

Pwyllgor Newid Hinsawdd, yr Amgylchedd a Seilwaith /
Climate Change, Environment and Infrastructure Committee
Ansawdd dŵr a gollyngiadau carthion / Water quality and sewage discharges
WQSD 01
Ymateb gan Dŵr Cymru / Evidence from Welsh Water



Dear Chair,

17th January 2022

Thank you for the opportunity to give evidence to the Senedd's [Climate Change, Environment, and Infrastructure Committee](#) ("the Committee") as part of its work on water quality and sewage discharges.

As a company, we appreciate that Wales is renowned for the environmental quality of its landscape, rivers and seas, which attract visitors and support our key industries. It is important for our continued economic success and wellbeing that we maintain this enviable reputation on behalf of the people of Wales. As the largest water company in Wales, we are dependent on a healthy environment – both in our rivers and beyond – in order to sustain the services we provide to our customers. As such, we need to protect our natural resources and limit any adverse impact that we may have. Whilst we have a strong and improving environmental record, it is always disappointing when our work has a detrimental impact on the environment and we will always investigate such incidents to ensure that we can learn any lessons that will inform our future way of working.

We hold ourselves to the highest standards and our environmental strategy and performance is a key focus of the independent Glas Cymru Board. Its oversight and scrutiny work of Welsh Water is reinforced by a sub-committee of the Board, the Quality and Environment Committee, but also our independent Glas Cymru Members who (as we do not have shareholders) hold the Board to account for the stewardship of our assets and for providing an essential public service

We have many challenges – as outlined below – that require partnership working with regulators, Governments, customers and other stakeholders if they are to be addressed fully. Similarly, whilst we have a major role to play in improving river water quality as is inferred by the Committee's inquiry, it is important to note that we can only contribute to part of the improvement, with more significant improvements required from other sectors (most notably from agriculture, land management and water from mines, that have a greater impact on river pollution and the failure to meet 'Good' river water quality standards).

As we prepare our Business Plan for the next five-year regulatory investment period (2025-2030, known as AMP8), we are striving to take a 'Team Wales' approach together with Natural Resources Wales, Welsh Government, Ofwat and other key stakeholders, to develop an investment programme that improves our

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Dŵr Cymru Cyf. (No./Rhif 2366777)
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Linea, Fortran Road, St Mellons, Cardiff, CF3 0LT

environment, maintains our high service levels and is affordable not only for our present customers, but also doesn't store up problems (both in terms of service or cost) for our future customers. River water quality is one factor that we have to consider as part of developing this Business Plan. With the wider impact of climate change on our network (i.e. extreme weather events) and our commitment, as one of the biggest energy users in Wales, to becoming a net zero carbon company by 2040, we will not be able to fix all of the issues we face within the next five year period. Working together with our regulators and Government, however, we are confident that we can play our part in making good progress to help improve river water quality but in a way that is proportionate, effective and at a cost that is acceptable to our customers.

In advance of our oral evidence, we provide the following written submission and happy to address any further points Members may wish to raise at the evidence-gathering session on 3 February 2022.

Dŵr Cymru Welsh Water - background

Dŵr Cymru Welsh Water is the statutory water and sewerage undertaker that supplies over three million people in Wales and some adjoining parts of England. As you may be aware, we are the only not-for-profit water company in England and Wales and because we have no shareholders, any financial surpluses are used for the benefit of Welsh Water's customers. Our assets and capital investment are financed by bonds and retained financial surpluses, and this operating model has allowed us to invest an additional £440 million over the past 20 years (money that would have gone to shareholders in most other water companies) in accelerating investment, keeping bills affordable and supporting proportionately more customers to pay their bills than any other water company.

We operate a highly capital-intensive business with an asset base that would cost £30 billion to replace, and which enables us to provide essential service to protect public health. Such an extensive asset base means that we currently invest around £1 million a day in our network and we are investing £1.8 billion over the 5 years to 2025 in our water and wastewater services while also doing all we can to keep bills as affordable as possible for customers.

Our wastewater network

Welsh Water's operating area is the third-largest of the wastewater companies in England and Wales. As we operate in a largely rural area, we have a disproportionately large number of small wastewater assets, many of which are remote. We operate more than 830 wastewater treatment works, over 36,000 kilometres of sewers and around 2,500 Combined Storm Overflows. Most of these assets were built in the last century, with our coastal sewage treatment works being the newest wastewater assets built in the 1990s and early 2000s and the transfer of private sewers and pumping stations in 2011 to Welsh Water completing that picture.

