once the first cycle of assessments is completed, if supplies proactively engage throughout the process.

If a similar risk assessment model were adopted in Ireland the regulatory authority could avail of and consider, as part of their risk assessments, any data collected for an area for the purposes of their annual monitoring programme, the Water Framework Directive, the MARWP, private wells grants, Irish Water raw water monitoring programmes etc. This would further mitigate costs. The cost would progressively reduce, particularly if smaller supplies integrate into the public mains or amalgamate into larger sustainable PriGWS where it is technically and economically viable to do so.

It should also be noted that the private well grant has, through pre and post works inspections, a risk assessment approach embedded in to it for many years, as has the funding of PriGWS for addressing water quality issues under the MARWP and for payment of the annual subsidy.

There are distinct benefits to the separate public and private supplies regulation approach taken by the UK. The approach ensures clear narrative and messaging on the duties and roles of the two key stakeholders - the private supplies and their quality regulatory authority. In addition, the UK approach provides an opportunity to better tailor the regulations to the scale of the issue.

Finally, the separate regulation approach, being more straightforward and clearer, is consistent with the whole of government approach of Better Regulation to improving the quality of the legislative processes in Ireland.

If a risk assessment model is introduced to regulations in Ireland there is a compelling case for omitting or delaying, on a priority basis or risk basis, the inclusion of PubGWS from the assessment process. This would be justified for a number of reasons:

- they are for practical purposes mostly relatively small (with few exceptions) extensions of the public mains with water quality determined largely determined by the public supply); and
- they are progressively being taken in charge in significant numbers leaving any risk assessment redundant once taking in charge occurs.

2.0 DBO CONTRACTOR OPERATED GWS (REGULATED)

2.1 Overview

This chapter covers those PriGWS where the water treatment process is operated by a private contractor on behalf of the scheme under a long-term (typically 20 year) Operation and Maintenance (O&M) contract, generally as part of a bundle of schemes. Some of these schemes also export water to Irish Water.

As discussed later in Chapter 3, some PriGWS are non-DBO operated i.e. the water treatment process is directly operated by the scheme.

One of the main reasons for the formation of the DBO bundles was to address water quality issues in some of the larger schemes with surface water sources that required complex treatment processes.

2.2 Numbers of DBO operated PriGWS and Population Served

The EPA reported in 2021 (the most recent comprehensive annual report available at the time of writing) that there were 380 *regulated* PriGWS, supplying a population of approximately 193,700 or circa 68,200 households. This equates to circa 4% of the national population.

Of these 133 PriGWS currently have their water treatment operated by a DBO service provider under a long-term O&M contract (see below). There are all regulated supplies - no *unregulated* schemes under O&M contracts.

The population served by these 133 DBO operated PriGWS is just under 135,500 (or circa 47,700 domestic connections, as reported by NFGWS in 2021). They account for circa 70% of households that are dependent on regulated PriGWS. This equates to circa 2.7% of the national population.

The average population served by each DBO operated scheme is just under 1,020 (135,500 divided by 133), equivalent to circa 360 domestic connections (at 2.84 persons per house). There is a broad range of size within these 133 schemes however, varying from 16 domestic connections to approximately 2,000, which is also the largest group water scheme in the country.

It is important to note that these numbers of PriGWS and the population served by them is moment in time data that is constantly changing. This as new domestic connections occur e.g. due to extensions being constructed, some connections ceasing (small in number) while some schemes are taken in charge while others still amalgamate. The figures above are rounded, without any significant loss of accuracy, for ease of consideration and comparisons.

2.3 Historical Context

In 2002 the European Court of Justice found that Ireland had failed to fulfil its obligations under Articles 7(6), 18 and 19 of Directive 80/778/EEC, in respect of total and faecal coliform compliance (Case C316-00). This led to the development of the Rural Water Programme, and from 2004 onwards a number of improvements were made to schemes, including:

- Upgrades to over 140 treatment plants for 133 schemes through 17 DBO projects across 16 counties (see Table 2.1 below)
- The amalgamation of 121 group water schemes into 38 schemes
- Interconnection of group schemes to the public mains, and taking in charge in some cases
- Upgrades to non DBO water treatment plants on over 200 GWS, mainly in respect of disinfection upgrades to groundwater sourced supplies.

As the judgement in C316-00 related specifically to microbial failures, much of the focus in the early days of the Rural Water Programme was, and remains, on supplies that were particularly vulnerable to microbiological non-compliance, in particular those that took their water from either surface water sources or shallow wells.

The scope of the 17 DBO projects involving over 140 treatment plants included a Design Build phase to upgrade the water treatment process, plus a suite of Operation and Maintenance contracts (one with each constituent group water scheme in the bundle) over a set performance period, generally 20 years. The contracts were organised broadly on a county by county basis. There was some flexibility in this approach however, generally at the periphery of counties where there was a good reason to incorporate a scheme from an adjacent county into a particular bundle. One exception to this countywide approach was in the south-east where 18 GWS were brought together into one contract spanning 6 counties to make the bundle more viable.

In contrast to other rural water initiatives, such as those associated with amalgamations of networks or connecting group scheme networks to public networks, immediate geographical proximity was not essential in determining the composition of these DBO bundles. The make-up of bundles generally reflected risk prioritisation and the willingness of schemes to enter such contractual arrangements at a particular time in the development of each scheme.

The table below shows the 17 O&M contracts currently in place.

Table 2.1 List of GWS O&M Contracts (17 current contracts)

Contract	No. of GWS	No of Domestic Connections	Average Domestic Connections per Scheme
Monaghan	9	6,350	706
Galway Bundle 2	15	5,580	372
East Cavan	10	4,856	486
Mayo Bundle 1a	13	4,508	347
Mayo Bundle 2	10	4,178	418
Clare Bundle	3	3,511	1,170
South Leinster Bundle	18	3,427	190
Galway Bundle 1	12	3,154	263
South West Cavan	4	2,480	620
Limerick	14	2,379	170
Roscommon	4	1,766	442
West Cavan	7	1,611	230
Sligo South East	5	1,448	290
Annagh	1	806	806
Sligo North West	6	750	125
Polecat Springs	1	474	474
Glinsk Creggs 1	1	425	425
Totals	***133***	***47,703***	***359***

The factors that determined the composition of the various DBO bundles included the scheme's history of microbiological non-compliance, the risk of microbiological contamination (where there was no history of non-compliance), and the willingness of individual schemes to join these bundles. The most significant factor in determining the composition of these initial bundles was the complexity of the treatment process required, and the vast majority of schemes included in these initial bundles were from surface water sources, where the type of treatment process required was too complex for GWS management committees to operate themselves.

2.4 Monitoring and Oversight

In general terms, the quality of water produced under these DBO contracts is comparable to that in public supplies, reflecting the professional operation of the water treatment processes. The four DBO contractors currently operating rural water bundles all operate water treatment facilities on behalf of Irish Water and produce similar quality water under those contracts.

It should be noted that the contractual point of compliance under these DBO contracts does not coincide with the point of compliance with the Drinking Water Regulations. The contractual point of compliance is generally at the exit from the first reservoir on the network, or sometimes at the exit from the water treatment plant. The point of compliance with the Drinking Water Regulations is at the consumer's tap. Furthermore, it is sometimes the case that the operation of the intake pipe from a surface water source is not part of the contractor's remit.

For all the above reasons, achieving compliance at the consumer's tap is a collaborative effort, requiring the contractor to meet his contractual obligations in respect of the water treatment process, coupled with the scheme's management of the network, including network scouring programmes, reservoir cleaning etc.

The management of the O&M phase of WTPs is a demanding activity for the schemes involved. To assist schemes undertaking their role as ''Employer'' managing the Private Service Provider operating their WTP a formal support system called *Performance Management System* was developed. Schemes are also supported by an *Employer's Representative,* normally a Consulting Engineer, experienced in water treatment processes and the form of contract in use.

Compliance with the terms of the contract is monitored using Monthly Status Reports (MSR) issued to each scheme, and penalties for non-compliance are imposed under the contract as required. The MSR is based on standard testing procedures and reporting templates. This approach ensures that a standardised report is presented to the scheme each month.

Given the difference in the extent of water treatment processes installed in DBO operated PriGWS and those operated by the scheme, in terms of contaminants that may present an immediate health risk to consumers, including Verocytotoxigenic Escherichia coli (VTEC) and cryptosporidium, it is probable that microbiological compliance rates are significantly higher in DBO operated PriGWS than in non DBO operated PriGWS. The reasons for this assumption include the fact that the terms of the DBO contracts include penalties for failure to achieve water of a certain quality, in addition to the existence of professional management structures, quality assurance systems, and capital replacement protocols built into those contracts.

The more integrated and complex treatment systems installed at the DB phase were based in the first instance on a risk assessment of the supply. This risk assessment is not a feature of non-DBO supplies to the same degree. However, some non-DBO schemes have completed risk assessments. In addition in 2013, supported by a Department grant and coordinated by the NFGWS, all regulated PriGWS (both DBO and non-DBO) commence preliminary work on source protection planning.

This preliminary source protection planning enabled supplies to carry out a professional, substantially desk based study, assessment of their water source(s), including the delineation of the source catchment area or "Zone of Contribution", mapping of the source catchment and an assessment of vulnerability in the case of groundwater sources. The resultant report with recommendations for appropriate actions is referred to in the sector as a Zone of Contribution Report (ZoC Report for short).

The benefit of the more complex and expensive treatment systems in WTPs procured under the DBO model is greater assurance, for the State as funder and the supply as water consumer, of water quality compliance with the Drinking Water Regulations on a consistent long-term basis.

The DB phase involves schemes operating under a hybrid model with a contractor operating the water treatment plant and the scheme operating the distribution network. Consequently, a high degree of coordination is required for this model to succeed.

A number of audits by supervisory authorities and process reviews of the operation of WTPs have shown that this coordination of the hybrid model is not the practice across the sector to the full and consistent extent that it needs to be. However, full application of the Performance Management System coupled with water quality focused training regimes such as the Quality Assurance system operated by the NFGWS of scheme management and caretakers can mitigate this occurring.

For compliance with parameters that do not present an immediate health risk to consumers, but may do so over the longer term, the differences between DBO and non-DBO operated PriGWS are less obvious. A case in point relates to Trihalomethane (THM) compliance.

As outlined in Volume 1, the European Commission started a pilot infringement case against Ireland in 2015 for failure to comply with the THM standard for drinking water, based on 2013/2014 EPA Drinking Water Quality Reports. In May 2020, the Commission issued a *Reasoned Opinion* that it considers that Ireland had failed to take the measures necessary to ensure THM compliance, both in public and private supplies. In July 2022 the European Commission referred the matter to CJEU.

The private group water schemes listed in the Reasoned Opinion are set out Appendix 3 of the EPA's 2019 report *Focus on Private Water Supplies,* where the schemes that are included on the Department of Housing, Local Government and Heritage's *Remedial Action List for Group Water Schemes* are listed. Of the eighteen supplies listed in Appendix 3, seven are on DBO operated PriGWS.

The temperate oceanic climate in Ireland, gives abundant vegetative growth which decays in late summer/autumn. This, with high all year-round rainfall, provides the recipe that is ideally suited to THMs formation in drinking water that, as is the case with this supply, are surface sourced and using chlorine for residual disinfection.

Reflecting this the THMs exceedances in some surface water sourced or surface influenced public and private supplies in Ireland are persistent and high while the former and current Drinking Water Directive specifies a limit of 100µg/l and lower if possible.

THMs exceedances in drinking water in Ireland typically comes with seasonal peaks in autumn, winter and spring which is associated with vegetation decay and growth cycles and flashy flows in the raw water catchments leads to the formation of organic is the raw water. Sampling and testing of THMs levels in the affected treated water supplies confirms this behavioural pattern.

Total Organic Carbon (TOC) is the key precursor in raw water that, after reaction with chlorine, leads to THMs formation, and exceedances if not removed, in treated drinking water. If the raw water source is eg a shallow lake or a flashy steam which facilitates vegetative matter and a highly coloured or organics laden raw water it facilitates high TOC formation. In these circumstances, THMs formation is intensified to its fullest potential.

The continual expanding knowledge base of water treatment processes shows that raw water with these characteristics are strong indicators of a risk of disinfection by-products issues in particular THMs in a water supply. This is if appropriate treatment process are not in place.

The understanding of the variable THMs formation potential of raw water used for drinking water supplies, or the understanding of the resolutions of it, were not as prominent in Ireland in the 2000s as they are now. This is the period when the treatment equipment was being considered and installed on a number of DBO and non-DBO operated group water schemes.

The water treatment infrastructure currently in place in some DBO operated WTPs, accepted as a valid process at the time of installation, are not capable of producing a supply of drinking water that meets the THMs standard of the Directive on a consistent long-term basis. Another historic reason that DBO operated schemes have THMs issues is because compliance with the parametric value for THMs was reduced in the 2000s (previously 150 µg/l but later lowered to 100 µg/l).

The point of compliance under the Directive is measured at the consumer's tap. However, the point of compliance for DBO operated schemes is either the exit from the WTP or from a treated water storage reservoir. This does not reflect the fact that THM levels can further rise in the distribution network if it is not properly managed and maintained through regular uni-directional flushing.

Where the adequate treatment infrastructure is in place to remove organics, THM formation is much less likely to occur in the distribution network as demonstrated, with some exceptions, by the compliance rate of PubGWS. This feature of THMs growth in distribution networks further illustrates the importance of schemes and contractor, in the hybrid model, operating in close partnership to ensure that each supply produces wholesome and clean water on a consistent long-term basis.

Generally the resolution of THMs issues where occurring in PriGWS is either though improve of the water treatment and distribution network operation processes, upgrading of treatment process, taking in charge or amalgamation. Solutions are considered and arrived at considering all factors on a case by case basis.

2.5 Governance

As discussed above, on DBO operated PriGWS, there is a hybrid operational model, with both the scheme and a private contractor responsible for different elements of the overall supply. This requires ongoing collaboration between the contractor and the scheme to achieve the scheme's overall objectives of water quality and continuity of supply.

The research undertaken as part of this study failed to find an equivalent to DBO operated PriGWS in any other jurisdiction. In other jurisdictions, supplies are either fully 'public' from abstraction to tap (including those operated by regulated private entities such as in the UK), or they are fully private.

The procurement model put in place for DBO bundles in the mid-2000s was successful in achieving its aims in terms of water quality improvements. In the early 2000, prior to the DBO contracts being implemented, E.coli compliance under the Drinking Water Regulations for group water schemes as a whole was as low as 71% but rose to approximately 90% in 2010 and approximately 95% by 2015. However, it has remained at around that figure since (see Figure 1.1).

At that point in time, handing over the entire scheme operation, water treatment and distribution network, to a private contractor was not considered, for a number of reasons. In particular the cost implication of including the distribution networks, then in poor condition in many cases with high leakage, would have been prohibitive. Furthermore, it could not have been realised in the short timeframe required to put these contracts in place.

The private sector expertise that existed at the time mainly applied to the design and operation of water treatment processes, but not to the operation of large rural distribution networks, many in poor or unknown condition. Indeed, this is still the case, where these DBO contractors do not have operational experience with distribution networks.

The fact that some of the DBO bundles also include public supplies is likely to impact on future bundle arrangements, as Irish Water may not envisage participating in future contracts after the current contracts come up for renewal.

2.6 Funding

The Annual Subsidy for group water schemes is designed to support the day to day operational costs of schemes providing water to their domestic consumers. Subsidy A and B are available to DBO operated PriGWS. Subsidy A is payable towards the general operational and management costs of all types of group water schemes.

Subsidy B is a supplementary subsidy available in addition to Subsidy A, payable towards operation and maintenance costs associated with "bona fide" DBO contracts for PriGWS. It has two components a - Fixed Charge and a Volumetric Charge component. The former (including VAT and indexation) can be recouped at 100%. The second (including VATand indexation) can be recouped at 85% of costs, up to the maximum design throughput of the water treatment plant.

Capital funding generally does not arise for water quality issues unless there is some water treatment deficiency that is not satisfactorily covered by the terms of the operational contract. However, if a deficiency arises it may be resolved and funded by a variation to the contract. A number arose in the early years of some contracts and some still occasionally arise e.g. installation of an additional disinfection barrier (typically an UV system) or the resolution of THMs.

Capital funding is available under a number of headings of the Multi Annual Rural Water Programme (MARWP), including source protection, enhancement of existing schemes, water conservation. This funding includes agreed and approved variations to the contract, and the replacement of end of life capital equipment under a provision in the contracts called the Capital Replacement Fund.

Both the annual subsidy and the Multi-annual Rural Water Programme are based on Application for Funding being made by the PriGWS concerned to the local authority. The more proactive local authorities encourage schemes to participate in both and help them to various extents in doing so.

2.7 Issues Arising

One of the main reasons for the introduction of the DBO model into the group water scheme sector was to address the then water quality issues in some of the larger schemes with surface water sources that required complex treatment processes. The schemes did not have the expertise to operate these complex treatment processes – a situation that remains unchanged.

Use of the DBO model in the group water sector has proved to be as success. The quality of water produced by group water schemes that have their WTPs operated and maintained under the DBO procurement model is, with a few exceptions, comparable to that in public supplies.

The Working Group has agreed, in principle, to the continuation of the DBO model for the delivery of the provision of water services for group water sector where appropriate to do so. Due to the passage of time the form of contract operated in the group water sector are facing a number of challenges. Therefore, Working Group also decided that an evaluation of the contracts, processes and systems will be required for the future application of the model in the sector.

Most of the Operation and Maintenance (O&M) contracts that were put in place for these bundles commenced in the mid to late 2000s. At that point in time a 20-year contract duration was considered appropriate as it provided a degree of certainty for the contractors for future revenue streams, and also certainty for the schemes. The most recent DBO bundle (County Mayo) has a shorter 15-year contract duration.

For the initiation stages of the DBO model in the group water sector in the 2000s, a long contract was more attractive to potential service providers, many being new entrants to the DBO market for water services. The 15-20 year long contract for the O&M phase encouraged service providers to take and absorb the risk of entering the new market – in the 2000s an entirely new business venture in Ireland for all of them.

Entering the new DBO market required initiating joint ventures, the setup of temporary and enduring teams from multiple professions and a more complex tendering process involving preliminary designs and cost projections. Commercially focused service providers had to take risks to complete these activities at significant cost without any guarantee of winning projects to recover their costs in the then fledgling but potentially lucrative market.

These longer duration O&M contracts also provided reassurance to the schemes, then for the first time considering participating on the DBO model, that the service provider was committed to provide a service to their scheme in the medium to long-term. This reassurance was a very significant at the time in persuading many of the schemes to participate in the DBO process.

Today the service providers have built up market share and gained extensive experience from operating in the DBO model in the water services market for both public and private supplies. Additionally, the service providers have established supplementary water services related business with other private sector areas (food production sector etc).

The service providers are, from the extensive experience gained from operating the DBO model in wider water services, now well established in the market. The market has worked through from inception, transition to steady state in both the public and private water services sectors.

Significantly, the water treatment plant and storage infrastructure for the participating group water schemes is now in place with any upcoming contracts more O&M focused (although some capital works will also be involved). A learning process with the some of the initial contracts meant that additional water treatment infrastructure was required. This was put in place, at some cost, through variations to the initial contracts.

A significant number of the initial O&M contracts for the group water scheme sector will come to an end in the next five years. Therefore, consideration needs to be given to an appropriate terms and length etc of time for the next round of O&M contracts for the schemes.

The original DBO procurement model used in the 2000s was the International Federation of Consulting Engineers (FIDIC)[9] 'Orange Book' form of contract. It was a Design Build only form of contract which was modified by the Department, with input from the public and private water services sector, to provide for an O&M contract phase. Given the experience and developments in water services in the interim the 'Orange Book' may not be the current preferred contract model.

A new form of contract specifically for DBO contracts has been issued by FIDIC referred to as the 'Gold Book' and has been in widespread use on Irish Water contracts. The 'Gold Book' conditions would still need to be amended to provide for the bundling concept and to provide for a number of features which are particular to the contracts required for group water schemes.

Consultation during this study suggests that there are positives and negatives with a long contract duration of 15-20 years. The negatives mainly relate to contract terms which were considered appropriate in the mid-2000s but have since proven to be difficult to adjust through variations to address water quality issues or risks not adequately addressed under the original contract.

New legislative requirements may also arise during the operational contract, e.g. the new Drinking Water Directive (with upcoming Drinking Water Regulations), requirements that may arise from the Water Environment (Abstractions and Associated Impoundments) Bill 2022, as well as legislation of more general application such as health, safety and welfare and from River Basin Management Planning. These legislative changes, in addition to new EPA advice and guidance on drinking water that arises from time to time, can present a contractual risk for such DBO contracts.

To balance this, in order to make it attractive for private contractors to sign up to the next round of these contracts, anything less than a 7-year term is considered commercially unfavourable by the service providers. It is noted that the current approach of Irish Water for its O&M contracts is a 7-year term (to limit long-term exposure to risk).

NFGWS favour a renewal of 20-year O&M contracts to provide stability and reassurance to participating schemes. On the other hand, a shorter-term contract presents a scheme with the opportunity, at more frequent intervals, to consider value for money and plan for alternatives such as taking in charge or amalgamation.

The DBO procurement model provided for a Capital Replacement Fund (CRF) paid for by the Employer for the replacement of items of capital plant that have a life of over five years. The process enables plant, with a design life of at least five years, which is reaching the end of its working life to be replaced in an orderly manner. The approach to administering the CRF element of the O&M contracts will be one of the considerations in the review process for the next round of contracts.

The CRF process incorporated into the original contracts was based on the contractor identifying, at tender stage, the plant that should be subject to replacement at set intervals. In practice however the plant actually installed varied from that put forward at tender stage as a result of more detailed design consideration post contract award. This led to a change of approach being required in administering the CRF and a degree of contractual flexibility was needed.

The ability to change scheduled items for replacement under the CRF process to items in greater need of investment for replacement was clarified by the Department in 2018. Shorter duration DBO contracts and the experience gained to-date by service providers would largely overcome this issue.

[9] The FIDIC acronym stands for the French version of the Federation's name (Federation Internationale des Ingenieurs-Conseil) the global representative body for national associations of consulting engineers. See at this link: https://fidic.org

The initial DBO contracts had issues around indexation of payments. All DBO contracts in Ireland use either the Wholesale Price Index (WSPI) or the Consumer Price Index (CPI) for indexation of payments, both published by the CSO. More recent contracts use the latter. The most appropriate indexation mechanism for future contracts will need to be considered and decided on when they are going to the market.

There are also issues in relation to performance bonds. Many of the initial bonds put in place in the mid-2000s were 'On-Demand' bonds based on 100% of the annual cost of operation of the supply. These On-Demand bonds offered the contractor little protection and are generally not available in the market now.

All of the above matters, and others, are considerations for the next round of operational contracts for group water schemes. To address this, the Department has set up a DBO Working Group to examine the future needs and arrangements, including in particular the contractual terms and conditions, for the use of the DBO contract model for group water schemes. This DBO Working Group has recently commenced its work.

Compliance for the THMs parameter continues to be an issue for some schemes procured under the DBO model. This is for the reasons discussed earlier including partly due to the hybrid operational model. The lowering of the parametric value for THMs to 100µg/l has made it difficult for some schemes under the DBO model to achieve compliance.

The lack of availability of extensive raw water data over the seasons was a significant issue during the initial design and construction of many DBO procured treatment plants contributed to the THM issue. The gathering of raw water data has significantly improved in recent years and all DBO contractors now have access to detailed raw water monitoring data which were not available previously.

The focus on uni-directional network scouring programmes in recent years, prompted by the local authorities as supervisory authority under the Drinking Water Regulations and supported by the NFGWS, has significantly increased the understanding of the contribution of network scouring to THM compliance. The Water Quality Audits undertaken by the local authorities as supervisory authority have also contributed greatly to improvements in this regard.

As stated earlier both the annual subsidy and the Multi-annual Rural Water Programme are based on Application for Funding being made by the PriGWS to the local authority. The more proactive local authorities encourage schemes to participate in both and help them to various extents in doing so. The approach of local authorities varies greatly nationally.

A potential weakness of the approach, where local authority help is not fully pro-active is that schemes with strong management will tend to more actively, and potentially more successfully, look for funding. Weaker schemes tend to take a reactive approach potentially making poorer applications or seeking funding when an emergency (typically asset failure) occurs.

The importance of National Water Resource Plans and Rural Water Strategic Plans is introduced above. A more strategic approach to support resolving issues and planning for funding in PriGWS would be though the preparation of a Rural Water Strategic Plan for each local authority area, or possibly regional area, similar to what was done in the 2000s.

3.0 NON-DBO PRIVATELY SOURCED GWS (REGULATED)

3.1 Overview

Many PriGWS have their water treated under a Design, Build and Operate (DBO) contract arrangement, and were discussed earlier in Chapter 2. This section of the report discusses those regulated PriGWS schemes who operate directly their own water treatment facilities.

Non-DBO operated PriGWS are predominantly ground water sourced schemes (with surface water influence in some cases) and can be as small as serving two houses. However, significant a number are from surface water sources which brings added water treatment challenges eg THMs, cryprosporidium.

