

Climate Change, Environment, and Infrastructure Recommendation #11: NRW Internal Review Findings

Classification: Official

Report Date: May 2024

1. Report Purpose

The review has been conducted to discharge the following recommendation from the Climate Change, Environment, and Infrastructure (CCEI) Committee.

Recommendation 11: NRW should review its regulatory and environment response to the issues at Cardigan Wastewater Treatment works with the aim of learning lessons. It should report back to the Committee on the findings of the review.

The recommendation is from the CCEI Committee's report on the performance of Dŵr Cymru Welsh Water (DCWW). The report, published in February 2024, outlines a series of recommendations aimed at DCWW and its regulators to aid improving the company's performance and ensuring better accountability¹.

2. Summary

This report covers the review undertaken by NRW following the publication of the Recommendation noted above. The review was focused on evaluating the regulatory and environmental response from NRW as a consequence to the issues seen at the Cardigan Wastewater Treatment Works (WwTW), which is operated by DCWW. As part of the review, NRW staff who currently have or have previously had an input into the regulation of the site were interviewed. In addition, relevant documentation was reviewed.

This has been a complex and long-term issue that centres around the intrusion of seawater into the wastewater network and the resultant negative impacts on the equipment used to treat the wastewater. This leads to untreated wastewater being

¹ Welsh Parliament Climate Change, Environment, and Infrastructure Committee "[Report on performance of Dŵr Cymru](#)" February 2024

released into the local water course (River Teifi). Following regulatory intervention, which remains live, the operator has since announced a full replacement of the treatment works.

The review of NRW's regulatory and environmental response has highlighted a number of findings. These range from elements of best practice to the continuing option for relevant & proportionate enforcement action. Improvements have also been identified, in particular related to the timeliness of NRW's response. Regardless of the low environmental impact seen as a result of the issues at the treatment works, the ultimate solution of significant capital expenditure by DCWW may have been identified and actioned sooner.

Enforcement Action: It is important to note that at the time of this review, the regulatory activity associated with Cardigan WwTW is still ongoing and enforcement action remains open & available to NRW. Therefore, the review will not comment / assess the enforcement action taken to date or suggest, via findings / recommendations, what future action should be taken. This is in order not to prejudice any future legal action associated with the regulation of the Cardigan WwTW.

3. Interviews

Alongside a review of the existing documents and evidence, a number of NRW employees were informally interviewed to support the review. They all either have had or play a current role in the regulation of the site or are a subject specialist, relevant to the recommendation.

4. Background

Cardigan Wastewater Treatment Works (WwTW) is located in Cardigan, Ceredigion and is owned and operated by DCWW. Wastewater treatment works are designed to take significant volumes of wastewater² from the surrounding area and to treat & clean that water prior to discharge into the local environment.

² Urban wastewater' is defined in the Urban Wastewater Treatment Directive as the mixture of domestic wastewater from kitchens, bathrooms and toilets, the wastewater from industries discharging to sewers, and rainwater run-off from roads and other impermeable surfaces such as roofs, pavements and roads draining to sewers. Urban wastewater is often referred to as 'sewage.'

