

Compliance Assessment Report CAR_NRW0049774

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: 25/07/2025 - 24/10/2025.

Parts of permit assessed: 1.1.1(b), 3.2.1, 2.3.11, 2.3.12 .

NRW Lead Officer: Geraint Harris.

Report sent to: The Plant Manager, Plant Manager, on 12/11/2025.

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

Part of permitted activity assessed (compliance criteria)	Assessment result	Permit condition
IR1A - Installations - Management - General Management	Ongoing (O)	1.1.1(b)
IR3A(2) - Installations - Emissions and monitoring - Emissions to air	C3 Minor	3.1.2
IR3A(2) - Installations - Emissions and monitoring - Emissions to air	C3 Minor	3.1.2
IR4B - Installations - Information - Reporting	Assessed (A)	

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

Total non-compliances recorded	Total non-compliance score
2	8

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
IR1A	Continue to implement and undertake the corrective actions stipulated in Viridor's responses to Action 1 to 6 from compliance report CAR_NRW0048572	Already completed
IR3A(2)	No Further action required at this point	Already

Criteria	Action needed	Complete by
		completed
IR3A(2)	Action 1: NRW requests that Viridor share the findings of their internal investigation into the VOC exceedance and start-up process. This should include any identified root causes, corrective actions taken, and proposed improvements to start-up protocols following major maintenance. These findings will inform NRW's assessment of compliance and determine whether further regulatory action is required. Due November 20th 2025.	01/12/2025

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

Continuation from CAR Form CAR_NRW0048572

CAR_NRW0048572 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.

Viridor response: "UEP039 Loss of CO or TOC or Particulate readings was issued to all operational shift teams on 10/01/25. Environmental Permit Operational Guidance training was delivered to the Operations Manager, Safety & Compliance Manager, Engineering Manager and Technical Compliance Lead on 13/02/25. The automatic changeover function for the standby FID system was configured and tested on 09/05/25."

CAR_NRW0048572 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.

Viridor response: "On 13/08/25 Viridor successfully implemented and tested a CEMS waste feeding interlock to the plant's DCS. This is a 'stop waste feeding' function for Line 1 and 2 to prevent boiler waste feeding if there is no reliable measurement available from either duty or standby FID, FTIR, Particulates or O2 probe."

During July 2025 all staff have been instructed to read and sign off the following toolbox talks/procedures:

- *ERF Toolbox Talk CEMS Operating Techniques*
- *Emissions to Air and EA Requirements Toolbox Talk*
- *Internal CEMS Compliance (EN14181) Procedure*

The procedures are held electronically on the Viridor Electronic Document Management System (EDMS) and can therefore be accessed as needed. The procedures are delivered annually as a refresher, with records maintained. Any new starters will be captured with the procedures as part of their training.”

CAR_NRW0048572 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.

Viridor response: “Viridor has implemented a series of in-house daily checks on the FID systems to provide earlier opportunities to identify potential issues. The implementation of the waste feed interlock is the main measure that has been identified to prevent a reoccurrence of the incident. In addition, Viridor has arranged CEMS refresher training for the operations teams to be delivered by Envea on W/C 15/09/25. The training will include; system operation and data interpretation, scheduled maintenance and cleaning procedure, basic troubleshooting and fault diagnosis.”

CAR_NRW0048572 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.

Viridor response: “Line 2 had a zero fault due to clock drift affecting the time of the daily zero. This was rectified during the visit on 04/01/25, and clock drift is now checked every service visit and adjusted if required.”

CAR_NRW0048572 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.

Viridor response: “The investigation identified that the CDAS system was inadequately configured to perform automatic switching between analysers and was only configured for analyser switching during FTIR faults, not FID faults. This was corrected on 09/05/25.”

CAR_NRW0048572 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.

