

Compliance Assessment Report CAR_NRW0048572

Permit being assessed: LP3030XA.

For: Cardiff Energy Recovery Facility, **held by:** Viridor Trident Park Limited

At: Trident Park, Glass Avenue, Cardiff, CF24 5EN.

Type of assessment: Report/Data Review,

Reason: Routine.

On: 17/06/2025.

Parts of permit assessed: 1.1.1(b), 2.3.8(h), 3.6.1(a) 3.2.1, 4.3.1.

NRW Lead Officer: Geraint Harris.

Report sent to: Plant Manager, Plant Manager, on 19/08/2025.

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

Part of permitted activity assessed (compliance criteria)	Assessment result	Permit condition
IR2C - Installations - Operations - Operating techniques	Action only (X)	
IR2C - Installations - Operations - Operating techniques	C3 Minor	1.1.1(b)
IR1A - Installations - Management - General Management	Ongoing (O)	1.1.1.(a)
IR1A - Installations - Management - General Management	Ongoing (O)	1.1.1(a)
IR1A - Installations - Management - General Management	C3 Minor	1.1.1(b)
IR4C - Installations - Information - Notification	C3 Minor	4.3.1(b)
IR3A(2) - Installations - Emissions and monitoring - Emissions to air	Action only (X)	
IR3A(2) - Installations - Emissions and monitoring - Emissions to air	Action only (X)	
IR2C - Installations - Operations - Operating techniques	C3 Minor	2.3.8(h)
IR3E - Installations - Emissions and monitoring - Monitoring	C3 Minor	3.6.1(a)

Part of permitted activity assessed (compliance criteria)	Assessment result	Permit condition
IR3E - Installations - Emissions and monitoring - Monitoring	C3 Minor	3.6.1(a)

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

Total non-compliances recorded	Total non-compliance score
6	24

How we use the non-compliance score to calculate your annual fee is explained in the 'Important Information' section below.

2. What action is required?

Criteria	Action needed	Complete by
IR2C	Action 1 Please confirm whether the incident on the 14th of February 2025 occurred before or after the interventions described above were put in place.	19/09/2025
IR2C	Action 2: Please investigate if any further actions can be taken to ensure permit condition 2.3.8(h) is complied with going forward and report your findings to NRW.	19/09/2025
IR1A	Action 3: NRW would like to know what the learning opportunities were following Viridor's root cause investigation. Have additional measures or checks been implemented that either prevents a reoccurrence or identifies earlier opportunities that the pressure is falling? Please provide details.	19/09/2025
IR1A	Action 4: With regards to Line 2, have you investigated why the analysis went out of service and is there anything that can be done to reduce the risk of a re-occurrence?	19/09/2025
IR1A	Action 5: Are there any learnings from Viridor's and Envea's investigation that could be applied to other aspects of the CEMS data handling software?	19/09/2025
IR4C	Action 6: Please submit to NRW your root cause investigation explaining why you failed to inform NRW of the contravention of permit conditions 2.3.8(h) and 3.6.1(a) on the 14th of February.	19/09/2025
IR3A(2)	Action 7: To ensure clarity and consistency in NRW's compliance assessment, we request the following: <ol style="list-style-type: none"> 1. Confirmation of whether a permit exceedance actually occurred on 13th April 2025, including whether the 237 mg/m³ reading was the eighth or higher exceedance within the 24-hour period, thereby breaching the 95% threshold. 2. A full 24-hour dataset for 13th April 2025, showing all 10-minute CO averages used to determine compliance with the 95% rule. 	19/09/2025

Criteria	Action needed	Complete by
	3. An explanation of the rationale behind the submission of the Schedule 5 Notification, including whether it was based on a confirmed breach, a precautionary interpretation, or a misapplication of the permit conditions.	
IR3A(2)	Action 8: NRW would like to know if all opportunities for the prevention of gas cylinders in coming wastes, as well as opportunities to remove cylinders before they enter the hopper, have been considered. NRW would like to know what the outcome of this review was and any justifications for not considering any of the actions that resulted from this review. Due 18th July 2025.	19/09/2025
IR2C	Comply with permit condition 2.3.8(h) at all times	19/09/2025
IR3E	Ensure that permit condition 3.6.1(a) is complied with at all times.	19/09/2025
IR3E	Ensure that permit condition 3.6.1(a) is complied with at all times.	19/09/2025

Compliance criteria codes are listed in the 'Important information' section below.