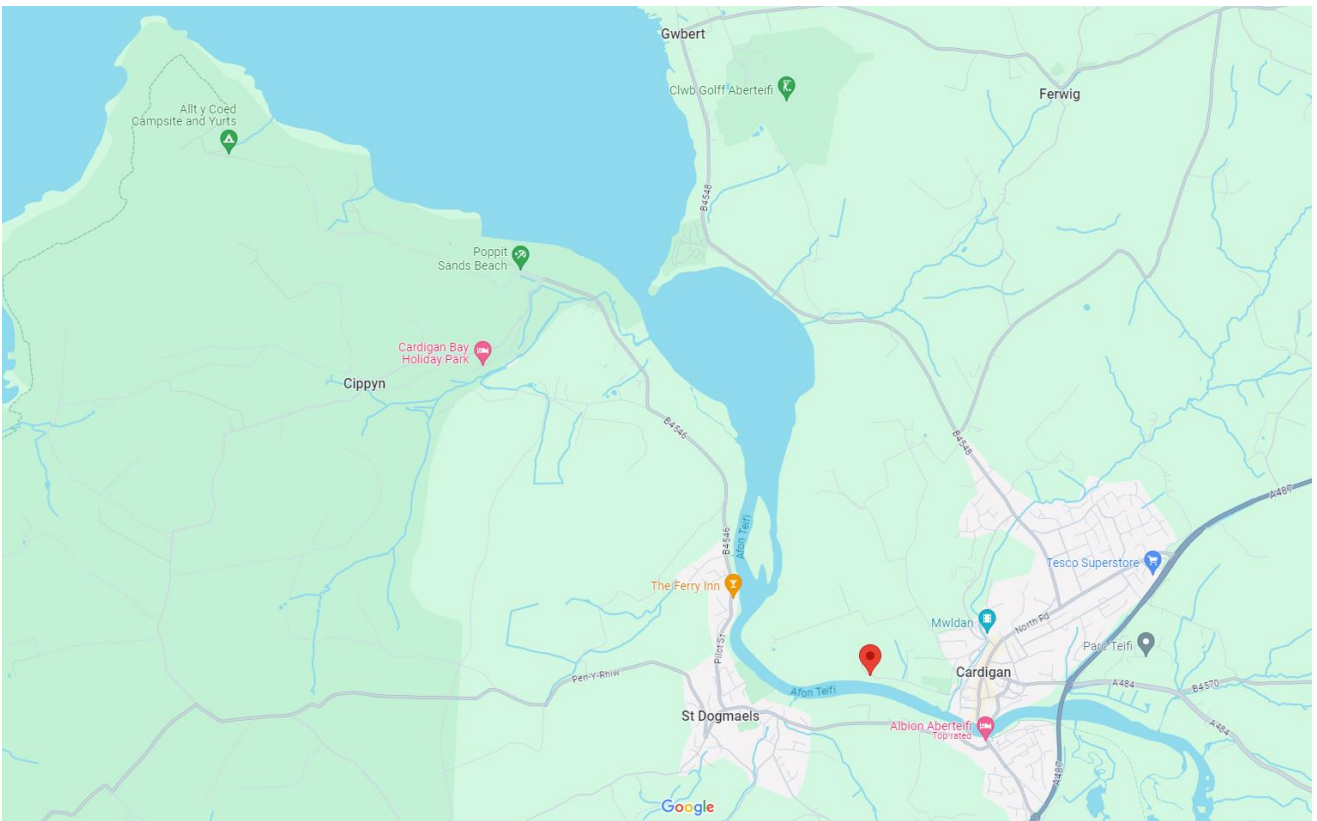


Figure 1 & 2 – Location of Cardigan WwTW (red dot) by the River Teifi and surrounding area

Natural Resources Wales' regulatory role covers continuous discharges from the water industry, as well as intermittent discharges, such as those from combined sewer overflows or emergency overflows. Typically, any discharge to controlled waters requires a discharge authorisation (environmental permit), which sets out standards for the monitoring of effluent from treatment plants. The Cardigan WwTW is permitted by NRW (permit reference numbers are BH0074101 and BP0275401) and falls under the regulation of NRW's Ceredigion Environment Team within Mid-Wales Operations.

The site discharges into the Teifi estuary and has been subject to regulatory scrutiny since 2015 due to the saline (seawater) intrusion into the WwTW. This overwhelms the works causing a reduction in treatment capacity. The saline intrusion is due to the location of the WwTW on an estuary (tidal river) and seawater can regularly enter the works along the wastewater & sewage network.

