

Compliance Assessment Report CAR_NRW0046621

Permit being assessed: BC0018601

For: Llannant Wastewater Treatment Works, held by DWR CYMRU CYFYNGEDIG

At: Llannant Road, Gorseinon, Swansea, SA4 4ND.

Type of assessment carried out: Report/Data Review, Reason: Routine.

On 26/12/2024.

Parts of permit assessed: Operating Techniques

NRW Lead Officer: Sarah Bennett.

Report sent to: CARS@dwrcymru.com, CARS mailbox, on 18/03/2025.

1. Summary of our findings (full details in section 4)

Part of permitted activity assessed (criteria)	Assessment result	Permit condition
WQ-B3 - Water Quality - Operations - Operating techniques	Assessed (A)	

Result types are explained in more detail in the 'Important Information' section below.

2. What action is required?

No action required.

3. What will happen next?

Any non-compliance we have identified and recorded on this form is an offence. It can result in criminal prosecution and/or suspension or revocation of your permit.

At this time, we do not intend to take any further action.

This statement does not stop us from taking additional enforcement action if further relevant information comes to light or offences continue.

4. Details of our assessment

The purpose of this Compliance Assessment Report is to record my response to you following a request to consider exceptional circumstances, which occurred on the 26/12/2024, when assessing compliance with relevant UV permit conditions.

On Boxing Day, December 26, 2024, you informed us, via a UVNOT that all UV banks at Llannant WwTW had failed due to a possible comms card failure. A second UVNOT then informed us that 2 UV banks had subsequently been put back into operational and dosing was within compliance limits. The 3rd bank was off and isolated due to water damage. You notified us that the 3rd bank came back into service on the 21 January 2025.

On the 15 January 2025 we received a request from you to take into account, when assessing compliance, exceptional circumstances which led to the failure of the UV plant. You believed that you were not compliant with condition 2.3.3 (c) of your permit on the 26/12/2024. Condition 2.3.3 (c) states that no more than 10% of measurements taken consecutively during any 24-hour period from midnight to midnight should fall below the 50% dose limit specified in the permit. Non-compliance with this condition is referred to as a UV Day Failure. 10% of 24 hours is 2 hours and 24 minutes.

We have since received the UV data for the last quarter of 2024 and we agree that there was a period of time when an undisinfected discharge was made..

We received a second report on the 13 March 2025 with further supporting information. My understanding is that the failure of the UV plant meant the final effluent discharge to the Loughor Estuary, which is normally UV treated continuously, had not been UV treated for a period of 3 consecutive hours meaning the discharge was non-compliant for a maximum of 36 minutes.

Below is an extract from the information you provided:

On 26th December 2024 a high level alarm was announced at Llannant WWTW at 11:57 for low measured applied dose on the UV disinfection process. The alarm list is shown below:-

Time	Alarm Text	Level
27/12/2024 14:57	LLANNANT SWK - UV BANK A MAJOR FAULT	4
26/12/2024 16:12	LLANNANT SWK - UV BANK A MAJOR FAULT	4
26/12/2024 14:44	LLANNANT SWK - OUTSTATION M2M VODA COMMS FAILED / GSM IN OPERATION	4
26/12/2024 13:42	LLANNANT SWK - UV APPLIED DOSE NO CHANGE ALARM	4
26/12/2024 12:42	LLANNANT SWK - UV TOTAL APPLIED DOSE LOW	6
26/12/2024 11:57	LLANNANT SWK - UV TOTAL APPLIED DOSE LOW LOW	7
26/12/2024 11:57	LLANNANT SWK - UV BANK C INTENSITY MONITOR FAILED	1
26/12/2024 11:42	LLANNANT SWK - UV BANK B MAJOR FAULT	4

The UV data below shows that there was a period of 3 hours when there was flow passing through the unit but all banks of lamps were off:-

