

Urban Waste Water Treatment in 2020



ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: *We implement effective regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.*

Knowledge: *We provide high quality, targeted and timely environmental data, information and assessment to inform decision making at all levels.*

Advocacy: *We work with others to advocate for a clean, productive and well protected environment and for sustainable environmental behaviour.*

Our Responsibilities

Licensing

We regulate the following activities so that they do not endanger human health or harm the environment:

- waste facilities (*e.g. landfills, incinerators, waste transfer stations*);
- large scale industrial activities (*e.g. pharmaceutical, cement manufacturing, power plants*);
- intensive agriculture (*e.g. pigs, poultry*);
- the contained use and controlled release of Genetically Modified Organisms (*GMOs*);
- sources of ionising radiation (*e.g. x-ray and radiotherapy equipment, industrial sources*);
- large petrol storage facilities;
- waste water discharges;
- dumping at sea activities.

National Environmental Enforcement

- Conducting an annual programme of audits and inspections of EPA licensed facilities.
- Overseeing local authorities' environmental protection responsibilities.
- Supervising the supply of drinking water by public water suppliers.
- Working with local authorities and other agencies to tackle environmental crime by co-ordinating a national enforcement network, targeting offenders and overseeing remediation.
- Enforcing Regulations such as Waste Electrical and Electronic Equipment (WEEE), Restriction of Hazardous Substances (RoHS) and substances that deplete the ozone layer.
- Prosecuting those who flout environmental law and damage the environment.

Water Management

- Monitoring and reporting on the quality of rivers, lakes, transitional and coastal waters of Ireland and groundwaters; measuring water levels and river flows.
- National coordination and oversight of the Water Framework Directive.
- Monitoring and reporting on Bathing Water Quality.

Monitoring, Analysing and Reporting on the Environment

- Monitoring air quality and implementing the EU Clean Air for Europe (CAFÉ) Directive.
- Independent reporting to inform decision making by national and local government (*e.g. periodic reporting on the State of Ireland's Environment and Indicator Reports*).

Regulating Ireland's Greenhouse Gas Emissions

- Preparing Ireland's greenhouse gas inventories and projections.
- Implementing the Emissions Trading Directive, for over 100 of the largest producers of carbon dioxide in Ireland.

Environmental Research and Development

- Funding environmental research to identify pressures, inform policy and provide solutions in the areas of climate, water and sustainability.

Strategic Environmental Assessment

- Assessing the impact of proposed plans and programmes on the Irish environment (*e.g. major development plans*).

Radiological Protection

- Monitoring radiation levels, assessing exposure of people in Ireland to ionising radiation.
- Assisting in developing national plans for emergencies arising from nuclear accidents.
- Monitoring developments abroad relating to nuclear installations and radiological safety.
- Providing, or overseeing the provision of, specialist radiation protection services.

Guidance, Accessible Information and Education

- Providing advice and guidance to industry and the public on environmental and radiological protection topics.
- Providing timely and easily accessible environmental information to encourage public participation in environmental decision-making (*e.g. My Local Environment, Radon Maps*).
- Advising Government on matters relating to radiological safety and emergency response.
- Developing a National Hazardous Waste Management Plan to prevent and manage hazardous waste.

Awareness Raising and Behavioural Change

- Generating greater environmental awareness and influencing positive behavioural change by supporting businesses, communities and householders to become more resource efficient.
- Promoting radon testing in homes and workplaces and encouraging remediation where necessary.

Management and structure of the EPA

The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

- Office of Environmental Sustainability
- Office of Environmental Enforcement
- Office of Evidence and Assessment
- Office of Radiation Protection and Environmental Monitoring
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet regularly to discuss issues of concern and provide advice to the Board.



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Executive summary

Waste water must be treated to make it clean and safe before it is released back into our rivers, estuaries, lakes and coastal waters. While there has been progress recently, waste water treatment at many areas is still not as good as it needs to be. This is putting our environment and public health at risk. Based on current investment levels and Irish Water's current rate of delivery of infrastructure it will take at least two decades to bring Ireland's waste water infrastructure up to the necessary standards. Priority must be given to areas where improvements are most needed and will deliver the greatest benefits.

Some of the key achievements in 2020 include a reduction from 19 to 12 in the number of large towns failing to comply with European Union (EU) treatment standards. Irish Water also brought the discharge of raw sewage from Killala, County Mayo to an end by providing a new treatment plant to serve the village.

In this report the EPA identifies where waste water treatment must improve, as a priority, to protect our environment and public health from the harmful effects of waste water discharges. The priority areas range from Ireland's largest treatment plant at Ringsend in Dublin to small towns and villages where waste water is adversely affecting the local environment. Irish Water is making progress in resolving environmental issues and the number of priority areas has reduced by one-third over the past four years. However, there is still a long way to go to bring all deficient treatment systems up to standard.

Priorities and challenges

Comply with EU treatment standards. Treatment at 12 large towns and cities failed to comply with EU standards set to protect the environment. This is unacceptable as the final deadline for Ireland to comply was 15 years ago. These areas generate more than half of Ireland's sewage, with most of this produced in the greater Dublin area served by Ringsend treatment plant. The Ringsend plant is overloaded and cannot treat all the sewage it receives to the necessary standards. A major upgrade of the plant is ongoing.

Eliminate raw sewage discharges. 34 towns and villages release untreated sewage into the environment every day because they are not connected to treatment plants. There have been repeated delays in providing treatment at many areas and Irish Water continues to

extend the time frame to eliminate discharges of raw sewage. The changing nature of Irish Water's plans is a significant concern and the delays are prolonging risks to the environment and public health.

Improve collecting systems (sewers). The collecting systems serving seven priority areas must be upgraded to bring them up to standard and address the findings of a judgement from the Court of Justice of the European Union. Irish Water must also complete overdue assessments of the condition and performance of all collecting systems.

Protect waters at risk of pollution. Waste water is one of the main pressures on the quality of our inland and coastal waters. The EPA is prioritising 42 areas where improvements are most needed to prevent pollution. Irish Water has not provided a clear time frame to improve treatment at over two thirds of these areas. Infrastructure improvements that may be needed at these areas are not included in Irish Water's current investment plans and are therefore unlikely to start before 2025.

Protect vulnerable habitats. The EPA identified 12 towns and villages where treatment must improve to protect endangered freshwater pearl mussels. Irish Water does not have a clear time frame to carry out improvements at almost half of these areas.

Irish Water has not completed assessments of the impacts of waste water discharges on designated shellfish waters. These overdue assessments are essential to plan any improvements needed to protect shellfish waters.

Summary of key recommendations

Ireland must provide substantial and sustained funding for waste water infrastructure to protect our environment and public health and reduce the risk of European Union fines. The EPA recommends the following key actions for Irish Water.

- Improve treatment to resolve the environmental issues at each priority area and provide clear, site specific plans and time frames to carry out this work.
- Deliver improvement works in as timely a manner as possible and resolve the underlying causes for the repeated delays in upgrading treatment systems.
- Complete the overdue impact assessments for shellfish waters and the assessments of the condition and performance of collecting systems.

1 Introduction

This report by the Environmental Protection Agency (EPA) provides a summary of urban waste water treatment in Ireland during 2020.

Every day more than a billion litres of waste water is collected in our public sewers and treated at over 1,100 treatment plants. The treated waste water is then discharged back into the environment, mostly to rivers, estuaries, lakes and coastal waters. Irish Water is the national water utility responsible for providing this essential service. The EPA is the environmental regulator of Irish Water. The Commission for Regulation of Utilities is the economic regulator of Irish Water.