A key challenge for us – as with other water companies – is ensuring that we limit the impact of our work on rivers, seas and the wider environment. We have an extensive environmental footprint and we take this responsibility seriously and are investing £807 million on improving our wastewater assets during our current investment plan (2020-25). This overarching investment plan is supported by a specific National Environment Programme, developed in conjunction with our environmental regulators (Natural Resources Wales) so that we meet the sector specific and wider policy and legislative objectives set by the Welsh Government. Our investment plans, performance targets and the amount of revenue we can raise from customers are regulated and approved by Ofwat.

This investment is influenced by the particular characteristics of our operating area, which differentiates us from other water and sewerage companies, and this should also be borne in mind when considering how we maintain our asset base, and in particular how we provide our wastewater services:

- our operating area is characterised by a relatively long coastline (approx. 15% of Great Britain's coastline), which has implications for our wastewater treatment costs;
- wastewater treatment for the half of our customers who live along the coastline was built post-privatisation and so was financed through customer bills (this is not the case for predominantly-inland companies which did not need to make such an investment after the water sector was privatised, since investment in treatment works discharging to watercourses inland had already taken place);
- we operate across several distinct, rural, mountainous and sparsely populated areas, which means more assets (e.g. treatment works and lengths of pipe) per customer;
- there are a significant number of designated bathing beaches along the long Welsh coastline, which means strict permit levels for wastewater treatment;
- with lots of smaller wastewater treatment works, programmes to deliver environmental upgrades, such as the capability to remove phosphorous, are more expensive and bring technical challenges to small rural works.

These characteristics taken together create a unique set of challenges in providing high quality, wastewater services to our customers. However, these challenges become even more pronounced not only given the ever-increasing customer and regulatory focus on environmental issues but also when considering the wider climatic and socio-economic challenges we face today as a company. These include:

- **climate change**; with more intense storms and rainfall events due to climate change, this is increasing the amount of runoff from impermeable areas that drain to our network. This can often overwhelm many of our traditional assets which were not designed to cope with such extreme weather patterns;
- **climate change – lower summer rainfall**; this is reducing river flows in dry periods and reducing their ability to absorb the treated effluent for our sewage treatment works and still meet their environmental quality objectives;
- **population growth**; the general population has grown significantly which means more wastewater entering our sewers now than ever before; many of our rural works in north and west Wales see very large population fluctuations with holiday makers and second homes.
- **increased consumption** – due to the increased standards of modern living and the availability of more traditional and luxury household appliances, customers now consume more water than ever before which again adds to wastewater already in our sewers;
- **urban creep** - as towns and cities have developed, there is now less green space to absorb surface water. This surface water is often directed into our sewers and runs rapidly off such hard surfaces during rainfall. This is often compounded by local authorities who often make changes to highway and street scene drainage without consulting the water company and this can also add to the level of flows in our sewer networks.

Our performance

Over recent months, river water quality has been the subject of much interest, amid growing awareness that a high quality water environment is essential to support a healthy ecosystem. Our role in this - and in

particular, our Combined Storm Overflows - have been the focus of attention and it is important that whilst improvements and long-term investment is necessary, we also wish to set this against the context of our performance and the need to work with other sectors and customers to improve river water quality.

Wastewater treatment works (WwTW): the performance of our WwTW is critical to ensure that the wastewater we return to rivers, streams and sea is of the highest quality. Our environmental regulators (Natural Resources Wales and the Environment Agency) issue a 'discharge permit' for each site, which sets the standard for how the wastewater needs to be treated before it can be returned to the environment and nearly 99% of wastewater is now treated to the standards set by these permits. A key part of this is removing phosphorus from wastewater and we have invested £56 million to reduce the amount of phosphorus released from 14 wastewater treatment works between 2015 and 2020 and investing a further £70 million in the five years to 2025 in 19 of our treatment works. However, such investment also increases our operating costs, both financially and in terms of carbon – our phosphorus removal programme alone for 2015-20 has increased our operating costs by over £1 million a year, the majority of which can be attributed to increased power, chemical consumption and biosolids handling, all of which increase our carbon footprint.

Pollution incidents: problems with sewers and pumping stations (such as blockages or collapsed sewers) can often cause pollution incidents which can harm the local environment including rivers. These incidents are categorised by our environmental regulators, with each incident ranging from category 1 (serious) to category 3 (less serious). Having been one of the worst performing companies a decade ago, we are now one of the leading companies in terms of the number of pollution incidents. In 2020, 80% of pollutions were caused by blockages, and 74% of pollution incidents are now caused by third parties disposing of inappropriate items in toilets and sewers which subsequently cause blockages.