The regulatory issues currently present at the site are;

- The WwTW being unable to adequately deal with the volume of sewage entering the site whilst saline intrusion is present, which causes a consequential reduction in treatment flow to protect the treatment equipment and results in discharges to the River Teifi. This is contrary to;
 - Condition 1 of discharge permit (BH0074101): "*the discharge shall consist solely of secondary treated sewage effluent, which has been disinfected at all times by passage through membrane filters*" (Membrane filters are also known as Membrane Bioreactors, or MBR)
 - and condition 2.3.1(a) of storm permit (BP0275401): "*the discharge shall only occur when and only for as long as either (i) the flow passed forward is equal to or greater than the overflow setting indicated (88l/s) due to rainfall and/or snow melt or (ii) the hydraulic capacity of the sewer network downstream of the combined sewer overflow is reached due to rainfall and/or snow melt and the level of storm sewage in the sewer at the combined sewer overflow is greater than the weir level of the overflow structure which is specified as an overflow setting (88l/s)*"
- DCWW by-passing the MBR at a rate greater than expected and spilling sewage into the Teifi.
 - To mitigate the effect of the saline intrusion, at a specific conductivity rate DCWW will divert incoming sewage to storm storage tanks. This is undertaken by DCWW to protect the MBR, as the treatment process here is directly affected by the salt water. However, investigations are ongoing to assess permit compliance as this appears to be linked to exceptionally high spill figures.

5. Investigation Overview

5.1 Timeline

During the investigation, the regulatory timeline was discussed, and this captured the period from when the issue was first found through to recent activity by the local environment team.

An abridged timeline of events is outlined below, with a review of the regulatory and environmental response.

- 1) In July 2015, NRW became aware of an issue at the Cardigan WwTW during an audit of the OSM (Operator Self-Monitoring)³ that took place at the site. It was found that there was significant saline ingress into the network / WwTW that significantly affects the operation of membrane bioreactors (MBR). DCWW stated that incoming sewage was diverted to storm overflow tanks for storage prior to being returned back into the system for processing, which is contrary to the site permit. The permit breaches identified were communicated to DCWW during the site visit.
 - The visit, with associated actions, was recorded via the Compliance Assessment Report (CAR) A/150709/BH0074101.
 - In October 2015, a Warning Letter was issued to DCWW failing to comply with an environmental permit condition.
- 2) In March 2016, a follow-up site visit was conducted at the site.
 - The visit, with associated actions, was recorded via the CAR I/160315/BH0074101
- 3) In August 2019, an OSM audit was undertaken at the WwTW. This visit identified that (a) there was no system in place for Event Duration Monitoring (EDM) that met the required standards and (b) DCWW had conducted work to reduce saline intrusion within the network.
 - The visit, with associated actions, was recorded via CAR_NRW0035767 and the associated enforcement action was initiated in COLINS 9852. (COLINS is the NRW system for recording and managing enforcement investigations)

³ **Operator Self-Monitoring:** To show compliance against specific numerical conditions within an environmental permit, the operator has to collect and analyse samples of their permitted discharges. To ensure the operator is undertaking the monitoring correctly and effectively, the regulator will undertake periodic focussed audits on the operator's processes and management systems to ensure self-monitoring is performed correctly to an acceptable standard. Environmental regulators use Operator Monitoring Assessment (OMA) to provide a consistent and transparent approach to this assessment and further detail can be found in NRW's ["Technical Guidance Note M18 \(Monitoring\): Monitoring of discharges to water and sewer"](#)

- 4) Between December 2019 through to 2022 there were a number of interactions with DCWW and site visits by NRW staff to Cardigan WwTW site. There were also several regulatory engagements as noted in the table below.