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.

You are non-compliant with your permit.

We are currently considering taking enforcement action against you for the non-compliance recorded above. We will contact you in due course.

4. Details of our assessment

Trident Park

Q1 Monitoring Returns

The Q1 monitoring returns were received on time. The following non-compliances have been identified and discussed below.

TOC Surrogates

On 3rd January 2025, at 17:30, the FID analyser on Line 1 went out of service due to low sample pressure. Consequently, the standby FID was brought into operation on Line 1. At 17:30 on the same day, the duty FID analyser on Line 2 also went out of service due to a zero fault. Since the standby FID was already in use on Line 1, no standby FID was available to monitor the TOC emissions from Line 2. Both FID faults were resolved by 09:00 on the 4th January 2025. However, during the outage on Line 2, waste continued to be charged.

On the 14th of February 2025, the FID analyser on line 1 went into fault, and the CEMS did not automatically switch over to the standby analyser. Consequently, no TOC readings were available for

line 1 from 14:00 to 17:29. Viridor continued to charge waste into line 1 while unable to measure their TOC emissions.

Permit condition 2.3.8(h) states that waste must not be charged if continuous emission monitors, used to demonstrate compliance with emission limit values for particulates, TOC, or CO as outlined in Schedule 3, are unavailable, unless alternative techniques, agreed in writing with Natural Resources Wales, are used to demonstrate compliance. To date, no such written agreement has been made with Natural Resources Wales.

The incidents on 3rd to 4th January 2025 and 14th February 2025 involved failures of the FID analysers used to monitor TOC emissions. During both events, waste continued to be charged while TOC emissions were not being monitored, and no alternative techniques had been agreed with NRW.

The contravention of permit condition 2.3.8(h) for both incidents constitutes a single Category 3 non-compliance, based on reasonably foreseeable impact rather than the actual impact observed during these specific incidents. The absence of TOC monitoring during waste charging represents a significant compromise of environmental protection safeguards, as TOC monitoring serves as a critical backstop condition designed to prevent pollution even during abnormal operating conditions, as mandated by the Industrial Emissions Directive.

While low CO levels may suggest stable combustion during both incidents, they cannot be used to justify compliance with permit condition 2.3.8(h). The permit explicitly requires continuous TOC monitoring, and no written agreement exists to use CO as a validated surrogate. This absence is not just procedural, it reflects the lack of technical validation needed to ensure CO reliably indicates TOC levels.

CO and TOC measure different aspects of combustion and can behave independently. Therefore, CO cannot definitively rule out elevated TOC emissions. Using CO data without formal validation risks undermining the integrity of the regulatory framework.

However, CO levels can be cautiously considered in the risk assessment. While they do not eliminate the breach, they may help demonstrate that the likelihood of a Category 1 or 2 non-compliance (i.e. major or significant impact) is low.

The facility has a documented history of three recorded VOC exceedances, primarily linked to power failures affecting support burners. This establishes that TOC exceedances are not theoretical but have actually occurred at this site, creating a clear precedent for potential future occurrences during unmonitored periods. Several operational factors create reasonable foreseeability of harm during monitoring outages, including waste composition variability where certain wastes such as nitrous oxide gas cylinders are known to cause TOC spikes, equipment malfunction potential through failures in air supply systems or abatement infrastructure that can cause elevated TOC levels, and operational variables including inadequate temperatures or improper waste feeding that may lead to incomplete combustion.

