Dŵr Cymru Welsh Water

Appendix D

Dŵr Cymru Welsh Water & Denbighshire Bathing Water Quality

December 2024

Wastewater process overview

DCWW operate a vast wastewater network across Denbighshire featuring pumping stations, wastewater treatment works and storm overflows. As a result of this infrastructure, DCWW are permitted to discharge 2 types of wastewater effluent:

1. **Treated final effluent** – this is the treated end product that is discharged from a wastewater treatment works and is returned back into the environment (either into a river or coastal waterbody). Wastewater undergoes up to 5 stages of treatment and the level of treatment is determined by works permit, issued to DCWW by Natural Resources Wales (NRW). Compliance against this permit is monitored through regulatory sampling and regulatory data submission to NRW as well as on site inspections
2. **Storm effluent** – in heavy rainfall/storm conditions the sewer network can become overwhelmed by sudden high flows of surface water/ rain water (as much of the network is combined, meaning sewage and rain water travels in the same pipes). In these circumstances, in order not to cause internal or external flooding, storm overflows are permitted to operate and allow storm effluent (a dilute mixture of sewage and rainwater) to be discharged into a river or coastal waterbody. Storm overflows must only discharge under permit conditions set out by NRW and compliance against these permits is monitored through regulatory data submissions to NRW as well as on site inspections where applicable. Note that storm effluent is not the same as raw sewage.

How do DCWW protect bathing waters?

- Welsh Water disinfect final effluent near bathing waters using ultra violet treatment but this is not usual practice in rivers. This helps maintain the bathing water quality by making bacteria in the treated wastewater inert.
- Where a bathing water does not meet good status, Welsh Water work with NRW to undertake investigations into bathing water quality
- Where it is identified that Welsh Water assets contribute to less that 'good' status, improvements will be incorporated into our 5 yearly investment plans
- Welsh water carry out UV treatment at Denbigh, Dyserth, Rhuddlan, St.Asaph and Llanasa wastewater treatment works

The impact of storm overflows on bathing water quality

Storm overflows have the potential to impact bathing water quality. However, a discharge from a storm overflow does not necessarily cause poor bathing water quality and the absence of storm overflow discharges does not guarantee good bathing water quality (due to the impacts from other sources and sectors). Data below examines the impact of nearby storm overflows on bathing water quality samples at Rhyl and Prestatyn

Prestatyn

There are 8 DCWW overflows in the vicinity (within 2km) of Prestatyn bathing water:

Permit No	Asset Name (SO Map)	EO/CSO
CG0317701	Prestatyn Nant Hall Road Foul	Emergency
CM0052701	Prestatyn Marine Park	Emergency
CM0052801	Prestatyn Coronation Gardens	Emergency
CM0148301	Prestatyn Bastion Gardens No 2	Emergency
CM0173101	Prestatyn Meliden Road	Storm
CM0193101	Prestatyn Bodnant	Storm
CM0193301	Prestatyn The Mall	Storm
CM0193501	Prestatyn Purbeck	Storm

How these assets operated on days that bathing water samples were collected can be seen below:

Bathing Water Sample Data				DCWW Overflow Data								Summary
Sample Date	Sample Time	escherichia coli count	intestinal enterococci count	Prestatyn Nant Hall Road Foul	Prestatyn Marine Park	Prestatyn Coronation Gardens	Prestatyn Bastion Gardens No 2	Prestatyn Meliden Road	Prestatyn Bodnant	Prestatyn The Mall	Prestatyn Purbeck	
07/05/2024	14:35:00	10	10	No	No	No	No	No	No	No	No	No discharges - 'excellent' sample
24/05/2024	11:03:57	4300	713	No	No	22/05 255 mins	No	22/05 75 mins	No	No	No	Discharges - 'poor' sample
07/06/2024	14:50:00	10	18	No	No	06/06 15 mins	No	05/06 15 mins	No	No	No	Discharges - 'excellent' sample
24/06/2024	13:55:00	10	10	No	No	No	No	22/06 15 mins	No	No	No	Discharges - 'excellent' sample
10/07/2024	13:02:00	91	27	No	No	No	No	No	No	No	No	No discharges - 'excellent' sample
25/07/2024	10:15:00	136	118	No	No	No	No	No	No	No	No	No discharges - 'good' sample
13/08/2024	14:36:00	10	10	No	No	13/08 120 mins	No	13/08 60 mins	No	No	13/08 75 mins	Discharges - 'excellent' sample
27/08/2024	15:45:00	45	27	No	No	No	No	No	No	No	No	No discharges - 'excellent' sample
02/09/2024	10:25:00	600	550	No	No	No	No	No	No	No	No	No discharges - 'poor' sample
19/09/2024	11:45:00	100	10	No	No	No	No	No	No	No	No	No discharges - 'excellent' sample