3.2 Numbers of Schemes and Population Served

As outlined in Volume 1, the EPA reported for 2021 that there were around 380 *regulated* PriGWS. Of these some 133 schemes, accounting for 70% of households that depend on regulated PriGWS, currently have their water treatment plant operated by a DBO service provider under long-term O&M contracts.

This means that there are approximately 250 schemes, accounting for 30% of non-DBO operated regulated PriGWS, that are operating their own water treatment facilities. The population served by non-DBO operated regulated PriGWS is approximately 58,200, or circa 1.2% of the national population.

The average population served by each non-DBO operated regulated PriGWS is approximately 230 (58,200 divided by 250 schemes), or about 80 households per scheme (at 2.84 persons per house). This clearly demonstrates that the size of each of these non-DBO operated PriGWS is quite small, compared to 360 households per scheme for DBO operated supplies (which are larger by a factor of 4.5).

Some two-thirds of non-DBO operated PriGWS are unregulated, and therefore not part of the current monitoring programmes under the Drinking Water Regulations. These are small schemes, serving from 2 to circa 18 houses and believed to be mostly at the smaller end of this range. These exempted non-DBO operated PriGWS are considered in Chapter 6. The focus of this chapter is on the one-third regulated non-DBO operated PriGWS.

It is important to note that these numbers of PriGWS and the population served by them is moment in time data that is constantly changing. This as new domestic connections occur e.g., due to extensions being constructed, some connections ceasing (small in number) while some schemes are taken in charge while others still amalgamate. The figures above are rounded, without any significant loss of accuracy, for ease of consideration and comparisons.

3.3 Monitoring and Oversight

In reporting on the performance of regulated PriGWS, the EPA do not distinguish between DBO service provider operated PriGWS and those that are directly operated by the scheme. The EPA focus is on the regulation threshold.

The EPA have consistently highlighted the fact that the performance of PriGWS lags behind that of public supplies. In their report *Drinking Water Quality in Private Group Schemes and Small Private Supplies – 2021* the EPA note that 17 PriGWS failed to meet microbiological standards. A key finding is that *'Compliance with drinking water standards in private supplies hasn't improved in recent years. One in 20 supplies failed to meet the standard, compared to 1 in 200 for public water supplies'.*

More specifically the report in discussing PriGWS states that *'In 2021, compliance of supplies with E. coli standards was 95.4% (94.6% in 2020) … (17 supplies with failures, supplying almost 4,000 people down from 20 in 2020). … This means 1 in 20 supplies failed to reach the standard'.*

A previous report for 2019 points to '*a lack of operational disinfection infrastructure in four schemes, with temporary loss of power supply and management practices accounting for most of the other failures'*.

The 2021 report also states that *'Compliance with E. coli standards has remained relatively unchanged in recent years at around 95% which is poor when compared with the compliance levels achieved for public water supplies of 99.5%'.* Again, it is important to note that the monitoring programme, which is based on a very limited number of samples, does not fully pick up on all failures and risks on these supplies.

A key weakness of non-DBO operated PriGWS supplies is the lack of certainty in providing drinking water that meets the requirements of the Drinking Water Regulations on a consistent long-term basis due to limited monitoring.

Despite the progressive capital works undertaken under successive MARWP and its predecessors to achieve microbiological compliance, many smaller non-DBO operated PriGWS do not have the same level of protection against cryptosporidium as larger private schemes or public schemes have. However, many non-DBO schemes, where there is risk to cryptosporidium, have over recent years installed additional disinfection treatment (validated UV units) and monitors to verify effectiveness.

A significant number of the PriGWS identified in EPA reports from recent years as having water quality issues are progressively being resolved under the MARWP through treatment upgrade, taking in charge or amalgamation.

There are also wider issues of human health concern on non-DBO operated PriGWS such as nitrates, pesticides and others. In addition, ongoing THM non-compliance is of increasing concern. Some of these issues are discussed later in Chapter 11 as some of the drinking water quality issues that are of increasing concern in PriGWS and needing to be sustainably resolved. They are not unique to PriGWS as they are also an issue being resolved by Irish Water in some of their public supplies.

3.4 Governance

The DBO procurement process for PriGWS in the 2000s and early 2010s was established based on a range of factors. A total of 133 schemes that were particularly vulnerable to microbiological non-

compliance were 'bundled' into 17 projects for upgrading of their water treatment plants on a countywide – and in some cases regional - basis.

The model was in particular driven by a requirement to resolve serious drinking water quality risks on some PriGWS. This took account of the raw and treated water quality monitoring information available on them at the time. It was also chosen as the preferred approach by some schemes with less serious or no particular raw water quality risks.

Reflecting the technical and economic assessment done in any Strategic Rural Water Plan completed at that time e.g. the extent of distribution network development public and private was another key factor in considering solutions.

Some PriGWS did not meet the criteria in terms of risk to warrant inclusion in a DBO procurement model or joining a bundle was not part of the recommendation of the Strategic Rural Water Plan for the local authority in which the schemes concerned. In other cases, however, schemes were reluctant to join a particular DBO bundle or were nervous about handing control of their water treatment plant over to a private company in a then new and evolving feature of water services in Ireland.

As a result, a number of PriGWS chose to remain outside these DBO even though the scheme met, and still meet, the risk criteria in terms of microbiological and chemical non-compliance. As stated earlier, the average number of households served by each non-DBO operated PriGWS is at about 91 small, compared to 359 households per scheme where DBO operated.

Consultation during this project suggests that, compared to PubGWS, there is a desire in some cases among non-DBO schemes to remain fully independent others would now consider the DBO procurement model, although overall there are mixed views on this. These latter examples are typically where a resolution of a water quality issue is required and where the scheme do not have the experience to operate complex water treatment plants or capacity to address this independently.

There are also examples however of non-DBO schemes who would join the DBO procurement model regardless of water quality issues. This is as it would, in their view, allow the provision of a more consistent and professional operation of their water treatment infrastructure.

There is at least one example of a non-DBO scheme with water quality issues who decided in the early 2000s, after progressing through the DB process in a DBO bundle, to exit from a bundle but is now trying to re-join the bundle. In this case resolution of a water quality issue is required but the scheme may not have the financial capacity to meet the added operational costs independently (Subsidy B is only available to schemes in a long-term O&M contract as part of the DBO procurement model).

Significantly, there are other non-DBO schemes (and some DBO schemes) that have decided to be taken in charge. These schemes are undertaking this process under the MARWP. Almost 50 medium to small sized regulated PriGWS (mostly non-DBO) are currently progressing to taking in charge under the MARWP with a further approximately 40 schemes amalgamating. There are others interested in, or encouraged to do so, under the upcoming MARWP.

As with PubGWS, the management structures of non-DBO schemes can be weak and are often still run, on an informal and part time basis, by the original committee members. They are not water services professionals, and many are now retired. This is not always the case and there are many examples of strong committees and excellently operated schemes with good governance in this category - particularly so those schemes that have participated in amalgamation/rationalisation.

Nevertheless, the age profile of the management on such non-DBO PriGWS has been a growing concern for many years. The age profile of members of management committees is less of an issue

where professional management structures with paid employees have been put in place. This is more a feature of larger schemes than smaller schemes. The Department and other stakeholders in the sector have identified growing age profile and governance as an issue of particular concern on the grounds of sustainability, value for money and public health.

The Department has developed mitigating policies particularly through the measures in the MARWP, to progressively promote, rationalisation/amalgamation and taking in charge by connection of PriGWS to the public mains. Taking in charge and amalgamation is preceded by a technical and economic assessment of the viability of physically connecting two or more schemes.

Where taking in charge resolves any water quality, quantity or management weakness issues on a sustainable enduring basis it gives maximum quality of service for consumers on the supply and return to the State as the majority funder. For example, in the MARWP 2019-2021, the Expert Panel identified 25 PriGWS approved for funding under Measures 1 to 3 where the most sustainable long-term solution is stated as:

> *rationalisation/amalgamation with a nearby group water scheme…[and where] the local authority should proactively advise, assist and focus the scheme in doing so; funding under the programme should only be used towards achieving this long-term solution*

In addition, the Expert Panel identify 12 PriGWS approved for funding under Measures 1 to 3 where the most sustainable long-term solution is stated as:

> *interconnection to, and taking-in-charge by Irish Water.*

This excludes a number of other PriGWS on the MARWP that had already chosen, or were encouraged by local authorities, to connect to the public mains and be taken in charge by Irish Water.

The NFGWS actively encourage PriGWS to positively consider rationalisation/amalgamation. For this they developed a Rationalisation/Amalgamation Strategy in 2016. This strategy has been informed by the Federation's own research which found that 47% of regulated PriGWS nationally serve less than 100 houses.

In addition to governance and water quality issues water treatment plants and water distribution networks regardless of their size, output or complexity come with a capital and operational cost. They need electricity for motive power and chemical for treatment. They require operational caretakers for maintenance and regular servicing and inspections. In addition, they require ongoing capital investment to keep the assets fit for purpose.

Higher than necessary water treatment plant and numbers of supplies, both public and private, means that a greater cost burden is being placed on the State as funder of water services, as the benefits of economies of scale are not being utilised to their fullest potential. The value for money and affordability for the State of the continued operation of large numbers of plants/supplies where consolidation opportunities exist to reduce these numbers, is not justifiable in the long-term.

Progressively adopting a consolidation approach for public and private supplies where viable and value for money to do so also helps to mitigate the climate change crisis (more efficient use of energy, chemical and labour etc).

3.5 Funding

The Rural Water Annual Subsidy Scheme is designed to support the day-to-day operational costs of Group Water Schemes. Subsidies, A, B and C are discussed in detail in Volume 1.

Subsidy A is available to all schemes. Subsidy C, which is a supplementary subsidy available to schemes in certain circumstances in addition to Subsidy A, aims to incentivise small PriGWS of less than 100 houses to progress into more sustainable entities through amalgamation or rationalisation. The grant aid available is currently €100 per house, in addition to Subsidy A. Subsidy B does not apply to non-DBO schemes.

In terms of capital funding, grant aid for non-DBO operated PriGWS is available under a number of measures of the current MARWP including Source Protection, Public Health Compliance, Water Conservation, and Transition to the Public Water Sector (taking in charge).

As stated earlier almost 50 medium to small sized regulated PriGWS (mostly non-DBO) are currently progressing to taking in charge under the MARWP with a further approximately 40 schemes amalgamating. There are others interested in, or encouraged to do so, under the upcoming MARWP.

3.6 Issues Arising

Some two-thirds of non-DBO operated PriGWS are unregulated, and therefore not part of the current monitoring programmes under the Regulations. These are discussed separately in Chapter 6. The focus of this chapter is on the one-third regulated non-DBO operated PriGWS.

As outlined earlier, many non-DBO operated PriGWS do not have adequate protection against microbiological or chemical contamination, and their consumers are at risk of e.g. illness from waterborne VTEC and cryptosporidium. THM non-compliance is also an ongoing issue but is being addressed under the MARWP, albeit at a pace that the EPA consider less than ideal.

The EPA report annually on the water quality shortcomings in private water supplies. The EPA have stated in their report for 2019 that [there are] *many issues affecting the private water supply sector. Action is needed by water suppliers, local authorities and the Department ... to improve the situation and ensure public health is protected.* In their report for 2021 the EPA refer to the need to *Finalise the review and progress the governance and funding model for the delivery of rural water services.*

DBO operated PriGWS have access, through the service provider, to technical expertise. It can be said that there is still a difference in the degree to which the managers of non-DBO operated PriGWS access technical expertise, other than when a water quality problem presents itself. This technical expertise is available through the Rural Water Section in the local authority (in the first instance), and through engaging consulting engineers. The NFGWS are also available to provide guidance where required.

In addition, the better organised schemes have maintenance and/or service contracts in place. In other cases, however, such expertise is not called upon on an organised, scheduled basis. This is a management weakness that can present risks for consumers when equipment failures occur. There is often a focus on product suppliers which are called in as an emergency response to plant failures. This is most likely related to the small size or weak management structures of non DBO-operated PriGWS.

The population served by non-DBO operated PriGWS is approximately 1.3% of the national population, with an average of 91 households per scheme. Because of the small unit size of these schemes, they sometimes do not receive the same focus as larger schemes. This is despite the supports – financial,

training and technical – being available through external advice as mentioned above, Department funding, etc.

Regardless of their size, they non-DBO operated PriGWS have the same responsibility, in the interests of the public health of their consumers, to provide water that meets the quality requirements of the Drinking Water Regulations on a consistent long-term basis. The annual EPA water quality reports shows that this is not happening in a significant number of cases (see Figure 1.1).

In order to address the weak management structures in some of these schemes, the most sustainable long-term solution is their taking in charge or rationalisation/amalgamation. There have been significant delays in the amalgamation and taking in charge processes. However, as this can involve subsuming a smaller network with water quality or leakage issues into a larger better performing supply agreements have to be reached and improvement works carried out all of which take time.

Typically, the better performing scheme in the case of amalgamation has insisted on improvements (as it is entitled to do) in the poorer performing scheme prior to its incorporation. The main delays in this process however are related to the time it can take for both parties to reach agreement on the amalgamation. Some schemes with water quality issues appear to not appreciate the significance of resolving these speedily. Local authorities have shown reluctance to enforcement in some cases. The situation with taking in charge is similar.

From the beginning of 2023 Irish Water will begin the process of separating itself from the current Service Level Agreement arrangement (SLA) with local authority. By 2026 local authorities will no longer have any involvement in the public water services function. This has implications for a small number of PriGWS awaiting to be taken in charge by interconnection where their water treatment plant is currently informally operated by local authorities (now Irish Water via the SLA).

In some cases, the desire of PriGWS to remain independent has not been matched by a response of the community of water consumers to step up and replace the committee members who have run the scheme for many years. The NFGWS campaign encouraging schemes to put professional management structures in place has improved this situation and is attracting new members to become involved.

Many voluntary organisations can find refreshing their management structures a difficult challenge to overcome. PriGWS, particularly smaller ones, are voluntary or part-time organisations yet they have an obligation to provide a water supply that is wholesome and clean, a task that requires dedicated regular rather than part-time attention with and increasing need for the skills of well-trained water professionals.

Although the water in the majority of regulated non-DBO PriGWS are probably safe to drink most of the time, some are at risk from contamination with human health implications. This is particularly so if they depend on a surface water source or a vulnerable groundwater source (approximately one third of no-DBO operated PriGWS), inadequate treatment equipment in place, or have poor operation and management structures.

A number of serious illnesses caused by pathogens, such as *E. coli 0157* and *Cryptosporidium* can be transmitted through contaminated drinking water supplies. All water supplies must be compliant with the quality standard in the Drinking Water Regulations on a consistent long-term basis. Compliant most of the time is not sufficient.

The voluntary nature of non-DBO operated PriGWS, coupled with absence of skilled well-trained water professionals, can lead to consumers on these supplies having increased exposure to human health

risks that are water quality related. The level of risk associated with water quality with a human health dimension increases as supply size reduces.

Close examination of the annual drinking water quality monitoring returns to the EPA show that the water quality issues are persistent and long running in some schemes, mostly smaller ones. The poor water quality is typically caused by improperly operated water treatment systems, or no or inappropriate systems in some cases, coupled with poor distribution system management.

4.0 PUBLICLY SOURCED GWS (REGULATED)

4.1 Overview

Publicly Sourced Group Water Schemes (PubGWS) are supplies where water is provided from the public supply by Irish Water. However, responsibility for the distribution network rests with the scheme.

There are some examples of community owned publicly sourced supplies (with community owned distribution networks) in Austria and Denmark. However, in most other jurisdictions, supplies are either fully 'public' from abstraction to tap (including those operated by regulated private entities such as in the UK), or they are fully private.

The uniqueness of PubGWS comes from the historical development of rural water supplies in Ireland, as described in Section 3 of Volume 1.

In the latter part of the last century Exchequer funding focused and was often available for the creation and upgrading of large public regional schemes. This included the integration in to them of smaller localised public supplies and some PriGWS particularly where quality is deficient. However, funding was not as readily available for extending the distribution network to serve a dispersed rural population, where the economies of scale did not exist to justify such network extensions.

Funding was available for the construction of some distribution mains where it was more cost effective to do so, including for PubGWS, through the Rural Water Programme (and its predecessors), supplemented by voluntary community effort.

It was common practice in some counties to integrate these PubGWS extensions into the public supply network immediately upon their construction i.e. they never functioned as PubGWS. Others were integrated into the public supply over the years. However, many were not integrated and remain as PriGWS, some expanding over the years.

The majority of existing PubGWS are exempted. Also, the majority, both exempted and regulated, are moribund (referred to as 'orphan' by the sector) and do not have a management structure in place which creates challenges, when issues arise, of responsibility for quality of consumer service.

4.2 Numbers of Schemes and Population Served

As outlined in Volume 1, the EPA reported in 2021 that there were 364 'regulated' PubGWS, serving a population of just over 68,200. To put this in context, the population served by PubGWS is circa 24,000 households. This equates to circa 1.4% of the national population.

These are only the *regulated* schemes, generally supplying greater than $10m^3/d$ or 50 persons. There are also an estimated 1,000 unregulated PubGWS serving approximately 14,000 persons (circa 5,000 households). This equates to circa 0.3% of the national population. These are discussed separately in Chapter 6.

In 2021 therefore, there was an estimated population of approximately 82,200 population (circa 29,000 households) in total relying on PubGWS, both regulated and unregulated, for their household water supply needs.

At 364 regulated PubGWS there is an approximately 50/50 split between the number of regulated Group Water Schemes in Ireland.

Looking at the numbers, the average number of people supplied by the 377 regulated PubGWS that serve around 70,785 people is approximately 188, in other words about 68 houses per supply.

The unregulated PubGWS generally serve between 2 and 18 houses, but the average is at the lower end of this range, comprising extended family arrangements in many cases. They are for all practical purposes part of the public mains with no meaningful separate infrastructure involved.

It is noted that the number of PubGWS is reducing each year as they are taken in charge. Currently, the majority of PubGWS are 'orphan' schemes, leaving taking in charge difficult.

The MARWP for the 2019-2021 cycle includes almost 300 PubGWS of various sizes or almost 50% of regulated supplies.

It is important to note that these numbers of PubGWS and the population served by them is moment in time data that is constantly changing. This as new domestic connections occur e.g. due to extensions being constructed, some connections ceasing (small in number) while many schemes are being taken in charge. The figures above are, without any significant loss of accuracy, rounded for ease of consideration and comparisons.

4.3 Monitoring and Oversight

As these schemes receive their water from a public supply, water quality is broadly similar to that in the parent public scheme. In recent years the EPA have reported on water quality in these schemes in the same report as public supplies (as opposed to in their separate *Report on Private Water Supplies*).

In setting the sampling requirements for water supplies, the Drinking Water Regulations do not differentiate between public and private supplies. Furthermore, the Regulations do not differentiate between public source and private source supplies. Nevertheless, in carrying out their monitoring programme, the consultation during this study suggests that local authorities in some cases focus on check sampling for PubGWS, with a modified audit regime based on risk.

In their *Drinking Water Quality in Public Supplies* report (2019), there was a 100% compliance rate for E. coli for PubGWS The EPA state that problems with disinfection by-products (such as THMs) can arise in PubGWS if the distribution network is not well managed (or not managed at all in the case of many orphan schemes). Of the 377 PubGWS monitored, 7 schemes reported trihalomethanes failures. These THM failures are not confined to the PubGWS and are replicated in the parent public supply.

Unregulated PubGWS (over 1,000 supplies) are not subject to the same level of local authority oversight and lie outside the monitoring and reporting regime under the Drinking Water Regulations. The average number of houses on each unregulated PubGWS is small, and, given that these schemes receive their water from a public source, this deficit in monitoring and oversight is not a significant issue.

4.4 Governance

The management structures of PubGWS vary from very strong, to inactive, to none. A number of PubGWS have no active management structure in place and are moribund (commonly referred to as 'orphan') schemes.

In some cases, PubGWS have very strong, active committees, and wish to remain independent. These are in the main some of the larger PubGWS, but not exclusively so.

In other cases, the PubGWS may still have a strong, active committee, but that committee has been actively campaigning for the scheme to be taken in charge by Irish Water for several years.

In 2021, only 55 PubGWS were affiliated to NFGWS. If for argument's sake these 55 are a subset of the 377 regulated PubGWS, this corresponds to 15% of schemes affiliated to NFGWS.

It was never intended that PubGWS would have an enduring separate existence to their parent public supply. The expectation was that they would become part of the public supply network immediately upon commissioning or that this would happen over time. Therefore, many of the original schemes have become part of the public mains and no longer exist. However, for others the necessary formal transfer and integration into the public mains was not processed by the local authorities as Water Services Authority for public supplies prior to Irish Water assuming this responsibility in 2014.

The average number of domestic connections on the 1,099 unregulated PubGWS is small. These are clearly minor network extensions and there is no compelling economic or governance argument for them remaining as PubGWS.

The same can be said of the regulated PubGWS the average size of which is only 68 domestic connections, with many schemes functioning as minor extension of the public mains, the majority being moribund or 'orphan' with no management structures in place.

PubGWS get their water supply fully treated from the public mains. The supply typically, for smaller schemes at least, flows through the scheme distribution mains under sufficient pressure from the parent supply to reach consumer taps unaided. In this way the majority of PubGWS need no equipment such as pumping stations, treatment equipment or storage reservoirs. This is unlike PriGWS that have to operate and manage sources, pumping stations and water treatment plants and in some cases storage reservoirs.

This distinction between the two types of group water scheme means that most PubGWS can function on a day to day without facing any regular operational needs or bills (eg power, chemicals etc.). This has eased the majority PubGWS into becoming 'orphan'. This 'orphan' status is a feature almost unique to PubGWS.

Group water schemes, including PubGWS, are community-owned and community-run organisations and they remain the full operational and management responsibility of the scheme right up until such time as they are formally taken in charge by Irish Water. This equally applies to 'orphan' schemes with the members being fully responsible in the absence of a management structure.

The taking in charge process has shown that a number of PriGWS have legacy debts accumulated over time (a long number of years in some cases). It is a particular feature of four local authority areas (Cavan, Mayo, Leitrim and Sligo) due to their non-domestic charging arrangement with PubGWS..

The local authorities and Irish Water are actively working to progressively resolve issues around debt in some schemes and this requires goodwill and a proactive approach by the schemes involved. The situation is creating an added work burden, in resolving these issues, on the human resources of both organisations. It is delaying the taking in charge of the schemes concerned and potentially others.

An added complexity with PubGWS is that some were developed in series ie separate schemes developed as extensions of an existing scheme (referred to as 'daisy chain' schemes in the sector). In some instances, this has caused quantity of supply issues for the schemes that are most remote from the parent supply. This occurs if a scheme closer to the public supply becomes 'orphan' or does expedite participation in taking in charge.

A further difficulty, which is a potential health and safety risk, with some PubGWS that do have pumping stations (an estimated 20% of supplies based on recent taking in charge cases) is where these assets are poorly maintained and are deteriorating. In such instances there is a risk of supply outages as the stations deteriorate or suddenly fail.

The existence of the 'orphan' PubGWS in particular, if not taken in charge quickly, will present progressively increasing difficulties once local authorities fully exit from their agreement with Irish Water between now and 2026. Such challenges include leakage impacting on the quality and quantity of the supply to the consumers on the schemes. This will also potentially impact on the quality of service provided by Irish Water to their customers on the parent supply.

Leakage management in PubGWS is considered generally to be not as good as in PriGWS, and if the scheme is 'orphan' the situation will progressively worsen. Excessive leakage in these schemes reduces the headroom (spare capacity) of the parent supplies. This creates a risk for Irish Water in unnecessary investment in capacity upgrades to the parent supply. Such investment could be deferred or avoided entirely if the PubGWS were taken in charge and under the operational and management control of Irish Water who have active leakage control measures in place across all of its network assets.

Poor leakage management in PubGWS also creates a risk for Irish Water in not having spare capacity to allow new connections and taking in charge, including by PriGWS that need to do so due to water quality or management issues.

Finally, 'orphan' PubGWS, apart from the multitude of operational issues outlined above, create local issues for applicants seeking planning permission. This can happen if there is no member of the scheme management available to issue letters to applicants confirming availability of a water supply for the development. Such confirmation is required to make a valid planning application.

4.5 Funding

While the operating costs of these PubGWS tend to be lower than for PriGWS, they can still be considerable and include for example staff costs, maintenance costs, and (exceptionally) power costs.

PubGWS are eligible, under the **Annual Subsidy** scheme, for Subsidy A. In practice however, the vast majority of regulated and unregulated PubGWS do not apply for Subsidy A. In 2021, under 170 PubGWS applied for Subsidy A (11.5% of all PubGWS).

A number of the 170 PubGWS have subsequently been taken in charge or are in the process of doing this, funded under the MARWP, to bring them to the basic standard to enable them to do so. Some more have expressed interest in doing so under the upcoming MARWP. Others are good examples of well operated and managed PubGWS.

The majority of PubGWS are moribund or 'orphan' with no active management in place, and for this reason no operation and maintenance is carried out and no costs are incurred by the scheme. This lack of asset management leads to elevated levels of leakage, which can impact on the Irish Water service to its customers.

Where these schemes do apply for Subsidy A, charging can only be imposed on domestic connections for excessive usage and no flat rate or standing charge is permitted for domestic consumers. However, the maximum subsidy amount that a PubGWS can receive is limited by the threshold rate per house (currently the Subsidy A rate payable per house for a PubGWS cannot exceed €115).