DateTime	Flow	Measured Applied Dose	Transmissivity	Bank A Lamps On Ratio	Bank B Lamps On Ratio	Bank C Lamps On Ratio
	T_2_E22719	T_2_E22721	T_2_E22723	T_2_E22726	T_2_E22730	T_2_E22734
	l/s	mJ/cm ²	%	%	%	%
26/12/2024 10:15:00	115.70	115.10	75.00	97.00	100.10	100.10
26/12/2024 10:30:00	132.70	98.90	75.00	97.00	100.10	100.10
26/12/2024 10:45:00	123.20	115.70	75.00	97.00	100.10	100.10
26/12/2024 11:00:00	140.20	132.20	76.00	97.00	100.10	100.10
26/12/2024 11:15:00	130.80	144.40	76.00	97.00	100.10	100.10
26/12/2024 11:30:00	139.80	99.30	76.00	97.00	100.10	100.10
26/12/2024 11:45:00	113.40	0.00	76.00	0.00	0.00	0.00
26/12/2024 12:00:00	123.50	0.00	76.00	0.00	0.00	0.00
26/12/2024 12:15:00	160.30	0.00	76.00	0.00	0.00	0.00
26/12/2024 12:30:00	143.00	0.00	76.00	0.00	0.00	0.00
26/12/2024 12:45:00	128.80	0.00	76.00	0.00	0.00	0.00
26/12/2024 13:00:00	138.80	0.00	76.00	0.00	0.00	0.00
26/12/2024 13:15:00	123.40	0.00	76.00	0.00	0.00	0.00
26/12/2024 13:30:00	140.70	0.00	0.00	0.00	0.00	0.00
26/12/2024 13:45:00	110.80	0.00	75.00	0.00	0.00	0.00
26/12/2024 14:00:00	111.80	0.00	75.00	0.00	0.00	0.00
26/12/2024 14:15:00	140.50	0.00	74.00	0.00	0.00	0.00
26/12/2024 14:30:00	148.90	0.00	73.00	0.00	0.00	0.00
26/12/2024 14:45:00	114.30	0.00	72.00	0.00	0.00	0.00
26/12/2024 15:00:00	112.20	97.60	71.00	0.00	0.00	0.00
26/12/2024 15:15:00	129.30	40.10	70.00	97.00	100.10	0.00
26/12/2024 15:30:00	149.00	32.20	69.00	97.00	100.10	0.00
26/12/2024 15:45:00	98.10	41.00	69.00	97.00	100.10	0.00
26/12/2024 16:00:00	141.90	83.90	67.00	97.00	100.10	0.00

Since this was a public bank holiday the standby Operator was called to attend to the alarm, and he reached site at approximately 12:40. On attendance at site he confirmed that the UV process was not operational and there was flow being discharged.

The Operator is responsible for ensuring compliance is maintained at the site and in such circumstances there are two options to consider. The first is to bring the UV process back into service so that disinfection of the biologically treated effluent resumes and it becomes compliant, and the other is to prevent the non-disinfected biologically treated effluent from being discharged. For the latter to be possible incoming flows would have to be held on site in storm storage to prevent an untreated discharge being made, or further back in the network.

Flows arriving at the treatment process during this period averaged approximately 130l/s and if the storm tanks had been empty would have provided around 110 minutes of storage before they were full.

Unfortunately there had been intermittent rainfall in the preceding few days so the storm tanks were already full and there was no available storage to contain the diverted flows. To have diverted to storm to protect compliance at the works would have incurred a discharge of settled sewage of approximately 130l/sec for the duration the UV process was unavailable.

In this instance containment would have needed to have been utilised in the network sewage pumping stations and the network sewers themselves. It would have been very difficult to monitor the levels of sewage in these assets and to ensure that there were no spills made to the environment from storm overflows and in certain sections of sewer there may have been a risk of property flooding where overflows were not present.

The Operator elected to allow fully biologically treated (non-disinfected) effluent to be discharged whilst he tried to resolve the issue with the UV disinfection process. This was believed to have a lower risk of impact than to try to contain flows in the network.

There are 3 separate UV banks at Llannant, and he attempted to operate the banks in manual by physically switching each bank from automatic to manual, but this did not bring the banks of lamps back into service. Further inspection of the unit could identify no reason for the unit being offline, so the Operator called the

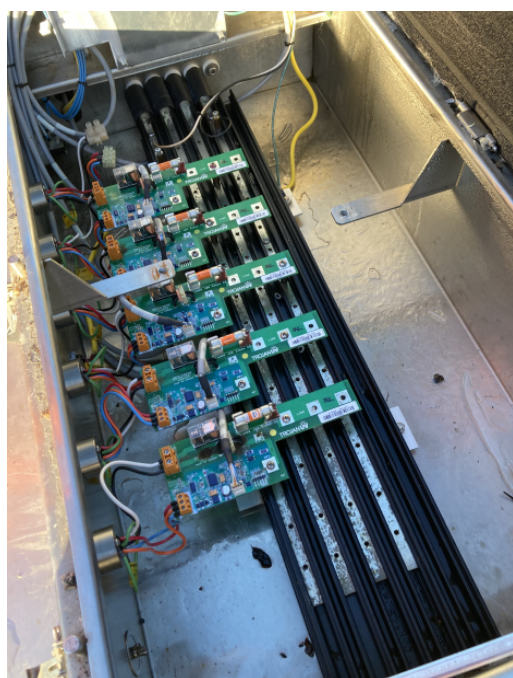
ICA (Instrumentation, Control and Automation) Technician for assistance by phone call. Further checks were carried out under the instruction of the ICA Technician, but they were unable to diagnose the fault.

