Briefing Paper

Afon Cynffig / Kenfig River Pollution Incident

Independent monitoring findings, 22 May 2026

Prepared by A Peace for Nature

Purpose of this briefing

This briefing summarises the findings of independent environmental monitoring undertaken by A Peace for Nature on 22 May 2026 on the Afon Cynffig / Kenfig River downstream of the Marlas STW SPS outfall, North Cornelly. NRW Permit information: https://publicregister.naturalresources.wales/Search/Results?SearchTerm=marlas

The monitoring was undertaken in response to the ongoing pollution incident affecting the river and was designed to assess water quality conditions from an upstream control point through to downstream impact locations. The results show severe deterioration in water quality downstream of the outfall, including exceptionally elevated ammonia and phosphate, severe dissolved oxygen depletion and continuing evidence of wastewater related impact several kilometres downstream.

A full field monitoring report has been prepared separately.

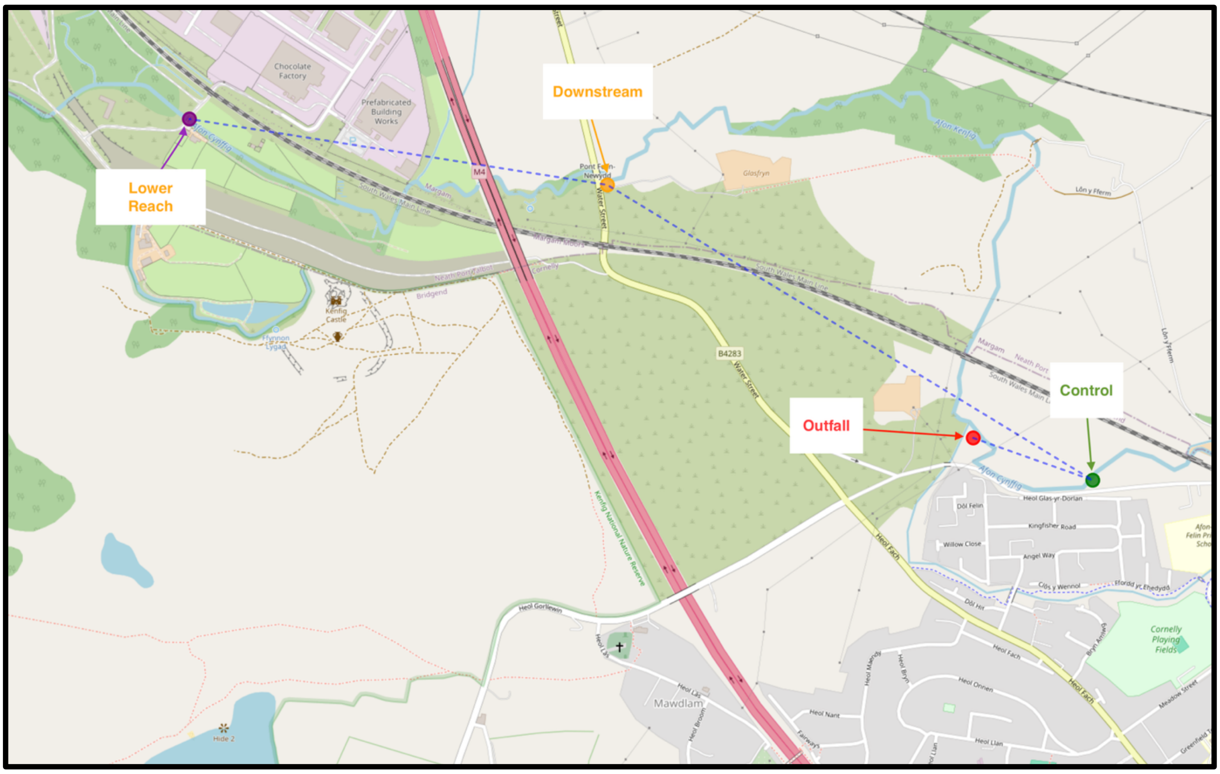
Background

Dŵr Cymru Welsh Water has confirmed that temporary treatment works and aeration equipment have been deployed at Marlas Pumping Station as part of mitigation work associated with issues on its wastewater network in the area.

A Peace for Nature remains concerned that public communications around the deployment of aeration equipment could be interpreted as suggesting that the river is being restored or that conditions are improving for fish and wildlife. Our monitoring does not support that conclusion across the wider affected reach.