PubGWS are connected to, and supplied with treated water from, the Irish Water system. PubGWS generally consist of domestic, mixed use (typically domestic and farming) and non-domestic (typically farming, schools, sports facilities etc) connections. These non-domestic connections are also members of the schemes. The tariff rates or water charges by Irish Water for the water supplied to these non-domestic connections fall under the regulatory remit of the Commission for the Regulation of Utilities (CRU).

Until recently the tariffs paid by PubGWS to Irish Water were based on tariffs set by the local authorities prior to 1st January 2014, and therefore varied by authority. PubGWS were until this classed as 'out-of-scope' of the Irish Water Non-Domestic Tariff Framework that applied to all of its other non-domestic customers.

On 2nd June 2022, the CRU published its decision on an *Enduring Charging Arrangements* for PubGWS The enduring charging arrangements that apply from 1st October 2022 will be based on the Irish Water Non-Domestic Tariff Framework. PubGWS are being given a two year transition arrangement (until 1st October 2024) for the new tariff rates to fully apply.

The decision makes the tariffs, formerly charged to PubGWS, consistent with those paid by other non-domestic customers of Irish Water. An analysis undertaken by the CRU on a small sample of PubGWS suggests that the majority of non-domestic consumers on schemes will, over the two- year transition period, see tariff increases. However, tariffs were unchanged for at least eight years, from before January 2014 to October 2022.

Prior to Irish Water, two types of tariffs arrangements existed for PubGWS. These are ‘bulk meter’ PubGWS (limited to Cavan, Leitrim, Mayo and Sligo) and ‘directly-billed’ schemes (in all local authorities other than these four) for the application of the Irish Water tariffs.

Bulk meter PubGWS have a single bulk meter at their point of connection with the Irish Water supply. The scheme (not the individual non-domestic customers) is billed by Irish Water using the tariff rates (standing and volumetric charges). The amount of water that a 'bulk meter' PubGWS pays for, based on the bulk meter reading at the tariff rate, is reduced by an allowance (domestic) for each domestic member connection on the scheme.

On 'directly-billed' PubGWS, the non-domestic and mixed-use consumers (not the scheme) are billed directly by Irish Water using the tariff rates (standing and volumetric charges). The bill is based on the consumer meter reading (or estimated where a meter is installed) at the tariff rate. If a directly-billed PubGWS connection is a mixed-use connection (ie domestic and non-domestic) then the amount of water it pays for is reduced by an allowance (domestic). The domestic allowance concept for PubGWS is similar to that previous used. However, it is now adjusted to achieve consistency nationally (authorities uses different domestic allowances previously).

The CRUs decision is fair as the domestic allowance per domestic connection is now the same for all PubGWS. It also standardises the domestic allowance granted per dwelling nationally regardless of whether the dwelling is connected directly to the public water system or connected to a PubGWS. Bulk meter schemes bill their non-domestic members based on their operation and management costs of distributing the water including the Irish Water charge.

Directly-billed schemes bill their non-domestic members based on their operation and management costs of distributing the water including excluding the Irish Water charge.

All PubGWS can apply for the Annual Subsidy, up to the rate per house allowed (currently €115 per house), to meet any cost shortfalls associated with distributing water to its domestic members. The Framework sets out new harmonised tariff rates which apply to Irish Water non-domestic customers nationally including PubGWS.

All PubGWS can apply for the Annual Subsidy, up to the rate per house allowed (currently €115 per house), to meet any cost shortfalls associated with distributing water to its domestic members. Taken together, the Department's *Terms and Conditions for Subsidy towards the Operational Costs of Group Water Schemes* (issued August 2018), and the CRU Decision Paper *Enduring Charging Arrangements for Public Group Water Schemes (June 2022)* achieve transparent, fair and equitable subsidy and tariffs for PubGWS.The tariff rates, to be fully transitioned by 1st October 2024 for PubGWS, will focus the attention of schemes on considering their enduring future.

The upcoming MARWP is expected to see an increasing trend in applications among PubGWS for taking in charge.

In terms of financial assistance for **capital works** under the MARWP, while funding for water conservation is available, in the context of these supplies this mainly relates to *Transition to the Public Water Sector*. The allocation under the MARWP 2019-2021 was approximately €14.4M, or 27% of the total allocation under the programme.

In terms of Taking in Charge, some 300 PubGWS (mostly regulated PubGWS), applied for and were approved for funding under the MARWP. Taking in Charge was always, and continues to be, 100% funded to incentivise schemes to consider doing so.

4.6 Issues Arising

Consultation with the EPA suggests that in some cases there are unclear responsibilities for the operation and monitoring of PubGWS. It is true to say that PubGWS occupy an unusual position in the context of rural water in Ireland, and there are few equivalents in other jurisdictions.

The fact that approximately 27% of the total allocation under the MARWP 2019-2021 was for taking in charge means that there is strong financial support available for PubGWS that wish to do so, and consequently discontinue as an independent entity.

There is no persistent water quality driver in the PubGWS themselves for the current focus on taking in charge (though water quality issues could arise over time due lack of proper operation of the distribution system, for the 'orphan' schemes in particular). However, given that compliance with the Drinking Water Regulations is similar in PubGWS to that in public schemes, there is a water quantity focus in ensuring minimal leakage through the entire network operated by Irish Water, including the PubGWS networks. This approach protects the State investment in these supplies and is particularly important for PubGWS with weak or no management structures in place. Therefore, the approach is consistent with and delivers on all three high level themes (quality, conservation and future proofing) in the *Water Services Policy Statement 2018-2025*[10]. It will also progressively lead to better greater opportunities to achieve sustainable solutions for PriGWS by the group water sector being more focused and consolidated.

A significant issue that appears to be increasing, is the age profile of the membership on some of the management committee members in PubGWS, and the moribund status of the majority of schemes. In many cases these schemes were established to extend a piped water supply to a somewhat dispersed rural population. They were never intended to have enduring status as a PubGWS as their original status was as a funding mechanism, however the local people behind the original initiative have stayed on to manage the scheme. On retirement, some of these key people have not been replaced, and orphan schemes have resulted.

The vast majority of PubGWS do not have day to day tasks to undertake to receive a water supply at their members' taps. Unlike PriGWS they do not have to operate or manage any infrastructure such as pumps or a water treatment plant. This absence of any operational tasks to physically undertake, on a day to day or regular basis, t to obtain their water supply can quickly tip the schemes further along the incline to becoming moribund.

The EPA regulates Irish Water public supplies, which is sampled by Irish Water, but the same water conveyed to customers on PubGWS falls under the remit of the local authority monitoring programme. The local authorities often focus on check sampling for PubGWS, with a modified audit regime based on risk. This demonstrates that PubGWS are treated differently to both public supplies and private supplies. However, this does not add to or create any health risk, it is a decision focused on the efficient use of monitoring resources.

Historically, and as discussed earlier, different charging regimes exist nationally between Irish Water and PubGWS and some issues have arisen in the past. Some PubGWS were charged based on a bulk meter, in other instances Irish Water bill non-domestic members of the scheme directly (in the majority of cases), while some were not charged for water at all. This issue is now regularised through the new charging regime to be introduced from 1st October 2022.

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[10] *Water Services Policy Statement 2018-2025,* Government of Ireland. See at this link: https://www.gov.ie/en/publication/49364-water-services-policy-statement-2018-2025/

In terms of future ownership, some PubGWS committees wish for the schemes to remain independent entities, while other PubGWS committees wish for the schemes to be taken in charge by Irish Water. In the latter category, the consultation has highlighted examples where the taking in charge process has extended over a long period and is still not concluded.

Prior to the establishment of Irish Water each local authority had its own procedures in place for the taking in charge of group water schemes leaving Irish Water with multiple procedures to follow. A single set of detailed procedures and protocols for taking in charge by Irish Water were formulated and agreed in July 2016 for the Rural Water Sector by a review group made up of officials from the Department, the NFGWS, Irish Water and local authorities. The procedures (implemented by *Circular WSP 01/01, 5 July 2016 - Taking in Charge by Irish Water of Group Water Schemes*), adopting the best practices from the previous fragmented arrangements, now provide a consistent national approach to the taking in charge of schemes.

The first group water scheme taken in charge by Irish Water, a pilot in developing the above procedures, was in February 2016. Some 186 group water schemes were taken in charge from then to the end of August 2022. These former group water schemes supplied water to just under 5,000 domestic connections (the average scheme size was circa 26 domestic connections, smaller than the average sized regulated PubGWS which is 68 domestic connections).

Irish Water is currently (as of the end of August 2022) processing a further 80 schemes. The majority of schemes taken in charge are PubGWS though some were PriGWS that are now connected to Irish Water. The frustration expressed in the past among some group water schemes about the taking in charge process being prolonged should no longer be the case. It is a matter for schemes, where the more sustainable solution is taking in charge, to apply to and work with their local authority to progress the process and applications to Irish Water using the procedures and the funding available under the MARWP. Substantial funding is allocated, and available, under the MARWP which meets 100% of the cost of taking in charge. Approximately €14.4m was allocated for taking in charge, or 27% of the total allocation, under the 2019-2021 funding cycle of the MARWP.

In orphan schemes, the networks are in effect managed by the local authority on an informal basis, but this is not part of the Service Level Agreement between the local authority and Irish Water. More certainty will need to be brought to this informal arrangement as the current agreements finish at the end of 2022 and new agreements will need be agreed and put in place before local authorities fully exit from their involvement in public water services (not later than 2026).

Irish Water's responsibility for these schemes only commences when they are formally Taken in Charge under Section 95 of the Water Services Act 2007. This is currently somewhat of a grey area as orphan schemes may regard themselves as taken in charge when in fact they are not and the members are fully responsible for their scheme until it is formally taken in charge by Irish Water.

Schemes must show responsibility and tolerance while the process, involving significant work to bring scheme infrastructure up to the basic standard for taking in charge, is underway. Schemes can avail of the Annual Subsidy to fund their operational costs of providing water to their members for domestic use while the taking in charge process is underway.

Schemes may also charge at an appropriate level that avoids cross-subsidisation, their non-domestic members for providing water for their use. By managing their scheme affairs in this way, the accumulation of debt, as discussed earlier, need not arise.

There have been significant delays in the Taking in Charge process for PubGWS, which have to be completed over multiple MARWP cycles. There are often practical issues associated with this process such as establishing wayleaves on historical GWS assets on private lands. This has proven difficult to address on orphan schemes and requires significant local authority time input to resolve.

With taking in charge protocols established, giving a consistent national approach, and if the recent application trends continue, it is likely that most, and likely ultimately all, PubGWS will be taken in charge over time. This, coupled with the fact that no new PubGWS are being built, means that the number of households served by PubGWS will diminish over time.

5.0 SMALL PRIVATE SUPPLIES

5.1 Overview

Small Private Supplies (SPSs) are supplies serving a commercial or public activity. The abstraction, treatment and distribution of treated water are managed by the commercial or public entity. Examples of commercial or public activities served by Small Private Supplies include pubs and restaurants, hotels, crèches and national schools - they generally do not have any domestic connections. Small Private Supplies are not Group Water Schemes; the domestic connection feature is absent.

While Small Private Supplies are relatively small in number, small in terms of the volume of water supplied, and not part of the national water supply population, they are a type of supply that many people (or a member of their household), going about their daily lives in rural areas encounter, potentially several times daily. This leaves Small Private Supplies particularly important from a public health perspective.

They are a long-established feature of EPA drinking water quality reporting but are not referenced in the Drinking Water Regulations. However, Small Private Supplies are regulated under the Drinking Water Regulations regardless of the population or volume that they supply

The word 'small' in the context of Small Private Supplies refers to the fact that they supply on average less than $10m^3/d$.

The reason that SPSs are categorised differently by the EPA for reporting purposes stems from the fact that in the Drinking Water Directive, exemptions from the Directive include:

> *water intended for human consumption from an individual supply providing less than 10 m^3 a day as an average or serving fewer than 50 persons, unless the water is supplied as part of a commercial or public activity.*

Consultation during this study found that the term Small Private Supplies is poorly understood, apart from by those involved in the monitoring programme. The fact that the title does not include the very aspect that makes them regulated (i.e. commercial or public activity) can somewhat undermine their importance.

5.2 Numbers of Small Private Supplies

Given that these supplies are regulated, there is a reasonable body of data available in respect of Small Private Supplies, certainly in respect of the number of such supplies that exist in Ireland.

In 2019 there were 1,778 Small Private Supplies registered with local authorities, but it is thought that are many more that have not been registered. Regulation 8(3) of the Drinking Water Regulations places an onus on local authorities to maintain a register of all supplies in its functional area.

5.3 Monitoring and Oversight

The EPA have consistently highlighted the fact that the performance of SPS lags behind that of public supplies, and that the levels of enforcement under the Drinking Water Directive is low for SPS.

These supplies are mainly commercial entities, and in many cases would fall below the threshold of $10m^3$ a day for monitoring and reporting under the Drinking Water Regulations 2014, SI 122 of 2014 (as amended in 2017) were they not part of a commercial or public activity. However, while supply volumes may be low, being part of a public activity Small Private Supplies can supply and thus impact on several people daily. This leaves them particularly important from a public health perspective.

Under the Drinking Water Regulations 2014 (Part 2 Table B), the frequency of check and audit samples is *to be determined by the Supervisory Authority, subject to any relevant guidance issued by the Agency*. The EPA advise in their *Handbook for Private Water Supplies*, that:

> *Sampling and analysis, even once per year, for a whole range of parameters that are unlikely to be present in small private water supplies is not an effective use of resources. Therefore, the EPA recommends that for each of these small supplies the WSA, in consultation with the private water supplier, carries out a risk assessment (see Section 10 of this Handbook) taking into account the nature of the catchment, the activities in the catchment and any treatment provided to decide whether any of the parameters are likely to be present in the supply.*

In practice, given that there are 1,778 Small Private Supplies registered with local authorities, these risk assessments are not undertaken on each Small Private Supply. A judgement call is often made on the appropriate number of check and audit samples taken annually, with a focus, naturally, on vulnerable consumers on supplies such as creches.

In the EPA report *Focus on Private Water Supplies 2019,* it is stated that 19% of registered Small Private Supplies were not monitored.

Of the 1,418 Small Private Supplies monitored, 88 failed to meet the required standards under the Drinking Water Regulations. This equates to a failure rate of approximately 6%. There were also specific issues with certain parameters. A total of 20 Small Private Supplies which were monitored for nitrates failed to meet the standard.

As with other types of smaller supplies including Group Water Schemes, the monitoring programme, which is based on a very limited number of samples, does not pick up on all failures and risks on these supplies.

5.4 Governance

Small Private Supplies are represented by sector specific commercial or public activity groups. However, they are not represented by any group with a specific water quality focus. They are not GWS and are therefore not represented by the NFGWS. There is of course nothing to stop the various sector specific commercial or public activity groups developing a water quality focus. While Small Private Supplies can avail of such advice from consulting engineers or other independent water supply experts (as they would do for other parts of their commercial or public activity) they generally operate independent of any such representation, or any meaningful access to technical advice.

While the local authorities are available to provide technical advice to the owners of these supplies, in most cases the supply owners choose not to avail of this option.

The supplies, by definition, serve a commercial or public activity, and therefore the focus is the operation of that activity, rather than the operation of the water supply.

5.5 Funding

SPS have some level of capital and operational costs, which may typically include abstraction pumping costs, maintenance costs, water treatment costs and importantly water quality monitoring costs.

As the Rural Water Programme is focused on providing funding support for water services with a domestic dimension, SPS are not eligible for the capital or operational subsidy funding.

5.6 Issues Arising

One of the main challenges with Small Private Supplies is the extent to which they choose to register with the local authority as a *water supplier* under the Drinking Water Regulations. The local authority can only include them in their monitoring programmes if they know of their existence, and currently, in contrast to UK legislation, there is nothing to compel the owners of such supplies to register with the local authority.

In many cases their existence is known to the HSE through monitoring under Food Safety legislation, where the business is associated with food production. However, the HSE are precluded, under the same Food Safety legislation, from providing any information to the local authority on these supplies, so many of they remain outside the local authority monitoring and reporting programmes, unnecessarily so.

Under Regulation 7(12), the Agency may supervise performance of the Local Authority in respect of its monitoring functions, although in recent years, the EPA's auditing of local authority monitoring programmes under the Regulations has only taken place sporadically. A consistent theme in these audit reports is the lack of data on population served and volume supplied, in respect of Small Private Supplies. This is also discussed in their annual *Focus on Private Water Supplies* report.

The majority of Small Private Supplies take their water from individual wells on their own property. In cases where the construction of the well is sub-standard this presents a considerable risk. The adequacy of installed water treatment facilities on these supplies can be poor. Where the commercial or public activity is associated with commercial food preparation the quality of installed treatment

tends to be higher as this is a central consideration in business continuity. In other cases, however, installed treatment facilities can be poor. There have been well documented examples of waterborne infection outbreaks in supplies serving creches, which serve a particularly vulnerable group of consumers.

As stated earlier, the focus for the owners of these supplies is the operation of their commercial or public activity. This means that, food preparation businesses excepted, their water supply will only receive attention should a problem arise.

As these supplies are commercial or public activity entities, no grant aid is available for their operation or upgrading. They are not eligible to receive funding for capital upgrades under the Rural Water Programme, or the Annual Subsidy for operational costs. This can mean that these supplies may not receive the same interventions as those serving households, until a problem arises, and urgent action is required.

In terms of monitoring of these supplies, in the absence of a specified minimum number of annual check and audit samples in the Drinking Water Regulations, local authorities make a risk-based judgement call on the appropriate number of samples and tend to focus on vulnerable consumers on supplies such as creches. This risk-based approach is welcome as it targets the highest risk supplies and consumers, but it can also be subjective and can mean that other Small Private Supplies go unmonitored.

While Local Authorities receive an administration and overheads grant to cover the cost of administering the Rural Water Programme, no specific exchequer funding is available for monitoring Small Private Supplies. While local authorities are entitled to recover the costs of such sampling from the businesses, they can be unwilling to directly charge them for monitoring as the sampling costs can affect the viability of some very small businesses. It could be argued that that approach is essentially subsidising these businesses, given that businesses that avail of public supplies are subject to water charges.

In areas served by the public mains, there has been a trend over the years among some high water use commercial activities to develop a private supply in parallel to their public supply. The reason for developing the private supply is either a perceived opportunity to minimise the impact of Irish Water tariffs (charges) and/or to have an emergency supply available for business use based on a perceived risk of failure or shortage of water associated with issues with the public supply.

In this way these commercial activities have dual water supplies - the public mains and a Small Private Supply. This occurrence creates an unnecessary added public health risk for the commercial activities concerned, and a public health risk to the public supply if cross contamination occurs.

6.0 EXEMPTED PRIVATELY SOURCED GWS

6.1 Overview

The Drinking Water Regulations fully apply to supplies that are supplying more than a threshold of 50 people or supplying more than 10m^3 on average per day.

The wording of the threshold in the Regulations was taken directly from the former Drinking Water Directive[11] on the Quality of Water Intended for Human Consumption, where under Article 3(2) Member States may exempt such supplies from the provisions of the Directive. The new Drinking Water Directive[12] takes a similar approach under Article 1(3).

The Regulations also fully apply to supplies of any size if the drinking water is supplied as part of a commercial or public activity (no exemption threshold applies in these cases, for example a house operating a B&B or a pub with living accommodation, crèche etc). Supplies that are supplying water at above these thresholds or in the circumstances of commercial or public activity are what is referred to as *regulated* supplies.

Supplies that are supplying water below these thresholds are what is referred to as *exempted* supplies. Relating the threshold to house numbers gives a better sense of scale. Assuming, for rural areas, an occupancy ratio of 2.84 persons per house (CSO, 2016), would suggest approximately 18 houses as the transition between *exempted* and *regulated*.

The term 'exempted' and 'unregulated' are both in common use in Ireland. The two terms describe the same thing; a supply which is exempt from certain monitoring and reporting requirements under the regulations.

Many of the monitoring and reporting arrangements under the Drinking Water Regulations do not apply to *exempted* supplies. However, substantial parts of the Regulations, particularly the quality standards, do full apply to exempted supplies and the local authority must provide advice where water quality issues arise. These issues are discussed further below.

Other jurisdictions in the EU, for example the UK countries, have in terms of monitoring, taken a similar approach to Ireland to 'below threshold' supplies. However, a significant difference between the approaches in the UK counties is that they have provisions in their drinking water regulations requiring the water quality regularity authority to carry out risk assessments on all shared supplies i.e. of two or more houses (and single houses on request).

The majority of exempted supplies in Ireland are individual household supplies (private wells). Census 2016 indicated that almost 180,000 households nationally (around 10.3% of all households) have private sources of water supply, usually a borehole. This particular subset of exempted supplies is discussed separately in Chapter 7.

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[11] *Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption,* Official Journal of the European Union. See at this link: https://ec.europa.eu/environment/water/water-drink/legislation_en.html

[12] *Council Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast),* Official Journal of the European Union. See at this link: https://eur-lex.europa.eu/eli/dir/2020/2184/oj

The next largest group of exempted supplies consists of smaller PriGWS and PubGWS. The scale of each of these is detailed below. Other types of exempted supplies also exist in small numbers (eg. clusters of rural houses, including some rural housing estates, with a piped supply from a source that is not an established group water scheme).

While the exemptions in the Regulations apply to both public supplies and private supplies, they are of more significance in private rural water supplies than public supplies. The latter have the benefit of being under the responsibility and expertise of Irish Water who are where possible progressively integrating them into larger supplies. This is as many of these private rural supplies are small PriGWS consisting of a handful of houses and thus falling well below the threshold and without expertise to operate.

In Scotland, these supplies are called *Type B supplies* under the *Private Water Supplies (Scotland) Regulations 2006*, whereas the *Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017* apply to regulated supplies (previously known as *Type A* supplies).

The EPA have consistently highlighted, in its annual drinking water quality reports, that the water quality performance of private water supplies lags behind that of public supplies. However, while the majority of regulated PriGWS achieve microbiological compliance and are safe to drink, most of the time the situation with exempted supplies is far less certain.

A number of serious illnesses can be transmitted through contaminated drinking water supplies. Contaminated drinking water is a recognised source of VTEC and Cryptosporidium. Ireland has the highest incidence of VTEC in Europe and a high proportion of cases have been linked to contaminated private wells and PriGWS.

The HSE and the EPA encourage users of private wells and the managers of PriGWS to ensure that the source is protected against the entry of surface water run-off and access by animals and that any disinfection system in place is well maintained. They are also encouraged to have regular checks carried out on the microbiological quality of the water supply.

6.2 Numbers of Exempted Supplies and Population Served

There are almost 180,000 unregulated *household supplies* serving around 10.3% of the population, and these are discussed separately in Chapter 7.

In relation to the number of *non-household* exempted supplies, it is not possible to say definitively how many of these supplies there are in Ireland, but available information from previous local authority surveys and other published sources suggests that these include:

- 800 PriGWS (approximately) serving almost 40,000 persons or just over 14,000 domestic connections (0.8% of the population)
- 1,100 PubGWS (approximately) serving almost 15,000 persons or just over 5,000 domestic connections (0.3% of the population)

In terms of non-household exempted supplies therefore (i.e. not taking their water from a well or other household supply), exempted supplies serve approximately 1.1% of the population.

The approx. 800 exempted PriGWS (based on a 2017 survey of local authorities) serving approximately 40,000 population (14,000 houses) suggests an average supply size of 17 houses. This seems high as it

would be close to the threshold for regulation of 50 persons. The most likely explanation is that the population in the survey returns is a significant under estimate of the actual numbers. The number of houses is likely to be substantially correct. The data on the approx. 1,100 exempted PubGWS suggests that the average scheme size is 4-5 houses.

6.3 Monitoring and Oversight

There is a perception among some working in water services that the Regulations do not apply to exempted supplies. However, it is not correct to say that the Drinking Water Regulations do not apply to these supplies, as the exemptions only relate to *monitoring* and *reporting* requirements of the Regulations. The water supplier itself still has a duty under Regulation 4 to ensure that the water is *wholesome and clean and meets the requirements of these Regulations*. This misconception amongst local authorities became evident during the consultation.

The Supervisory Authority has certain duties under Regulation 14 in respect of exempted supplies. They must notify the population served by an exempted supply of:

> *(a) the fact that these Regulations do not apply to such supply, and (b) action that can be taken to protect human health from the adverse effects resulting from any contamination of water intended for human consumption*

Where it is apparent to a local authority that a potential danger to human health arises from the quality of an exempted supply, it shall ensure that the consumers of that supply are given appropriate advice promptly.

Under the Drinking Water Regulations, local authorities must maintain a register to record the details of each water supply for which it is the Supervisory Authority. These duties for the Supervisory Authority assume in the first instance that the Authority knows of the existence of the supply. While this will be established and known by them in the majority of cases, there are cases where the Supervisory Authority is not aware, or has not been informed, of the existence of the supply by the supplier, or the Authority's records of exempted supplies is out of date. There is currently no onus on the exempted supply to inform the local authority of the existence of the supply or any material changes to its structure (eg. where it has become larger or has gained a commercial or public activity requiring it to be treated as regulated supply).