At this point the ICA Technician left home and travelled to Llannant WWTW. Additional support was requested from the OT (Operational Technology) Department who are able to provide expert assistance on diagnosing and resolving control issues in PLC's etc. The OT Technician called into Clydach Depot to collect some replacement parts which may have been needed and reached Llannant WWTW around 14:00.

The indication from the initial inspection by the ICA and OT Technicians was that there was a communication failure between the PLC and the UV plant which was preventing the UV plant operating in automatic or manual. Several key components were replaced in the PLC which serve in the communication link between the 3 banks of UV lamps and the PLC.

Power to the UV system could not be restored following this process which indicated that there may be a fault further down the communications link. The cubicles housing the motherboard and individual UV module controllers are situated above each of the 3 UV banks and these are sealed weatherproof stainless-steel housings. Each cubicle was opened in turn and bank C cubicle was found to contain a small amount of water/ice in the base approximately a few millimetres deep. There was some indication of a small amount of corrosion present on some areas of the circuitry on the motherboard and module controllers.

Photographs below of bank C cubicle with thin layer of ice visible in base:-



The standard design of the communications cable between all 3 banks and the PLC is a 'daisy chain' design which means a single communications card serves all 3 banks and a fault or short circuit in the chain can potentially cause all 3 banks to be affected. Under normal circumstances when a bank becomes unavailable, provided the communications link is not severed or corrupted, the standby bank will be called into service and an alarm generated. In this instance the communication was corrupted due to the short circuiting or similar impact in the circuitry of bank C, and this caused all 3 banks to become unavailable until bank C had been electrically isolated from the communications chain.

An inspection of the cubicle could not identify the route that water had entered the unit, and this will be monitored over the next few weeks. A replacement motherboard and modules have been ordered and will be installed as soon as possible. In the meantime, the UV plant is operating on the duty/assist banks and is meeting the target measured applied dose.

The circumstances around this failure have not been seen on any of our UV disinfection systems previously and the risk has been unknown until now.

You have requested that we take the following circumstances into consideration:

- That the discharge was made in an emergency in order to prevent harm to human health.
- The fault that occurred was unexpected and has not been seen on any of your UV disinfection systems previously and the risk has been unknown until now.
- Due to the nature of the fault, it was not possible to rectify it within the 2 hours 24 minutes allowed in the permit (10% of 24 hours).
- The 10% of 24 hours specified in the permit was exceeded by only 36 minutes.
- You believe that a discharge non-UV treated effluent to the estuary would not have measurable impact.

When assessing compliance with UV permit conditions we can take into account the circumstances outlined in Operational Instruction 58-_03 "Assessing compliance with consent conditions relating to UV disinfection of continuous discharges of treated wastewater" which states the following:

If the UV dose falls below 50% of the consented level for more than 2.4 hours consecutively in a 24 hour period (midnight to midnight), then the plant will have complied with condition 1(g) of the consent if:

- the occurrence was reported in the exception report;
- and we are satisfied that the cause was an emergency and outside the control of the consent holder;
- and that all possible measures were taken to minimise the impact of the discharge on controlled waters (as specified in standard consent condition 4(c).V).

My understanding is that, in this case, an emergency relates to a contravention which occurs when a discharge is made in an emergency to avoid danger to human health.

I am satisfied that the cause was outside of your control at the time it occurred.

I accept that the act of discharging non-disinfected final effluent was undertaken in an emergency in the sense that it was allowed in order to avoid the danger to human health that would otherwise have occurred if the flow to Llannant WwTW had been shut off. In this context, the non-compliant discharge has to continue in order to avoid danger to human health.

I can see from your report that all possible measures were taken to minimise the impact of the discharge, notably that you responded very quickly, out of hours, and reduced the time a non-disinfected discharge was made to a maximum of 36 minutes.

In accordance with our guidance, the discharge has therefore complied with condition 2.3.3 (c).