Combined Storm Overflows (CSOs): these CSOs are overflows built into the sewer or pumping station to release wastewater to stop sewers and treatment works from becoming overwhelmed during periods of heavy rain and backing up into customers' properties. Due to the fact that the majority of the sewer network in Wales was built before the 1970s, it is 'combined', taking rainwater as well as wastewater. The system in Wales has to operate in wetter than UK average climatic conditions, and we have some of the highest numbers of these CSOs per 1,000km of sewer in the industry.

The discharges from these CSOs are regulated via permits issued by our environmental regulators. but we are conscious that we need to better understand how they perform. This is why we have led the industry in terms of investing over £10.5 million in installing Event Duration Monitoring (EDMs) monitors on over 99% of our CSOs. These EDMs tell us when a CSO has discharged and for how long and this is helping improve our understanding of how our assets perform and will inform our work and future investment. We publish all this data on our website and also provide a Real Time CSO Alert Service all year round at 30 bathing sites in Wales which provide real-time information to registered users on when a CSO starts operating and when it stops. We provide this service voluntarily to beach managers, such as the Local Authority, and to Surfers Against Sewage for their Safer Seas Service website and app - and alerts are also sent to Natural Resources Wales.

In their latest data, Natural Resources Wales estimate that CSOs are a confirmed or probable reason for not achieving good status in 4.6% of water bodies. However, while CSOs are mainly operating as designed and permitted, they can discharge more often due to:

- hydraulic overloading from increased flows since the sewer was originally designed. This can be caused: as a result of the connection of additional impermeable surfaces to the sewerage network (housing/business growth and when permeable areas are paved over); from increases in overall rainfall and rainfall intensity due to climate change; from increased population connected to the sewer network; from network issues (e.g. siltation and infiltration) – all this is made worse given the ‘combined’ nature of our sewers which often need to carry surface water and wastewater;
- misconnection of land drainage such as from farmland but also infiltration into the sewer network, whereby water finds its way into the sewer network through cracks or displaced joints in the pipework;
- blockages (over 20,000) caused by ‘unflushable’ items that customers dispose to sewers (e.g. wet wipes or cooking oils). We run a behavioural change campaign every year to educate customers to be careful what they flush or throw away in a bid to reduce the £7 million annual cost of clearing 2,000 blockages a month in our sewers;
- sewer collapses and deterioration of the sewer system

Removing all CSOs and eliminating spills could require duplication of nearly all our existing sewer network and have an estimated cost of between £9 and £14 billion (for comparison, our total investment for all our services is £1.8 billion between 2020 and 2025) and increase customer bills significantly – adding hundreds of pounds to every customer’s bill. Trying to reduce CSO ‘spills’ by using traditional method such as building big concrete storage tanks to hold back the water is carbon intensive, can introduce more odour issues and is difficult to adapt to a changing climate.

Our impact on river water quality

Our investment over the past 20 years and collaboration with stakeholders has played a key role in ensuring that 39.22% of Wales' water bodies are deemed to be in ‘Good or High Ecological Status’ (compared to 16% in England) as assessed under the Water Framework Directive by Natural Resources Wales in 2021.

As a company owned on behalf of customers, it is imperative that any investment we make is evidence-based and in preparing our current Business Plan (2020-25), we developed our largest-ever research programme to ensure that we could understand the impact of our work and where we need to target any investment.

This is also supplemented by wider research on the quality of our inland waters and the latest research by Natural Resources Wales (NRW) [2020] shows that we are not the primary cause for waterbodies failing to achieve ‘good ecological status’. A number of other sectors can be identified to help improve river water quality including: mine waters, livestock management, land management, industrial estates, small sewage discharges (private), drainage misconnections, surface water drainage from developed area and storage – slurry, fuel, oils, chemicals.

We cannot therefore improve river water quality on our own. The need to adopt a collaborative multi-sectoral approach to improve river water quality is evidenced by the Source Apportionment Graphical Information System (SAGIS) water quality modelling we have undertaken in relation to the river Wye and other Welsh freshwater Special Areas of Conservation (SAC). This system, developed and used by regulators and the wider industry, has allowed us to build a virtual representation of the river Wye. It takes data inputs from different sources and sectors and identifies the proportion of phosphorus from

each. The model allows us to test proposed improvements in our sewage treatment works discharges to establish their impact on water quality in the river. SAGIS modelling on the Wye has shown that our assets account for around one third of phosphates in the river, with agriculture and land management being the primary source (this was recently highlighted in the House of Common's Environmental Audit Committee report on Water Quality in Rivers – January 2022). We are working on completing similar modelling work during 2022 for the other 8 SAC rivers in Wales whether they are failing their standard or not.