There are also examples of where the local authority has included the exempted supply in their monitoring programme as a result of a specific potential risk to human health, even though there is no requirement to do so under the Regulations.

The EPA has a statutory role the Drinking Water Regulations 2014 in issuing guidance and advice to local authorities in respect of exempted supplies, and published *Advice Note 12 on Exempted Supplies* in 2013. In this Advice Note, practical advice is provided on how the local authority should communicate with customers on an exempted supply, both to inform them that they are on an exempted supply, and in the event of a potential danger to human health. Local authorities take a different approach to this provision of guidance and advice. For example, some local authorities have well developed guidance and web pages - other local authorities less so.

6.4 Governance

Governance of exempted PubGWS and PriGWS remains an issue. These schemes typically have weak management structures, particularly in the case of exempted PubGWS. These supplies often have little or no NFGWS involvement or representation. It can be said that exempted PubGWS have little need for such representation as smaller schemes are substantially a 'service connection' and have no meaningful water mains component.

6.5 Funding

Both subsidy and capital funding are available for exempted supplies in the same way as it is for regulated supplies. Participation in funding applications is relatively low however in the case of exempted supplies.

In terms of capital funding, few exempted PubGWS participate under the MARWP. Most that do are in response to local authority encouragement for them to be taken in charge.

Proportionally, the participation rate of exempted PriGWS in the MARWP is also low. Under the MARWP, exempted and regulated PriGWS are encouraged equally to participate. Those that participate are encouraged to be taken in charge or amalgamate (where this is technically and economically viable and it is a condition of funding). Most exempted PriGWS applications appear to be reactive (where assets are about to fail) or emergency (where assets have failed). This reactive/emergency approach coupled with low participation is a concern as it suggests poor management. A better understanding of issues around communication needs to be developed. In this regard a comprehensive survey of the sub-sector would be a good starting point.

In terms of funding for operational costs, less than 2% of all exempted PubGWS apply for the annual subsidy, and only 10% of all PubGWS applying for subsidy are exempted supplies. This is a very low participation rate suggesting that exempted PubGWS have no day to day costs and effectively see themselves as part of the public mains (most are moribund).

Approximately 25% of all PriGWS applicants for the annual subsidy are exempted supplies. The majority serve less than 10 houses with the vast majority of these serving 2-3 houses. This is a very low participation rate suggesting that exempted PriGWS have low day to day costs and effectively function without engaging with the local authorities on an annual basis.

6.6 Issues Arising

Under Regulation 14 local authorities, as Supervisory Authority, have certain duties to provide information to consumers on Exempted Supplies. This includes both in general to all consumers on the supply informing them that their water supply is unregulated, and advice where a danger to public health is apparent. There is little evidence that such information is provided by local authorities in any consistent and easily available way to such consumers.

The duty of the Supervisory Authority under Regulation 14(1), to inform consumers on these exempted supplies that *these Regulations do not apply to such supply* can cause confusion, as it implies that the supply is exempt from the entirety of the Regulations, rather than just the monitoring and reporting requirements. For consumers on exempted supplies, they are unlikely to fully understand

what such a notification means, for example whether the managers of the scheme have any statutory duty in respect of the quality of water supplied (which they do under Regulation 4).

Exempted supplies can also apply for capital and operational funding under the MARWP and the Annual Subsidy, in the same way as regulated supplies. To avail of the Annual Subsidy each exempted supply must have their water supply tested annually.

In practice however, many exempted supplies do not avail of funding until an emergency water quality or supply continuity problem arises.

In terms of management of exempted supplies, these supplies will typically not have the management expertise that is available within larger supplies. As these supplies, by definition, fall outside the monitoring and reporting requirements of the Regulations, a deterioration in water quality over time will not be picked up in the same way as it would with regulated supplies, and remedial measures will be reactionary under funding programmes rather than targeted (as is the case with regulated supplies). An example of this is where the HSE detect illness in the community where equipment such as pumps or water treatment fails due to lack of any or regular maintenance.

The majority of exempted supplies take their water from individual wells. In cases where the construction of the well is sub-standard this presents a considerable risk (i.e. if the source is surface influenced). The adequacy of installed water treatment facilities on these supplies can be poor, has failed, or was never installed in the first instance.

It should be noted that, other than the almost 180,000 unregulated household supplies, which serve around 10.3% of the population, exempted supplies serve only 1.1% of the population (approximately 53,000 persons), and there would be a significant additional burden on both local authorities and the EPA in monitoring and reporting on these supplies.

The research undertaken as part of this study has highlighted that exempted supplies can be considered one of the most significant weaknesses in the governance and monitoring of Rural Water Services in Ireland.

The links between exempted supplies and incidences of waterborne disease in Ireland, such as those caused by VTEC and Cryptosporidium, have been well established.

It is an anomaly in the regulatory system that there is an obligation to register a DWWTS (e.g., a septic tank) but not a water supply that falls under the thresholds in the Drinking Water Regulations (i.e. an exempted supply). It is also an anomaly in the planning and regulatory system that, depending on circumstances, a new DWWTS requires planning permission but a private well can be constructed on an existing domestic premises without planning or any other consent.

There is a strong case for a registration system for all private water supplies, with the onus on the water supplier to register, and to maintain data on its treatment system. Such a register could be audited, based on risk, by the Supervisory Authority. This register could be used to identify water quality risks to those supplies by linking the supplies to other catchment-based water quality datasets that have been or are being developed under the Water Framework Directive.

The population and volumetric thresholds for determining what constitutes an exempted supply are EU wide thresholds taken directly from Council Directive 98/83/EC. These thresholds will have different implications for monitoring and reporting in different EU countries depending on the extent of the rural population, farming activity and source vulnerability in each country. In Ireland, exempted supplies (including household supplies) serve over 11% of the population, or approximately 550,000

people. This is a considerable proportion of the population to lie outside the monitoring and reporting requirements of the Drinking Water Regulations.

A significant part of the rural population in Ireland relies on private water supplies, the majority of this being exempted supplies (11% of the population) for their daily household drinking water needs. In addition, others (eg. tourists and visitors) also use these private supplies from time to time. Many of the water sources concerned are vulnerable and there is increasing human activity (more housing, more intense farming in these areas. These exempted supplies have, relative to public supplies, limited, inadequate and sometimes poorly maintained treatment equipment installed, or no treatment installed at all in some cases.

Taking all of these interacting factors into account, there is a real and increasing risk that a significant portion of the population in Ireland is not receiving an adequate level of regulatory protection under the current Drinking Water Regulations approach, in contrast to consumers on public supplies. Consumers on public water supplies avail of drinking water that is more frequently monitored and comes from increasing improving and sophisticated treatment systems. In addition, the treatment systems are operated under water industry standard operational procedures that are rigorously applied by Irish Water as national water utility. These shortcomings can be coupled with the DWWTS co-location risk and the associated regulatory anomalies regarding the development of water sources close to them.

There is a very compelling case that the current Drinking Water Regulations are too broad in that they cover all water supplies, and that there would be a benefit in having a more focused approach consisting of two separate sets of regulations, i.e... one for public and another for private supplies, as is the case in the UK.

The voluntary nature of group water schemes, coupled with an absence of trained water professionals, can lead to consumers on these supplies having increased exposure to human health risks that are water quality related. Water quality issues are persistent and long running in some schemes, mostly smaller ones (annual EPA focus on private supplies reports). The poor water quality is typically caused by improperly operated water treatment systems, or no or inappropriate systems in some cases, coupled with poor distribution system management. These increased risks exist even for supplies using the DBOs model where water quality focused network management and monitoring may be inadequate thus diminishing the expected more assured water quality benefits from the heavy investment by the State in their water treatment infrastructure and its ongoing operation.

The level of risk associated with water quality with a human health dimension increases as supply size reduces. Risk exposure is particularly acute in the case of exempted supplies. Generally, ‘exempted supplies’ do not participate in water quality focused training regimes such as the Quality Assurance system operated by the NFGWS. The taking in charge of schemes, where possible, eliminates and the progressive amalgamation/rationalisation, involving the appointment of professional managers, greatly helps to mitigate these human health related risks. The risk is exacerbated by the reluctance of some supplies to proactively consider the above elimination or mitigation options. Some non DBO GWS can be as small as two houses (the average is 82 houses) thus taking in charge or amalgamation/rationalisation are not practical propositions for all exempted schemes.

Therefore, unacceptable human health risks will remain for the ‘exempted’ PriGWS (800 supplies serving 40,000 persons or 0.8% of the population) if appropriate elimination/mitigation action is not taken.

If exempted PubGWS were taken in change as a single exercise rather than piecemeal (which would be feasible as there are only 5,000 domestic connections in this group), this would benefit all parties,

including consumers, Irish Water (in respect of leakage control) and local authorities. The vast majority of exempted PubGWS are believed to be moribund and functioning for all practical purposes as part of the public mains incurring no day-to-day operational costs.

In relation to exempted PriGWS, these are not believed to be moribund or 'orphan' and need to function to at least operate pumps and treatment equipment in some cases. The best approach from a public health perspective is to be taken in charge or amalgamated, where technically and economically viable to do so. However, it is unlikely to be technically and economically viable to do so in many cases due to their remoteness and therefore they will need standalone solutions with treatment requirements based on risk. For these supplies, there may be merit in progressively undertaking better location mapping, linked to risks such as source vulnerability, VTEC incidence etc.

There may also be merit in undertaking a survey of activity and needs of exempted PriGWS, to more fully understand the sub-sector.

One other option for addressing the issue with exempted supplies is to develop a formal risk assessment procedure for such supplies, as other jurisdictions have done. This is discussed in detail at the end of the next chapter.

7.0 HOUSEHOLD SUPPLIES

7.1 Overview

Under the Drinking Water Regulations, an "exempted supply" means a supply of water which:

> *(a) (i) constitutes an individual supply of less than 10 cubic metres a day on average or serves fewer than 50 persons, and (ii) is not supplied as part of a commercial or public activity, or*
>
> *(b) is used exclusively for purposes in respect of which the relevant supervisory authority is satisfied that the quality of the water has no influence, either directly or indirectly, on the health of the consumers concerned.*

Household supplies will always fall below this threshold and will be exempt from the monitoring and reporting requirements of the Regulations.

In Ireland, most supplies that serve only a single household are private wells, but a very small number comprise rainwater capture and treatment.

Household supplies are a very specific subset of exempted supplies as they are the responsibility of the householder and are therefore worthy of separate discussion here. They also serve a substantial portion of the Irish population, as discussed below.

7.2 Numbers of Household Supplies and Population Served

It is not possible to say for certain how many household supplies there are in Ireland, the CSO 2016 census reports the number to be almost 180,000. Assuming an occupancy ratio of 2.75 persons per house (CSO, 2016), would suggest a population served of the order of 495,000, equivalent to around 10.3% of the population).

In terms of population served, 10.3% is a significant figure. To put this in context, if the population served by these household supplies were all resident in one county it would be the third largest county after Dublin and Cork, or stated another way, the population served is only marginally less than the population of Connaught.

By way of comparison, in Austria some 8% of the population are served by individual wells. Over 15 million U.S. households rely on private household wells, or approximately 12% of the population.

In England, there are some 29,333 single dwelling supplies, serving an estimated 70,000 people (0.1% of the population). The number of people served by household supplies in Ireland, relative to our population, is therefore approximately one-hundred times that in England, reflecting the dispersed nature of our population.

Most household supplies in Ireland are from bored wells (boreholes) but some rely on surface water (springs, streams, rivers etc). Installed treatment for household supplies ranges from no treatment, to softening only, to filtration, to full protection from cryptosporidium and other waterborne pathogens (validated UV with or without filtration).

7.3 Monitoring and Oversight

As with any water supply, in broad terms the Drinking Water Regulations apply to household supplies, as the exemptions only relate to *monitoring* and *reporting* requirements of the Regulations.

Each of the almost 180,000 householders is a *water supplier* under the Regulations, and therefore each has a duty under Regulation 4 to ensure that the water is *wholesome and clean and meets the requirements of these Regulations*.

In the same way as any exempted supply, the Supervisory Authority has certain duties under Regulation 14 in respect of exempted supplies. They must notify the population served by an exempted supply of:

> *(a) the fact that these Regulations do not apply to such supply, and (b) action that can be taken to protect human health from the adverse effects resulting from any contamination of water intended for human consumption*

Consultation with local authorities would suggest that the communication requirements for exempted supplies under Regulation 14 are applied to small non-household supplies, but not to household supplies.

Under Regulation 14*, where it is apparent to a local authority that a potential danger to human health arises from the quality of an exempted supply* (including household supplies) *it shall ensure that the consumers of that supply are given appropriate advice promptly*. In practice this is not undertaken, as the resource requirement for such a task would be considerable.

The EPA have produced excellent advice in respect of household wells and recommend that householders test their well water at least once a year to check water quality. This advice is available at:

https://www.epa.ie/environment-and-you/drinking-water/household-wells/

In terms of overall impact on health and the environment, in the EPA's *Review of the National Inspection Plan for Domestic Waste Water Treatment Systems 2018-2021*, they point to household wells as presenting a particular risk where they are co-located with septic tanks.

7.4 Funding

Grants for upgrading private wells are available under the Rural Water Programme 2019-2021 (Measure 8) and full details of this process is outlined in Volume 1. This grant is 'demand-led' based on applications from householders.

Grant aid changed in 2020 with the publication of the *Housing (Private Water Supply Financial Assistance) Regulations (S.I. 192 of 2020)*. Grants of up to a maximum of 85% of €3,000 are now available for well rehabilitation, or up to 85% of €5,000 where the Local Authority agrees that a new well is the most appropriate solution. In terms of treatment costs, grants of up to 100% of €1,000 are available for installing or upgrading on-site treatment such as UV. There is no operation and maintenance grant available in the same way as for group water schemes. However, a household can avail of the grant every seven years and before the seven years if unforeseen circumstances occur.

7.5 Issues Arising

In terms of possible health risks to the householders on these almost 180,000 supplies, it can be said that there are a number of considerable challenges, in particular in respect of microbiological contamination.

It is unlikely that many of the householders on these supplies know that they are classed as a *water supplier* under the Regulations, who must produce water that is *wholesome and clean and meets the requirements of these Regulations*.

Given that these supplies lie outside the monitoring and reporting requirements of the Regulations, in terms in health risk to a certain extent they are at the mercy of:

- The quality of construction of the well, and protection of the well (or other source) and any treatment system in place
- Land use practices in the catchment close to the well (or other source)
- Their own health status (should an incident occur)

Some householders on their own private supply believe that they are immune from the effects of any microbes that may be in their water, and the fact that they are used to consuming the water affords them a level of protection against possible infection. This flawed belief at the very least ignores issues like the risk to visitors.

The Health Protection Surveillance Centre (HSPC) however state that Ireland has one of the highest rates of VTEC (Verocytotoxigenic Escherichia coli) infections in Europe. This toxic strain of E. Coli. produces a powerful toxin which can cause severe illness, particularly in children under five and the elderly. These groups are at risk of a complication called haemolytic uraemic syndrome (HUS), in which the red blood cells are destroyed and the kidneys fail. This happens in up to 10% of child cases. HUS is the principal cause of acute kidney failure in children, and the majority of cases of HUS are caused by *E. coli O157*.

Cases of VTEC infection in Ireland have increased significantly since 2010, as shown below, and many of these infections have been reported as occurring in private household supplies.

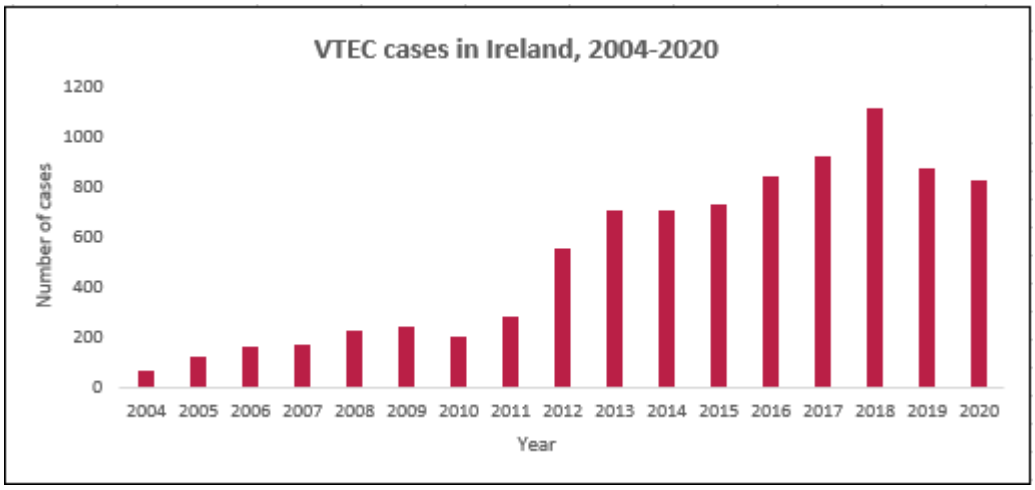


Figure 7.1 VTEC Cases in Ireland

Given that households on private supplies are typically also located in unsewered areas, there is a significant link between the installed quality and operation of DWWTS (discussed in Section 8) and the quality of water in household supplies. According to the EPA in 2020, *with 500,000 septic tanks and other forms of domestic waste water treatment systems operating in Ireland, householders with private wells in rural areas are particularly vulnerable to pollution from faulty septic tanks*.

In terms of the efficacy of the systems currently in place for householders to upgrade their private individual supplies, or to upgrade on-site treatment facilities for the water, consultation with those involved in the administration of private well grants suggests a number of common themes:

- The number of applications for grant aid was lower up to 2020, before the new financial assistance Regulations came into force
- The €1,000 grant aid allocated to water treatment for private wells is seen by some local authorities who participated in the consultation as inadequate and much of this is used in the cost of taking two water quality samples.
- Most applications are for drilling new wells, not for upgrading treatment facilities, and this is being driven by drilling companies

While the protection of human health for those served by household supplies is dependent on both the quality of construction of the well itself, and the level of treatment installed, many households are still operating on sub-standard wells with inadequate treatment, and do not have adequate protection from cryptosporidium, VTEC and other waterborne pathogens.

One option for addressing the issue with household supplies (and indeed all exempted supplies) is to develop a formal risk assessment procedure for such supplies, as other jurisdictions have done. In England and Wales for example, under Paragraph 6 of the *Private Water Supplies (England) Regulations 2016*, a local authority must carry out a risk assessment for every private water supply in its area and review and update that risk assessment every 5 years. In relation to private *household* supplies, the local authority is not required to undertake a risk assessment as standard but must carry out a risk assessment *if requested to do so by the owner or occupier of that dwelling*. The local authority can make a charge to the person making the request for this service up to the maximum specified in the Regulations.

The template developed by the DWI for such risk assessments is useful in that that list of questions contained in the risk assessment form highlight the potential risks associated with household supplies, and at the very least alert the householder to the potential risks associated with such supplies.

Finally, there may be merit in considering linking the private well grant to septic tank improvements given the issues raised on co-location. This could in effect constitute a fourth grant stream if the house has a defective DWWTS.

8.0 DOMESTIC WASTE WATER TREATMENT SYSTEMS

8.1 Numbers of DWWTS and Population Served

A significant percentage of the Irish population is not connected to the public sewer. Based on Census figures, it is estimated that some 30% of the total population is unsewered.

A detailed basis for estimates of DWWTS is provided in Section 2.3 of Volume 1, and outlines some of the uncertainties associated with providing accurate figures. It can be said however that the number of individual on-site Domestic Waste Water Treatment Systems (DWWTS) is of the order of 580,000, serving an estimated population of 1,650,000.

The vast majority of DWWTS are septic tanks, accounting for more than 80% of the total.

The high percentage of unsewered properties in Ireland stems from the fact that Ireland has a dispersed rural population compared to other Western European countries. While the population density of the Republic of Ireland was 70 persons per km^2 in 2016, this average is a blend of both urban and rural densities, and the average population density in rural areas was only 27 persons per km^2. The OECD classify areas with population densities of <150 per km^2 as predominately rural

By way of comparison, only 4.8% of the Austrian population are connected to DWWTS (septic tanks or similar). In some countries like Germany and Spain, the percentage of unsewered properties is even lower, as shown in Figure 8.1.

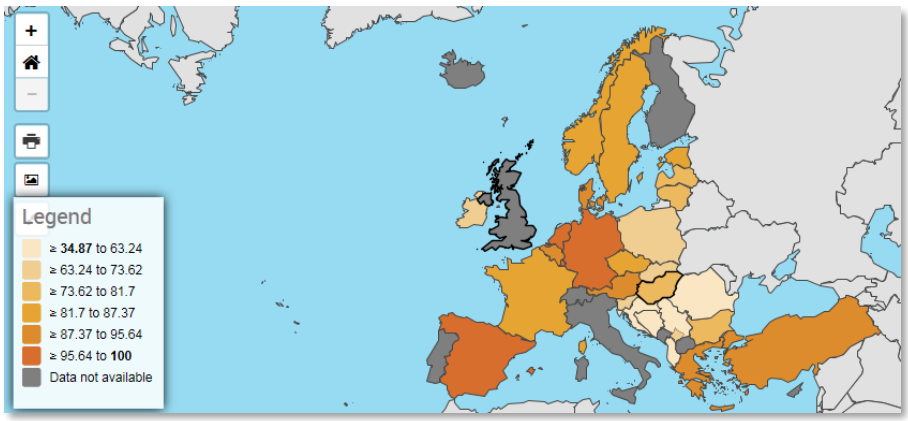


Figure 8.1 Percentage of Population Connected to a Public Sewer 2016

8.2 Registration

As outlined in Volume 1, in October 2009, the European Court of Justice ruled against Ireland in relation to rural waste water and deemed Ireland non-compliant with elements of the Waste Directive (Case C188-08). In response, the Irish government introduced legislation over the period 2012-2013 that required the registration of DWWTS.

The *Water Services (Amendment) Act (No. 2 of 2012)* sets out the legislative requirements in respect of registration of DWWTS, duties of owners of premises served by DWWTS, powers of Inspectors, duties of Water Services Authorities, duties of the EPA, and the National Inspection Plan.

The *Water Services Acts 2007 and 2012, Domestic Waste Water Treatment Systems (Registration) Regulations 2012 (S.I. No. 220 of 2012)* sets out the specific requirements for registration of DWWTS.

Owners of Domestic Waste Water Treatment Systems are now obliged under Section 60 of Water Services Act 2007 to register their systems, via the *Protect Our Water* website.

As of 20th October 2017, 462,611 DWWTS have been registered across the country. This is approximately 95% of the estimated total number of 580,000.

Consultation with local authorities as part of this study suggests that in general terms the registration rates are high across most counties.

8.3 National Inspection Plan

The EPA is required to produce a National Inspection Plan for the inspection of DWWTS and must review the plan at least every five years and make revisions if necessary. The first National Inspection Plan covered the period 2013-2014.

The EPA also produce comprehensive reports on progress with the National Inspection Plan, and these reports provide a summary of the areas where improvements have been made, and areas that still require action. In 2021, the EPA reviewed the 2018-2021 Plan and made recommendations to inform the 2022-2026 Plan. The EPA have prepared a *draft National Inspection Plan* for the period 2022-2026, incorporating the recommendations of this review.

Inspections of DWWTS are undertaken by trained technical staff within the local authorities, who were consulted with as part of this study. These staff are EPA appointed and trained but have other duties within the local authorities. Following the appointment of inspectors, on a three-year term, the EPA also provide ongoing facilities for collaboration between inspectors. Workshops have highlighted some differences in the approach to undertaking inspections, but in general there is a high level of consistency in this regard.

Since 2013 the EPA has appointed a total of 189 inspectors, and currently there are 127 appointed inspectors. The numbers of inspectors per county varying depending on the scale of DWWTS in a county but are in single figures in each county.

The number of inspections per county is set by the EPA based on overall risk to water quality and has remained constant at 1,000 per year since 2013. This is a minimum figure and local authorities are asked to undertake additional inspections if there is evidence at a local level that DWWTS are causing problems in an area.

The EPA have identified four spatial criteria and areas for inspection fall into one of ten risk zones depending on the degree of overlap of these spatial criteria. The spatial criteria comprise:

- At Risk water bodies
- Areas for Action
- DWWTS Significant Pressure areas
- Increased Groundwater Risk potential

Over half of the total number of 1,000 inspections are specified for Risk Zones 1B and 2B as set out in Table 8.1

Table 8.1 Allocation of DWWTS to Risk Zones (NIP 2018-2021)

Risk zone	At risk water body [1]	Area for action [2]	DWWTS significant pressure	Increased groundwater risk potential	Weighting applied to risk zone	National number of inspection per risk zone
1A	✓	✓	✓		100	59
1B	✓	✓	✓	✓	200	243
2A	✓	✓			25	142
2B	✓	✓		✓	50	360
3A	✓		✓		20	8
3B	✓		✓	✓	40	22
4A	✓				10	30
4B	✓			✓	20	77
5A					1	16
5b				✓	2	43
Total no. of inspections						1,000

While the inspection system is, in general terms, working well, some local authorities thought that the level of inspection was inadequate as it couldn't provide a meaningful picture of the problems associated with DWWTS. The EPA consider the level of inspections, at 1,000 per year, to be adequate relative to the risks to water quality posed by DWWTS and point to the fact that there are other significant water quality pressures such as agriculture within river catchments. They have stated that the inspection programme is good in identifying the pressures on water quality from DWWTS, but that the main weakness in the system is in enforcement and close out of legacy issues, as discussed later.