In response to the circumstances you listed in your report I would like to add the following comments:

I acknowledge that you could not have anticipated that the sealed weatherproof cubicle would allow the ingress of water and can accept that routinely opening the cubicles to inspect them could increase the risk of water ingress. However, **now that you have identified the risk, we would expect it to be taken into consideration when drawing up maintenance plans and UV alarm response procedures at this site and others that utilise the same or similar equipment. I recommend that you review your maintenance plan to ensure that it is robust enough to minimise all known risks.**

The purpose of the UV treatment at Llannant WwTW is to reduce the overall cumulative pathogen loading to the wider Burry Inlet Shellfishery. Whilst disinfection is required in the permit, the discharge is made to the Loughor Estuary at a point some 4.5 km upstream of the Burry Inlet South Shellfish Waters. My observations are that the neap tide was flooding at the beginning of the 3-hour discharge. It started to ebb at the same time the UV banks came back on. The duration of the non-disinfected discharge, dilution, state of the tide and distance to the Shellfish Waters are likely to have mitigated against any measurable impact. We did not receive any Cefas reports of E.coli exceeding the classification threshold at their monitoring points in the Burry Inlet.

Thank you.

End

If you have any queries about this report, or to discuss completion of any actions, please contact the NRW Officer named above.

Important information

Legal status of this report

Your permit is issued to you under the Environmental Permitting Regulations. You have a responsibility to comply with the conditions of your permit and prevent pollution/harm to the environment. You must also ensure that you comply with any other relevant legislation that may apply to your site's operations.

This report explains the findings of our assessment and any action you are required to take. We categorise non-compliance using our guidance for assessing non-compliance at regulated sites.

When we find potential non-compliance/s we will normally give you advice on how to maintain compliance.

To correct non-compliance, we may:

- require you to take specific actions
- issue a notice
- review the conditions of your permit.

Any advice and guidance we give will be without prejudice to any other enforcement response that we consider may be required.

Assessment results and non-compliance categories (used in section 1):

Assessment result	Description
Assessed (A)	Assessed or assessed in part, no evidence of non-compliance found
Action only (X)	Action only relating to the activity assessment
Ongoing (O)	Ongoing non-compliance, not scored

Non-compliance category	Description
C1 Major	Potential to have a major, serious, persistent and/or extensive impact or effect on the environment, people and/or property
C2 Significant	Potential to have a significant impact or effect on the environment, people and/or property
C3 Minor	Potential to have a minor or minimal impact or effect on the environment, people and/or property
C4 No environmental impact	Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property

If your assessment result in Section 1 is suspended, what does this mean?

In line with our guidance, we may suspend non-compliance for up to six months to allow time for remedial action to be taken. These will be re-instated if the action is not completed.

Full list of water quality action criteria (used in section 1 and 2):**WQ A: Management**

- WQ-A1 General management

WQ B: Operations

- WQ-B1 Permitted activities
- WQ-B2 The site
- WQ-B3 Operating techniques
- WQ-B4 Improvement programme
- WQ-B5 Pre-operational conditions

WQ C: Emissions and monitoring

- WQ-C1 Emissions to water
- WQ-C2 Emissions to land
- WQ-C3 Emissions of substances not controlled by emission limits
- WQ-C4 Installation of monitoring boreholes

WQ D: Information

- WQ-D1 Records
- WQ-D2 Reporting
- WQ-D3 Notifications

Enforcement response

Any permit condition non-compliance is an offence and we may take legal action against you. Action we take can include prosecution, serving a notice on you and/or suspension or revocation of your permit. See our Enforcement and Sanctions Guidance for further information.

Data protection notice

You should make sure that anyone named in this report knows that the information it contains will be processed by Natural Resources Wales to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s).

We may also use and/or disclose the report in connection with:

- offering or providing you with our literature or services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law
- assessing customer service satisfaction and improving our service
- Freedom of Information Act or Environmental Information Regulations requests.

We may also pass it on to our agents or representatives to do these things on our behalf.

Disclosure of information – this report will be available to view on-line

If you think this report contains commercially confidential information that should not be placed on our public register, you must contact your local Natural Resources Wales office within **fifteen working days** of receiving this report, using the contact details in the accompanying email or letter. You must give a full explanation of why it should not be

added to our public register, including specifying which information is commercially confidential. We will assess your request and respond to you within 20 working days to let you know if we agree to your request.

What do I do if I disagree with the report or have a complaint?

If you disagree with this compliance assessment report, you should contact the lead officer without delay to discuss your concerns.

If you are unable to resolve the issue with the lead officer or their line manager you should contact our Customer Contact team on 0300 065 3000 (Monday to Friday 08:00 – 18:00), or email enquiries@naturalresourceswales.gov.uk for details of how to raise your dispute further through our Complaints and Commendations procedure.

If you are dissatisfied with our response, you can contact the Public Services Ombudsman for Wales by phone on 0300 7900203 or by email at ask@ombudsman.wales

Welsh Language Standards

We are committed to establishing Natural Resources Wales as a naturally bilingual organisation. We will provide compliance reports in your preferred language.