Why is waste water treatment important?

Treating waste water to make it clean and safe is vital to protect our environment and public health. Untreated and poorly treated waste water can be contaminated with harmful bacteria and viruses that pose a health risk to people who come into contact with infected water. It can pollute our water environment and harm aquatic ecosystems by depleting oxygen levels in the water and releasing nutrients that lead to excessive and unwanted growth of algae and aquatic plants.

Environmental priorities

While there have been improvements in recent years, waste water treatment at many areas is still not as good as it needs to be. Substantial and sustained investment will be required over several years to bring treatment at all these areas up to standard. It is not possible to fix all the problems in the short term and therefore the resources that are available must be directed where they are most needed and will bring the greatest benefits.

The EPA has identified five key issues that we require Irish Water to address, as a priority, to protect our environment from the harmful effects of waste water discharges. Table 1 summarises these five environmental priorities and shows the number of urban areas where improvements are needed to address each of these issues. We refer to these urban areas as *priority areas*.

Table 1: Environmental priorities

<p>Ensure treatment at all large urban areas complies with European Union standards</p> <ul style="list-style-type: none"> • 12 large towns and cities that did not treat waste water to European Union standards in 2020 require improvements to meet these standards.
<p>Eliminate discharges of raw sewage</p> <ul style="list-style-type: none"> • 34 towns and villages discharging raw sewage into the environment every day must be connected to treatment plants.
<p>Upgrade collecting systems found non-compliant with European Union requirements</p> <ul style="list-style-type: none"> • 7 collecting systems (sewers) must be upgraded to address the findings of a judgement from the Court of Justice of the European Union.
<p>Improve treatment where waste water is the main pressure on water bodies at risk of pollution</p> <ul style="list-style-type: none"> • 42 priority areas require improvements to protect rivers, lakes, estuaries and coastal waters at risk of pollution from waste water.
<p>Improve treatment where needed to protect freshwater pearl mussels</p> <ul style="list-style-type: none"> • 12 areas need improvements in waste water treatment to protect endangered freshwater pearl mussels.

The EPA requires Irish Water to improve treatment at a total of 97 priority areas to resolve the environmental priorities in Table 1¹. The number of priority areas has reduced by a third since 2017 (Figure 1). You can keep up to date with the priority areas, and Irish Water’s action plans to improve treatment at each of these areas, through the EPA’s website at <https://www.epa.ie/publications/compliance--enforcement/waste-water/priority-areas-list-2021.php>.

¹ There is more than one environmental priority at some urban areas. For example, Cobh is one of the 12 areas that did not meet European Union treatment standards in 2020 and is also one of the 34 areas discharging raw sewage.

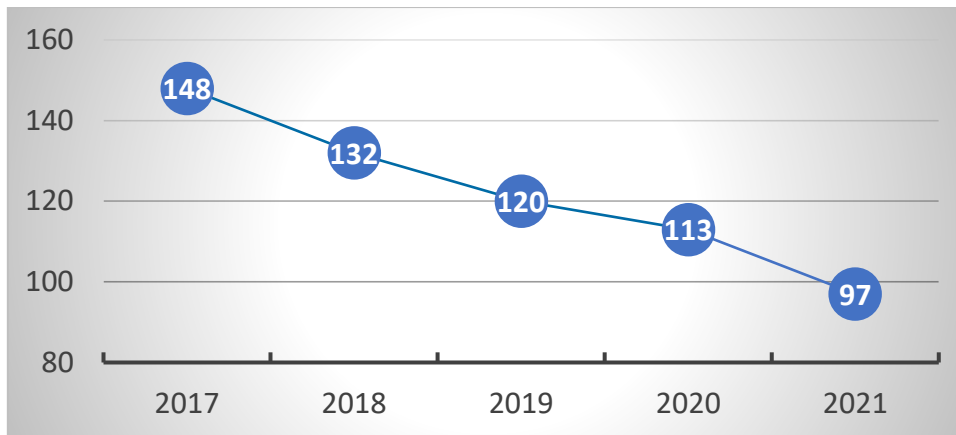


Figure 1: Reduction in the number of priority areas since 2017

Key concerns

There has been progress in resolving environmental priorities at some areas. However, there are still uncertainties around Irish Water's delivery of improvements at priority areas.

The following are key concerns:

- Irish Water has no clear plan and time frame to improve discharges from 29 priority areas where waste water is the main threat to water bodies at risk of pollution. Infrastructure works that may be needed to protect these waters are not included in Irish Water's capital investment plan 2020-2024 and are therefore unlikely to start before 2025.
- Even when funding is available, for example to stop discharges of raw sewage, Irish Water has repeatedly revised and extended the time frames to provide treatment and is taking much longer than expected to bring these projects to construction².

Irish Water needs to identify and resolve the underlying causes for delays and carry out essential upgrade works in as timely and efficient a manner as possible. We expect Irish Water to plan for the earliest possible completion of improvements at priority areas and to remove uncertainties around the delivery of these works.

² Projects must typically go through various stages and statutory processes prior to construction such as infrastructure design, land acquisition, planning permission, tendering and contractor procurement.

2 Treatment and effluent quality

The European Union’s *Urban Waste Water Treatment Directive* sets standards for waste water treatment at all large urban areas across Europe³. Compliance with the standards is a basic step in protecting our environment from the adverse effects of waste water discharges. The final deadline to comply with these mandatory standards was 2005. The main findings for Ireland in 2020 are:

174	Large urban areas in Ireland were subject to the EU treatment standards. Most (92%) of our urban waste water is generated in these areas.
162	Areas complied with the treatment standards.
12	Areas failed to comply with the treatment standards.

There has been a steady reduction in the number of areas failing to comply with the standards in recent years (Figure 2). However, more needs to be done to meet Ireland’s long overdue obligations on waste water treatment.

The areas that failed in 2020 (Figure 3) include Ringsend treatment plant in Dublin, which is overloaded and does not provide a sufficient level of treatment. This is of particular concern as almost half (43%) of Ireland’s urban waste water was conveyed to Ringsend for treatment during 2020. The 12 non-compliant areas account for 54% of the total waste water load collected in all large urban areas. You can find further information in *Appendix A* on the treatment standards breached at these 12 areas.

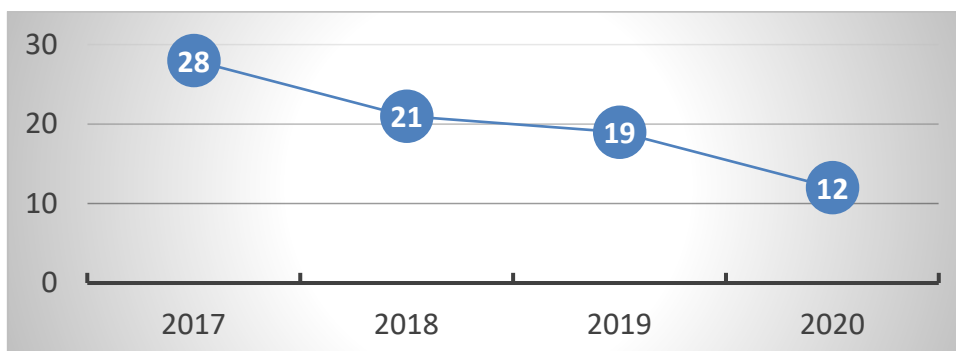


Figure 2: Number of large urban areas failing the European Union treatment standards

³ There is information on technical terms used in this report, such as the definition of a large urban area, in the *Glossary and background information*.