Consultation to inform this study found that, while the National Inspection Plan is achieving its targets in terms of the numbers of annual inspections (other than a slight dip in 2020 due to COVID-19) there are practical issues associated with undertaking inspections, such as the fact that they are labour intensive and must be conducted in pairs.

8.4 Operation

Given that the vast majority of DWWTS are septic tanks, accounting for more than 80% of the total, there is very little maintenance associated with most DWWTS, other than desludging. Proper operation can also include other maintenance such as repair of structural issues, replacement of covers etc.

The EPA's review of the National Inspection Plan 2018-2021 found that the two most common reasons for inspection failures are lack of desludging (24%) and lack of maintenance (39%).

Under the Water Services Act, householders are responsible for maintaining their DWWTS. Lack of maintenance and desludging has consistently been highlighted in every review of the National Inspection Plan and is clearly an issue where improvement is required. The reasons behind this operational deficit are broad. Given that septic tank systems can operate without power (in most cases), there is a risk that householders pay very little attention to their systems, until absolutely required to do so.

The reasons behind this lack of maintenance have been highlighted in a pilot project undertaken by the National Federation of Group Water Schemes, who piloted community septic tank de-sludging programmes within group water scheme catchment areas from 2015-2018. Data from that project suggested that on average 69% of homeowners knew *they had a legal obligation to properly maintain their DWWTS*, but only 32% *knew where to source information*.

In some respects, other than where there is a known issue or where the householder is particularly conscious of the environmental risks associated with not desludging, householders tend to desludge their septic tanks when other DIY priorities have been addressed.

Consultation to inform this study found that one local authority saw a significant increase in sludge volumes (400%) arising out of septic tank desludging since the start of the pandemic in March 2020. This clearly indicates that desludging is viewed as somewhat discretionary.

8.5 Funding

A detailed discussion on the history of grant aid for DWWTS is provided in Section 6.1.4 of Volume 1.

Since 2013, financial assistance from the exchequer has been available to householders to upgrade or replace their DWWTS, dependant on an *Advisory Notice* being served under the National Inspection Plan and is therefore not universal.

This system operated from 2013 to 2020. In 2020, the focus of grant aid changed, and was expanded, improved, and more targeted at areas where significant pressures existed. In this way the National Inspection Plan was aligned with the objectives of the River Basin Management Plan.

The availability of a grant for DWWTS was expanded in 2020 and became three grants each with different criteria (grant availability can overlap in some locations). These grants all cover remediation, repair, upgrading or replacement, and are administered by the local authorities under the Rural Water Programme. The grants, while expanded and improved financially, are not universal. Funding is 'demand-led' based on applications from householders.

There is still a category of grant aid available (under SI 184 of 2020) for DWWTS which fail inspections and are issued an Advisory Note, regardless of where in the country they are located.

The other two categories are targeted at specific water quality risk zones. The first relates to Prioritised Areas for Action under the River Basin Management Plan). To qualify here (under SI 185 of 2020), the householder must have received a letter from LAWPRO (Local Authority Waters Programme, a body created in 2018 to implement the River Basin Management Plan). This occurs in areas where LAWPRO have identified the DWWTS as a potential pressure.

The second relates to High Status Objective Catchment Areas under the River Basin Management Plan. In this latter category, grant application can be initiated by the householder.

As stated earlier, grants are administered under Measure 8 of the Rural Water Programme by the local authorities. Consultation with these authorities suggest that there are low levels of uptake of grants in High Status Objective Catchment Areas, as it very difficult to meet the necessary qualification criteria. This consultation also suggests that the €5,000 cap on financial assistance (up to 85% of the cost) is deterring many householders from applying for grant aid.

In terms of grant aid for operation of DWWTS, as stated earlier, other than desludging costs there are very little costs associated with the operation of most DWWTS. Typical desludging costs are of the order of €300 but vary significantly from place to place. Desludging frequency recommended by the EPA is dependent on the size of the tank and the number of persons served but varies from 1 to 5 years (typically 3 years for a normal house). The community septic tank de-sludging programme piloted by NFGWS saw the average de-sludging cost reduced to €170 per septic tank. Currently these are no grants available for desludging.

8.6 Impact on the Human Health and the Environment

The EPA's *Review of the National Inspection Plan for Domestic Waste Water Treatment Systems 2018-2021* includes a comprehensive discussion on the overall impact on the environment from DWWTS, based on the inspections carried out under the National Inspection Plan.

The high-level conclusion of that review was that approximately 25% of DWWTS had inspection failures that are a risk to human health or the environment.

The review drew specific attention to risks associated with co-location of household wells and DWWTS. Based on CSO data there are approximately 164,000 such situations (which is broadly consistent with the number of household wells nationally), or approximately 28% of the total of 580,000 DWWTS in Ireland. While this risk has always been known about, the review focuses in on the problem and reports that only 29% of DWWTS inspections in 2018-2020 were at households with household wells. At these locations, the inspection failure rate was 51%. The review goes on to recommend that the 2022-2026 National Inspection Plan increase inspections of DWWTS co-located with household wells.

In relation to inspections and associated failure rates, it is not proposed to critically appraise the EPA review here and the full discussion on inspection findings can be read in Section 4.5 of that review. The main findings can be summarised as follows:

- the inspection failure rate for DWWTS is approximately 50% and has stayed relatively static over the years
- the main reasons for failures are:
    - de-sludging and maintenance failures
    - structural defects causing illegal discharges to ditches/streams, leaks, ponding and rainwater ingress.
- There are considerable differences in inspection failure rates across water service authority areas (e.g. above 70% in Mayo and Roscommon, below 20% in Waterford, Carlow and Westmeath). These differences may be partly attributable to differing ground conditions in those counties (e.g. impermeable soils), but also possibly to differences in the way inspections were being conducted
- There is variation in the compliance rate based on the age of systems, with older systems failing more frequently than newer systems

8.7 Enforcement

The EPA's *Review of the National Inspection Plan for Domestic Waste Water Treatment Systems 2018-2021* also reports on progress with enforcement actions arising out of DWWTS inspections.

The current process from inspection to enforcement can be outlined as follows:

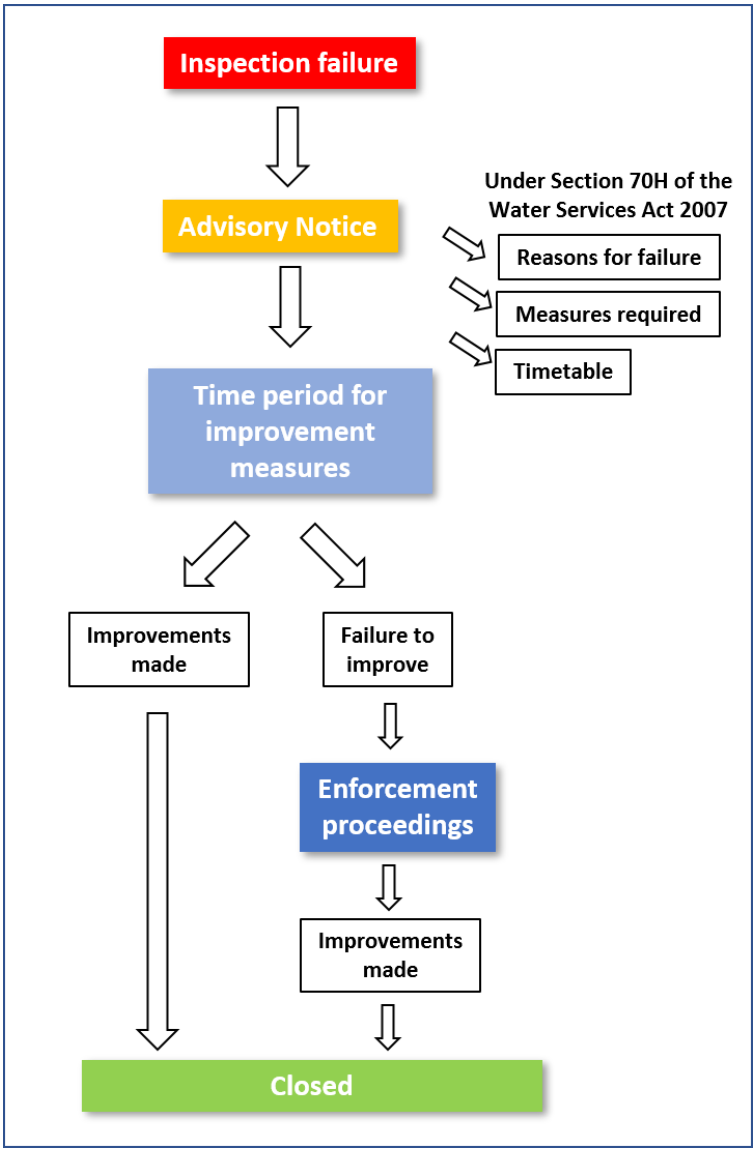


Figure 8.2 Process Flowchart from Inspection to Close Out

As part of this process, typical timeframes of 1 to 12 months are specified for remedial works depending on the seriousness of the issue and scale of works required. Failure to comply with an Advisory Notice is a prosecutable offence with a potential fine of up to €5,000.

From 2013 to 2020, 3,909 Advisory Notices were issued by Water Service Authorities. Of these a total of 2,972 (76%) have been closed. 429 Advisory Notices were open more than 2.5 years as of June 2021.

The failure to close out on open Advisory Notices is attributable to a number of factors. Consultation with local authority staff involved in the process highlighted several practical issues associated with this process, including:

- In order to avail of the remediation grant, DWWTS that were in place when the registration scheme commenced must have been registered on or before 1st February 2013. In some cases, such as where the householder was out of the country around 2013 and failed to register their system, this is seen as is overly restrictive
- The overall process can be quite lengthy, for example the initial serving of an Advisory Notice requires a Director's Order

- In order to undertake remedial works in response to an Advisory Notice, while grant aid is available, the fact that householders have to come up with the remediation cost upfront and then claim it back can be a deterrent

There is also an unwillingness on the part of some local authorities to take enforcement proceedings as part of this process, while others are very active in taking the legal route. Since 2013, only 34 summonses have been issued under this legislation for failure to comply with Advisory Notices. Of these 31, have been taken by only 3 water service authorities. Meaning that the remaining 25 water service authorities have collectively issued only 3 summonses in 8 years.

Another factor in the reluctance to take enforcement action in the courts is the perceived low likelihood of a positive outcome. Details from 24 of the 34 legal proceedings that have been concluded, show that the issues were ultimately corrected in 20 cases and not in the other 14 cases, and that fines were issued in only 6 cases.

9.0 GOVERNANCE OF THE RURAL WATER SECTOR

9.1 Current Governance Model

The governance model for the delivery of rural water services is set out in detail in Section 5 of Volume 1.

The term *governance* means different things to different people and can often be a poorly understood or loosely defined term.

One common definition of governance is:

> *the act or process of governing or overseeing the control and direction of something*

Using this definition, in the context of the rural water sector, governance is quite broad as there are many stakeholders that can be said to have control and direction over the delivery of services.

In terms of rural water supply, these include:

- The **owners** of private water supplies
  - Group Water Schemes (supported in some cases by the DBO contractors that operate private water supplies on their behalf)
  - Small Private Supply owners
  - Householders with their own private supply
- The **representative organisations** that advocate on behalf of the owners of private water supplies and provide advice and training to their members (NFGWS)
- The **national government department** (currently the Department of Housing Local Government and Heritage) that:
  - sets policy, and
  - provides funding to support the sector
- The **local government** structures that:
  - administer, at a local level, the grant aid provided by national government, and
  - undertake monitoring as set out in legislation
  - provide advice and support to the sector through the Rural Water Liaison Officer
- The **health authorities** that carry out their legislative role in respect of protection of human health (i.e. the HSE)
- The national provider of public water supplies, **Irish Water**, in respect of supplying and taking in charge Group Water Schemes
- The national regulator for public water supplies, the **Commission for the Regulation of Utilities**, who determine tariffs relevant to PubGWS.
- The body that provides **human health and environmental oversight** as set out in the legislation (i.e. the EPA)
- Other sector specific **expert groups**, that provide advice that inputs to the formulation of policy, including
  - An Fóram Uisce
  - Water Policy Advisory Committee
  - Rural Water Monitoring Committees, that act as a forum in the local authorities on rural water matters, particularly on group water schemes

These structures, and the interactions between the various stakeholders can be summarised as shown in the diagrams below, while each stakeholder is discussed in the subsections following.

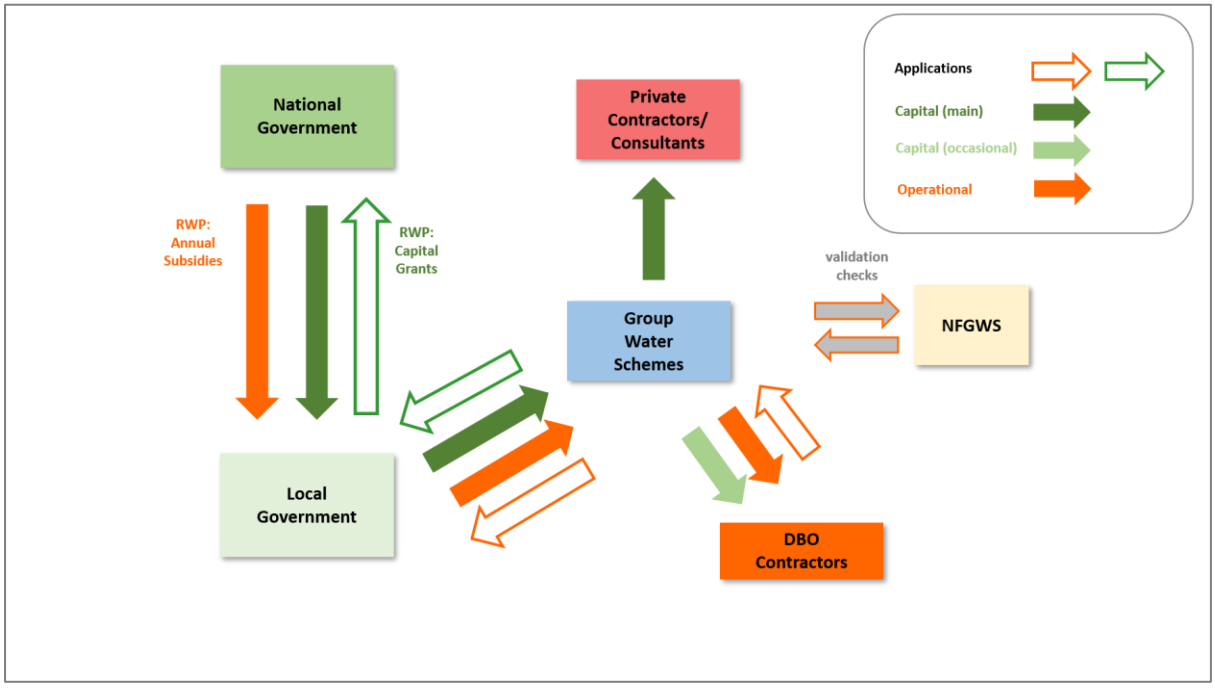


Figure 9.1 Current Funding Model for Rural Water Supply

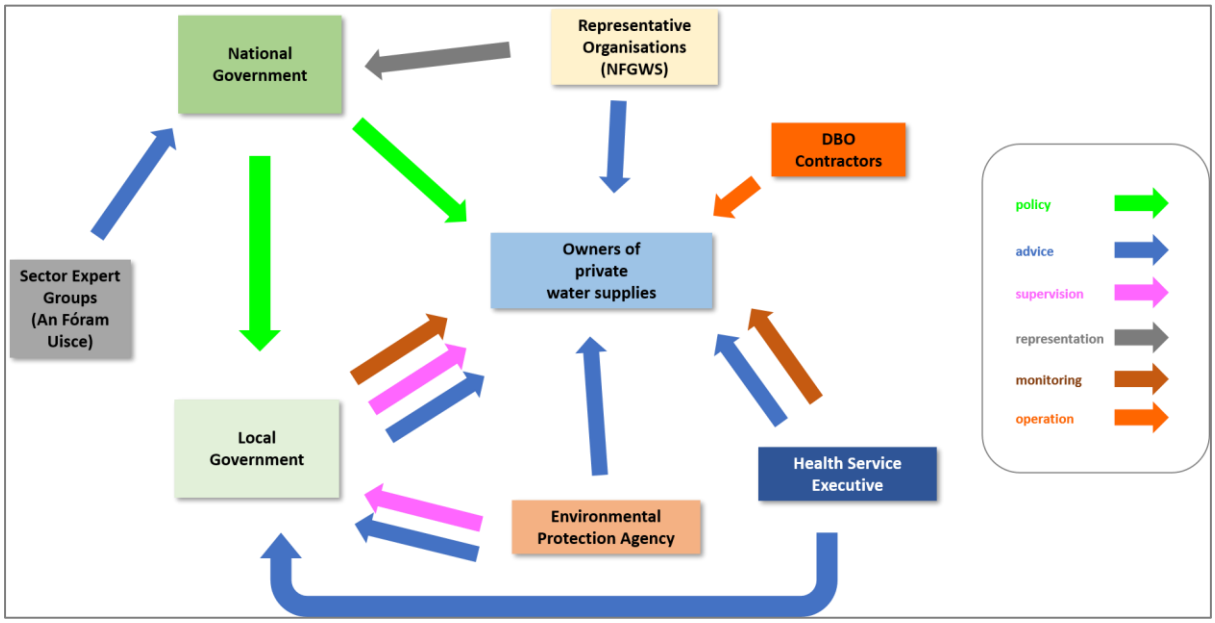


Figure 9.2 Current Governance and Regulation Model for Rural Water Supply

In terms of rural waste water, the main stakeholders include:

- The **owners** of DWWTS
- The **national government department** that
  - sets policy, and
  - provides funding to support the sector, currently the Department of Housing Local Government and Heritage
- The **local government** structures that
  - administer at a local level the grant aid provided by national government, and
  - carry out inspections
- The body that provides **human health and environmental oversight** through the National Inspection Plan (i.e. the EPA)

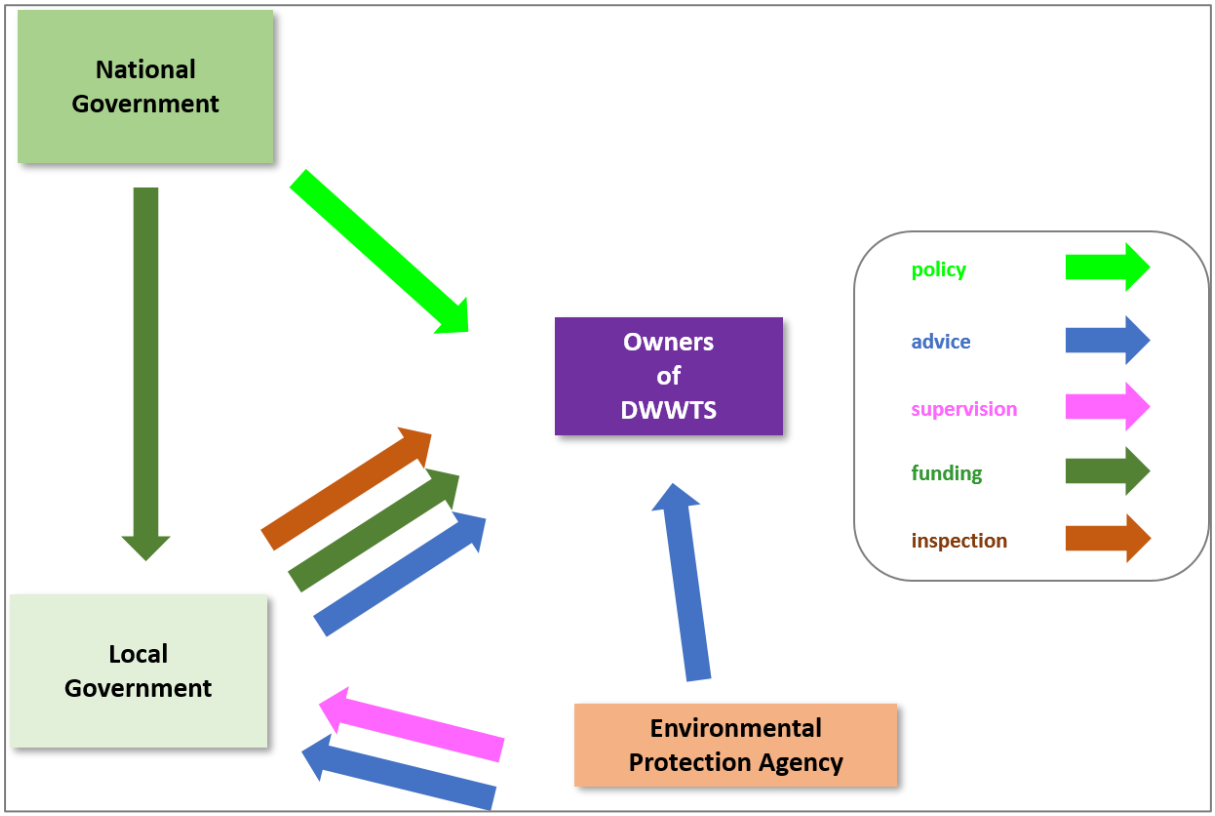


Figure 9.3 Current Funding and Governance Model for Rural Waste Water

9.2 Consultation on the Current Governance Model

A broad range of consultation was undertaken to inform this study. This included a representative sample of the stakeholders shown in Figures 9.1 and 9.2 and resulted in the collation of an extensive range of views on the current governance model.

These views were documented and examined in order to identify broad themes in the views expressed during the consultation.

The approach taken to consultation was an 'open book' approach, where all participants were asked to express their views without any worry about how those views would be reported on. Attendees were informed that the final report would not name any individual who expressed a view, just the organisation or cohort that they represented. Furthermore, this report deliberately does not contain an appendix of the consultation outcomes and the views expressed are summarised here in the main text.

The main views expressed and common themes emerging are grouped together under the headings listed below.

9.3 Ownership of Private Water Supplies

During this study a number of group water schemes were consulted with to provide a snapshot of the range of views within the rural water sector. These schemes were suggested by the Client, in consultation with the NFGWS, as providing a snapshot of the range of views of the rural water sector and included:

- A large GWS that is part of a DBO bundle, supplying over 2000 connections
- A large private source independently operated GWS, supplying over 400 connections
- A small private source independently operated GWS, supplying over 100 connections
- A large public source GWS
- A small public source GWS

The purpose of this consultation was to ascertain the views of these private water suppliers on the workings of the sector. While the individuals consulted with gave their own personal opinions which broadly represented the views of the scheme, it is acknowledged that these schemes represent a small sample base of the sector. However, it is assumed that the views expressed are broadly representative of the sector as a whole. Given that the five selected GWS were put forward to represent a broad range of views on the sector, it is no surprise that the views expressed were quite varied. Nevertheless, it is possible to identify some themes from this consultation.

One of the most fundamental aspects of the opinions expressed was on ownership of their schemes, and where they see their schemes in the future. For private source non DBO operated schemes (and indeed DBO operated schemes) there is a strong desire to remain independent. The managers of these schemes have a sense of pride in their assets as they have procured, installed, and managed the operation of the assets since their inception. These schemes will not favour being brought into public ownership, unless there is an overriding water quality issue where they feel their members' health may be compromised.

This sense of wishing to remain independent has strengthened since Irish Water was formed, possibly due to the negative press associated with water charges and the metering programme in the mid-2010s, which may have left a legacy of distrust in that organisation.

Irish Water are also seen as a Dublin based national organisation that do not understand the local concerns of a rural group water scheme. The owners of these schemes have pride in what has been achieved in their own communities and are advocates for a water supply being a community run not-for-profit enterprise

This view is strong but not universal. The exceptions to this are generally where water quality issues have proven difficult to address independently and where the scheme are actively looking to be taken into public ownership, or in some cases into a DBO bundle (in which case they would remain as private supplies).

In some cases, the desire to remain independent has not always been matched by a desire of the community to step up and replace the managers and committee members who have run the scheme for many years. This has resulted in an ageing of the scheme principals with no obvious succession plan. The amalgamation and rationalisation processes however have provided benefits in terms of management and scheme viability for independently operated GWS. In some cases, however, schemes are reluctant to engage with this process.

The NFGWS have targeted putting in place a management system to address this issue which involves operational work being undertaken by suitably qualified employees (Manager, Caretaker etc), resulting in the GWS board acting in a monitoring and oversight capacity.

In general terms, schemes currently part of DBO bundles wish to remain part of those bundles. This view is understandable given that:

- they have retained ownership of the scheme
- their water treatment processes are operated by competent technical personnel
- they benefit from enhanced Annual Subsidy arrangements

In the case of public source GWS, the views on ownership are mixed. Some schemes have been actively trying to be taken into public ownership for many years, including schemes where the scheme principals have reached retirement age. In others there is the strong desire to remain in private ownership, in the same way as most private source GWS. This desire to remain independent is strongest where the scheme is well run, with an active committee and an obvious success plan.