Viridor response: “The failure to notify NRW of the contravention of permit conditions 2.3.8(h) and 3.6.1(a) on the 14th of February 2025 was a result of human factors; the breach was not identified or communicated by the relevant people. Viridor has a Local Management Instruction (LMI) in place entitled Notifications to the Environmental Regulator (Natural Resources Wales or other). This has been reviewed and updated to include additional internal

checks of the daily emissions reports by the Operational team. This LMI has been re-trained out to the Trident Park team. In addition, the daily CEMS data from Trident Park is now automatically transferred to a third-party database that allows wider scrutiny of the data across Viridor.”

Conclusion:

The January and February 2025 incidents at Trident Park demonstrate a systemic failure in the operator’s management system to identify, mitigate, and prevent foreseeable risks to permit compliance.

In January, both FID analysers failed simultaneously, leaving Line 2 without TOC monitoring while waste charging continued. This revealed a lack of procedural safeguards, fallback mechanisms, and operator awareness of critical permit conditions. The absence of a system to prevent waste charging during monitoring outages, and the need to issue procedure UEP039 post-incident, indicate that the management system failed to anticipate and control this risk.

In February, despite training and procedural updates following the January event, the CDAS system failed to switch analysers during a FID fault, resulting in a loss of TOC monitoring. The misconfiguration only allowing automatic switching during FTIR faults was identified during the post-incident investigation. This outcome highlights that the management system lacked a robust verification or change control process to ensure critical automated systems were correctly configured and functioning as intended. The failure to detect and report the breach until June 2025 further underscores weaknesses in internal compliance monitoring and escalation procedures.

The operator’s responses to **Actions 1 to 6** in the CAR report further support this assessment:

- **Action 1** confirms that the February incident occurred after training and procedural interventions, and the management system failed to ensure technical safeguards were in place.
- **Action 2** led to the implementation of a CEMS waste feed interlock in August 2025, a critical control that should have been identified and embedded earlier.
- **Action 3** shows that daily checks and refresher training were only introduced after both incidents, indicating reactive rather than proactive management.
- **Action 4** revealed that Line 2’s fault was due to clock drift now addressed through routine service checks, again highlighting a lack of preventative maintenance planning.
- **Action 5** highlights that the management system lacked a robust verification or change control process to ensure critical automated systems were correctly configured prior to operational use
- **Action 6** identified human factors and procedural gaps in the failure to notify NRW, despite an existing Local Management Instruction (LMI) which had to be revised and retrained post-incident.

The responses collectively demonstrate that the operator’s management system lacked the necessary structure, foresight, and internal controls to ensure compliance with permit conditions. The recurrence

of similar failures, despite previous interventions, confirms that the system was neither resilient nor responsive enough to prevent reoccurrence.

The information provided in response to the six actions supports and justifies the identified non-compliances under condition 1.1.1(b) in compliance report CAR_NRW0048572. These actions address the underlying issues and provide a credible pathway for the operator to return to compliance. NRW will continue to monitor progress to ensure that the improvements are embedded and sustained.

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.

Viridor's response:

"The notification submitted 14th April, the 10-minute CO reading of 237.37 mg/Nm³ was the eighth exceedance within any 24-hour period (in this case 21:50 on 12/04/25 to 21:50 on 13/04/25), thereby breaching the 95% limit stated in Schedule 3, Table S3.1(a). Please see attached 24-hour CEMS dataset for 12th and 13th April 2025 showing the 10-minute CO breaches. The rationale behind submission of the Schedule 5 Notification was based on a confirmed breach, as demonstrated in the attached CEMS reports."

NRW acknowledges Viridor's confirmation that the 10-minute CO reading of 237.37 mg/Nm³ at 21:50 on 13th April 2025 was the eighth exceedance within the 24-hour period from 21:50 on 12th April to 21:50 on 13th April. This breached the 95% compliance threshold set out in Schedule 3(b), Table S3.1, confirming that a permit exceedance did occur. Accordingly, the submission of the Schedule 5 Notification under condition 4.3.1(b) was appropriate.