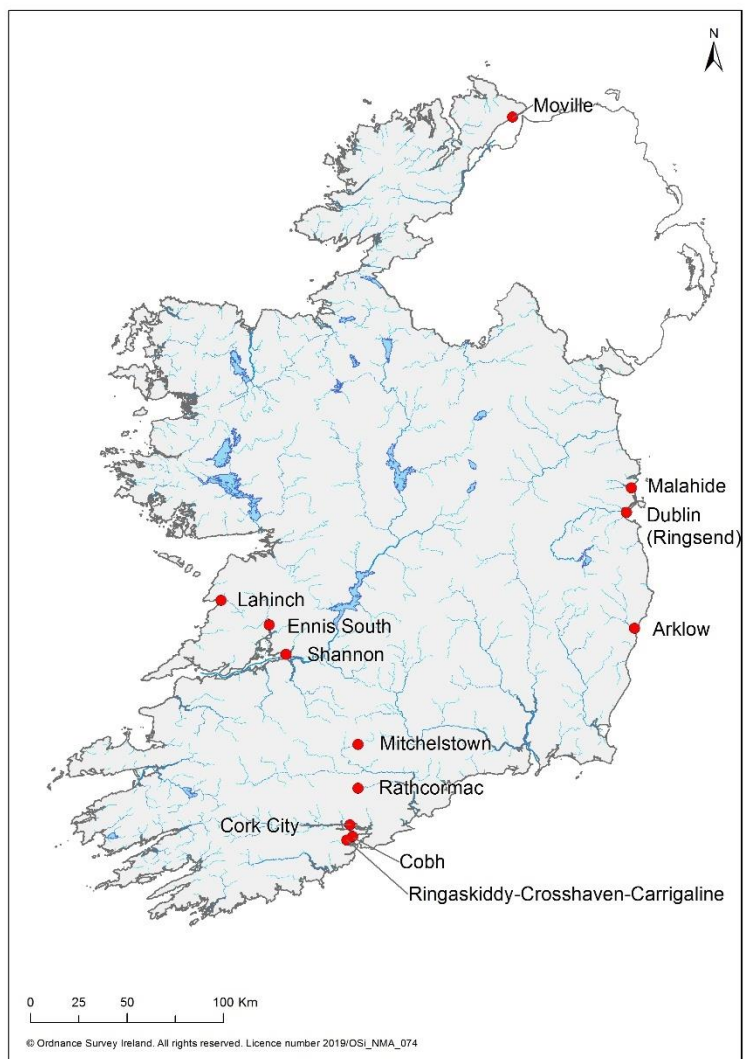
Most of the towns and cities that failed the standards require investment in treatment infrastructure. For example, treatment plants must be built at Arklow and Merville because waste water from these towns does not receive any treatment.

Irish Water expects to complete key infrastructure projects during 2021 at three of the 12 non-compliant areas. It will connect Cobh to a treatment plant, provide a more stringent level of treatment at Cork City and finish a much needed upgrade of Shannon treatment plant. A major upgrade and expansion of the overloaded plant at Ringsend is ongoing and Irish Water expects to complete this in 2025.

In addition to providing new and upgraded treatment infrastructure, Irish Water must make sure it operates and maintains the existing plants to get the best from them and minimise breakdowns. Some areas already have plants capable of meeting the treatment standards but failed due to occasional operational problems during 2020, for example Ennis South.

The EPA has repeatedly highlighted the towns and cities where treatment does not meet EU standards. In 2019 the Court of Justice of the European Union declared that Ireland has failed to fulfil its obligations under the *Urban Waste Water Treatment Directive*. Investing now to promptly improve deficient treatment systems is vital to protect our environment and public health and to reduce the risk of fines.

Figure 3: Areas that failed EU treatment standards in 2020



Topic Box: Improving treatment at a priority area

Prior to 2020 waste water from Tubbercurry, County Sligo was treated at an old treatment plant built in 1970. The plant was designed for a time when the population and volume of waste water to be treated was much smaller. The ageing plant was overloaded and unable to treat waste water from the town properly. The EPA highlighted that the plant was failing to meet EU treatment standards and polluting the local river. We identified Tubbercurry as a national priority area that required a major treatment plant upgrade.

Irish Water completed a new treatment plant at Tubbercurry at the end of 2019. The plant is treating waste water to a much better standard than before and protecting the environment by discharging a consistently cleaner effluent. The new plant met the EU treatment standards in 2020, bringing to an end more than a decade of non-compliance with the *Urban Waste Water Treatment Directive*. The EPA removed Tubbercurry from our priority areas as a result of these improvements.

The graph in Figure 4 shows the biochemical oxygen demand (BOD) of the effluent and illustrates the improvement in quality in 2020. High concentrations of biochemical oxygen demand indicate there is too much organic matter in the treated waste water. When organic matter decays it can harm the ecological health of a river and cause an unwanted drop in oxygen levels.

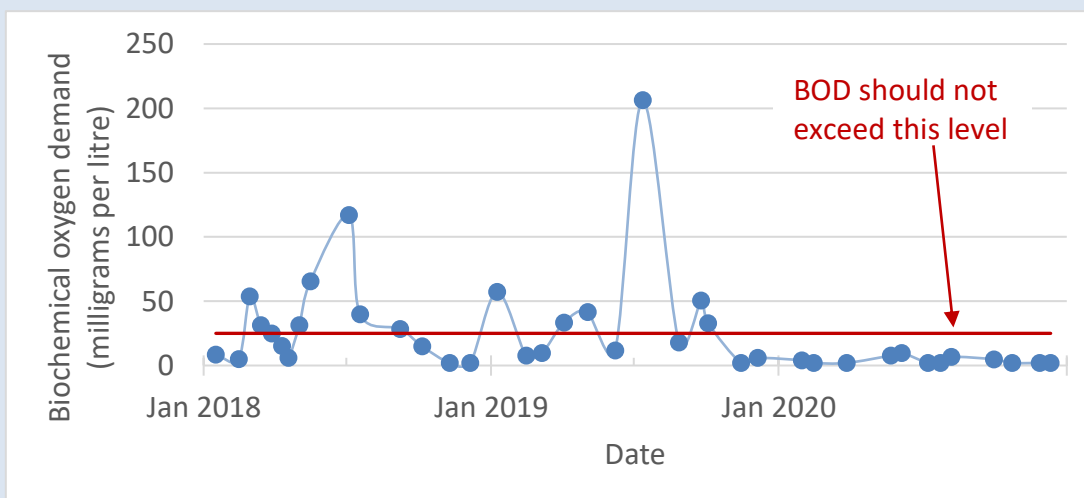


Figure 4: Effluent quality at Tubbercurry

3 Untreated sewage

34 towns and villages (shown in Figure 5) release untreated sewage into our environment every day because they do not have treatment plants⁴. This is down from 35 areas in 2019, following the completion of a new plant in Killala, County Mayo in 2020.