9.4 Role of the NFGWS

The National Federation of Group Water Schemes (NFGWS) is the representative body for the group water scheme sector in Ireland. It was registered as a Co-Operative Society in 1998 and its remit covers both private sourced supplies public sourced supplies.

At present some 403 Group Water Schemes are members of the Federation, representing 78,000 households, of which 47,703 households are on DBO operated schemes.

The majority of these 403 schemes are privately sourced schemes. Most of the Group Water Schemes that are members of the Federation are also regulated supplies, currently 360 schemes.

The Federation is a key player in the rural water services sector and continues to provide professional and technical expertise to its members, as well as advocating for those members on key funding and governance issues.

The Federation is very active in representing their constituent members but have also taken a lead role in a number of strategic areas that will benefit the sector into the future. These can be summarised as follows:

- Water Safety Planning. The Federation have promoted the use of Water Safety Plans to deliver improvements in private supplies from source to tap.
- Source Protection. The Federation have recognised the importance of Integrated Source Protection Plans in protecting water quality and have published a number of key documents in this area
- Water Demand Management and Climate Charge. In response to the climate change crisis, the Federation have targeted the reduction in UFW reduction and water wastage on GWS supplies. In addition they have developed recommendations for climate charge resilience and specific measures to prepare for extreme events such as extended drought
- Biodiversity. The Federation have a number of initiatives in this area, including working with landowners to implement source protection actions that have ancillary biodiversity benefits
- Rationalisation and Amalgamation. As part of an overall initiative to introduce professional management structures on GWS, the Federation actively promote the rationalisation and amalgamation of schemes, where appropriate

Consultation with schemes who are members of NFGWS as part of this study did not highlight any issues around the Federation's role in the sector and the Federation are seen as providing a valuable range of services to its constituent members.

Consultation with the Federation itself took place over two days in July 2021, during which a number of important issues were raised by the Federation in respect of the rural water sector. This consultation was attended by all of the key technical and managerial staff in the Federation, and a number of presentations were made during the consultation.

Also in July 2021, three separate submissions were made by the Federation to the DHLGH as follows:

- *A New Direction for the Group Water Scheme Sector*, submission to DHLGH, 15th July 2001
- *Future Group Water Scheme Investment Needs*, submission to DHLGH, 15th July 2001

A number of pertinent issues were raised by the Federation in the 1st document (*A New Direction for the Group Water Scheme Sector*) in relation to the direction of the sector into the future. One of the key messages from this document is the Federation's view that evaluation criteria should be broadened beyond economic considerations when taking in charge appears to be the most economically sustainable solution. The Federation stated that they support this approach for schemes that are unwilling to meet their statutory obligations or that do not have an active management committee, but added that every effort should be made to sustain schemes that are committed to providing safe and wholesome water to their members and to meeting the other terms and conditions of subsidy under the Rural Water Programme.

In the 2nd document (*Future Group Water Scheme Investment Needs*), the Federation provided their views on the level of investment required under the three key themes and policy objectives of the *Water Services Policy Statement 2018-2025*; Quality, Conservation and Future Proofing.

9.5 Role of the Department

The Department of Housing, Local Government and Heritage (referred to here as the Department) is responsible for the formulation and delivery of policy in the area of rural water, and for providing funding to support the sector under the Rural Water Programme. The Programme, through Exchequer funding, delivers improvements to private domestic water services, both water and waste water, in areas of rural Ireland where there is no access no public water or waste water infrastructure.

A dedicated Rural Water Unit within the Department is based in Ballina, Co. Mayo. The Unit has responsibility for the development of the policy framework and the stewardship of related rural water capital and operational funding for Rural Water Services.

Consultation undertaken during this study did not highlight any issues around the Department's overarching role in terms of policy development in the sector. In terms of the provision of funding under the Rural Water Programme, while many stakeholders expressed views on the adequacy of the funding allocations, again no issues were highlighted in relation to the Department fulfilling its role in relation to the provision of funding.

9.6 Role of the Local Authority (rural water)

Local authorities are multi-purpose bodies responsible for delivering a broad range of services for their area. Local authorities provide an extensive range of infrastructural services and play an active role in the development of the county's industry, business, social, arts, heritage and cultural affairs. They also function as the regulatory body for certain matters at local level.

Local authorities perform both a representational and an operational role because the Irish system of local government encompasses both democratic representation and public administration. The representational role is performed directly by the elected members of the Council, which gives them the authority and legitimacy to speak and act on behalf of their communities.

The operational role of a local authority is performed by the Chief Executive and his staff but day to day operational decisions called 'Executive Functions' are a matter for the executive but must have regard to the policy direction determined by the elected member.

In summary a local authority has four main roles:

- Service Provider;
- Provider/facilitator of infrastructure;
- Regulator; and
- Facilitator of economic and community development.

These roles are not always in harmony and can come into conflict, for example in carrying out the regulation and facilitator of economic and community development roles.

In relation to the Rural Water Sector as discussed, under the Drinking Water Regulations Local Authorities are the Supervisory Authority for private water supplies. They also have a devolved role from the Department to administer funding under the Rural Water Programme.

The consultation undertaken to inform this study included discussions with eight representative local authorities from mid-May 2021 to the end of June, as follows:

- Mayo County Council

- Tipperary County Council
- Limerick County Council
- Wexford County Council
- Galway County Council
- Cork County Council
- Cavan County Council
- Clare County Council

The role of the local authority was also discussed in the consultation sessions with the other stakeholders.

The rural water department of local authorities is, in some sense, the last bastion of a meaningful water services function in most local authorities. Since 2013 there has been a gradual drain of water services engineering expertise to Irish Water, other departments within the local authorities and to the private sector, with a gradual hollowing out of staff numbers in these rural water departments.

Engineering and scientific staff in rural water departments also frequently have their time split between rural water work, and work in respect of Irish Water projects. These staff have reported that, due to the increasing workload associated with compliance with Irish Water's standards, the rural water function is often squeezed to whatever time is left. In many cases these same staff also cover non rural water duties such as review of planning applications.

There are many titles and structures that were put in place in local authorities in the early 2000s under the initial Rural Water Programme that had a stronger role then than they do now. A good example of this is the title of *Rural Water Liaison Officer*. The consultation in this study found many RWLOs who have built up a level of expertise and trust with the GWS in the county. In other cases, where an experienced RWLO retires or moves to another post, it has been difficult to fill this role with a person of equivalent experience.

The current rural water model, based on county structure, predated Irish Water and was founded on a system where water services were delivered on a county by county basis. This did not change when the structure of public water services was changed to a national model.

In terms of incident response on rural water schemes, prior to the formation of Irish Water each local authority was tasted with developing a Drinking Water Incidence Response Plan (DWIRP) for water supply zones in their functional area, and group water schemes were to be included as part of these plans. Irish Water have since developed their own emergency response plans, which leaves the status of rural water in relation to emergency response somewhat uncertain.

There is also a significant variance in the structures of Local Authorities in respect of the delivery of rural water services. In general terms, the various responsibilities fall under the water services and the environment directorates. In most authorities the water services and environment functions rest in separate departments. Over the course of 2020/2021 there has been an increase in the degree of reorganisation of the water services and environment functions in local authorities. Some have looked at merging the water services and environment functions under a single Directorate, while some Local Authorities now have a Physical Development Directorate that encompasses both functions and indeed has a broader remit.

The structures that were generally in place in most local authorities over the past 20 years are shown in Figure 9.3 below. This graphic is only indicative and varies widely from authority to authority. Furthermore, the duties that staff carry out also vary, with no consistency in the route of the blue arrows in the diagram.

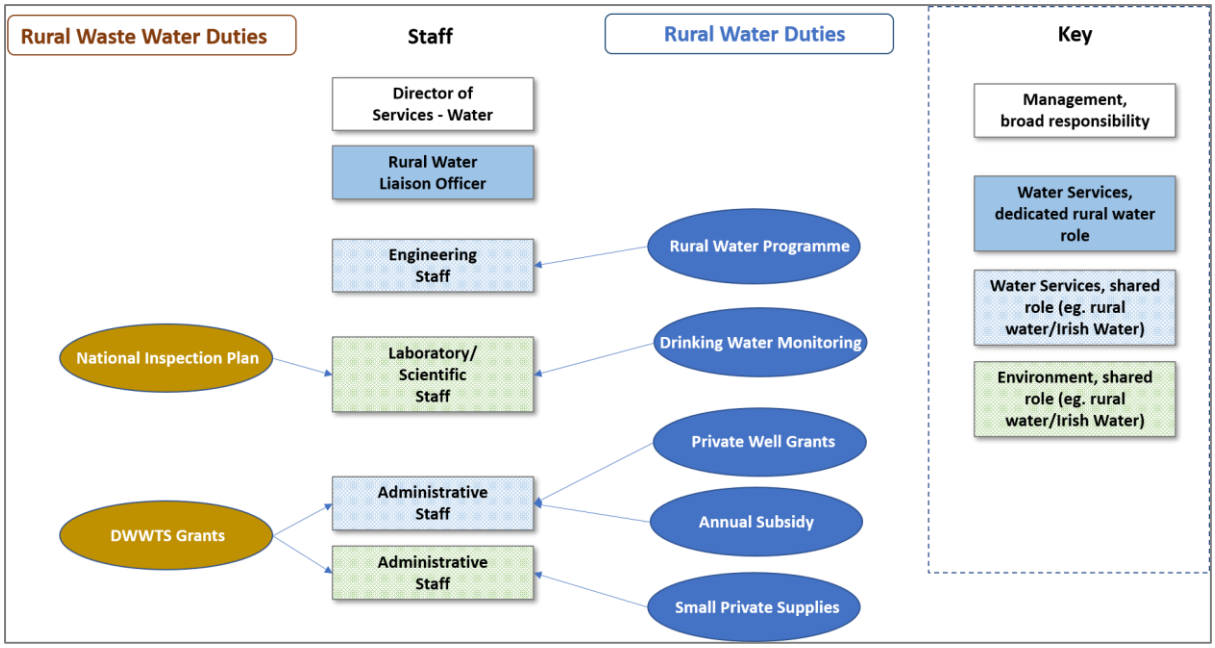


Figure 9.4 Typical Staff Model for Rural Water Services (current sample)

While the water services function in most local authorities has reduced in strength over the past eight years following the advent of Irish Water, the Rural Water Departments have one important feature in any consideration of the structure of the sector. Over the past 20 years a level of trust has built up between the group water schemes and these departments.

As the group water schemes are local community-based enterprises, they welcome the access that they have to technical personnel based in their own county, who can respond at short notice to issues that arise on their schemes. The schemes see this as a significant strength of the current structure.

Local authorities, as Supervisory Authority under the Drinking Water Regulations have powers under Regulation 12 (Intervention by Supervisory Authority) to step in where there is a risk to human health on a private water supply. This intervention includes two aspects:

- Issuing Directions to the water supplier
- Providing assistance or support to the water supplier

Consultation with the eight local authorities suggests that the focus is on the latter rather than the former. Most local authorities, in the case of a significant water quality issue which poses a danger to human health, will provide advice and assistance to resolve the matter. One of the questions put to the local authorities during consultation was the number of Directions issued under this regulation in the last three years. The consultation only recorded one such Direction issued across the eight local authorities.

The situations in which a Direction should be issued, are outlined under Regulation 9 (Protection of Human Health) which states that:

> *where a supervisory authority is of the opinion that*:

(a) non-compliance with a water quality standard or other parametric value specified in Part 1 of the Schedule, or

(b) the presence of any substance or micro-organism for which no water quality standard has been prescribed,

in water intended for human consumption, or the inefficiency of related disinfection treatment, constitutes, or may constitute, a risk to human health, the supervisory authority shall issue such direction to the relevant water supplier as it considers necessary to ensure that appropriate measures are taken for the purposes of preventing, limiting, eliminating or abating such risk, and the water supplier shall comply with such a direction.

The wording of this last paragraph contains a degree of subjectivity in that, before issuing a Direction under Regulation 12, the supervisory authority must first form the opinion that the supply constitutes a risk to human health. The term 'as it considers necessary' adds a further degree of subjectivity to this.

During the consultation with local authorities, there was also some confusion in relation to the difference between Regulation 9 and Regulation 12 in relation to issuing of Directions, and whether a Direction issued under Regulation 12 was subsequent to a Direction issued under Regulation 9, or whether they were one and the same thing. In any event, the consultation highlighted the fact that most local authorities do not in general exercise their powers under the Regulations in terms of issuing Directions, or certainly reserve this for the most serious water quality issues where all other means have failed to resolve the water quality issue.

9.7 Role of the Local Authority (rural waste water)

The duties and powers of local authorities in relation to rural waste water is described in Volume 1 and include:

- The maintenance of a register of domestic waste water treatment systems (DWWTS)
- Undertaking inspections of DWWTS under the National Inspection Plan

The performance of local authorities in carrying out this role is summarised in the EPA's *Review of the National Inspection Plan for Domestic Waste Water Treatment Systems 2018-2021*, as discussed in Chapter 8.

The consultation undertaken during this study did not highlight any significant issues around the inspection duties of local authorities in the National Inspection Plan.

9.8 Role of the Health Service Executive

As outlined in Volume 1, under current drinking water legislation, the HSE has statutory duties and powers in terms of the protection of human health for all water supplies, including both public and private supplies. Since 2007 the Health Service Executive has a statutory consultative role in Drinking Water and Health.

Prior to the formation of Irish Water in 2013, Water Quality Liaison groups were formed by most Local Authorities, generally meeting 2-3 times per year. These groups were comprised of senior Water Services personnel in the Local Authority, the Medical Officer of Health, and representatives of the Environmental Health Departments of the HSE. These groups have met less frequently in recent years, possibly on the basis that public water supply is now the remit of Irish Water.

There are two distinct functions within the Health Service Executive, in the context of drinking water:

- **Public Health**. This is the medical function within the HSE and a reference in the legislation to the HSE's powers in the protection of human health is taken as primarily referring to Public Health
- **Environmental Health**. This is the scientific/laboratory function within the HSE. The role of the Environmental Health section of the HSE is broader than just drinking water and for example includes border control/imports, tobacco, cosmetics, and food safety.

Prior to the formation of the Health Boards (which predated the HSE), the Environmental Health function was based in the local authorities. This approach is still common practice in other European countries where the (laboratory focused) environmental health teams sit within the local authority structures.

The Environmental Health function in each region in Ireland is headed up by a Principal Environmental Health Officer.

The HSE's *National Drinking Water Group* was set up in 2008 to bring together expertise from both functions, with the following remit:

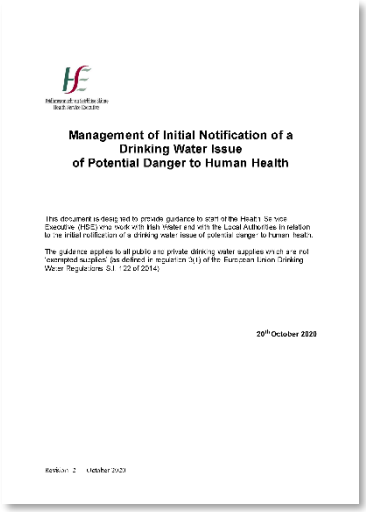
- To support best practice and promote competence among HSE personnel who have a role in the protection of public health in relation to drinking water by;
    - reviewing evidence, developing guidance, standardising responses, and updating drinking water and health guidance and materials as necessary
    - assessing and addressing the training needs of the group
    - monitoring new and emerging issues
    - sharing drinking water incidents and experiences
- To review communications within the HSE and between the HSE and other agencies in relation to drinking water and health
- To act as the HSE expert group and resource on drinking water and health issues.

The chair of the HSE's *National Drinking Water Group* rotates between the Public Health and Environmental Health functions on a two-yearly basis.

The Public Health function of the HSE is organised on a regional basis, reporting to a National Director of Health & Wellbeing (although this title has changed numerous times), who reports to the Chief Clinical Officer. Surveillance of infectious diseases (eg. cryptosporidium) is the responsibility of Public Health departments at a local level, and the Health Protection Surveillance Centre (HPSC) at a national

level. The identification of illness in the community, and putting in place response measures, is seen as a key component of the protection of human health and is the remit of Public Health. If illness is detected where the water supply is a possible contributory factor, Public Health may direct Environmental Health to look at water quality sampling. Public Health may also advise consumers on a supply to boil or restrict their water supply and will contact local GPs to investigate the matter.

The respective roles of the Public Health and Environmental Health functions on drinking water can be examined in the context of responding to drinking water quality incidents. In recent years, there had been a lack of clarity around some of the roles associated with incident response. In October 2020, the HSE issued a documented titled *Management of Initial Notification of a Drinking Water Issue of Potential Danger to Human Health*. This sets out the protocols by which incidents are dealt with, for both public and private supplies.


Management of Initial Notification of a Drinking Water Issue of Potential Danger to Human Health

The document is based around the generation of an Initial Notification Record (INR) and sets out three algorithms for how the process should work, from initial notification through to resolution:

- Algorithm A: Process flow for completion of the Initial Notification Record (INR) Template where a Drinking Water Issue is first identified by Local Authority
- Algorithm B: HSE process flow following receipt of Drinking Water Incident notifications
- Algorithm C – Notification and Initial Consultation Process when HSE Public Health first identifies cases of Human Illness which may be associated with a Drinking Water Source

This document has brought a degree of clarity to the management of drinking water incidents. The system was developed to mirror Irish Water's incident response protocols but has been expanded to cover rural water supplies.

There are still some gaps in the system, however, in respect of rural water supplies. For example, Algorithm A is predicated on the local authority receiving notification of a parametric failure / incident. Given the very low number of check and audit samples taken on small supplies, it is very unlikely that a serious water quality issue, for example an issue with VTEC or cryptosporidium in the supply, will be picked up in routine sampling, and will almost always be detected first through illness in the community.

Furthermore, the document recognises the fact that the INR system is an Irish Water system and suggests that use of an adapted INR template and work instruction for private regulated supplies be agreed locally between HSE and Local Authority. While a template for this is provided in the appendices to the HSE document, the discussions held during the stakeholder consultation for this study suggested that these protocols are not fully embedded in the rural water sections of local authorities. It should be noted however that the HSE document is dated October 2020 and it will probably take a period of time for the template to be adapted for use in rural water.

9.9 Role of the Environmental Protection Agency (drinking water)

While the EPA are the S*upervisory Authority* for public water (supplied by Irish Water) under Regulation 3 of the Drinking Water Regulations, 2014, this supervisory responsibility does not apply to rural water, where the local authorities are the Supervisory Authority.

As outlined in Volume 1, the EPA have a wide range of statutory obligations under the Drinking Water Regulations, including:

- Reviewing Local Authority monitoring programmes
- Issuing guidelines, under a broad range of areas, to assist both local authorities and water suppliers
- Supervising Local Authority performance in their statutory duties

The EPA department tasked with managing the Agency's statutory role in relation to rural water (and indeed public water) is the Drinking Water Inspectorate. The overall views of the Drinking Water Inspectorate on private water supplies are reflected in their annual *Focus on Private Water Supplies Report*.

The consultation undertaken suggests that, while the interaction between the EPA and the local authorities in respect of rural water supplies has become more streamlined in recent years, the current monitoring and reporting systems still fall short of the well-developed systems that have been put in place with Irish Water in respect of public supplies in recent years.

On the public side, the EDEN (environmental data exchange network) portal is used by Irish Water for uploading drinking quality data, and failures of water quality parameters are notified to the EPA electronically through this system. The same streamlined process does not exist on the private water side, however.

The results of rural water monitoring are collated by local authorities and are to be submitted to the EPA by 28th February each year. In recent years this deadline has not been achieved by many local authorities, and COVID further delayed the returns in 2021. The EPA generally spend several months reviewing this data and engaging directly with all 31 local authorities to close gaps in the data. The EPA see this process as time consuming and would welcome a more streamlined process.

In terms of the EPA's own performance in carrying out their statutory role, under Regulation 7(12), the Agency may supervise the performance of a Local Authority in respect of its monitoring functions. Part of this process involves auditing of the local authority monitoring programmes. This process used to take place annually but in recent years has only taken place sporadically. The EPA admit that the reason for this decrease in audit frequency is related to the increase in audit requirements on the public side, given that 85% of the population get their water from a public supply, coupled with the fact that the EPA themselves are the Supervisory Authority for public supplies.

A good example of how the requirement for EPA auditing of public water supplies can ramp up unexpectedly was in September 2021 where, following issues with the Gorey and Ballymore Eustace supplies, the Minister for Housing, Local Government and Heritage ordered an audit of all water treatment plants in the country.

The EPA Drinking Water Inspectorate are fully cognisant of the challenges that face the rural water sector, and point to the fact that Ireland has the highest rate of VTEC failure in water supplies, together with challenges in relation to lack of effective cryptosporidium barriers on many rural supplies, plus longer term risks such as THMs, nitrates and other water quality issues on rural supplies.

Some consultees have commented on the possibility of the EPA becoming the Supervisory Authority for all water supplies, both public and private. If this were to happen it would more closely reflect the situation in other European countries where oversight of all water supplies is vested in one body. In effect, the EPA can be considered to already have this role, given that they have supervisory oversight

over the local authority's Supervisory Authority role (under Regulation 7(12) of the Drinking Water Regulations).

Consultation with those stakeholders involved with the Drinking Water Regulations at a local authority level did not highlight any specific issues around the EPA's role in the implementation of the Regulations.

9.10 Role of the Environmental Protection Agency (waste water)

The EPA are the co-ordinating body for the *National Inspection Plan* for DWWTS, under the Water Services Act, 2007 (as amended).

The Agency must provide inspectors with guidance and advice and report on the implementation of the National Inspection Plan by local authorities.

The Agency also provides a broad range of guidance in respect of rural waste water. One of the key guidance documents in this area is the Code of Practice for Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10), most recently updated in March 2021. The Code of Practice (CoP) is published under Section 76 of the *Environmental Protection Agency Act.*

As discussed earlier, the EPA's current views on how that plan is performing are set out in their 2021 Review of the 2018-2021 National Inspection Plan.

Consultation with those involved in the National Inspection Plan at a local authority level did not highlight any specific issues around the EPA's role in the implementation of the plan.

9.11 Role of Irish Water

Irish Water is a regulated water services utility, whose remit covers the provision of public water supplies. Irish Water has service level agreements in place with local authorities under which local authorities act as agents of Irish Water in the performance of certain water services functions.

While Irish Water do not have a statutory role in relation to rural water services, public and private water services in rural areas do not operate independent of each other. Irish Water have a role in respect of rural water services, through Taking in Charge group water schemes, and also in supplying water to public sourced Group Water Schemes (PubGWS). In addition, community water and waste water connections are also vested in Irish Water following commissioning.

Some stakeholders consulted with during this study highlighted some issues with Irish Water's role in the sector, both in relation to the slow pace of the Taking in Charge process and with the requirements to be met before connection of group schemes to the public main is completed.

9.12 Role of the CRU

The Commission for Regulation of Utilities (CRU) is the financial regulator for public water supplies and aims to ensure that Irish Water operates in an efficient manner. One of the key ways in which the

CRU does this is through the revenue control process. In fulfilling their duties, the CRU has an indirect role in the rural water sector in that they determine tariffs which are relevant to PubGWS.

9.13 Role of An Fóram Uisce

An Fóram Uisce (the Water Forum) was established in June 2018 at which time the pre-existing *Public Water Forum* and the *National Rural Water Services Committee* (the committee tasked with advising the Minister and addressing issues regarding rural water) were dissolved, and their functions transferred to An Fóram Uisce. An Fóram's remit covers both public and private water supplies.

An Fóram Uisce was established initially on an administrative basis, to provide a platform for public engagement in the drafting and implementation of the River Basin Management Plan for Ireland (2018–2021).

An Fóram Uisce was statutorily established under Part 5 of the Water Services Act 2017. The functions of An Fóram Uisce are set out in Section 26 of the Act, and in respect of rural water include the provision of advice to *the Minister in relation to Government water policy having regard to, amongst other things…. rural water services.*

An Fóram provides an opportunity for stakeholders to debate and analyse a range of issues with regards to water quality, rural water concerns, issues affecting customers of Irish Water and the implementation of the Water Framework Directive and the River Basin Management Plan for Ireland 2018-2021.

In their Strategic Plan 2018-2021, An Fóram Uisce have listed the following goals in respect of rural water supplies:

- Engage with County Rural Water Committees, advising them of our role and responsibilities and identifying issues of concern for them
- Engage with the Department of Housing, Planning and Local Government to rural water investment needs (water supply and waste water in relation to treatment)
- Employ expertise to provide advice and guidance to An Fóram in relation to rural water services (including capital investment, water quality, water conservation and consumer interests).

Some consultees have expressed the opinion that *National Rural Water Services Committee* provided a more direct link between the Minister and the GWS sector given that it specifically applied to rural water, and that the establishment of An Fóram Uisce has led to a further degree of separation between the sector and government.

10.0 FUNDING

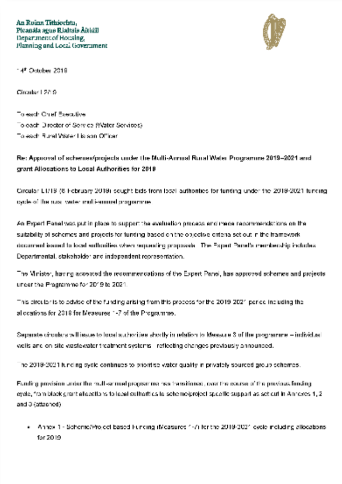
10.1 The Rural Water Programme (Capital Funding)

The merits of any system that allocates public funding to local schemes can be hotly debated and the exchequer funding provided through the Rural Water Programme is no different.