Notice	Requirement	Timescales	Outcome	COLINS #
Legal notice pursuant to Regulation 36 of the Environmental Permitting (England and Wales) Regulations 2016	DCWW to provide NRW with a plan outlining proposed monitoring and/or investigations to identify a solution to either reduce salinity in the Cardigan WwTW network or enable the works to adequately treat sewage during periods of high salinity	Issued: 23/01/2020 Deadline: 01/06/2020	Complied with – DCWW outlined works to be undertaken on the network and investigations into alternative treatments	10181
Legal notice pursuant to Regulation 36 of the Environmental Permitting (England and Wales) Regulations 2016.	DCWW to provide a report to NRW detailing the outcomes/results of the Cardigan sewer network investigations and of the pilot plant works at Cardigan WwTW. The report would have to identify solutions and give timescales for completion of works which would either reduce salinity in the Cardigan WwTW network to a treatable level or enable the works to adequately treat sewage during periods of high salinity	Issued: 01/10/2020 Deadline: 14/01/2022	Complied with – DCWW findings proposed a feasibility study to install updated technology / treatment process	

- 5) In September 2022, DCWW submitted a feasibility study to NRW that outlined the preferred option, which would be subject to outline design.
- 6) During 2023, NRW Officers visited the WwTW to review the operation and to view the cleaning operations DCWW regularly undertake to manage the effect of saline intrusion and the consequences on the MBR. In addition, another notice was issued to DCWW following the submission and review of the feasibility study.

Notice	Requirement	Timescales	Outcome	COLINS #
Legal notice pursuant to Regulation 36 of the Environmental Permitting (England and Wales) Regulations 2016	DCWW to complete and provide NRW with a copy of the outline design for the new works; to confirm that funding has been acquired in DCWW's AMP 8 business plan; and to confirm the date within the AMP 8 period when the full solution will be operational at Cardigan enabling the works to adequately treat sewage during periods of high salinity	Issued: 23/10/2023 Deadline: 31/03/2025	Being complied with – DCWW have submitted a planning application to Ceredigion County Council	12898

- 7) In 2024 (to date), NRW has reviewed the WwTW flow data from the 01/01/2022 through to 23/08/2023 and is currently assessing the results.

The review, with associated actions, is recorded via CAR_NRW0044090

Compliance and enforcement documents referred to are available on NRW's Public Register: [Natural Resources Wales / Public register: environmental permitting, water resources and marine licensing information](#)

6. Regulatory Review, findings, and ongoing actions

Compliance Assessment

The timeline above outlines the key regulatory activities undertaken by NRW since the issue of saline intrusion and the consequential permit breaches by DCWW were first noted.

It is clear from discussions with staff that the issues seen at the Cardigan WwTW are complex and not easily rectifiable. Regulatory engagement with DCWW has followed our regulatory and enforcement processes with operational staff using judgement in deciding a course of action on resolving the operational difficulties at the site. Staff also correctly recorded the details of visits and action via Compliance Assessment Reports (CARs) as required with further discussions also taking place via other forums e.g. peer groups and Place-based DCWW engagement meetings.

Finding: *The environment teams assessing permit compliance for WwTW, and other sources of water discharges do not have up to date and current guidance to aid comprehensive and consistent assessment.*

Action: The development of the regulatory handbook and Annex 10 of OGN116 has supported the regulatory staff in their duties since their publication. NRW is continuing to review and update legacy Environment Agency guidance in line with NRW's OGN process and staff feedback.

Finding: *Environmental impact was based on bathing waters and visual assessment primarily. The former is seasonal, and the latter cannot accurately ascertain the water chemistry. With ever-changing capacity and skill/experience levels within the Environment Teams, the lack of guidance or other support on how and when to assess water quality breaches may lead to under/over categorisation of permit breaches and incorrect assessment of the environmental impact.*

The environmental impact of the discharges may have been reduced due to the significant volume of saline water ingress at the WwTW. However, the compliance scoring has been correctly scored on the potential environmental impact. More investigation and assessment could have been undertaken on the discharge from the site, however, to confirm the actual impact.