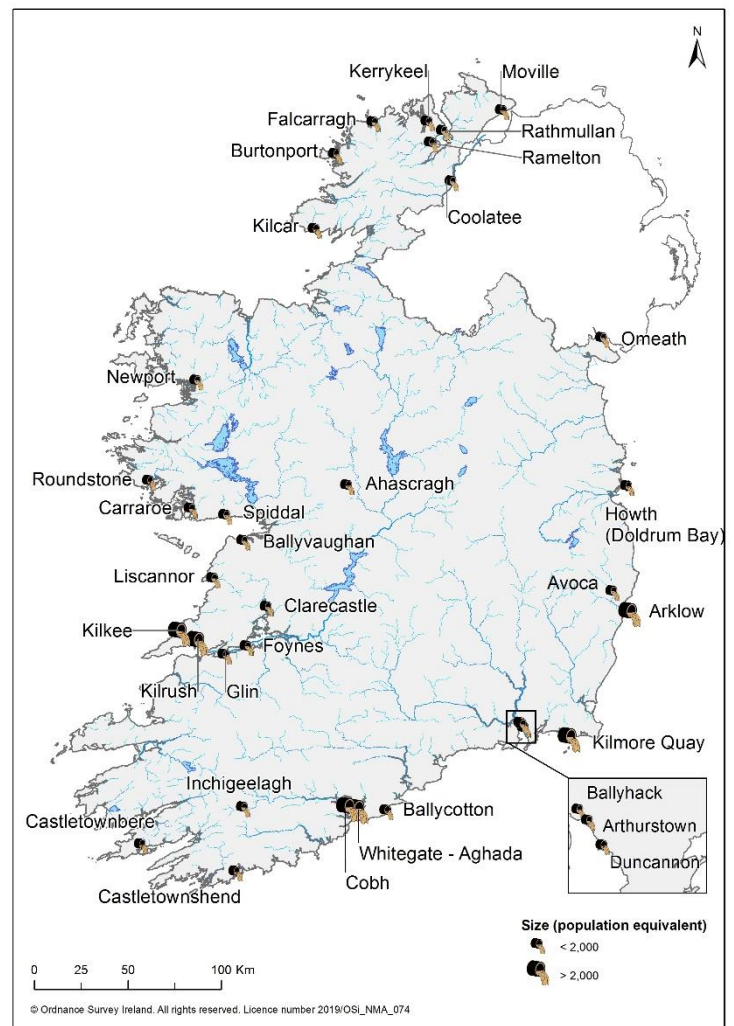
Treating waste water to make it clean and safe is vital to protect our environment and public health. *Appendix B* shows when Irish Water plans to connect each of these areas to treatment. Ten towns and villages are not scheduled to receive treatment until 2025 and a further two are likely to continue discharging untreated sewage until 2027.

Over the years Irish Water produced various plans to eliminate discharges of raw sewage. However, it has repeatedly failed to deliver on these plans and continues to extend the time frame to provide treatment for many areas.

For example, during the past year Irish Water revised the number of areas it intends to connect to treatment by the end of 2023 from 28 down to just 14.

The repeated changes in plans and delays in bringing projects to construction are prolonging risks to the environment and people’s health. Irish Water must provide the infrastructure needed at each of these 34 areas without any further delays.

Figure 5: Areas discharging raw sewage



⁴ This refers to the situation in mid-2021. 31 of these are small towns and villages, which are below the size thresholds for large urban areas. The three large urban areas with no treatment are Arklow, Cobh and Merville.

4 Waste water collecting systems

Ireland's waste water collecting systems include approximately 30,000 kilometres of underground sewers and around 2,000 pumping stations. These carry sewage away from our homes and communities and convey it to over 1,100 treatment plants. In many areas the sewers also collect surface water runoff from impermeable surfaces such as roads.

Collecting systems should have enough capacity to collect and retain waste water during all normal local weather conditions and all normal seasonal variations in waste water load. If waste water discharges from a collecting system before it reaches a treatment plant it can cause pollution, affect local amenities and pose a health risk.

Ireland is required to improve the collecting systems at seven priority areas, listed in *Appendix C*, to bring them up to standard and address the findings of a judgement from the Court of Justice of the European Union⁵. In 2019 the Court declared that Ireland had failed to ensure waste water collected in these seven systems was retained and conveyed for treatment. Ireland risks substantial fines from the Court if the improvements needed at these areas are not completed promptly.

Assessing the performance of collecting systems

There is a shortage of information on many collecting systems. For example, Irish Water does not have enough information on the frequency and extent of discharges of untreated waste water from collecting systems. Irish Water needs to build an accurate picture of the condition and performance of all collecting systems and the impacts and risks arising from the operation of storm water overflows⁶. The findings from this work will inform future planning and investment to address shortcomings in collecting systems. It will take significant investment over many years to complete all the assessments of Ireland's collecting systems and to fix deficient systems.

⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:62017CJ0427>.

⁶ There is more information about storm water overflows in the *Glossary and background information* and on the EPA's website at <https://www.epa.ie/our-services/compliance--enforcement/waste-water/urban-waste-water/>.

By the end of 2020 Irish Water had assessed the performance of 1,508 of its estimated 2,400 storm water overflow outlets. Almost one quarter of those assessed did not meet the necessary standards⁷.

Discharges from collecting systems

Waste water sometimes discharges from collecting systems before it can reach a treatment plant. This may happen if:

- a storm water overflow outlet is activated to relieve a sewer of excess flows caused by heavy rainfall;
- a pump used to move sewage through a collecting system breaks down or stops working and causes an emergency overflow into a local watercourse;
- a sewer is blocked, for example by wet wipes or a build-up of grease and fats; or
- the sewer has inadequate capacity or structural defects.

Waste water caused 27 bathing water pollution incidents during the 2020 bathing season and most of these were associated with discharges from waste water collecting systems⁸. A bathing water pollution incident is any event with the potential to cause a temporary decline in bathing water quality. Local authorities take a precautionary approach when reporting such incidents, meaning not all incidents result in an actual decline in water quality. This precautionary approach is taken to protect bathers' health.

⁷ The standards are set out in the *Procedures and criteria in relation to storm water overflows*, which is available on the EPA website at <https://www.epa.ie/publications/licensing--permitting/waste-water/UrbanWasteWater2.pdf>.

⁸ Based on information reported by local authorities. Local authorities are responsible for managing bathing waters and for reporting and investigating pollution incidents. The bathing season runs from 1st June to 15th September. The EPA report on [Bathing Water Quality in 2020](#) has more information on bathing waters.

5 Risks to surface water quality

Clean rivers, lakes, estuaries and coastal waters support a rich diversity of species and habitats and are vital to the natural environment and our own wellbeing. The ecological health of almost half of Ireland's surface waters is unsatisfactory because of pollution and other human disturbance. Urban waste water is one of the common pollution pressures, affecting 13% of the unsatisfactory surface waters. Untreated or poorly treated waste water can cause pollution by releasing nutrients that lead to excessive and unwanted growth of algae and plants and by depleting oxygen levels in the water. This can happen if a treatment plant does not provide adequate treatment or if untreated sewage escapes from sewers and pump stations.

In preparation for Ireland's national River Basin Management Plan 2018 – 2021 the EPA assessed Ireland's surface waters and identified water bodies at risk of pollution. We also identified the key pollution pressures on these water bodies. Arising from this work, which was completed in 2017, the EPA targeted 59 priority urban areas where we identified waste water as the most significant pollution pressure threatening local surface waters. We required Irish Water to resolve the risk of pollution by improving treatment at these areas.