Across the bathing season, storm overflows were discharging on 4 sample days, one of these samples returned a ‘poor’ result. Note that ‘exceptionally wet weather’ was recorded by the Met Office on 24th May 2024

Rhyl Central

There are 7 DCWW overflows in the vicinity (within 2km) of Rhyl Central bathing water:

Permit No	Asset Name (SO Map)	EO/CSO
CG0317001	Rhyl Tynewydd Road	Storm
CG0347301	Rhyl Coast Road	Storm
CG0429601	Rhyl Westbourne Grove (Reservoir) Nra	Storm
CG0429701	Clifton Park Road CSO No 2	Storm
CM0044001	Rhyl Marine Lake	Storm
CM0173001	Clifton Park Rd CSO1, Rhyl	Storm
CM0193201	Dyserth Bay CSO	Storm

How these assets operated on days that bathing water samples were collected can be seen below:

Bathing Water Data				Storm Overflow Data							Summary
Sample Date	Sample Time	escherichia coli count	intestinal enterococci count	Rhyl Tynewydd Road	Rhyl Coast Road	Rhyl Westbourne Grove (Reservoir) Nra	Clifton Park Road CSO No 2	Rhyl Marine Lake	Clifton Park Rd CSO1, Rhyl	Dyserth Bay CSO	
07/05/2024	13.00	118	136	No	No	No	No	No	No	No	No discharges - 'good' sample
24/05/2024	14.15	1700	360	No	23/05 465 mins	No	No	22&23/05 1395 mins	No	22&23/05 915mins	Discharges 'poor' sample
07/06/2024	13.50	10	18	No	No	No	No	No	No	No	No discharges - 'excellent' sample
17/06/2024	12.45	10	10	No	No	No	No	No	No	No	No discharges - 'excellent' sample
24/06/2024	13.20	10	10	No	No	No	No	No	No	No	No discharges - 'excellent' sample
03/07/2024	12.50	10	10	No	No	No	No	No	No	No	No discharges - 'excellent' sample
10/07/2024	11.50	82	109	No	No	No	No	No	No	No	No discharges - 'good' sample
17/07/2024	11.47	18	10	No	No	No	No	No	No	No	No discharges - 'excellent' sample
25/07/2024	11.15	245	64	No	No	No	No	No	No	No	No discharges - 'excellent' sample
02/08/2024	13.01	191	136	No	No	01/08 45 mins	No	No	No	No	Discharges - 'good' sample
09/08/2024	11.30	260	64	No	No	No	No	No	No	No	No discharges - 'good' sample
14/08/2024	14.14	45	10	No	No	No	No	No	No	No	No discharges - 'excellent' sample
19/08/2024	13.20	182	280	No	No	No	No	No	No	No	No discharges - 'poor' sample
27/08/2024	13.40	240	137	No	No	No	No	No	No	No	No discharges - 'good' sample
02/09/2024 (discounted)	11.20	210	240	No	No	No	No	No	No	No	No discharges - 'poor' sample
19/09/2024	11.01	460	350	No	No	No	No	No	No	No	No discharges - 'poor' sample

Across the bathing season, storm overflows were discharging on 2 sample days, one of these samples returned a ‘poor’ result. Note that ‘exceptionally wet weather’ was recorded by the Met Office on 24th May 2024.

Water quality modelling and bacterial source apportionment

DCWW completed a coastal bathing waters study for Rhyl and Prestatyn in 2017 which indicated that diffuse pollution sources were the main factor affecting bathing water quality. Further support from DCWW was requested by NRW to expand understanding of diffuse sources and therefore the National Environment Programme (NEP) output for DCWW to complete another bathing water study was agreed for AMP7 (period 2020-2025).