Capital funding for improvement measures to schemes is provided by the Rural Water Programme, which commenced in 1998. In 2016, with the transition from the previous annual block grant-based funding to multiannual funding focusing on schemes/projects, the Department established a bids evaluation panel (the Expert Panel) to assist the Department with its evaluation of bids from local authorities.

Capital funding under the Rural Water Programme is underpinned by the Department's *Water Services Policy Statement 2018-2025* which sets out the Government's expectations for the delivery and development of water and waste water services and informs decisions on rural water services through a series of water services policy objectives across three thematic areas of Quality, Conservation and Future Proofing.

It is beyond the scope of this study to carry out an in-depth analysis of where exchequer funding is and should be allocated under the Rural Water Programme. The Department's focus for each Rural Water Programme has been (by necessity), and will continue to be, based on government policies and wider macro-economic and environmental considerations, taking account of:


An Roinn Tithíochta, Pleanála agus Rialtais Áitiúil
Department of Housing, Planning and Local Government

Re: Approval of schemes/projects under the Multi-Annual Rural Water Programme 2019–2021 and grant Allocations to Local Authorities for 2019

An Expert Panel was put in place to support the evaluation process and make recommendations on the suitability of schemes and projects for funding based on the objective criteria set out in the framework document issued to local authorities when requesting proposals. The Expert Panel's membership includes Departmental, stakeholder and independent representation.

The Minister, having accepted the recommendations of the Expert Panel, has approved schemes and projects under the Programme for 2019 to 2021.

The 2019-2021 funding cycle continues to prioritise water quality in privately sourced group schemes.

- The objectives of overarching environmental policies such as the River Basin Management Plan, under the Water Framework Directive
- European drinking water quality legislation, an example being preparing the sector for the changes required to comply with the new Drinking Water Directive[13]
- The objectives of water and waste legislation
- The risk of fines imposed by the Court of Justice of the European Union for failure to comply with existing water or waste legislation. An example of this is the allocation of funding in the Rural Water Programme towards addressing THM compliance and the National Inspection Plan for DWWTS.
- Societal changes in the sector. An example of this is the focus on amalgamation and rationalisation and taking in charge of private source group water schemes to address weaknesses in management structures of some schemes.

The Rural Water Programme commenced in 1998 and over the years has changed focus in response to the above considerations. In the first programme, the main focus for investment was addressing issues highlighted in the 2002 European Court of Justice ruling on drinking water. This saw high levels of investment between 2004 – 2008 with lower levels of investment from 2012 onwards reflecting the resolution of the ruling through completion of various works in particular completion of the Design Build Operate (DBO) phase in 2011. The current levels of capital funding allocations are of the order of €30M per year.

The amount of capital funding drawn down each year under the Rural Water Programme is different to the allocated amount and is shown below.

[13] *Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast),* Official Journal of the European Union. See at this link: https://eur-lex.europa.eu/eli/dir/2020/2184/oj

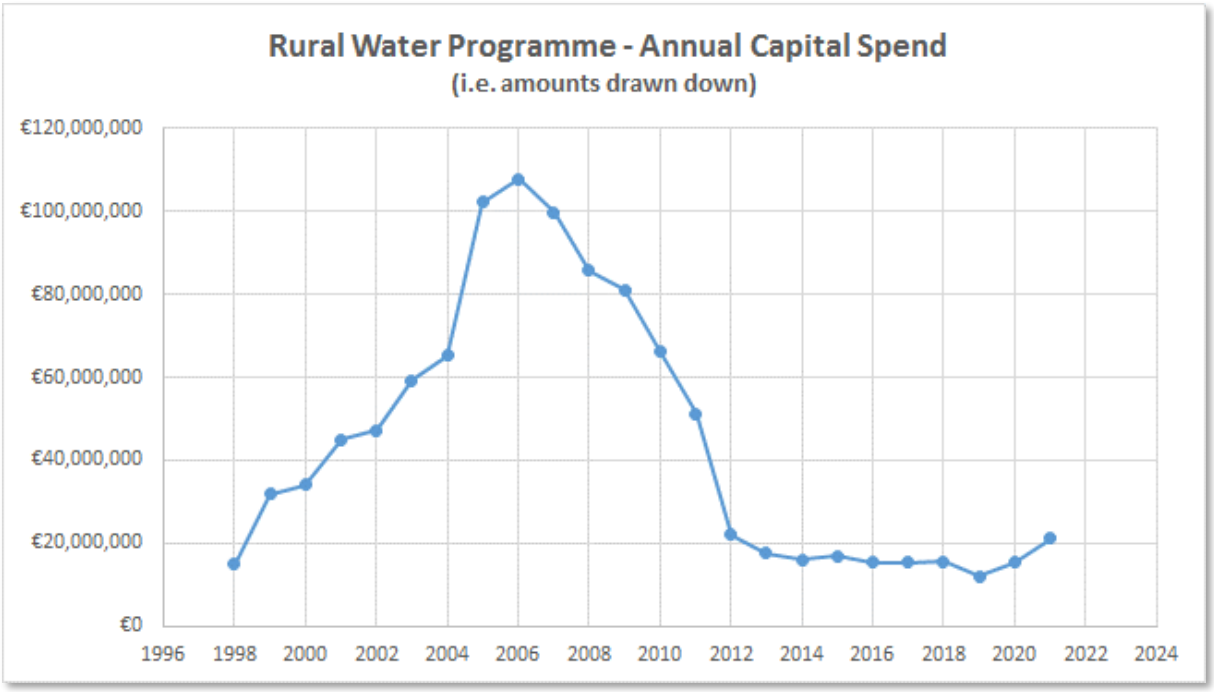


Figure 10.1 Rural Water Programme - Capital Expenditure

The various stakeholders consulted during this study expressed a range of views in relation to the operation and adequacy of capital funding under Rural Water Programme.

It is no surprise that most of the views on the operation of the MARWP came from those tasked with administering the programme in local authorities. The main comments from these discussions have been listed here, in no particular order, and without any analysis on the part of the author. The main views are as follows:

- The discretion that local authorities had under old RWPs is no longer there, and approval of funding now rests with the Expert Panel
- The approval system is very transparent
- The quality of the information received from the GWS in their application for capital funding can be poor in some cases and needs to improve
- There is a need for schemes to engage professionals to support their capital grant applications, but this is a risk for them as there is no guarantee of recouping this expenditure if the application is unsuccessful
- The 2018-2021 MARWP was seen as focused on taking in charge
- Recent MARWP has been positive in terms of funding allocation in that the amounts that schemes applied for were generally approved.
- Proper consideration is given where there is a need for emergency funding
- The 3-year MARWP cycle is good in that monies don't have to be spent in a calendar year. However, it is also inflexible and can't be changed over the 3-year period. An annual review/gate was suggested
- The unit cost per house (for connections to the public main) is very restrictive, especially where Irish Water's connection charge and the Road Opening Licence LTI charge greatly increases the cost per household

- There have been issues relating to the timing of the announcement and application process for funding, with the process for the 2018-2021 MARWP seen as particularly rushed

It should be noted that the main focus of the capital funding available through the MARWP is on addressing issues in regulated supplies. This is reflective of the workings of both the grant application process, and also on the fact that there is a system in place for reporting on water quality issues on regulated supplies, which in turn leads to solutions to address these issues through the MARWP.

There was also some feedback in relation to the need to provide centralised wastewater treatment for unsewered villages and clusters of houses, and that capital funding should be made available for that purpose. This gap in wastewater infrastructure has been recognised by both Irish Water and the Department, and provision has been made for capital funding under a new Measure A8 of the Multi-annual Rural Water Programme 2022-2025 (*Waste Water Collection and Treatment Needs for Villages and Settlements without Access to Public Waste Water Services*).

10.2 The Rural Water Programme (Annual Subsidy to Group Water Schemes)

The Annual Subsidy scheme is designed to support the day to day operational costs of Group Water Schemes supplying water for domestic use. There are 3 subsidies available:

- **Subsidy A** - payable towards the general operational and management costs of all types of group water schemes.
- **Subsidy B** - payable (in addition to Subsidy A) towards operation and maintenance costs associated with "bona fide" Design, Build, Operate (DBO) contracts for group water schemes.
- **Subsidy C** - a supplementary subsidy available in addition to Subsidy A to incentivise small privately sourced group water schemes, of less than 100 houses, to progress into more sustainable entities (through amalgamation or rationalisation).

The value of annual subsidies drawn down since the start of the Rural Water Programme in 1998 shows a different profile to that drawn down annually under capital funding and is shown below.

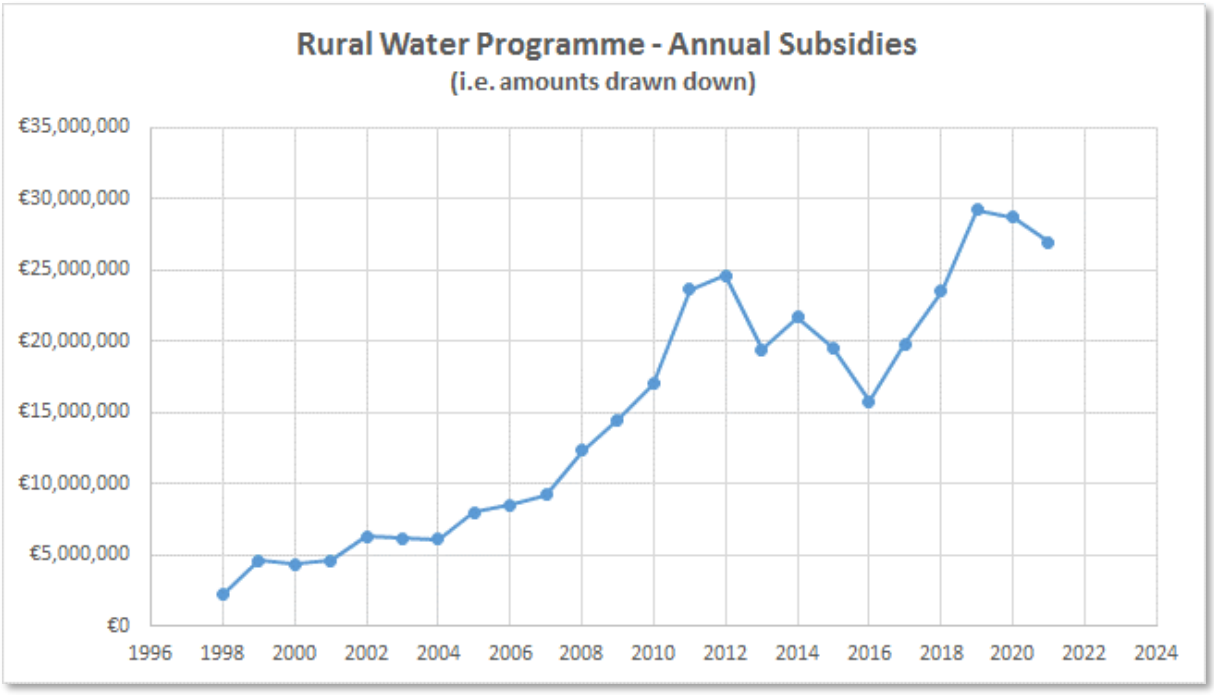


Figure 10.2 Rural Water Programme – Annual Subsidies (drawn down)

The schemes themselves must complete the application forms, and the same form is used to apply for Subsidy A, B and C.

All applications must be submitted with a full statement of audited accounts, unless they are smaller schemes, with those schemes *exempted* from the Drinking Water Regulations being the suggested transition point, in which case a statement of accounts along with supporting documentation (paid invoices) will suffice.

There were no strong views expressed by any of the stakeholders during the consultation that the level of subsidy is inadequate, so it can be concluded that in broad terms the level of support available is meeting the needs of the scheme owners. There were some concerns raised however in relation to future monitoring costs to meet the requirements of the Recast Drinking Water Directive and also in respect of raw water quality monitoring as part of Integrated Source Protection Plans.

Taking Subsidy A as an example, any costs that relate to complying with mandatory minimum standards of the Drinking Water Regulations can be recouped in full (this includes costs such as operational monitoring of water quality, treatment and disinfection consumables, maintenance of source protection measures, and network maintenance). All other eligible costs can be recouped up to 85% (including maintenance and repair of buildings, insurance, and salaries). However, if a scheme can demonstrate a higher domestic membership/usage, it may be entitled to a higher percentage. Schemes fund the balance through non-domestic charges or exceptional use charges.

In practical terms, there is little or no direct charging of domestic consumers by group water schemes, given that charging can only be imposed for excessive usage (subject to the threshold of the subsidy scheme), defined as greater than 160m^3 per domestic connection per annum, and no flat rate or standing charge is permitted for domestic consumers for operational purposes. On some schemes the threshold for excessive usage has been set even higher, for historical reasons. One scheme

interviewed only charged for usage in excess of 213m^3 per domestic connection, based on an agreement that predated the setting of the 160m^3 threshold by the Department. The unit rate per connection, for excessive usage, varies considerably, from €0.50 per m^3, to in excess of €1.00 per m^3. This rate is largely irrelevant however, given the small number of connections to which this will apply.

For non-domestic consumers, it is a further condition of the Annual Subsidy payment that schemes fully apply usage-based charges to non-domestic consumers so that they are not cross-subsidised by the domestic customer sector of the scheme.

For private group water schemes the rate per house cannot exceed €231, while for public group water schemes the rate per house cannot exceed €115.

Most of the views on the operation of the Annual Subsidy came from those tasked with administering the subsidy in local authorities. The main comments from these discussions have been listed here, again in no particular order and without any analysis on the part of the author:

- Most PubGWSs don't apply for the Annual Subsidy (in 2021, under 170 PubGWS, 11.5% of all PubGWS applied for Subsidy A).
- A lot of hand holding is required in assisting GWS in their Annual Subsidy applications.
- Not all applicants properly complete the Annual Subsidy application forms, and this leads to difficulties and delays
- Administration staff assist GWS with subsidy payment applications, even though it is a primarily a GWS responsibility
- Flexibility is required as some applications are submitted late
- Many GWS don't understand sampling charges
- Assigning Eircodes was a big issue for the GWS

11.0 FUTURE CHALLENGES FOR THE SECTOR

11.1 Introduction

The preceding chapters of this report cover the current operation of the Rural Water Sector and provide a critique on the operation of it. This assumes that the legislative, economic and environmental conditions on which the services are delivered are static and will not change into the future.

The Sector as with any change is not a static in time constant. How well the Sector needs, and is prepared, to face such change is worthy of consideration. This chapter discusses a number of the more pertinent challenges facing the sector.

A common way of viewing the external business environment for any organisation is to use a PESTEL analysis, where the latter of the acronym stand for:

- **P** political factors
- **E** economic factors
- **S** social factors
- **T** technological factors
- **E** environmental factors
- **L** legal factors

This PESTEL framework is more suited to assessing threats from the external business environment to the continuity of a commercial enterprise. Most elements of the approach however can be applied to the future of rural water services in Ireland.

11.2 Climate Change

Climate change is not only topical, it is present around us, and all of society, including the Rural Water Sector, must do their part in meeting the challenges of climate change.

Climate change is a good example of an external environmental factor (the second E in PESTEL) that has the potential to significantly affect the Sector.

The Department's *Water Services Policy Statement 2018-2025* sets out key policy objectives and priorities for water services in Ireland until 2025. The three high level themes (Quality, Conservation, and Future Proofing) are intricately linked to climate change.

Under the Future Proofing theme, Policy Objectives in the Statement include adapting water services to withstand the impact of climate change and of such weather-related events. The approach is

consistent with the *National Adaptation Framework - Planning for a Climate Resilient Ireland*[14], published in January 2018.

The *Water Quality and Water Services Infrastructure - Climate Change Sectoral Adaptation Plan*[15], prepared under the National Adaptation Framework generates a baseline of current climate and weather-related impacts and consequences for the water services sector.

The Sectoral Adaption Plan makes an assessment of how the sectoral impacts may change in the period to 2050, based on available climate modelling and analysis. The Plan also sets out adaptive measures which are being undertaken, clarifying where future adaptation efforts are required.

Fresh clean water is a precious limited resource, even in Ireland with its temperate oceanic climate with abundant rainfall and lack of extreme temperatures, as well as a costly one.

Ireland's *Climate Action Plan 2021 – Securing our Future*[16] is clear on the effects of climate change, saying:

> *The science is indisputable, and the effects of climate change are already clear. Extreme weather events are becoming more frequent with devastating consequences. Climate change is here and is already impacting our world, with risks to global security including food supplies. Ireland is also at risk of more frequent storms and flooding.*

Most climate change models for Ireland show increased rainfall in the north-west of Ireland but reduced rainfall in the south-east, with an increased risk of drought in those areas.

Climate change will affect the delivery of both rural water supply and rural waste water. In the context of rural water services, the principal risks from climate change relate to drought and flooding.

On the public water services side Irish Water supports the national objectives for climate change mitigation to meet its obligations under the National Adaptation Framework to ensure the resilience and sustainability of water services.

The Rural Water Sector, in particular group water schemes, will also need to prepare and adapt for climate change. Some climate related issues for private supplies to consider include (examples only - this is very much a non-exhaustive list):

- High rainfall and flooding leading to mobilisation of pollutants particular for surface water sourced supplies,

[14] *National Adaptation Framework - Planning for a Climate Resilient Ireland,* Department of Communications, Climate Action and Environment. See at this link: https://www.gov.ie/en/publication/fbe331-national-adaptation-framework/

[15] *Water Quality and Water Services Infrastructure - Climate Change Sectoral Adaptation Plan,* Government of Ireland. See at this link: https://assets.gov.ie/75644/057df848-7665-4df1-9abf-1a493f1de7f9.pdf

[16] *Climate Action Plan 2021 – Securing our Future,* Government of Ireland. See at this link: https://www.gov.ie/en/publication/6223e-climate-action-plan-2021/

- Hot weather and prolonged dry spells increasing the demand for water a number of which have occurred in recent years.
- Water resource planning and conservation – on both supply and demand sides.

Adaptive measures will most likely include, depending on circumstances, such measures as:

- increasing raw water quality monitoring,
- considering alternative sources of supply,
- installing water level monitors in boreholes to understand trends during extreme weather.

For rural water supplies, water demand management is the biggest climate change challenge facing the Rural Water Sector.

The group water scheme sector, through Rural Water Programme funding (both capital and operational) and through its own proactive action, is well positioned to face climate change. This does not mean that the sector does not need to take further action to future proof against climate change.

The NFGWS has long encouraged water conservation practices to use water efficiently by reducing unnecessary water usage and wastage. The NFGWS have a number of initiatives to mitigate the possible effects of climate change, including an ongoing Water Demand Management and Conservation programme[17].

Mitigation actions include (particularly on PriGWS) leakage reduction through active leakage control, defective mains replacement, and near universal consumer metering. As well as minimising the negative impact on the water environment, the actions minimise energy use in water treatment plants and pumping stations.

Notwithstanding the good work that is taking place within the sector, there is also a need to further strengthen and align policies in areas such as:

- Source protection.
- Catchment management.
- Biodiversity.

The *Draft River Basin Management Plan 2022-2027*[18], to be published by the end of 2022, states that:

> *'… sustainable water management is important to addressing and adapting to the impacts of climate change, with many of the required measures having co-benefits for climate mitigation and biodiversity'.*

In order to achieve the necessary outcomes for climate change mitigation the implementation of the measures outlined in the Draft Plan will require all stakeholders to work more closely together.

[17] NFGWS website. See at this link: https://nfgws.ie/category/gws-guidance-support/water-conservation-and-network-management/

[18] *Draft River Basin Management Plan 2022-2027,* Government of Ireland. See at this link: https://www.gov.ie/en/consultation/2bda0-public-consultation-on-the-draft-river-basin-management-plan-for-ireland-2022-2027/

Climate change also affects rural waste water. Increased flooding will lead to potential washout of DWWTS where these systems do not exclude rainwater. This may lead to pollution of the water environment and the increased spread and viability of harmful pathogens. However, properly designed systems should avoid or at least mitigate this occurring.

11.3 New Drinking Water Directive

The new *Drinking Water Directive*, commonly referred to as the Recast Directive, was published in December 2020 by the European Commission. Ireland has until early January 2023 to transpose the new Directive into Irish law.

An implementation group (the Drinking Water Directive Expert Group) led by the Department and comprising a wide range of stakeholders has been established to examine the implications of the new Directive on the operation of water services in Ireland. The Directive is a good example of an external legal factor (the L in PESTEL) that has the potential to significantly affect the Rural Water Sector.

The Directive contains a number of important changes. These include:

- A focus on risk assessments in drinking water catchments,
- Changes to some parameters and parametric values,
- Changes to monitoring frequencies,
- Increased access to information,
- Specification of materials in contact with water.

An example of the potential impact of changes to parametric values under the new Directive is for *chlorates*. At present there is no parametric value for chlorate in the current Drinking Water Regulations. In the new Directive a parametric value of 0.25mg/l is specified, but the Directive states that 0.70mg/l *shall be applied where a disinfection method that generates chlorate, in particular chlorine dioxide, is used for disinfection of water intended for human consumption*.

The most common disinfection method in rural water supplies is sodium hypochlorite (chloros) which degrades over time to produce chlorate and chloride. The impact of this new parametric value on the operation of rural water supplies is being examined by the Directive Expert Group.

All stakeholders involved in the delivery of rural water supplies welcome the new Directive's focus on risk assessment and the Water Safety Plan approach in general. For example, the NFGWS are strong advocates of a catchment-based risk assessment approach to ensuring clean and wholesome water.

Another parameter of note in the new Directive is PFAS, which is an abbreviation for *per and poly fluoroalkylated substances*. The EPA describe[19] PFAS as:

> *'They can be found in many everyday products – outdoor clothing and equipment, textiles, paints, food packaging, photographic coatings, non-stick coatings on cookware as well as fire-fighting foam.*

[19] *What are PFAS?*, EPA website. See at this link: https://www.epa.ie/our-services/monitoring--assessment/waste/chemicals/pfas/#:~:text=PFAS%20is%20an%20abbreviation%20for,have%20been%20identified%20to%20date.

They can have harmful effects on human and animal health and stay in the environment and in our bodies for long periods of time where they can increase in concentration. They are often referred to as "forever chemicals".

Some PFAS have been linked to an increased risk of cancer, high cholesterol, reproductive disorders, hormonal disruption (also known as endocrine disruption) and weakening of the immune system.

Human and environmental exposure to PFAS can arise from contaminated water and food, …'.

The new Directive sets a limit of 0.5µg/l for 'PFAS Total' and 0.1µg/l for the 'Sum of PFAS' (those PFAS considered a concern as regards water intended for human consumption).

There are concerns in the Rural Water Sector around achieving compliance with the PFAS standard in areas where the water supply is taken from a catchment which may have had a history of industrial emissions, or for example close to airports where fire-fighting foam has been used.

There are also concerns around the level of monitoring that will be required to inform the risk assessments called for in the new Directive.

11.4 Water Abstraction Legislation

Current water abstraction legislation in Ireland only applies to public supplies and was based on the Water Supplies Act 1942, the focus of which was procedures for compensating riparian owners affected by water abstractions, and providing compensation flows downstream of the abstraction.

This legislation is not fully compliant with the Water Framework Directive. In the absence of a comprehensive and modern abstraction-management and control regime in Ireland the European Commission has brought an infringement action against Ireland to fully transpose the Directive.

In response, Ireland, as an interim measure, introduced the *European Union (Water Policy) (Abstraction Registration) Regulations 2018*[20], which came into effect on 16th July, 2018 and required all abstractions of 25m^3 per day or more to arrange to have that abstraction entered onto the register of abstractions maintained by the EPA. Most regulated group water schemes would abstract in excess of this amount of water.

The *General Scheme of the Water Environment (Abstractions) Bill* went through pre-legislative scrutiny in 2020 and a Bill for primary legislation was finalised by the Department.

The *Water Environment (Abstractions and Associated Impoundments) Bill 2022*[21] was initiated and presented to the Oireachtas in September 2022. The purpose of the Bill is to set out a system of controls on the abstraction and impoundment of water, to protect our environment and to ensure full compliance with Ireland's responsibilities under the Water Framework Directive.

[20] *European Union (Water Policy) (Abstraction Registration) Regulations 2018,* electronic Irish Statute Book. See at this link: https://www.irishstatutebook.ie/eli/2018/si/261/made/en/print

[21] *Water Environment (Abstractions and Associated Impoundments) Bill 2022,* Bill 87 of 2022, Houses of the Oireachtas. See at this link: https://www.oireachtas.ie/en/bills/bill/2022/87/?tab=documents

At a high level, the Bill provides for a modern registration, licensing and control regime for water abstractions. Its focus is on the largest abstractions in Ireland as well as smaller abstractions that may cause short-term or ongoing environmental damage.

The Bill also includes provisions relating to water impoundment infrastructure associated with abstractions. These are not a feature of the Rural Water Sector

The Bill proposes a graduated and proportionate registration and licensing system for the abstraction of water. The Bill provides for:

- a simple registration system for water abstractions above a minimum threshold of 25 m^3 per day, and
- a licence requirement for water abstraction above a threshold of 2,000 m^3 per day and in certain other circumstances.