Waste water is no longer considered a significant pollution pressure at 19 of these areas and we removed these from our priority areas between 2018 and 2021. However, we recently added two further sites to the priority areas following a decline in river water quality attributed to discharges from Ferns in Wexford and Quin in Clare. This means the EPA is now prioritising 42 areas, shown in Figure 6 and *Appendix D*, where improvements are needed to prevent waste water from harming rivers, lakes, estuaries and coastal waters.

What is Irish Water doing to prevent pollution at the 42 priority areas?

Irish Water has improved treatment at five of the priority areas and the EPA is assessing if these improvements have resolved the risk of pollution.

Treatment upgrades to protect waters at risk of pollution are either ongoing or due to start between 2021 and 2024 at a further eight areas.

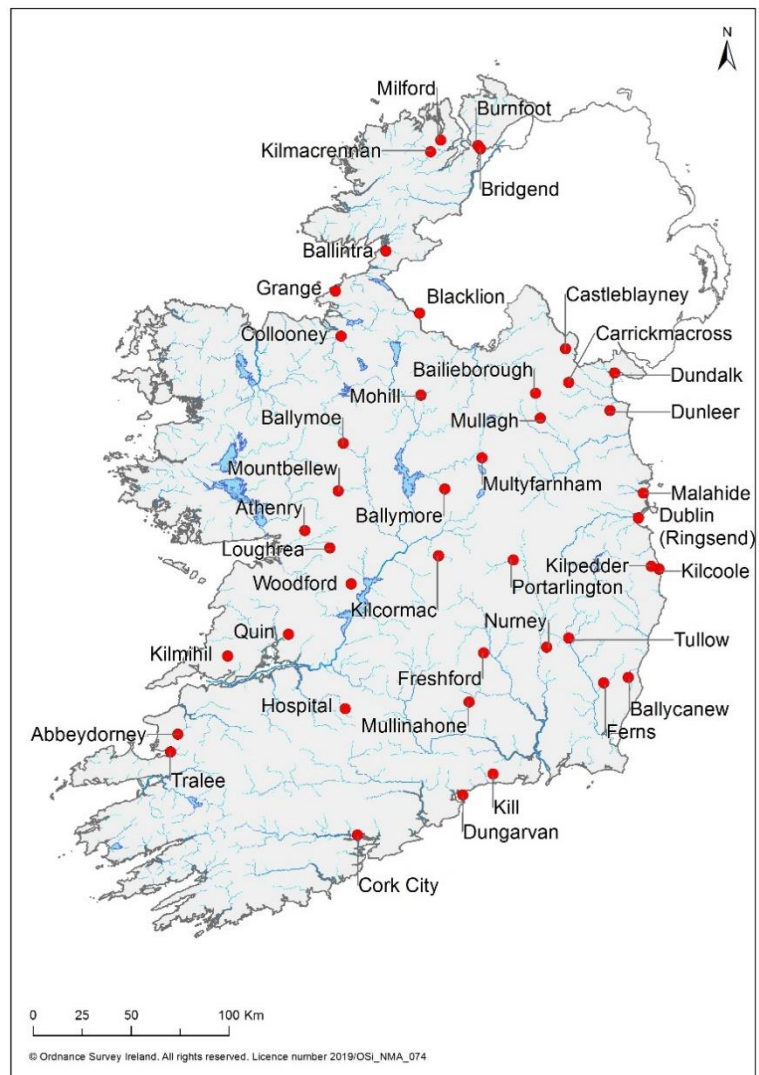
Irish Water does not have a clear plan and time frame to resolve the risk of pollution from the remaining 29 areas. Infrastructure improvements that may be needed to protect

surface waters at these areas are not included in Irish Water’s capital investment plan 2020-2024 and are therefore unlikely to start before 2025. The EPA prosecuted Irish Water in 2020 for discharging inadequately treated waste water from one of these areas, Abbeydorney in County Kerry⁹.

Some of the action plans to improve discharges changed significantly over the past year. For example, Irish Water revised the completion date for the upgrade of Bailieborough treatment plant in Cavan from 2022 to 2025.

Irish Water must identify and implement clear action plans to improve discharges from the priority areas. This may involve upgrading the collecting and treatment systems, as well as improving the operation and management of these systems.

Figure 6: Areas prioritised to protect surface waters



⁹ There is more information about the prosecution on the EPA’s [website](#).

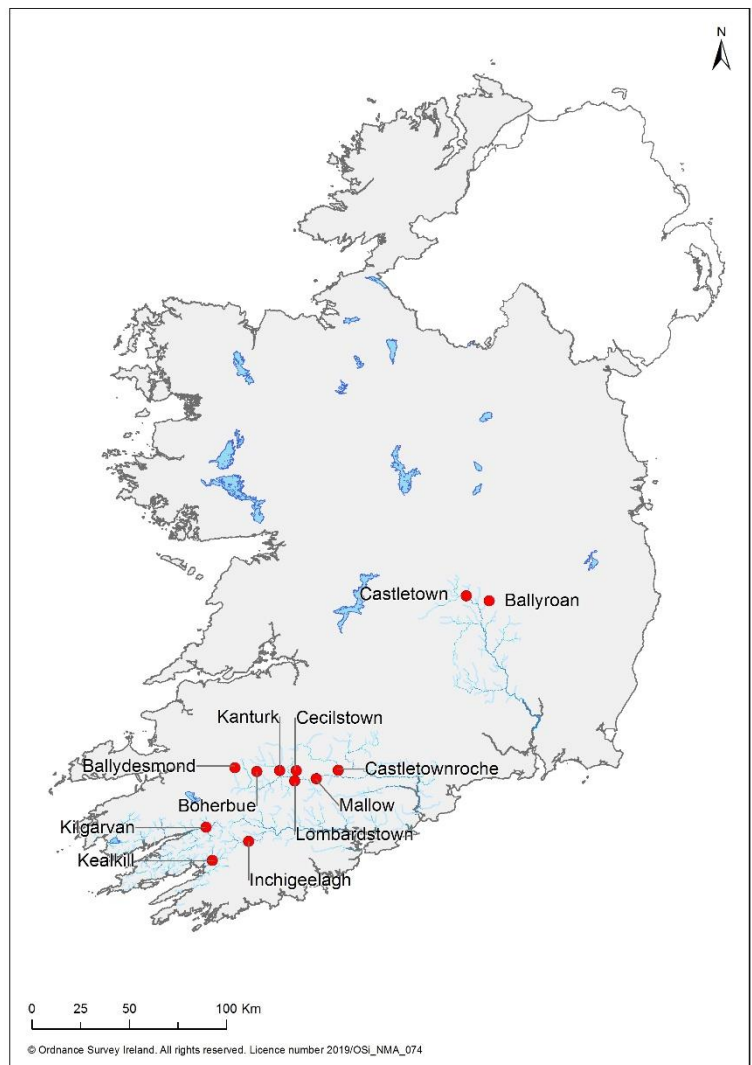
6 Protecting freshwater pearl mussels

The EPA has identified 12 towns and villages where waste water treatment must improve to help protect freshwater pearl mussels (Figure 7 and *Appendix E*). This is down from 13 areas last year, following the completion of a new treatment plant at Millstreet in Cork.

Irish Water has not provided a clear time frame to complete all the necessary improvements at five of the 12 priority areas. It is likely that the threat to pearl mussels at these five areas will not be resolved until after 2024.