NRW welcomes Viridor's clarification regarding its internal compliance procedures and interpretation of permit conditions. This response in conjunction with the 24-hour emissions data set, helps to resolve the ambiguity highlighted in our previous correspondence, particularly in relation to the exceedance threshold and the rationale behind the notification.

Although the breach was brief and combustion conditions were stabilised promptly, the incident nonetheless constituted a **breach of permit condition 3.1.2** and exceeded the emission limit value set out in Schedule 3(b), Table S3.1.

In accordance with NRW's compliance scoring guidance, the carbon monoxide (CO) exceedance is classified as a **Category 3 (C3) minor non-compliance**, based on the principle of reasonably

foreseeable impact, rather than retrospective analysis of actual harm. Importantly, carbon monoxide is a dangerous substance with clear potential to pollute and cause harm to human health both onsite and offsite, even when ambient concentrations remain below air quality standards. CO is produced by incomplete combustion, and its presence in emissions is a recognised indicator of combustion instability a condition that can lead to broader environmental and operational risks. Permit compliance limits are not solely based on ambient thresholds; they are designed to prevent foreseeable harm, ensure process stability, and uphold Best Available Techniques (BAT). In this case, the presence of gas canisters in the waste stream a known risk factor for combustion instability further supports the need for regulatory intervention.

NRW welcome Viridor's proactive engagement in addressing the root cause of this exceedance. As noted, it remains BAT to minimise contamination of incoming waste with gas cylinders, and NRW encourage continued efforts in this area. NRW, through action 8, requested confirmation that all opportunities to prevent the presence of gas cylinders in incoming waste, and to remove them prior to entry into the hopper, have been considered. NRW also requested the outcome of this review and justification for any actions not taken.

Viridor has undertaken a comprehensive review of measures to minimise the presence of pressurised gas cylinders, particularly nitrous oxide (NO_x) and butane types, in residual waste streams received at Trident Park. The increase in such items is linked to the illegal use of larger catering-style N₂O cannisters, which are increasingly found in domestic waste.

Viridor has implemented a multi-layered approach to address this issue including:

1. Customer Engagement and Education

- Regular Customer Fuel Alerts are issued to highlight risks associated with non-conforming waste, including gas cylinders.
- Alerts are reviewed at monthly client meetings and cascaded to frontline council staff (e.g. street cleansing teams, HWRC operatives).
- Viridor's Education Centre promotes awareness of problematic waste types, including gas bottles, to schools and community groups.
- Councils are encouraged to amplify these messages via social media.

2. Operational Controls and Audits

- The Fuel Supply Team conducts audits of customer sites (e.g. HWRCs, transfer stations) to assess waste inspection procedures and segregation practices.
- Sites identified as medium or high risk may face increased inspection frequency or exclusion from the ERF.
- Onsite segregation (e.g. caged storage areas for cylinders) is reviewed during audits.

3. Onsite Visual Inspections

- Tipping hall teams and crane operators conduct visual checks of incoming waste to identify and remove non-conforming items.
- Inspection frequency is increased following incidents involving gas cylinders.
- External contractors are periodically engaged to support waste sampling and inspection.

These measures reflect the appropriate measures to minimise occurrence of compressed gas cylinders in the waste as outlined in the Environment Agency Incinerator and Co-incinerator Start-up & Shut-down Guidance, which recognises that while operators cannot inspect every load, they should implement appropriate controls such as:

- Clear waste specifications prohibiting cylinders,
- Onsite and offsite load inspections,
- Feedback mechanisms to customers when prohibited items are received.

Operators have a strong incentive to prevent cylinders from entering the waste stream not only for permit compliance, but also to avoid serious safety risks and costly operational disruptions.

Given that all appropriate measures are presently implemented to mitigate the risks associated with gas canisters, issuing a management non-compliance for failure to identify and remove them would not be justified.