How are we responding

Nonetheless, we know our assets can impact on river water quality and NRW's research estimates that 22.5% of unique waterbodies in Wales do not or may not achieve 'Good Status' due to the impact of our operations. There are a number of reasons for this but the primary causes relate to the high levels of phosphorous or ammonia in rivers (which is a by-product of wastewater) or diffuse pollution (CSOs can increase the amount pollutants in the receiving water body). It is this data that we use in partnership with our environmental regulators to determine the make-up of our 5-year National Environment Programme investment. This also includes a significant amount of further monitoring and investigations to help move our understanding from those discharges suspected of causing a detriment, to confirm or remove, with typically 5-10% of the programme being spent on further science and investigation work.

We are committed to playing a major role in helping more of Wales' rivers achieve Good Ecological Status (as set out in the Water Framework Directive) and this is a key driver in our current National Environment Programme with £250 million of investment to be made between 2020 and 2025. This work includes:

- **targeted interventions to reduce phosphate levels:** where there is clear evidence that our assets impact on local rivers, we will drive investment to ensure that we play our part to address this issue. For example, we are investing £70 million over the next five years to increase phosphorus removal at wastewater treatment works across the area we serve.
- **collaborate and share learnings with other key stakeholders:** with so many sectors often influencing river water quality, it can sometimes be difficult to have a clear, single, plan to drive improvements. Not every sector has an incentive to collaborate or improve and actions can sometimes prioritise short-term convenience over long-term impact. A case-study in how to overcome this can be seen in the development of the Wye Nutrient Management Plan which was first produced in 2014 by the Environment Agency and Natural England recognising the required phosphorus targets to be met through the activities of a number of different organisations and sectors working together (environmental regulators, council bodies, third sector organisations and Welsh Water) as no single organisation or sector can solve the phosphate issue in isolation. Such an approach has been fundamental in allowing us to identify and prioritise our investment in this area supported by our membership of Herefordshire Council's River Wye Nutrient Management Board - one of the only bodies currently with cross border responsibilities. A similar collaborative approach is being developed for other Welsh SAC rivers and we will support this work.
- **innovative plans to low carbon nature-based solutions to improve river water quality and offset the impact of development:** we are working with the Wye & Usk Foundation and Hereford Council to support measures to remove additional phosphorus from our treated effluent above that

required by their permits by establishing low carbon wetland treatment sites that will offset the impact of development. These will take the form of a series of interconnected ponds that provide a natural filtering process to further improve the quality of water being returned to the river by removing unwanted pollutants and nutrients (e.g. ammonia, nitrogen and phosphorus) naturally whilst also enhancing local biodiversity. The construction of the first of these sites starts in January 2022 and is designed to offset both the impact of the development and deliver a net improvement in water quality. In addition, we plan to pursue similar nature-based solutions in dealing with high spilling CSOs, and we recently received approval from NRW to start constructing such a facility in Pont Y Felin, near Pontypool.

- **evidence-led investment to reduce the reliance on CSOs:** we have developed a new CSO Strategy which sets out our ambition for further reducing the reliance on overflows from the sewer network. This will involve investing over £100 million between now and 2025 to secure a progressive reduction in any adverse impact caused by CSOs on our rivers and seas. We will prioritise those which are having the most significant impact on water quality. For the longer-term, we are working in partnership to produce a CSO Roadmap for Wales (co-designed by Welsh Government, Natural Resources Wales, Ofwat, Hafren Dyfrdwy and Welsh Water) and it is aimed at ensuring that the role of CSOs in Wales is understood, improved, and fit for the 21st century and the challenges we face. We are also developing our first ever comprehensive Drainage and Wastewater Management Plan that looks at how we can work in partnership with stakeholders to reduce the risk of flooding and our impact on the environment between now and 2050.

While factors affecting water quality are wide ranging and varied within catchments, we are fully aware of increasing public concern about the use of CSOs. However, the work involved in reducing our reliance on CSOs should not be underestimated given that the vast majority of our sewer network is ‘combined’. This means that there is usually only one single pipe that collects rainwater that runs off gutters, drains and roads as well as the wastewater from homes and businesses. This reduces the capacity of our network and impacts its primary objective – which is to carry wastewater.

We fully supported the Welsh Government’s ‘Statutory Standards for Sustainable drainage systems introduced in 2016 (ensuring new developments follows good practice using the sustainable drainage (SuDS) approach) as this has reduced the amount of surface water entering our sewer network from new developments compared with previous arrangements. We also supported the Welsh Government’s commencement of schedule 3 of the Flood and Water Management Act which came into effect in January 2019.