Freshwater pearl mussels are globally endangered molluscs that require clean, fast flowing, well oxygenated rivers and a clean river bed. They are sensitive to small changes in environmental conditions and are declining both nationally and internationally due to deteriorating river quality. Pollution by inadequately treated waste water can be detrimental to the survival of new generations of mussels.

Figure 7: Areas prioritised to protect freshwater pearl mussels



7 Protecting shellfish waters

There are 64 designated shellfish waters around our coast. Ireland designated these as protected areas to support the life and growth of shellfish, such as oysters and mussels. If these waters are polluted by sewage then shellfish in the area may accumulate bacteria and viruses that are harmful to humans. People can fall ill by eating contaminated shellfish and can suffer stomach cramps, vomiting and diarrhoea.

The EPA requires Irish Water to assess the impacts of waste water discharges on shellfish in 43 of the designated shellfish waters. We use the findings of these assessments to identify where discharges need to improve.

The EPA does not require impact assessments for the remaining 21 shellfish waters. We may not require an assessment if, for example, there are no discharges near the shellfish waters, or if we have already set out the controls necessary to protect the designated shellfish water in a waste water discharge authorisation.

15	Assessments showed no adverse impact from waste water discharges.
3	Assessments, covering Donegal Bay, Drumcliffe Bay and Killary Harbour, found that discharges must improve to protect the shellfish waters. Irish Water must now identify and carry out the improvements needed at these areas.
25	Assessments are not complete. The long overdue assessments for these shellfish waters (listed in <i>Appendix F</i>) must be completed promptly, as discharges may potentially be impacting on some of these areas.

A common way to help protect shellfish waters is to disinfect the treated waste water before it is discharged. This is usually done using ultraviolet lamps to kill or inactivate bacteria and viruses in the waste water.

8 Improving waste water treatment

Infrastructure

When the EPA issues licences for waste water discharges we require improvements in waste water infrastructure within specified time frames, where such works are needed to reduce environmental risks. The pace at which Irish Water is carrying out these works continues to fall far short of EPA requirements. Irish Water has completed just 57% of the improvement works that were due up to the end of 2020 (Figure 8). Approximately 230 individual works are more than five years overdue and nearly half of these are at priority areas.

The improvements completed by Irish Water during 2020 include a major upgrade of Strandhill waste water treatment plant in County Sligo (Figure 9). The EPA required this upgrade because the old plant was overloaded and provided a poor level of treatment. There has been a welcome improvement in the quality of the effluent discharged from Strandhill following the upgrade works.

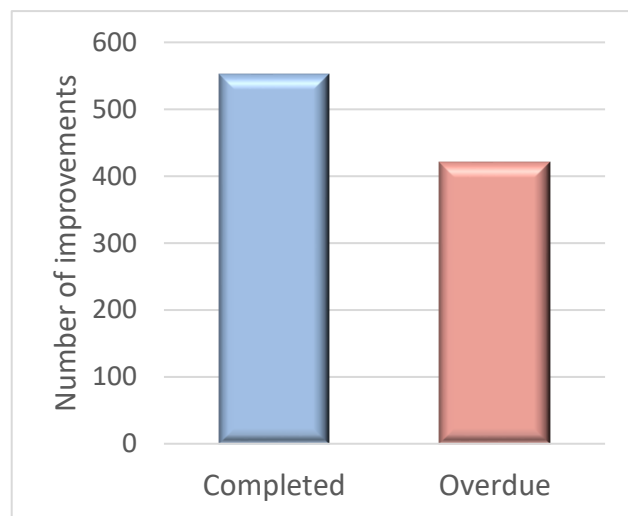


Figure 8: Status of improvement works due up to the end of 2020



Figure 9: Strandhill waste water treatment plant

Operation and maintenance

Treatment systems should always be operated, managed and maintained in a manner that gets the best from them, improves resilience and reduces breakdowns.

- Over 440 short duration environmental incidents during 2020 were caused by issues around the operation and maintenance of treatment plants, up from 330 in 2019¹⁰.
- There was a 50% increase in breakdowns of equipment at treatment plants in 2020 compared to 2019.

Proactive maintenance and servicing of plant and equipment is key to reducing breakdowns and keeping treatment systems in the best condition. Maintenance should take a preventative approach, for example by checking, servicing and calibrating equipment regularly, rather than just reacting to problems when they occur. When equipment breaks down we expect Irish Water to take action promptly to mitigate any risks to the environment.

Further measures that we recommend to protect the environment if critical equipment stops working include telemetry warning systems that trigger a rapid response in emergency situations and standby pumps that run automatically if duty pumps break down.

Sewage sludge

Sewage sludge is a thick, soft mix of residual matter left over when waste water is treated. Good sludge management, such as removing sludge from the treatment process at an appropriate rate, is an essential part of waste water treatment. Irish Water removed 58,448 tonnes of sewage sludge from its treatment plants in 2020. Most of this was reused as a soil enhancer or fertiliser on agricultural land. There is more information on the reuse and disposal of sludge in *Appendix H*.

¹⁰ *Appendix G* has further information on environmental incidents.

9 Concluding remarks

There have been some positive achievements in the past year, including an increase in the number of large towns complying with European Union treatment standards. The number of priority areas where improvements are most needed has reduced from 113 to 97.

However, waste water treatment at many areas is still not as good as it needs to be. It will take substantial investment over several years to bring all deficient treatment systems up to standard. In this report the EPA has set out the key issues we expect Irish Water to address, as a priority, to protect our environment and public health from the harmful effects of waste water discharges.

While Irish Water is making some progress, there have been repeated delays in completing important projects, such as providing treatment for areas discharging raw sewage. There is also continued uncertainty around plans to resolve some priority issues. For example, Irish Water does not have clear time frames to improve treatment at many of the areas where waste water is a significant threat to water bodies at risk of pollution. Irish Water must remedy the underlying causes for delays and provide certainty on when and how it will resolve the priority issues set out in this report.

There is a shortage of information on waste water collecting systems. Irish Water must continue building an accurate picture of the condition and performance of all collecting systems and the risks arising from the operation of storm water overflows. It also needs to complete overdue assessments of waste water impacts on shellfish. This information is needed to help target and plan future improvement projects.



Figure 10: Killala waste water treatment plant

Photo courtesy of Glan Agua Ltd

Glossary and background information

<p>Directive</p>	<p>The Urban Waste Water Treatment Directive. The EPA assesses compliance with the Directive’s treatment and effluent quality standards using effluent monitoring results and information on the type of treatment, the size of the urban area and the type of receiving water the effluent discharges into. Irish Water provides this information to us and is responsible for ensuring it is true and accurate.</p>
<p>Effluent</p>	<p>Waste water discharged from a waste water collecting and treatment system.</p>
<p>Effluent quality standards</p>	<p>Irish Water monitors effluent regularly to check if it is properly treated and meets the necessary quality standards.</p> <p><u>Standards for secondary treatment.</u></p> <p>The Directive sets mandatory standards for two parameters that we use to assess polluting potential, namely biochemical oxygen demand and chemical oxygen demand. These measure the amount of oxygen used up (demanded) to break down polluting matter in the effluent. If effluent does not meet these quality standards it may lead to a drop in oxygen levels within the receiving waters, which could harm aquatic life and biodiversity. Effluent discharged from all 174 large urban areas must meet these basic standards.</p> <p><u>Standards for more stringent treatment.</u></p> <p>Effluent discharged to sensitive areas requires a higher level of treatment to remove nutrients that could lead to pollution. Phosphorous and nitrogen are the main nutrients that drive pollution in sensitive areas. The Directive sets maximum limits on the concentration of phosphorus and nitrogen in effluent discharged to sensitive areas from towns and cities with a population equivalent of at least 10,000. A total of 38 towns and cities were subject to these standards in 2020.</p>