While aeration may provide localised temporary oxygenation in the immediate area of active equipment, the data collected on 22 May 2026 shows that severe oxygen depletion persisted downstream. This raises serious questions about the effectiveness of the current mitigation strategy and whether it is sufficient to protect the wider river environment.

Sampling locations



Four sample locations were monitored:

Location	Coordinates
Upstream Control	51.526898, -3.707427
Outfall	51.527683, -3.711015
Downstream After Outfall	51.532399, -3.721977
Downstream Lower Reach	51.533634, -3.734511

Location	Approximate River Distance from Upstream Control
Outfall	300 to 400 metres
Downstream After Outfall	~1.5 km
Downstream Lower Reach	~3.2 km

Field Results

Parameter	Upstream Control (15:24 hrs)	Outfall (14:17 hrs)	Downstream After Outfall (17:08 hrs)	Downstream Lower Limit (16:20 hrs)
Temperature	14.4°C	16.6°C	16.0°C	15.4°C to 15.9°C
Conductivity	560.9 µS/cm	885.4 µS/cm	600.2 µS/cm	479.4 µS/cm to 482.4 µS/cm
Reference Temperature (Tref)	25.0°C	25.0°C	25.0°C	25.0°C
Dissolved Oxygen	87.5% saturation	59.5% saturation	24.9% saturation	20.8% saturation
Ammonia Nitrogen (NH_3-N) (HR)	0.6 mg/L	50.6 mg/L	5.7 mg/L	4.1 mg/L
Phosphate (PO_4^{3-}) (HR)	0.19 mg/L	18.5 mg/L	12.3 mg/L	1.1 mg/L
Nitrate (NO_3^--N)	2.4 mg/L	13.0 mg/L	3.1 mg/L	2.7 mg/L
Turbidity	3.76 FNU	98.9 FNU	6.48 FNU	4.25 FNU
pH	9.18	9.30	8.88	8.18

Figure 1 Table showing results from field-based surface water tests taken on 22 May 2026 on the Afon Cynffig / River Kenfig by APFN

Key findings

The monitoring data shows a clear deterioration in water quality at and downstream of the Marlas STW SPS outfall.

The most serious findings were:

1. Ammonia reached 50.6 mg/L at the outfall. This is an exceptionally elevated concentration for a freshwater river environment.
2. Ammonia remained elevated downstream, with 5.7 mg/L recorded approximately 1.5 km downstream and 4.1 mg/L recorded at the downstream lower reach.
3. Phosphate reached 18.5 mg/L at the outfall and remained highly elevated downstream at 12.3 mg/L approximately 1.5 km downstream.
4. Dissolved oxygen fell to 24.9% saturation downstream after the outfall and 20.8% saturation at the downstream lower reach.
5. Conductivity and turbidity increased sharply at the outfall, indicating a substantial change in water chemistry and suspended material within the affected reach.
6. The data indicates that wastewater related impact was not confined to the immediate outfall area and remained evident several kilometres downstream.

Dissolved oxygen and aeration concern

Five visible aeration devices were observed operating within the affected reach during the monitoring visit.

Additional dissolved oxygen readings recorded around the aeration deployment were as follows:

Time	Location	Dissolved Oxygen Saturation
14:19	Outfall	61.7%
14:39	Outfall	59.5%
14:49	Mid-range of aeration deployment	86.8%
14:51	Mid-range of aeration deployment	86.1%
16:36	Downstream Lower Limit	20.8%

These readings indicate that the aeration equipment may be producing localised oxygenation around the active devices. However, this effect does not appear to be sustained through the wider affected river reach.

The downstream readings of 24.9% and 20.8% saturation are extremely concerning. They indicate severe oxygen depletion and conditions capable of placing fish, invertebrates and other aquatic life under acute stress.

On the evidence available to APFN, the current aeration deployment should not be presented as proof that river health is improving. It should be treated as emergency mitigation only. The critical question is whether the mitigation is maintaining ecologically protective dissolved oxygen levels throughout the affected reach. The APFN monitoring data indicates that it is not currently doing so.

Concern regarding public reassurance

Dŵr Cymru Welsh Water has publicly stated that 24/7 aeration equipment has been introduced into the River Kenfig “to help support fish and other wildlife helping to improve river health.”