TOC emissions represent volatile organic compounds (VOCs) that contribute to ground-level ozone formation, secondary organic aerosol formation, and climate change. The regulatory framework specifically requires continuous TOC monitoring because these compounds have the potential to cause

pollution as defined under the Environmental Permitting Regulations. During both outage periods (15.5 hours and 3.5 hours respectively), the operator would have been unable to detect any exceedances of the TOC emission limit value or take appropriate corrective actions. This creates a genuine risk that elevated emissions could occur undetected and uncorrected, potentially leading to environmental harm that could have been prevented through proper monitoring and timely intervention.

While the incidents were of relatively short duration and operational data suggested stable conditions, the loss of continuous monitoring for a critical emission parameter cannot be dismissed as having no potential environmental impact. The Category 3 classification appropriately reflects the genuine potential environmental risk from monitoring system failures while providing a proportionate response that recognises the circumstances were not as severe as would warrant Category 1 or 2 classification.

The incidents involving TOC monitoring failures on Line 2 in January and Line 1 in February each represent distinct breaches of permit condition 3.6.1(a), which requires continuous monitoring of emissions. These breaches occurred at separate emission points (A1 and A2) and cannot be consolidated, as each point has independent monitoring obligations tied to separate process lines. While the monitoring requirements may be identical, the physical and regulatory separation of these points means each failure must be assessed individually. NRW has therefore applied a **Category 3 non-compliance to each incident**, reflecting the short duration and stable readings of other parameters.

Permit condition 2.3.8(h), which prohibits waste charging when TOC monitors are unavailable unless alternative techniques have been agreed in writing with NRW is operational in nature, whereas the breach of 3.6.1(a) is an equipment/maintenance failure. These are fundamentally different types of non-compliance and must be treated separately under NRW's compliance guidance. This is a recognition of distinct regulatory failures with different root causes and remedial actions.

The January incident revealed an underlying competency issue where operators lacked consistent understanding of critical safety procedures when monitoring equipment failed. This demonstrates a failure to use "sufficient competent persons and resources" as required by condition 1.1.1(b). Evidence of this deficiency includes continued waste charging despite TOC monitoring outage, the need for immediate communications to shift teams following the incident, implementation of procedure UEP039 'Loss of CO or TOC or Particulate readings', and formal training delivered in February 2025 covering permit condition 2.3.8(h). The recurrence of similar issues in February, despite remedial training, further substantiates the systemic nature of this management system failure. This constitutes a **Category 3 non-compliance with condition 1.1.1(b)**, reflecting the potential for elevated emissions to go undetected due to operator unawareness.

The February incident demonstrates a failure in technical resources where the CDAS system was inadequately configured to perform automatic switching between analysers. Investigation revealed that the CDAS was only configured for analyser switching during FTIR faults, not FID faults. This constitutes **Category 3 non-compliance with condition 1.1.1(b)** because the technical resource (CDAS) was not competent to perform the required task, Viridor failed to ensure proper configuration of critical automated systems, and the system failure directly led to loss of continuous monitoring capability. The operator bears responsibility for ensuring proper functionality of automated systems,

regardless of third-party involvement in installation or maintenance.

Action 1: Please confirm whether the incident on the 14th of February 2025 occurred before or after the interventions described above were put in place. **Due 19th September 2025.**

Action 2: Please investigate if any further actions can be taken to ensure permit condition 2.3.8(h) is complied with going forward and report your findings to NRW. **Due 19th September 2025.**

With regards to the analyser failures on line 1 in January, Viridor reported that the duty FID analyser went out of service due to low sample pressure. On investigation, it was found that the screw on the back pressure diaphragm had become loose. This was re-tightened to regain the sample pressure. The screw was subsequently checked during the next scheduled service visit.