<p>Large urban area</p>	<p>Towns and cities with a population equivalent of at least 2,000 that discharge effluent to freshwater or estuaries, and areas with a population equivalent of at least 10,000 that discharge effluent to coastal waters.</p> <p>The population equivalent can change from year to year, for example population growth or a new industry could lead to an increase in waste water within a town. Consequently, the number of areas that meet the size threshold for a large urban area can vary from year to year.</p>
<p>Population equivalent</p>	<p>A term used to indicate how much waste water is generated in an urban area. It includes waste water generated by the resident population, the non-resident population (for example, tourists) and industries. A population equivalent of one is defined as the organic biodegradable load having a five-day biochemical oxygen demand of 60 grams of oxygen per day.</p>
<p>Sensitive area</p>	<p>A water body is classified as a sensitive area if it is eutrophic; may become eutrophic if protective action is not taken; or is intended for abstraction of drinking water and contains more than 50 milligrams per litre of nitrates. Ireland’s sensitive areas are listed in the Urban Waste Water Treatment (Amendment) Regulations, 2010 (Statutory Instrument number 48 of 2010).</p> <p>Eutrophic refers to the enrichment of waters by nutrients, leading to an accelerated and unwanted growth of algae and aquatic plants.</p> <p>Phosphorus enrichment tends to drive eutrophication in rivers and lakes, whereas nitrogen enrichment tends to drive eutrophication in estuaries and coastal waters.</p>
<p>Shellfish waters</p>	<p>Protected areas designated to support shellfish life and growth. They are identified in the following national regulations: Statutory Instrument (S.I.) 268 of 2006, S.I. 55 of 2009 and S.I. 464 of 2009.</p>

<p>Storm water overflow</p>	<p>Outlets from collecting systems designed to relieve sewers of excess flows caused by unusually heavy rainfall. They act as emergency safety valves and release excess flow from the sewer directly into local waters, such as rivers. Without these releases there could be a greater risk to the environment and people’s health because the sewer and treatment plant could become inundated, and homes and streets flooded by sewage. Storm water overflows should only activate in extreme rainfall and should not be used in normal conditions to compensate for a lack of sewer capacity.</p>
<p>Urban waste water</p>	<p>Domestic waste water, or the mixture of domestic waste water with industrial waste water and / or rainwater runoff.</p> <ul style="list-style-type: none"> - Domestic waste water is waste water from residential settlements and services, which originates mainly from human metabolism and from household activities. - Industrial waste water is waste water discharged from premises used to carry on any trade or industry. <p>Urban waste water is commonly referred to as ‘sewage’.</p>
<p>Waste water discharge authorisation</p>	<p>This is a legal document issued by the EPA to Irish Water which sets out the conditions under which Irish Water must control and manage waste water discharges from an urban area.</p> <p>A waste water discharge licence is required for discharges from areas with a population equivalent of 500 or more. A certificate of authorisation is required for discharges from areas with a population equivalent of fewer than 500.</p> <p>You can view each authorisation on the EPA’s website at https://epawebapp.epa.ie/terminalfour/wwda/index.jsp.</p>

Appendix A: EU treatment standards

Treatment at the 12 towns and cities listed below did not meet the standards in the European Union’s *Urban Waste Water Treatment Directive* in 2020.

County	Urban area	Failed the secondary treatment standards	Failed the more stringent treatment standards
Clare	Ennis South	x	
	Lahinch	x	
	Shannon	x	
Cork	Cork		x
	Cobh	x	x
	Mitchelstown	x	
	Rathcormac	x	
	Ringaskiddy & environs		x
Donegal	Moville	x	
Dublin	Dublin (Ringsend)	x	x
	Malahide		x ¹¹
Wicklow	Arklow	x	

What are the EU treatment standards that apply to Ireland’s large urban areas?

1. Waste water from all 174 large urban areas must undergo secondary treatment to remove organic matter. The treated waste water from these areas must also meet certain basic effluent quality standards used to assess polluting potential.
2. 38 of the 174 large urban areas require an additional, more stringent level of treatment to remove nutrients (nitrogen and/or phosphorus) and the concentration of nutrients in the treated waste water must be below specified limits. These additional standards apply at towns and cities with a population equivalent of 10,000 or more discharging into sensitive areas.

¹¹ Effluent released from Malahide treatment plant met the Directive’s effluent quality standards in 2020. However, Irish Water confirmed the plant does not provide the more stringent level of treatment required by the Directive to remove nitrogen.

Appendix B: Areas discharging untreated sewage

The table below lists the 34 areas that have no treatment plants and continue to release untreated sewage into the environment in mid-2021.

County	Urban area	Date for treatment ¹²
Clare	Ballyvaughan	2024
	Clarecastle	2023
	Kilkee	2025
	Kilrush	2023
	Liscannor	2023
Cork	Ballycotton	2024
	Castletownbere	2022
	Castletownshend	2024
	Cobh	2021
	Inchigeelagh	2023
	Whitegate - Aghada	2024
Donegal	Burtonport	2023
	Coolatee	2025
	Falcarragh	2025
	Kerrykeel	2023
	Kilcar	2023
	Moville	2027
	Ramelton	2025
	Rathmullan	2025
Dublin	Howth (Doldrum Bay)	2024

¹² Irish Water provided these dates in September 2021. Cobh, Castletownbere, Duncannon, Ballyhack and Arthurstown are the only areas where the date to provide treatment has not been extended over the past year.

County	Urban area	Date for treatment
Galway	Ahascragh	2023
	Carraroe	2027
	Roundstone	2024
	Spiddal	2024
Limerick	Foynes	2025
	Glin	2025
Louth	Omeath	2023
Mayo	Newport	2025
Wexford	Arthurstown	2023
	Ballyhack	2023
	Duncannon	2023
	Kilmore Quay	2024
Wicklow	Arklow	2025
	Avoca	2025

Appendix C: Priority collecting systems

Ireland is required to improve the collecting systems at the following areas to address the findings of a 2019 judgement from the Court of Justice of the European Union.

County	Urban Area
Cork	Cork City
	Fermoy
	Mallow
	Midleton
Roscommon	Roscommon
Westmeath	Athlone
Wexford	Enniscorthy

The Court also declared that one further area, Ringaskiddy-Crosshaven-Carrigaline in County Cork, did not have an adequate collecting system. Irish Water has completed improvement works to address this.

Appendix D: Pressures on surface water quality

The EPA is prioritising 42 areas, listed below, where improvements are needed to prevent waste water from harming rivers, lakes, estuaries and coastal waters.