APFN considers that wording concerning. It risks giving the impression that aeration is restoring the river or improving ecological conditions generally. The independent monitoring data does not support that conclusion across the wider affected reach.

The evidence indicates that aeration may be producing localised improvement only, while severe oxygen depletion persists downstream. Public reassurance should therefore be based on transparent monitoring data, not the mere presence of aeration equipment.

APFN considers that DCWW should be asked to provide the dissolved oxygen monitoring data relied upon to support its public statement, including upstream, within and downstream of the aeration zone, daytime and overnight readings and any technical assessment of whether the current aeration capacity is sufficient to overcome the biological oxygen demand within the affected reach.

Environmental significance

The combined pattern of results is highly concerning.

The upstream control point showed substantially better water quality than the outfall and downstream impact locations. At the outfall, ammonia, phosphate, conductivity, turbidity and nitrate all increased sharply. Downstream, some parameters reduced from the extreme outfall values, but dissolved oxygen fell to critically low levels and ammonia and phosphate remained elevated.

This pattern is consistent with a river under severe wastewater related stress.

The most significant environmental concerns are:

1. Highly toxic ammonia concentrations at and downstream of the outfall.
2. Elevated pH conditions that may increase ammonia toxicity risk.
3. Severe dissolved oxygen depletion downstream.
4. High nutrient enrichment capable of contributing to sewage fungus, algal growth and ecological imbalance.
5. Continued evidence of impact several kilometres downstream from the discharge reach.

Questions requiring urgent clarification

APFN considers that the following questions require urgent clarification from Dŵr Cymru Welsh Water and Natural Resources Wales:

1. Is the current discharge from the Marlas STW SPS outfall operating within the limits and conditions of Environmental Permit BP0169901?
2. If the discharge is not operating within permit limits, what enforcement action is being taken?
3. What dissolved oxygen monitoring is being undertaken by DCWW and NRW upstream, within and downstream of the aeration deployment?
4. What evidence supports DCWW's public statement that the aeration equipment is helping to improve river health?
5. Is continuous dissolved oxygen monitoring being maintained overnight?
6. What ammonia, phosphate, turbidity and microbiological monitoring is being undertaken by DCWW and NRW?
7. What technical assessment has been undertaken to determine whether the current aeration capacity is sufficient?
8. Why does severe oxygen depletion appear to persist downstream despite the deployment of aeration equipment?

9. What operational measures are being considered to reduce pollutant loading entering the river, including tankering or increased treatment capacity?
10. Will reasonable access be facilitated for continued independent monitoring where landowner consent exists?

APFN position

APFN recognises that aeration may be a legitimate emergency mitigation measure during a pollution incident. However, it must not be treated as evidence that the river is recovering unless that is supported by robust monitoring data across the affected reach.

The APFN results indicate that the Afon Cynffig / Kenfig River remains under significant environmental pressure. The most serious concern is that critically low dissolved oxygen conditions persisted downstream despite active aeration deployment.

On the evidence currently available, APFN considers that the current mitigation strategy requires urgent review.

Recommendations

APFN recommends that:

1. DCWW urgently publishes all environmental monitoring data associated with the incident, including dissolved oxygen, ammonia, phosphate, turbidity, pH, temperature and conductivity data.
2. Continuous dissolved oxygen monitoring is maintained upstream, within and downstream of the aeration zone.
3. Overnight dissolved oxygen data is made available, given the risk of oxygen depletion outside daytime monitoring periods.
4. DCWW provides the technical basis for its public statement that aeration is helping to improve river health.
5. NRW confirms whether the discharge is operating within the conditions of Environmental Permit BP0169901.
6. NRW confirms what enforcement, compliance or regulatory action is being taken in response to the incident.
7. The current aeration strategy is urgently reviewed to determine whether it is sufficient to maintain protective dissolved oxygen conditions downstream.
8. Additional or repositioned aeration is considered where downstream dissolved oxygen remains severely depleted.
9. Operational measures to reduce pollutant loading into the river are urgently reviewed, including tankering or other temporary treatment options where feasible.
10. Independent monitoring by APFN is supported and reasonable access is facilitated where landowner consent exists.

Conclusion

The independent monitoring undertaken by A Peace for Nature on 22 May 2026 shows severe and persistent water quality deterioration in the Afon Cynffig / Kenfig River downstream of the Marlas STW SPS outfall.

The results include exceptionally elevated ammonia and phosphate, severe dissolved oxygen depletion and continuing evidence of wastewater related impact several kilometres downstream.