Action 3: NRW would like to know what the learning opportunities following Viridor's root cause investigation were. Have additional measures or checks been implemented that either prevents a reoccurrence or identifies earlier opportunities that the pressure is falling? Please provide details. **Due 19th September 2025..**

Action 4: With regards to Line 2, have you investigated why the analysis went out of service and is there anything that can be done to reduce the risk of a re-occurrence? **Due 19th September 2025.**

Action 5: Are there any learnings from Viridor's and Envea's investigation that could be applied to other aspects of the CEMS data handling software? **Due 19th September 2025.**

Notification

Viridor failed to immediately notify NRW of the February permit breaches, as required under condition 4.3.1(b). Notification was not provided until 3rd June 2025, representing a delay of approximately four months. This constitutes a Category 3 non-compliance due to the absolute nature of the notification requirement, which is designed to ensure comprehensive regulatory oversight regardless of environmental impact. The delay significantly undermined NRW's ability to assess and respond to potential environmental risks in a timely manner. Moreover, Viridor missed multiple opportunities to identify and report the breach during equipment repairs and subsequent data reviews, indicating a systemic failure in internal compliance processes.

Condition 4.3.1(b) establishes a clear procedural obligation that operates independently of environmental impact assessment. Its absolute nature is intentional, preventing operators from making subjective judgments about the significance of breaches and ensuring that all non-compliances are brought to the regulator's attention. This approach supports NRW's broader regulatory objectives, including early intervention, coordination with other agencies, and maintaining accurate records of facility operations.

NRW's discovery of the breach through their own investigation strengthens the case for notification non-compliance. The fact that NRW had to discover the breach independently demonstrates that Viridor's internal monitoring and notification systems failed to operate as required by the permit conditions. This represents a systemic failure in Viridor's compliance management that could have

more serious consequences in future incidents.

The scoring of this non-compliance as Category 3 is proportionate and reflects NRW's commitment to consistent and transparent compliance assessment. It serves legitimate deterrence purposes by reinforcing the importance of robust internal monitoring and prompt reporting. Allowing operators to bypass notification requirements based on their own impact assessments would create dangerous regulatory gaps and undermine the integrity of environmental oversight.

Action 6: Please submit to NRW your root cause investigation explaining why you failed to inform NRW of the contravention of permit conditions 2.3.8(h) and 3.6.1(a) on the 14th of February. **Due 19th September 2025.**

Carbon Monoxide Exceedance

NRW has reviewed the Schedule 5 Notification submitted on 14th April 2025 under condition 4.3.1(b), which requires immediate notification in the event of a breach of any permit condition. The submission of this notice, alongside the recorded CO value of 237 mg/m³ on 13th April 2025, formed the basis of NRW's initial assessment that a permit exceedance had occurred, specifically, a breach of condition 3.1.2 and the emission limit value set out in Schedule 3, Table S3.1(a).

However, Viridor's subsequent position appears to suggest that the 95% compliance threshold was not exceeded, and that the reading fell within the permitted 7-block exceedance allowance. This raises a critical point of ambiguity, if no breach occurred, it is unclear why a Schedule 5 Notification was submitted under a condition that applies strictly to confirmed breaches.

Action 7: To ensure clarity and consistency in NRW's compliance assessment, we request the following:

1. Confirmation of whether a permit exceedance actually occurred on 13th April 2025, including whether the 237 mg/m³ reading was the eighth or higher exceedance within the 24-hour period, thereby breaching the 95% threshold.
2. A full 24-hour dataset for 13th April 2025, showing all 10-minute CO averages used to determine compliance with the 95% rule.
3. An explanation of the rationale behind the submission of the Schedule 5 Notification, including whether it was based on a confirmed breach, a precautionary interpretation, or a misapplication of the permit conditions.

It is BAT to ensure that the contamination of incoming waste streams with gas cylinders is minimised. In response to this permit breach, Viridor have stated that they have been attempting to identify suppliers of gas canisters including ongoing discussions with local authorities on collection of canisters from parks and other recreational spaces.

Action 8: NRW would like to know if all opportunities for the prevention of gas cylinders in coming wastes, as well as opportunities to remove cylinders before they enter the hopper, have been considered. NRW would like to know what the outcome of this review was and any justifications for not considering any of the actions that resulted from this review. **Due 19th September 2025.**

Compliance Report CAR_NRW0046411 (Feb)

CAR_NRW0046411 Action 1:

In addition to implementing Inconel-clad membrane walls in the first pass sidewalls and front wall, what other additional measures to prevent or minimise catastrophic boiler tube failures have been considered, including more extensive use of Inconel cladding, etc.. and why have these not been taken forward? Written response required by 28th March 2025.