DCWW worked closely with NRW to complete this 2nd study providing detailed reports. The outputs of this 2nd study were the same as the first AMP6 study but included sub catchment level detail of diffuse types and river inputs. Key points from the study outputs are included below:

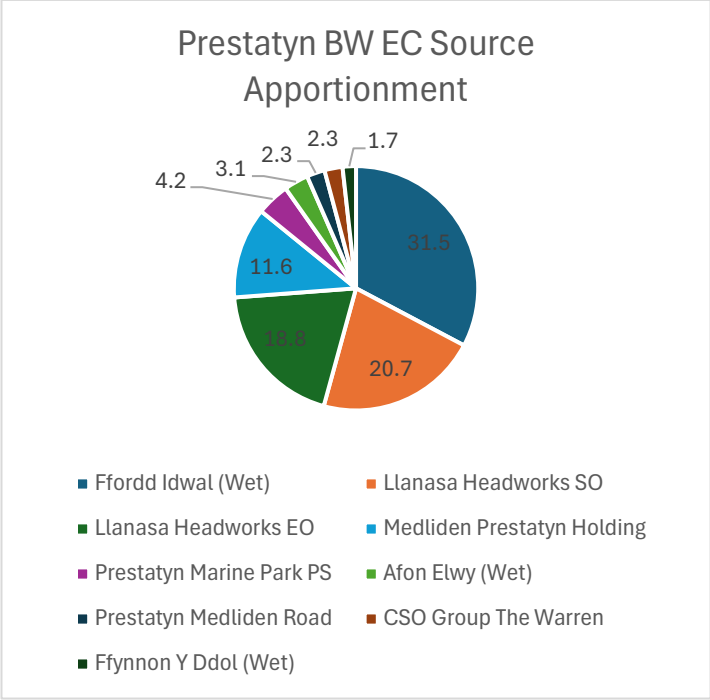
Finding 1 - The Rhyl bathing waters are predominantly impacted by diffuse loads from the upstream Clwyd catchment. These loads account for more than 75% of the bacteria impact and are due to faecal loading from cattle and sheep. Sheep account for the majority of livestock in the catchment and the majority of the load.

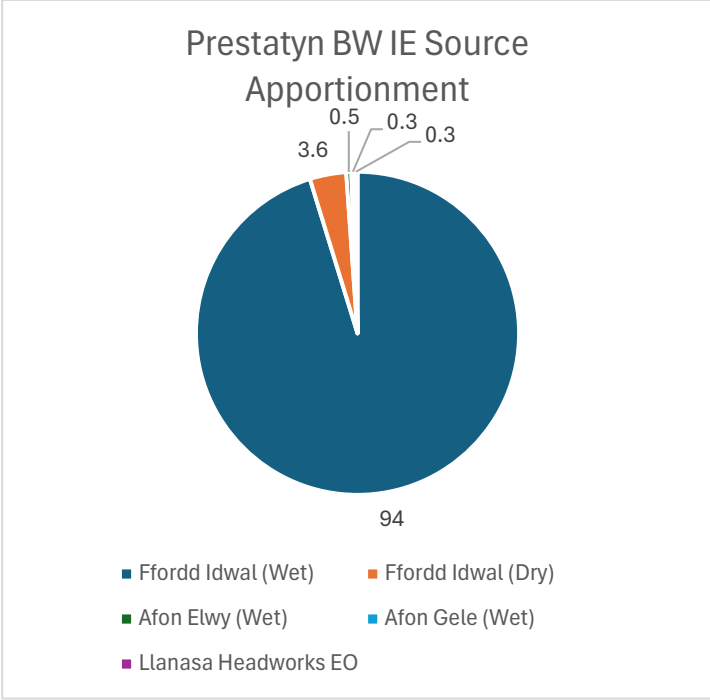
Finding 2 - Discharges from DCWW assets are predicted to account for less than 25% of the impact. Impacts are based on current best information regarding asset performance. Impact is greatest from the local Kinmel Bay catchment (3.5% IE at Rhyl and 5% IE at Rhyl East) due to its larger size and closer proximity. Upstream catchments are comparatively small, the largest contribute between 1% and 3% of the impact (Denbigh and Ruthin approx. 3% each, Rhuddlan and St Asaph approx. 1.5% each, Trefnant and Dyserth 0.5% each) and the remaining small catchments contribute approximately 1% of the total impact.

Finding 3 - Reducing discharges from DCWW assets is predicted to have relatively little effect due to the relatively small proportion of impact they represent. As a hypothetical exercise, the study included a scenario for removing all storm overflow discharges (which is impracticable). The scenario showed that this would reduce the DCWW impact to less than 5%, but the improvement in bathing water performance is relatively small and would not be sufficient to improve classification or remove the need for discounting.