The true scale of the challenge involved in retrofitting our network to reduce the volume of surface water entering our sewers and where possible catch, redirect and slow it down, is evidenced by the investment in our award-winning retrofit SuDS scheme (called ‘RainScape’) in Llanelli and Gowerton. To help reduce flooding and improve the water quality in the Loughor Estuary (which was impacted by CSOs operating more often than designed, which in turn was driven by Llanelli seeing almost as much storm water in its network as Swansea, which serves three times the number of properties), we invested £115 million across both areas between 2012 and 2020, laying around 14 miles of new pipework and kerb drainage, building a new tunnel just under one mile long underground to create rainwater sewers and planting almost 10,000 plants and trees in swales, planters and basins. The project delivered a 95% reduction in the

volume spilt from CSOs, reduced the risk of flooding and keeps another 1.5 million cubic metres surface water per year from entering the network.

We have also worked in partnership with Cardiff Council and NRW on a similar scheme, Greener Grangetown, contributing £1 million to remove more than 40,000m³ of rainwater each year from entering the combined sewer network as part of Cardiff's Grangetown urban regeneration project. These schemes demonstrate that there is neither a 'quick fix' nor 'easy fix' to reducing our reliance on CSOs in the short-term as it will take significant investment and collaboration. However, delivered in partnership with others we can deliver greater benefits for the communities we serve than working in isolation.

Summary

- Welsh Water is well advanced in its investment programme which will help reduce the impact of its assets and operations on river water quality. Every 5 years we work with our environmental regulators to scope a National Environment Programme that has led to several hundred million pounds of customers' money being spent on tightening discharges from treatment works, tackling storm water, CSOs and other intermittent discharges to enhance water quality in the last few 5 year business investment cycles or Asset Management Periods (AMP). We also carry out and report on investigations to establish where our operations are having a negative impact on the environment and to help to shape the investment plan for the next AMP in 2025-30.
- We cannot do this alone. Partnership working (between the Welsh Government, regulators, water companies, agriculture, highways and other sectors) is key to improving river water quality and long-term flood protection. For example, removing surface water from the sewer network is essential for reducing spills from the network and restoring capacity to meet future demands. Achieving this will require considerable partnership working with local authorities and financing.
- The work needed to improve river quality is a long-term project and requires support from regulators and Government, similar to the 20 year investment made to improve our coastal waters. To play our part in ensuring that Wales now has a third of the UK's Blue Flags despite only having 15% of Great Britain's coastline (with 100% of bathing waters in our supply area now complying with mandatory requirements compared to 12% in 1990), we have had to invest over £1 billion over successive 5 year AMPs to ensure that we keep bills affordable to 2010 and we have continued to invest our customers money since then. Meeting river water quality objectives or developing new inland bathing waters in a way that is compatible with our zero carbon objects may need similar levels of investment across multiple sectors in the coming decade and in the longer term if these standards are to be maintained.
- Customers can help improve river water quality by not flushing wet wipes and also being mindful of what is disposed in drainage systems which often connect directly to local waterways (which can mean that phosphates or detergents from washing cars will flow directly into rivers). Building on our 'Let's Stop the Block' campaign, we need to transform the public's understanding of water and the water environment, with a particular focus on education, information and support for changing behaviours. This is why we support and await the next steps for the Welsh Government's proposal to ban single use plastic as this will help limit wipes and other 'un-

flushable' material being flushed. This is key to reducing the amount of litter that enters the sewer network, causing blockages and polluting the water environment.

All this presents an opportunity to adopt a 'Team Wales' approach in our desire to ensure that our next National Environment Programme for 2025-30 continues to work for Wales and enables us to continue to play our part in protecting the environment during this 'decade of action' as described by the First Minister Mark Drakeford.

We take all our responsibilities seriously, especially our duty to protect the environment and river water quality and we are pleased that we secured the top 4* Environmental Performance Assessment rating in July 2021 after successfully meeting or exceeding targets set for our environmental performance as measured by our environmental regulators, by Natural Resources Wales and Environment Agency.

We remain fully committed to doing everything we can to protect and improve the water environment, and our ambitions are driven by our desire to ensure that we can continue to provide the most essential of public services in the face of significant climatic, economic and social challenges and also that as environmental guardians, we leave the environment in a better state for future generations.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'S.Wilson', with a horizontal line extending to the right.

Steve Wilson,

Managing Director, Wastewater Services, Welsh Water