Response received 26/03/2025, Viridor have stated:

“From build and into handover to Viridor the furnace Inconel coverage comprised the roof and 3 meters down the side walls and front wall. As part of improvements to the plant Viridor has replaced all the rear wall and all boiler wall penetrations joggle sets with Inconel cladding increasing the coverage from around 10% to 20%. The planned works to add Inconel to the lower front walls and side walls during the 2025 outage will increase Inconel coverage to the region of 45%. There are limitations on the amount of refractory that can be removed as the refractory system is required to retain heat in the first pass during operation to make sure roof temperatures can be sustained above T2S requirements stipulated in the Environmental Permit. Inconel cladding increases heat transfer rates and does not retain any heat to compensate for fluctuations in furnace temperatures caused by variability in combustion on the grate due to the inherent variability in the fuel’s CV (waste).

To improve reliability of the refractory system an independent report has been commissioned to identify the best refractory system to install that will provide protection to the carbon steel water walls and also provide the required heat transfer to support operation of the boilers. During the 2025 outage Viridor will spend in the region of £2 million pounds upgrading the refractory system. This work along with the installation of Inconel clad panels on the lower sections of the furnace will represent an investment of over £7 million in improving resilience in the boilers and reducing the risk of tube leaks.”

This response reflects what is specified in section 4.2.22 of the Waste Incineration Bref. NRW are interested in learning more about the new refractory system at the next compliance meeting.

4-Yearly Reviews (Permit Conditions 1.2, 1.3 and 1.4)

Viridor is required to undertake reviews every four years to identify opportunities for improving the use of raw materials and energy, as well as to assess whether appropriate measures for the avoidance, recovery and disposal of wastes can be enhanced. A submission for each of these permit conditions has been received and reviewed. There are some follow up questions that will be addressed through in-person meetings at a mutually agreed inspection date.

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 of 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	Score
C1 Major	Potential to have a major, serious, persistent and/or extensive impact or effect on the environment, people and/or property	60
C2 Significant	Potential to have a significant impact or effect on the environment, people and/or property	31
C3 Minor	Potential to have a minor or minimal impact or effect on the environment, people and/or property	4
C4 No environmental impact	Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property	0.1

How we use assessment scores

The number and severity of non-compliances recorded in a year will affect your annual subsistence fee the following year. A non-compliance factor is added to your site's Operator

Performance Risk Appraisal (OPRA) score when we calculate your fee to reflect the additional resource we use to assess permit compliance.

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

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

Full list of Industry compliance criteria (used in section 1 and 2):

1. Management

- IR1A – General management
- IR1B – Finance (only applicable to Landfill)
- IR1C – Energy efficiency
- IR1D - Efficient use of raw materials
- IR1E - Avoidance, recovery and disposal of wastes produced by the activities
- IR1F - Multiple operator installations

2. Operations

- IR2A – Permitted activities
- IR2B – The site
- IR2C – Operating techniques
- IR2D – Technical requirements
- IR2E – Improvement programme
- IR2F – Pre-operational conditions
- IR2G – Landfill engineering (only applicable to Landfill)
- IR2H – Waste acceptance (only applicable to Landfill)
- IR2I – Leachate levels (only applicable to Landfill)
- IR2J – Closure and aftercare (only applicable to Landfill)
- IR2K – Landfill gas management (only applicable to Landfill)

3. Emission and Monitoring

- IR3A – Emissions to water, air or land
- IR3B – Emissions of substances not controlled by emission limits
- IR3C – Odour
- IR3D – Noise and vibration
- IR3E – Monitoring
- IR3F – Pests
- IR3G – Air quality management plans
- IR3H – Monitoring for the purposes of the Industrial Emissions Directive (this heading includes Large Combustion Plants)
- IR3I – Fire

4. Information

- IR4A – Records
- IR4B – Reporting
- IR4C – Notification

Enforcement response

Any non-compliance with a permit condition 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 twenty 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 to 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.