County	Urban area
Carlow	Nurney
	Tullow
Cavan	Bailieborough
	Blacklion
	Mullagh
Clare	Kilmihil
	Quin
Cork	Cork City
Donegal	Ballintra
	Bridgend
	Burnfoot
	Kilmacrennan
	Milford
Dublin	Dublin / Ringsend
	Malahide
Galway	Athenry
	Ballymoe
	Loughrea
	Mountbellew
	Woodford
Kerry	Abbeydorney
	Tralee
Kilkenny	Freshford
Laois	Portarlinton
Leitrim	Mohill
Limerick	Hospital

County	Urban area
Louth	Dundalk
	Dunleer
Monaghan	Carrickmacross
	Castleblayney
Offaly	Kilcormac
Sligo	Collooney
	Grange
Tipperary	Mullinahone
Waterford	Dungarvan
	Kill
Westmeath	Ballymore
	Multyfarnham
Wexford	Ballycanew
	Ferns
Wicklow	Kilcoole
	Kilpedder

Environmental objectives

The European Union's *Water Framework Directive* is a key piece of legislation aimed at protecting and enhancing waters across Europe. The Directive requires Ireland to protect and enhance our waters to meet the following environmental objectives:

- achieve at least good status; and
- prevent any deterioration in existing status.

When we refer to waste water as a *pollution pressure* in this report, we mean it is putting parts of a river, lake, estuary or coastal water at risk of not meeting the specific environmental objective set for that water body.

Appendix E: Protecting freshwater pearl mussels

The table below lists the 12 towns and villages where waste water treatment must improve to help protect freshwater pearl mussels.

County	Urban area
Cork	Ballydesmond
	Boherbue
	Castletownroche
	Cecilstown ¹³
	Inchigeelagh
	Kanturk
	Kealkill ¹³
	Lombardstown
	Mallow
Kerry	Kilgarvan ¹³
Laois	Ballyroan
	Castletown

Irish Water previously reported it had completed all the necessary improvement works at Castletownroche. However, the EPA inspected the treatment plant in 2020 and found it still does not meet the required standards. Our site visit report is available at https://epawebapp.epa.ie/licences/lic_eDMS/090151b2807a12c7.pdf.

¹³ Environmental monitoring is ongoing to determine if recent improvements to waste water treatment at this area are sufficient to protect freshwater pearl mussels.

Appendix F: Shellfish assessments

Irish Water must complete overdue assessments of the impacts of waste water discharges on the following 25 designated shellfish waters.

County	Shellfish waters
Cork	Baltimore Harbour / Sherkin
	Castletownbere
	Cork Great Island North Channel
	Glengarriff
	Oysterhaven
	Rostellan North
	Rostellan South
	Rostellan West
Donegal	Lough Swilly
	McSwynes Bay
	Sheephaven
Kerry	Cromane
	Maherees
	Tralee Bay
	Valentia Harbour
Kerry and Cork	Kenmare River
Louth	Carlingford Lough
	Dundalk Bay
Mayo	Blacksod Bay
Sligo	Sligo Bay
Waterford	Dungarvan Harbour
Waterford and Wexford	Waterford Harbour
Wexford	Bannow Bay
	Wexford Harbour Inner
	Wexford Harbour Outer

Appendix G: Environmental incidents

An environmental incident is:

- any discharge that does not comply with the requirements of a waste water discharge licence; or
- any occurrence at a waste water works with the potential for environmental contamination or requiring an emergency response.

There were 1,108 short duration or one-off incidents during 2020. Most of these were caused by short term issues with the operation, management and maintenance of treatment plants or by blocked sewers and problems at pump stations. Adverse weather during Storm Ellen and Storm Francis in August caused over 90 incidents.

At the end of 2020 there were also an additional 238 longer term incidents that were either still ongoing or were likely to recur unless Irish Water resolves the underlying cause of the incident. These are referred to as *recurring incidents*. Figure 11 shows the number of recurring incidents at the end of each year since 2017.

- Almost three quarters of these recurring incidents are medium to long term problems at treatment plants that are unlikely to be solved until the treatment infrastructure is upgraded.
- 13% of the recurring incidents can be fixed by improving the operation and management of treatment plants.
- The remainder (13%) are due to problems with waste water collecting systems.

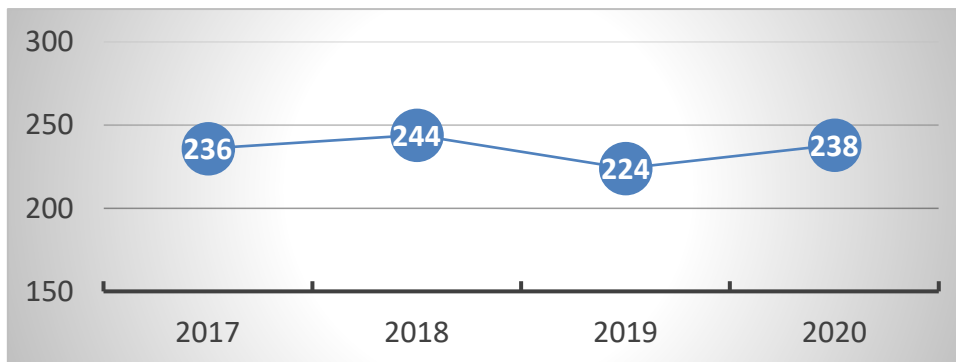


Figure 11: Number of recurring incidents at the end of each year

Appendix H: Sewage sludge

The table below shows the reuse and disposal routes for sewage sludge removed from Irish Water's waste water treatment plants during 2020.

Sludge contains valuable nutrients such as nitrogen and phosphorus and is mostly used as a soil enhancer or fertiliser on agricultural land. When used in this manner it must first be treated to make it stable and free of harmful bacteria and viruses. It must then be spread on the land in a way that ensures the nutrients are effectively used for plant growth or assimilated into the soil.

Sewage sludge reuse and disposal routes in 2020

	Agriculture	Compost	Landfill	Other	Total
Tonnes dry solids	51,792	6,503	74	79	58,448

All sludge sent for composting was subsequently reused in soil / agriculture.

The category *Other* in the table above refers to treated sludge in storage at the end of 2020 awaiting landspreading on soil / agricultural land.

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL

Tá an Gníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaoil a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaoil a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: Déanaimid córais éifeachtacha rialaithe agus comhlionta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.

Eolas: Soláthraimid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithé agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.

Tacaíocht: Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaoil atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaoil inbhuanaithe.

Ár bhFreagrachtaí

Ceadúnú

Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaoil:

- saoráidí dramhaíola (*m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola*);
- gníomhaíochtaí tionsclaíoch ar scála mór (*m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta*);
- an dionalmhaíocht (*m.sh. muca, éanlaith*);
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe (*OGM*);
- foinsí radaíochta ianúcháin (*m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíochta*);
- áiseanna móra stórála peitрил;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdarás áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhírú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózón.
- An dlí a chur orthu siúd a bhreiseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaoil.

Bainistíocht Uisce

- Monatóireacht agus tuairiscí a dhéanamh ar cháilíocht aibhneacha, lochanna, uisce idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairiscí a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairiscí ar an gComhshaoil

- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairiscí neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil (*m.sh. tuairiscíu tréimhsiúil ar staid Chomhshaoil na hÉireann agus Tuarascálacha ar Tháscairí*).

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn

- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn.

Taighde agus Forbairt Comhshaoil

- Taighde comhshaoil a chistiú chun brúnna a shainiú, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeraíde, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta

- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaoil in Éirinn (*m.sh. mórphleananna forbartha*).

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas

- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaoil ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaoil (*m.sh. Timpeall an Tí, léarscáileanna radóin*).
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta

- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an gníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:

- An Oifig um Inmharthanacht Comhshaoil
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Fianaise is Measúnú
- Oifig um Chosaint Radaíochta agus Monatóireachta Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair inní agus le comhairle a chur ar an mBord.



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