In summary a licence will be required where the abstraction:

- meets or exceeds the licensing threshold of 2,000 m3 per day,
- is determined by the EPA as, in certain circumstance, needing a licence, or
- is a significant abstraction.

The Bill defines the meaning of significant abstraction. The EPA is required to assess each proposed abstraction above the registration threshold and below the licensing threshold to determine if it is a significant abstraction. Where the EPA determines an abstraction is significant a licence will be required. Each assessment of significance shall be reviewed not less than once every six years.

In the context of PriGWS, the 25m^3 per day threshold for registration (approximately 35 connections) would apply to about two-thirds of regulated supplies, whereas the licensing threshold of 2,000m^3 per day would apply to very few PriGWS. However, it remains to be seen when the licencing regime is in place the extent to which the significant abstraction requirement will apply.

This is another example of an external legal factor (the L in PESTEL) that has the potential to significantly affect the rural water sector.

11.5 Water Quality Issues of Increasing Concern

Some water issues are of increasing concern largely due to the impact of human activity. Three will be looked at here by way of example. These are:

- Nitrates,
- Manganese
- Trihalomethanes (THMs).

Water quality issues of increasing concern are another example of an external environmental factor (the second E in PESTEL) that has the potential to significantly affect the Rural Water Sector.

Nitrate is listed as a *chemical* parameter under the former and new Drinking Water Directive. The parametric limit is unchanged in the new Directive.

Nitrates cannot be classed as an emerging contaminant, however, they are an increasing concern in rural water supplies using groundwater abstractions.

The presence of nitrates is brought on by human activity such as more intensive agriculture and the presence of poorly functioning septic tanks close to a shallow or inadequately protected and/or designed sources.

The majority of sources for PriGWS, SPS, and private household wells are from groundwater but will not necessarily have nitrate issues. However, once a groundwater is contaminated with nitrates, even if the cause is eliminated or better controlled, it can be slow to eliminate the contamination from the groundwater source.

The drinking water standard of 50 mg/l nitrate, originally set by the WHO in 1958, aims to protect bottle-fed infants from methaemoglobinaemia. Infant methemoglobinemia is also called “blue baby syndrome. It occurs when bacteria, either in the soil or in the immature infant gut, convert nitrates to nitrites. Nitrites easily combine with foetal haemoglobin to form methaemoglobin, which cannot carry oxygen around the body.

The EPA and the HSE published a joint position paper on nitrates in 2010. While this issue is not confined to private water supplies, the *EPA/HSE joint position paper: nitrates in drinking water*[22], states that:

> *‘Shallow, rural domestic wells are most likely to be contaminated with nitrates, especially in areas where there are more intensive agricultural practices, or on occasion, poorly functioning on-site wastewater treatment systems nearby’.*

The EPA report *Focus on Private Water Supplies 2019* notes four PriGWS and 20 SPS as failing to meet the standard in the Directive. Due to the random and sporadic nature of monitoring not all nitrate exceedances will be picked up in the monitoring programmes.

A *Do Not Consume* restriction due the presence of nitrates in a water supply is very disruptive for the consumers. It is significantly more restrictive than a Boil Water notice in that the water cannot be consumed even after boiling. There have already been examples of where extended Do Not Consume

[22] *HSE/EPA joint position paper: nitrates in drinking water,* April 2010, Lenus - The Irish Health Repository website. See at this link: https://www.lenus.ie/handle/10147/281453

notices have been imposed on rural water supplies due to nitrates, and this is likely to be more frequent in the coming years.

The resolution of nitrates can be expensive to install and operate for small water supplies. Resolution by treatment includes reverse osmosis, ion exchange or blending which is not feasible for small localised supplies as it is unlikely that an alternative source not impacted by nitrates will be available.

Resolution of a nitrates issue by use of an alternative source may be by connection to the public mains and the subsequent taking in charge of the scheme by Irish Water or amalgamation with another PriGWS without water quality issues.

Simple household treatment procedures such as boiling, simple filtration, disinfection, and water softening do not remove nitrate from water. Boiling may actually increase the nitrate concentration of the remaining water.

It is interesting to note that that this requirement in terms of the total of nitrate and nitrite concentrations had already been adopted in the definition of wholesomeness in the *Private Water Supplies (England) Regulations 2016*[23].

Manganese is listed as an *indicator* parameter in the both the former and new Drinking Water Directive. The parametric limit is unchanged in the new Directive.

Manganese cannot be classed as an emerging contaminant, however, they are an increasing concern in rural water supplies using both groundwater and surface water abstractions.

Any exceedance of the parametric value of 50 µg/l is investigated in the normal way without particular concern, unless levels were deemed to be toxic. There is increasing concern amongst health professionals where manganese levels in supplies are high.

The report from the WHO led *Drinking Water Parameter Cooperation Project*[24] in 2017 stated that:

> *There are questions regarding possible adverse health effects of manganese from drinking-water. Data on the potential health-effects of manganese remain uncertain, particularly relating to the form of manganese that may be of concern, and it is difficult to determine a suitable health-based value at this time. … Due to the uncertainties it is recommended to retain manganese as indicator parameter this time …'.*

On this basis, HSE Public Health have adopted a limit of 120 µg/l above which they will recommend a Do Not Consume notice.

A *Do Not Consume* restriction due the presence of manganese in a water supply is very disruptive for the consumers. It is significantly more restrictive than a Boil Water notice in that the water cannot be consumed even after boiling. There have already been examples of where extended Do Not Consume

[23] *Private Water Supplies (England) Regulations 2016,* legislation.gov.uk. See at this link: https://www.legislation.gov.uk/uksi/2016/618/contents/made

[24] *Drinking Water Parameter Cooperation Project - Support to the revision of Annex I Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption (Drinking Water Directive) – Recommendations,* European Commission website. See at this link: https://ec.europa.eu/environment/water/water-drink/review_en.html

notices have been imposed on rural water supplies, and this is likely to be more frequent in the coming years.

The resolution of a manganese issue can be expensive to install and operate for small water supplies. Depending on circumstances the resolution of a manganese issue on a PriGWS consist of water treatment plant upgrades, which can be expensive and unviable for smaller supplies.

Resolution of a manganese issue by use of an alternative source may be by connection to the public mains and the subsequent taking in charge of the scheme by Irish Water or amalgamation with another PriGWS without water quality issues. Development of a new source may be a consideration.

Simple household treatment procedures such as boiling, simple filtration, disinfection, and water softening do not remove manganese from water. Boiling may actually increase the manganese concentration of the remaining water.

Trihalomethanes (THMs) are a *chemical* parameter under the former and new *Drinking Water Directive*. The parametric limit is unchanged in the new Directive.

THMs cannot be classed as an emerging contaminant, however, they have emerged as an increasing concern in rural water supplies using surface or surface influenced water abstractions.

THMs are disinfection by-products, which form when natural organic matter in the water source such as rotting vegetation, reacts with chlorine used in the disinfection treatment process. This is a problem when river and lake waters are used as drinking water sources, as they contain more natural organic matter than groundwater.

Because of the nature of Ireland's source waters THMs formation is a complex issue. They are often difficult problems to resolve while also maintaining the necessary level of disinfection in the water supply.

Disinfection is the most important aspect of providing safe drinking water, so the challenge is to minimise the amount of THMs formed, while still ensuring that disinfection is effective.

The EPA and the HSE published a joint position paper on THMs in 2011. The *HSE/EPA joint position paper: trihalomethanes in drinking water*[25] states that:

> *'Studies examining the association between THMs and drinking water show that there may be associations with cancer. These associations are weak, are not consistently demonstrated in scientific studies and are unlikely to be large. However, the possibility that they exist remains.*
>
> *When uncertainty such as this emerges in environment and health, a precautionary approach is needed'.*

[25] *HSE/EPA joint position paper: trihalomethanes in drinking water,* Lenus - The Irish Health Repository website. See at this link: https://www.lenus.ie/handle/10147/281452

In the new *Drinking Water Directive*, while the parametric limit for THMs referred to as *Trihalomethanes – Total* remains unchanged at 100 mg/l, there is a note to that requirement stating that:

> *'Where possible, without compromising disinfection, Member States shall strive for a lower parametric value'.*

The EPA report *Focus on Private Water Supplies 2019* lists eight PriGWS and four SPS that failed to meet the standard for THMs in the *Drinking Water Directive*. Due to the random and sporadic nature of monitoring not all THMs exceedances will be picked up in the monitoring programmes.

A Do Not Consume notice restriction due the presence of THMs in a water supply is very disruptive for the consumers and is significantly more restrictive than a Boil Water notice in that the water cannot be consumed even after boiling.

There have already been examples of where extended Do Not Consume notices have been imposed on rural water supplies due to THMs, and if the issue is not resolved quickly, it is likely to be more frequent in the coming years.

Low population density is a feature of supply areas for PriGWS. This leaves long distribution networks with few consumers per kilometre. This adds greatly to the costs and operational challenges of providing good quality drinking water that is compliant with the Directive on a consistent-long basis. Additionally, THMs can increase in storage/distribution networks.

The resolution of a THMs issue can be expensive to install and operate for small water supplies. Depending on circumstances the resolution of a THMs issue on PriGWS consist of water treatment plant upgrades, which can be expensive and unviable for smaller supplies.

Resolution of a THMs issue by use of an alternative source may be by connection to the public mains and the subsequent taking in charge of the scheme by Irish Water or amalgamation with another PriGWS without water quality issues.

Simple household treatment procedures such as boiling, simple filtration and water softening do not remove THMs from water. Boiling may actually increase the THMs concentration of the remaining water.

In November 2021, the European Commission referred Ireland to the Court of Justice of the European Union (CJEU) for failure to comply with the requirements of the former Drinking Water Directive.

In the referral, the Commission alleges that the level of THMs in drinking water has exceeded the parametric value established by the Directive in 30 water supplies (21 public supplies and nine PriGWS) although this figure will be contested by Ireland during the case.

11.6 River Basin Management Plan

The Water Framework Directive requires all Member States to protect and improve water quality in all waters so that good ecological status is achieved by 2015 or, at the latest, by 2027. Ireland is required to produce a river basin management plan every six years under the Directive.

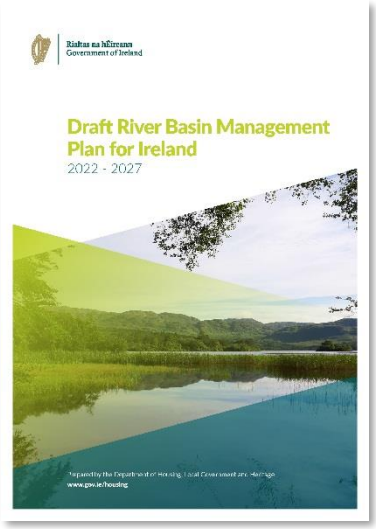
The first River Basin Management Plan (RBMP) was published in 2009. The second plan, published in 2018, covered the years 2018-2021.

The focus of the RBMP 2018-2021 was on a reduction in pollution pressures in over 700 water bodies in Ireland. It placed *a major emphasis on establishing the right governance and delivery structures for an effective catchment-based approach*.

For the third cycle a six-month long public consultation was undertaken ending in March 2022 on the *Draft River Basin Management Plan for Ireland 2022-2027*[26]. The Department intends to publish the final version of the plan before the end of 2022.

The Local Authority Waters Programme (LAWPRO), a national shared service working on behalf of all local authorities in Ireland, was set up under the second cycle Plan. LAWPRO now co-ordinates the local authority role in the development and implementation of River Basin Management Plans. LAWPRO structures are based on 12 Community Officers, supported by scientific staff in five regions.

The EPA have a dedicated Water Programme Catchment Unit, who provide national co-ordination for the overall range of measures in each of the water bodies.



The guiding principle in the draft third cycle Plan is 'the Right Measure in the Right Place'. There is a growing appreciation amongst all stakeholders that there is a need to align all policies for water quality in catchments, to achieve the objectives of the Directive.

Integrated Catchment Planning is a cornerstone of the draft plan for the 2022-2027 cycle, and it proposes:

> *'Using catchment, sub-catchments and water bodies to examine the pressures on our water resources at an appropriate scale allows us to effectively manage our waters. It is also used as a means to bring together all public bodies, communities and businesses that have a connection with these catchments. The process involves:*

- *Gathering the best available information to understand the catchment - where the water comes from, how it flows through the landscape and the activities that may be causing pollution.*
- *Looking at all the uses of water - drinking, agricultural, industrial and recreational, and also the ecosystems that depend on water to survive.*
- *Engaging local communities and involving them in the management of their catchment.*

[26] *Draft River Basin Management Plan for Ireland 2022-2027*, Government of Ireland. See at this link: https://www.gov.ie/en/consultation/2bda0-public-consultation-on-the-draft-river-basin-management-plan-for-ireland-2022-2027/

- *Adopting appropriate measures to ensure that activities that represent a significant threat to water resources are effectively managed. 5. Applying the scientific and local knowledge of how the catchment operates to protect and improve water, providing a healthy, resilient, productive and valued resource that supports vibrant communities.*

The NFGWS, the representative body for group water schemes, have adopted this catchment-based approach. In their Strategic Plan 2019-2024 the NFGWS have prioritised Integrated Source Protection Plans (ISPP).

Supported by funding from the Department under the Multi-annual Rural Water Programme, the NFGWS initiated pilot projects in Monaghan and Roscommon. These projects are now substantially complete.

Leading from these pilot projects the NFGWS have produced useful documents for future projects for the sector such as *A Framework on Source Protection for Drinking Water Sources*, and *A Handbook on Source Protection & Mitigation Actions for Farming*. The Department intends to reference the importance of the use of the documents in the upcoming Multi-annual Rural Water Programme.

The EPA's Water Programme Catchment Unit see the work done by the NFGWS as being the model for proper catchment-based source protection measures for the group water scheme sector. The model would be difficult to replicate to the same extent on public water sources. This is as the consumers of the water on public supplies are not generally the owners of the lands in the catchment.

It is in this area in particular that group water schemes as community owned and community run entities may have a distinct advantage over Irish Water driven by a sense of pride or community spirit, have persuasive authority to move forward the required catchment measures. Irish Water may not, in certain cases, have the same persuasive authority.

12.0 KEY MESSAGES

The purpose of this project was to increase, in an impartial way, the stock of knowledge available to inform and support the Working Group established by the Minister to review the Rural Water Sector.

The scope of the project includes a review of the governance, supervision, funding and wider investment needs for the Rural Water Sector. A core part of the scope too was to review the system of monitoring water quality in the Sector and how deficiencies are identified and responded to.

The systematic desktop study for the Literature Review presented in Volume 1 is focused on the existing national operation of the Rural Water Sector based on relevant information available from various sources.

The purpose of this Output Report is to highlight gaps in the current workings of the Sector, such that the Working Group can develop recommendations for consideration by the Minister on how to (by addressing these gaps), make rural water a world class water service. The outputs of the consultation process with the stakeholders in the Sector, which was undertaken in the latter half of 2021, is the key to doing this.

Both the systematic desktop study for the Literature Review process, and the consultation carried out to inform the preparation of this Output Report have highlighted a number of areas which should be examined to improve the governance, supervision, funding monitoring arrangements within the sector. These are set out below as key messages.

The messages are given for by chapter order, rather than in any perceived order of importance.

DBO Contractor Operated Privately Sourced GWS (Regulated)

12.1 Many of the O&M contracts will come to the end of their performance period in the next 5 years and consideration needs to be given to an appropriate term for the next round of contracts.

12.2 Compliance issues, in particular in respect of THMs, continue in many schemes on DBO operated PriGWS.

Non DBO Operated Privately Sourced GWS (Regulated)

12.3 Although the water in the majority of regulated non-DBO operated PriGWS is probably safe to drink most of the time, some are at risk from contamination. This is particularly so if they depend on a surface water source, a vulnerable groundwater source, inadequate treatment equipment in place, or have poor operation and management structures.

12.4 In order to address the weak management structures in some of these schemes, the most sustainable long-term solution is either interconnection to the public (Irish Water) mains, or rationalisation/amalgamation where this is viable and value for money to do so.

Publicly Sourced GWS (Regulated)

12.5 A number of publicly sourced GWS have no active management structure in place (orphan schemes). In some schemes, the networks of orphan schemes are in effect managed by the local authority on an informal basis, but this is not part of the Service Level Agreement between the local authority and Irish Water. This is currently somewhat of a grey area as orphan schemes may regard themselves as taken in charge when in fact they are not.

12.6 With taking in charge protocols established, giving a consistent national approach, and if the recent application trends continue, it is likely that most, and likely ultimately all, PubGWS will be taken in charge over time. This, coupled with the fact that no new PubGWS are being built, means that the number of households served by PubGWS will diminish over time.

Small Private Supplies

12.7 Despite EPA advice that local authorities carry out risk assessments to determine an appropriate sampling programme for Small Private Supplies, these risk assessments are generally not undertaken, and a judgement call is often made on the appropriate number of check and audit samples taken annually.

12.8 A consistent theme in reports from EPA auditing (of local authorities as Supervisory Authority) is the lack of data on population served and volume supplied, in respect of Small Private Supplies.

12.9 Small Private Supplies operate independent of any such water focused representation, or any meaningful access to technical advice.

12.10 There is nothing to compel Small Private Supplies to register with the local authority as a *water supplier* under the Drinking Water Regulations. The local authority can only include them in their monitoring programmes if they know of their existence, and currently, in contrast to UK legislation, there is nothing to force the owners of such supplies to register with the local authority.

12.11 Small Private Supplies often have dual water supplies (the public mains and a Small Private Supply). This creates an unnecessary added public health risk for the commercial activities concerned, and a public health risk to the public supply if cross contamination occurs.

Exempted Privately Sourced GWS

12.12 The exemptions in the Drinking Water Regulations only relate to *monitoring* and *reporting*. The water supplier itself has a duty under Regulation 4 to ensure that the water is *wholesome and clean and meets the requirements of these Regulations*. The managers of exempted supplies may not realise that they have such a statutory duty.

12.13 Local authorities, as Supervisory Authority, have certain duties under Regulation 14, to provide information to consumers on Exempted Supplies, in respect of informing consumers that their water supply is unregulated, and providing advice where a danger to public health is apparent. There is little evidence that this information is provided to such consumers.

12.14 A deterioration in water quality over time will not be picked up on exempted supplies in the same way as it would with regulated supplies, and remedial measures will be reactionary, for example where the HSE detect illness in the community from a VTEC outbreak.

12.15 It is an anomaly in the regulatory system that there is an obligation to register a DWWTS (e.g., a septic tank) but not a water supply that falls under the thresholds in the Drinking Water Regulations (i.e. an exempted supply).

Household Supplies

12.16 Household supplies are a particular concern as they lie outside the monitoring and reporting requirements of the Regulations.

12.17 Ireland has one of the highest rates of VTEC (Verocytotoxigenic Escherichia coli) infections in Europe and cases of VTEC infection in Ireland have increased significantly since 2010. Many of these infections have been reported as occurring in private household wells.

12.18 Household wells continue to present a particular risk where they are co-located with septic tanks. There may be merit in considering linking the private well grant to septic tank improvements given the issues raised on co-location.

12.19 It is an anomaly in the planning and regulatory system that, depending on circumstances, a new DWWTS requires planning permission but a private well can be constructed on an existing domestic premises without planning or any other consent.

Domestic Wastewater Treatment Systems

12.20 There is a high rate of registration of DWWTS in Ireland, currently about 95% of the estimated number of 580,000 of such systems.

12.21 The National Inspection Plan for DWWTS is rightfully targeted at areas where significant pressures exist and is aligned with the objectives of the River Basin Management Plan.

12.22 Householders are responsible for maintaining their DWWTS under the Water Services Act, Lack of maintenance and desludging has consistently been highlighted in every review of the National Inspection Plan and householders often pay very little attention to their systems, until absolutely required to do so.

12.23 The €5,000 cap on financial assistance (up to 85% of the cost) for the upgrading of DWWTS is deterring many householders from applying for grant aid.

12.24 Lack of enforcement and close out of legacy issues is still an issue for rural waste water, and there is an unwillingness on the part of some local authorities to take legal proceedings as part of this process.

Governance

Ownership of Private Water Supplies

12.25 For some independently operated privately sourced GWS there is a desire to remain independent unless there is an overriding water quality issue where they feel their members' health may be compromised.

12.26 While the NFGWS has introduced campaigns encouraging GWS to put professional management structures in place, the ageing profile of the key personnel in many GWS remains a concern.

Governance

Local Authorities

12.27 There has been a gradual reduction in staff numbers in the Rural Water Departments of local authorities. There is a lack of technical expertise in some local authorities to meet the needs of a sector which is becoming increasingly complex.

12.28 Over the past 20 years a level of trust has built up between Group Water Schemes and these Departments, and Group Water Schemes welcome the access that they have to technical personnel based in their own county, who can respond at short notice to issues that arise on their schemes.

12.29 Most local authorities do not exercise their powers under the Drinking Water Regulations in terms of issuing Directions, or certainly reserve this for the most serious water quality issues where all other means have failed to resolve the water quality issue.

Governance

Health Service Executive

12.30 The Environmental Health function within the HSE was originally a local authority function, as it still the case in many European countries.

12.31 These HSE protocols around incident response assume that the local authority receives notification of a parametric failure / incident. Given the very low number of check and audit samples taken on small supplies, it is very unlikely that a serious water quality issue will be picked up through routine sampling and will almost always be first detected through illness in the community.

12.32 The HSE incident response protocols are based an Irish Water system and the HSE suggest that use of an adapted Initial Notification Record (INR) template for private regulated supplies be agreed locally between HSE and Local Authority. These protocols are not yet fully embedded in the rural water departments of local authorities.

Governance

Environmental Protection Agency

12.33 The EPA's monitoring of local authority monitoring programmes under the Regulations used to take place annually but in recent years such auditing has only taken place sporadically.

12.34 Consideration could be given to nominating the EPA as the Supervisory Authority for all water supplies, both public and private, more closely reflecting the situation in other European countries where oversight of all water supplies is vested in one body.

Governance

Legislation

12.35 There may be a need for separate regulations for public and private water supplies, as is the case in the UK. Given that approximately 83% of the Irish population receives its water from public supplies, there is a risk that private supplies, and in particular exempted private supplies, will not be subject to the same oversight as regulated supplies under the current Regulations. The risk assessment process for private supplies, as set out in the UK Regulations, would offer significant benefits if applied to private supplies in Ireland.

Funding

Rural Water Programme (Annual Subsidy)

12.36 The level of financial support available for the operation of group water supplies through the Annual Subsidy is seen by most stakeholders as meeting the needs of the sector.

Funding

Rural Water Programme (Capital Funding)

12.37 The Rural Water Programme had annual capital allocations of over €120M (then including small public supplies) during the 2000s. This high level of expenditure was required to fund the significant upgrades required in the sector to address the issues raised in the 2002 European Court of Justice ruling on drinking water.

12.38 The current levels of capital allocations under the Rural Water Programme are of the order of €30M per year, and reflect the fact that much of the 'heavy lifting', in terms of upgrades to private water supplies, was achieved in the 2000s The current capital allocations are tailored to the current needs of the sector, to meet the objectives of overarching environmental policies such as the River Basin Management Plan, new legislation, and in response to fines imposed by the European Union for failure to comply with existing legislation.

Future Challenges

Climate Change

12.39 Water demand management is a key climate change challenge facing the rural water sector.

12.40 The Department's *Water Services Policy Statement 2018-2025* sets out key policy objectives and priorities for water services in Ireland until 2025. Two of the three themes (Conservation, and Future Proofing) are intricately linked to climate change.

Future Challenges

Recast Directive

12.41 The *Drinking Water Directive 2020/2184* (the Recast Directive), was published in December 2020, and certain sections of the new Directive must be transposed into Irish law by January 2023.

12.42 A separate Working Group is examining the implications of this Directive on water supplies in Ireland, including rural water supplies. There are some challenges in the new Directive, such as compliance with parametric values for chlorates and PFAS.

Future Challenges

Water Abstraction Legislation

12.43 Current water abstraction legislation in Ireland only applies to public supplies.

12.44 This legislation was found to be not fully compliant with the Water Framework Directive and was part of an infringement action brought by the European Commission against Ireland. As an interim measure Ireland introduced the *European Union (Water Policy) (Abstraction Registration) Regulations 2018*, which required all abstractions of 25m^3 per day or more to arrange to have that abstraction entered onto the register of abstractions maintained by the Agency.

12.45 Further legislation in the area of water abstraction is currently being prepared and a Bill for primary legislation in this area is being finalised by the Department. The impact of this new legislation on abstractions for rural water supplies will only be known when the new legislation is published.

Future Challenges

Water Quality Issues of Increasing Concern

12.46 There are growing water quality concerns in relation to both nitrates and manganese in rural water supplies.

Future Challenges

River Basin Management Plan

12.47 There is a need to align all policies in respect of water quality in catchments, in order to achieve the objectives of the Water Framework Directive.

12.48 The work done by the NFGWS on source protection is a good model for proper catchment based source protection measures, and has a significant benefit in relation to driving catchment based measures, as the consumers of the water are generally the owners of the lands in the catchment.