Action: NRW has taken the learning from Cardigan and will review its current guidance to officers in how to assess environmental compliance under such circumstances

Finding: *Regulatory activity is still ongoing regarding the issue on the by-passing rates / low flow rates seen. The review of EDM data and wider flow/dry weather flow for permit compliance assessments should be championed and supported to ensure staff are able to accurately assess the full compliance performance of relevant DCWW assets. An initial enforcement response was made and there is ongoing consideration of the need for any further enforcement action.*

Action: Support is being provided to the Ceredigion Environment Team via seconded staff within the Regulatory Approaches team to audit and assess DCWW data. Continued support from NRW Legal team in relation to further enforcement work is ongoing.

Finding: *Timeline: Since the issue was first raised in 2015, NRW has had prolonged engagement with DCWW to address the saline ingress. This timeline reflects the complexity of the network, the cause of the saline ingress and consequential effect on the treatment process and the investigations needed to assess suitable alternatives. Through the review, it is apparent that regulatory staff have followed the regulatory principles to move through to the provision of a suitable sustainable solution by DCWW. However, the abridged timeline highlights there was period between 2016 – 2019 where there is little recorded regulatory activity, although engagement was reported to be continuing between DCWW and NRW.*

Action: While NRW can point to a number of conflicting priorities that may explain the lack of regulatory assessment from 2016-19 highlighted in the review, we have since acted through the introduction of a Regulatory Service Plan, which directs teams to conduct compliance activity on a set schedule based on site risk and compliance. For Cardigan WWTW, the expectation from this point is that it would have a minimum of one inspection per annum if it were a high performing site with no regulatory concern. Sites with compliance issues would have increased compliance assessment.

Enforcement Action

It is important to note that at the time of this review, the regulatory activity associated with Cardigan WwTW is still ongoing and enforcement action remains open & available to NRW. Therefore the review has not assessed the enforcement action taken to date nor does it suggest, via findings/recommendations, what future action should be taken. This is in order not to prejudice any future legal action associated with the regulation of the Cardigan WwTW.

The NRW Enforcement and Sanctions Policy⁴ outlines the principles that the organisation follows for enforcement activities. It is a publicly available document, which is routinely referenced when engaging with customers. NRW has a clear governance approach to decision making for enforcement activity to ensure a consistent approach is applied.

Use of enforcement options: the Enforcement and Sanctions Policy outlines the enforcement options available to NRW. It has been evidenced that enforcement actions (warnings and notices) have been deployed throughout the course of the engagement with DCWW on the consequences of saline intrusion and associated permit breaches. This has been recorded via COLINS (Contravention, Offence, Legal, Information and Notification System) as outlined in OGN 007 (OGN 007: National Investigation Manual).

The investigation is complex and it is not uncommon for final enforcement responses to occur much later than the original offending.

Finding: *Enforcement action has taken place and has been recorded via COLINS. This has been undertaken with engagement with NRW's Legal team.*

Action: NRW continues to have the ability to progress with further enforcement action. The site remains under investigation and any breaches will continue to be dealt with in line with the Policy.

Review, conclusions, and actions

The regulatory and environmental response to the Cardigan WwTW and the ongoing non-compliance with permit conditions is live and ongoing by NRW, primarily led by the Ceredigion Environment Team. The timeline for the implementation of a technical solution to saline ingress (£20m investment to replace the WwTW) is known and in the public domain, with work on site expected to commence in 2025. Regulatory activities have been documented and enforcement action has been regularly assessed, issued where identified and the ability for NRW to take further enforcement action is open and available.

The review of the regulatory and environmental response has identified a number of findings; both where there has been good practice/guidance followed and where improvements can be made. Overall, the regulatory response has been reasonably proportionate to the complexity of the technical issues identified, the environmental impact and the delivery of a sustainable outcome to address the issues. However, the timeliness

⁴ [Natural Resources Wales / Enforcement and sanctions policy](#)

of the response overall by NRW may have been more prompt, if resourcing and wider draws on the regulatory team's time allowed.

The actions highlighted above are ongoing, further guidance, training and discussion is required to fully implement the regulatory requirements.