NRW will ask to see evidence that all of the above measures are being applied in a future compliance visit.

Q2 Monitoring Returns

The Q2 monitoring returns were received on time. The following non-compliances have been identified and discussed below.

VOC Exceedance – Line 1, Trident Park (27th June 2025)

On 27th June 2025, Viridor Trident Park Limited reported a VOC emission of 24.41 mg/Nm³ on Line 1 between 03:00 and 03:29, exceeding the permit limit of 20 mg/Nm³. This occurred during the early stages of stabilisation following a major maintenance shutdown. The operator's review concluded that the exceedance was likely due to waste composition, and combustion conditions were stabilised with emissions returning to normal from 03:30h.

The OTNOC Management Plan Template (v0.10, 04/10/2024) is explicit in stating that ELV exceedances caused by waste composition do not qualify as abnormal operation and must be included in the OTNOC plan. It further clarifies that such exceedances are counted as permit breaches and scored accordingly under the Compliance Classification Scheme (CCS).

Since Viridor concluded that the breach did not occur during a period of OTNOC, it does not meet the criteria for abnormal operation as defined in Conditions 2.3.11–2.3.12 and Schedule 6. Therefore, this incident constitutes an actual non-compliance against permit condition 3.1.2.

To assess the potential impact, a conservative H1 risk assessment was undertaken using formaldehyde as a surrogate VOC. Formaldehyde is representative of short-term toxicity and has a 30-minute Environmental Assessment Level (EAL) of 100 µg/m³.

Using a conservative flue gas flow rate of 40 Nm³/s per line, and assuming Line 2 was operating at the short-term ELV of 20 mg/Nm³, the total VOC mass emission rate was calculated as:

$$\text{TVOC} = 40 \times (24.41 + 20) / 1000 = 1.7764 \text{ g/s}$$

Applying the H1 short-term dispersion factor of $16 \mu\text{g}/\text{m}^3/\text{g/s}$ (based on a 90 m stack), the estimated 1-hour ground-level concentration (GLC) gives:

$$\text{GLC}_{1\text{h}} = 1.7764 \text{ g/s} \times 16 \mu\text{g}/\text{m}^3/\text{g/s} = 28.42 \mu\text{g}/\text{m}^3$$

Converted to a 30-minute average using a factor of 1.3:

$$\text{GLC}_{30\text{min}} = 28.42 \times 1.3 = 36.95 \mu\text{g}/\text{m}^3$$

This equates to 36.95% of the formaldehyde EAL, indicating low environmental risk. Given the short duration and conservative assumptions, no further modelling is required.

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. In this case, the exceedance lasted for a single 30-minute period and was promptly resolved once combustion conditions stabilised. Therefore, the actual impact is no likely greater than a **category 3 non-compliance**. Short-duration ELV exceedances linked to waste composition are typically transient and self-limiting. Unless there is evidence of persistent or repeated breaches, or elevated ground-level concentrations, such events are unlikely to warrant a higher CCS classification.

Under the Waste Incineration BAT Conclusions (EU 2019/2010), it is BAT to minimise emissions during all operating conditions, including start-up and shut-down. This includes ensuring that combustion is stable, abatement systems are fully operational, and waste feed is introduced only when conditions are suitable to prevent elevated emissions.

Viridor's Schedule 5 Notification for the VOC exceedance on the 27th June 2025 states that an "investigation into the event is to be undertaken to identify any lessons learned for future boiler start-ups from major maintenance shutdown periods." This suggests that the root cause may relate to operational procedures during start-up, particularly following extended outages. Identifying and addressing these is critical to preventing recurrence and ensuring robust environmental management.

Action 1: NRW requests that Viridor share the findings of their internal investigation into the VOC exceedance and start-up process. This should include any identified root causes, corrective actions taken, and proposed improvements to start-up protocols following major maintenance. **Due December 1st 2025.**

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.