The data does not support any public reassurance that aeration alone is restoring river health across the affected reach. The evidence indicates that aeration may be producing localised oxygenation only, while critically low dissolved oxygen persists downstream.

APFN considers this to be a significant pollution incident requiring urgent regulatory scrutiny, transparent publication of monitoring data and immediate review of the effectiveness of current mitigation measures.

Interpretation of Monitoring Parameters

The monitoring parameters selected during this investigation were chosen to assess both general river health and the potential influence of sewage-related pollution within the affected river system.

Dissolved Oxygen (DO)

Dissolved oxygen measures the amount of oxygen available within the water column for aquatic life. Healthy rivers typically maintain sufficiently high dissolved oxygen concentrations to support fish, invertebrates and aerobic microbial communities.
Reduced dissolved oxygen concentrations can indicate elevated organic pollution loading, excessive microbial decomposition activity or sewage contamination. Very low dissolved oxygen conditions can place severe stress on aquatic ecosystems and may contribute to fish kills and ecological degradation (Welsh Government, 2009). The significantly reduced dissolved oxygen saturation values recorded within parts of the affected reach are consistent with elevated biological oxygen demand associated with organic pollution.

Ammonia Nitrogen (NH_3-N)

Ammonia is one of the most important indicators of sewage contamination and organic waste pollution within freshwater systems. Elevated ammonia concentrations are commonly associated with untreated or partially treated sewage discharges, agricultural waste or decomposing organic matter. Ammonia can become highly toxic to fish and aquatic organisms, particularly at elevated pH and temperature conditions (UKTAG, 2007). The elevated ammonia concentrations recorded within the outfall reach and downstream monitoring locations strongly indicate substantial organic and wastewater-related contamination within the affected section of river.

Phosphate (PO_4^{3-}) (HR)

Phosphate is a nutrient commonly associated with sewage effluent, detergents, agricultural runoff and organic pollution. Excessive phosphate concentrations can contribute to eutrophication, excessive algal growth and ecological imbalance within river systems. Elevated phosphate concentrations may also promote the development of sewage fungus and other pollution-tolerant microbial communities (UKTAG, 2013; Exton et al., 2024). The substantially elevated phosphate concentrations identified during monitoring are significantly above expected background concentrations for a healthy river system (Environment Agency, 2019).

Nitrate (NO_3^--N)

Nitrate is another nutrient parameter commonly used to assess water quality and nutrient enrichment. While nitrate can occur naturally at low concentrations, elevated levels are frequently associated with wastewater discharges, agricultural runoff and nutrient pollution. Excessive nitrate loading may contribute to ecological imbalance and excessive biological productivity within freshwater systems (Environment Agency, 2019).

Conductivity

Conductivity measures the ability of water to conduct electrical current and is influenced by the concentration of dissolved ions and salts present within the water. Elevated conductivity readings can indicate increased dissolved pollutant loading, including wastewater contamination, sewage effluent or other anthropogenic inputs. The marked increase in conductivity recorded adjacent to the outfall compared with the upstream control location indicates a significant increase in dissolved ionic loading within the affected reach.

Turbidity

Turbidity measures the cloudiness or clarity of water and reflects the concentration of suspended particles present within the river. Elevated turbidity may result from suspended sediments, organic matter, sewage solids, microbial growth or disturbed riverbed deposits. High turbidity can reduce light penetration, affect aquatic habitats and indicate deteriorating water quality conditions.

pH

pH measures the acidity or alkalinity of water. Healthy freshwater systems generally remain within a relatively stable pH range. Elevated or unstable pH conditions can influence chemical toxicity, aquatic ecosystem health and ammonia toxicity. The elevated pH values recorded during monitoring may increase the toxicity potential of ammonia present within the affected reach (UKTAG, 2007).

Temperature

Water temperature directly influences dissolved oxygen availability, biological activity and chemical processes within freshwater ecosystems. Higher temperatures generally reduce the ability of water to retain dissolved oxygen while simultaneously increasing biological oxygen demand and microbial activity (Welsh Government, 2009).

Reference Temperature (Tref)

The conductivity monitoring equipment used during this investigation applies automatic temperature compensation to a standardised reference temperature of 25.0°C (Tref).
This process allows conductivity readings collected under varying environmental temperatures to be directly compared using a consistent calibration reference standard.