A summary of source apportionment for bacterial load can be seen below:

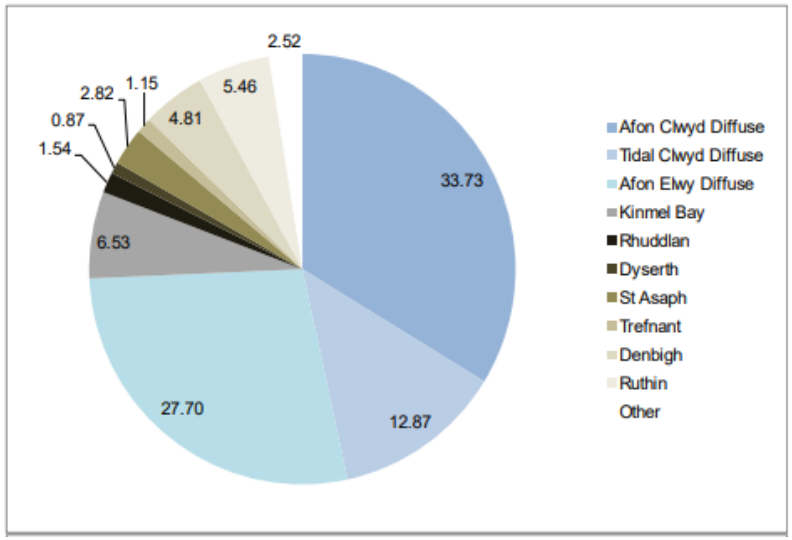
Prestatyn


Prestatyn BW EC Source Apportionment
31.5
20.7
18.8
11.6
4.2
3.1
2.3
2.3
1.7
Ffordd Idwal (Wet)
Llanasa Headworks SO
Llanasa Headworks EO
Medliden Prestatyn Holding
Prestatyn Marine Park PS
Afon Elwy (Wet)
Prestatyn Medliden Road
CSO Group The Warren
Ffynnon Y Ddol (Wet)

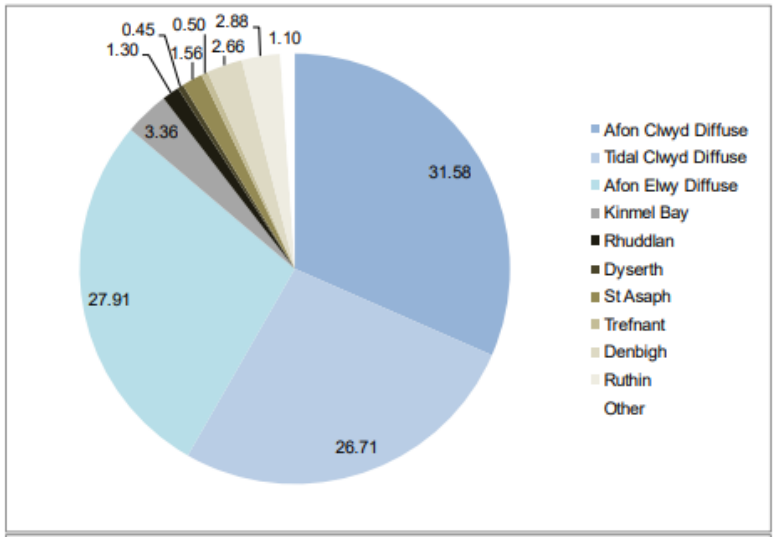

Prestatyn BW IE Source Apportionment
94
3.6
0.5
0.3
0.3
Ffordd Idwal (Wet)
Ffordd Idwal (Dry)
Afon Elwy (Wet)
Afon Gele (Wet)
Llanasa Headworks EO

Rhyl Central

a) Rhyl EC



b) Rhyl IE



AMP8 Investment in Denbighshire

Final determination from Ofwat is due on 19th Dec and therefore all proposed schemes are subject to change. However, DCWW has proposed a number of improvements to wastewater facilities in Denbighshire in our AMP8 business plan. These include:

- Rhuddlan storm tank capacity increase
- Tremeirchion phosphorous removal scheme (nature based solution)
- Denbigh flow increase (increasing treatment capacity)
- Ruthin flow increase (increasing treatment capacity)

Near Real Time Data Platform

As of early 2024, DCWW have been publishing storm overflow data in near real time on our Storm Overflow Map. This allows the public to view asset by asset storm overflow data to within 1 hour of operation. Assets are still being added to the platform (which is currently in ‘beta’ version) but assets in the vicinity of bathing waters were prioritised in the first tranche of uploads and therefore the assets in the bathing water areas of Rhyl and Prestatyn are well represented on the map. This data is also voluntarily supplied to the campaign group ‘Surfers Against Sewage’ by Welsh Water and is used to populate the ‘Safer Seas and Rivers App’. It is worth noting, however, that the Safer Seas and Rivers App aggregates data and applies and more generic ‘area’ warning/indicator, rather than providing granular, asset level detail which is available on DCWW’s platform. A link to the DCWW Storm Overflow Map is available here and an example screenshot can be seen below