Cyfoeth Naturiol Cymru
Natural Resources Wales

Compliance Assessment Report CAR_NRW0045914

Permit being assessed: BL3986ID.

For: Aberthaw Works, **held by:** Tarmac Cement Limited

At: Aberthaw Works, East Aberthaw, Barry, Vale of Glamorgan, CF62 3ZR.

Type of assessment: Site Inspection,

Reason: Routine.

On: 31/12/2024 between 09:00 and 17:00.

Parts of permit assessed: Emissions, waste fuels, storage, amenity.

NRW Lead Officer: Antony Leakey.

Report sent to: Tarmac Secretaries (UK) Limited, Company Secretary, on 23/01/2025.

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	C3 Minor	1.1.1
IR3A(2) - Installations - Emissions and monitoring - Emissions to air	C3 Minor	3.1.2
IR3B - Installations - Emissions and monitoring - Emissions of substances not controlled by emission limits	C3 Minor	3.2.1
IR3D - Installations - Emissions and monitoring - Noise and vibration	C3 Minor	3.5.1
IR4C - Installations - Information - Notification	C3 Minor	4.3.5

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

Total non-compliances recorded	Total non-compliance score
5	20

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	Review protection of damage to infrastructure by internal vehicle movements and demonstrate implementation of identified improvements.	01/04/2025
IR3A(2)	Review start up from shut down emissions management.	Already completed
IR3B	Pre-cooling area designated to minimise fugitive emissions of clinker dust during tipping at the quarry.	Already completed
IR3D	Review scope for reduced cooler tube discharge chute degradation and demonstrate implementation of identified improvements.	01/04/2025
IR4C	Review, confirm and demonstrate implementation of revised NRW notification procedures.	01/04/2025

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.

At this time, we are issuing you with a warning for the non-compliance recorded above. Warnings may influence future enforcement response for continued or further non-compliance.

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

Aberthaw Cement Works

Emissions and reporting review 2024, inspection – 20 May and 10 October 2024 and incident update

Summary of previous CAR action status			
Permit condition	Action summary	Due date	Action status
3.5.1	EOP4: Noise and Vibration review and noise action plan improvements.	Ongoing	Refractory breaking limited working hours. Raw mill door surround improvements and cooler tube discharge scroll repairs early 2025.
3.2.1	Dust management measures.	Complete	Suppression water spray UV treatment

			installed. Road sweeper procured.
n/a	Tarmac to identify an appropriate opportunity to vary the new kiln hood release point into the permit.	Ongoing	Ongoing
3.1.2	Review coal mill bag filter inspection and maintenance regime and burst bag detection provision.	Ongoing	Ongoing
3.2.1	Review environmentally critical control functions and provide an update on implementation of improvements to minimise dust releases.	Ongoing	Follow up at future site inspection.
3.2.1	Review kiln restart process.	Ongoing	Follow up at future site inspection.
3.2.1	ID fan automatic balancing system replacement.	Complete	Commissioned May 2024
1.1.1 & 3.2.1	Cooler tube shell tracking and condition monitoring.	31/3/24	Complete. New shell age tracking implemented.
3.1.2, 3.3.1 & 1.1.1	Demonstrate implementation of RCA actions and provide updated monitoring data.	1/4/24	Complete. Follow up at future site inspection.
2.3.8	Provide a trial risk assessment prior to acceptance of the still bottom residue waste.	Complete	DSEAR RA may need static charge accumulation and dissipation testing for processing dusty material
2.3.12	Review tyre temperature-residence time assessment.	Ongoing	Follow up at future site inspection.

Noise assessment

Further noise improvements have been limited during 2024 due to spending constraints associated with poor demand. Noise complaints have continued and now include alleged impacts at Fonmon to the east of the works.

A check during brisk easterly weather conditions in West Aberthaw on 7/3/24 did identify a significant contribution from the cement works to ambient sound levels, including impulsive and rattling sounds. An indicative 50 dB(A) was measured during calm spells. Significant

rattling sound was subsequently identified due to stone tipping into the quarry conveyor hopper, although it seems unlikely that this sound would travel over 1.4 km without line of sight (quarry wall and cement works form a barrier) without significant attenuation, suggesting that other more local sources, such as the cooler tube discharge chute, may be responsible. Degradation of the cooler tube "snail" chutes is known to occur during operation and will increase the drop height of clinker exiting the cooler tubes. These chutes are reported to have a 2 year lifetime, but replacement frequency is 5 years to align with deterioration of other cooler tube components. This suggests that there is scope for minimising the noise impact further. This is a category 3 non-compliance with permit condition 3.5.1 due to the likely intermittent impact due to wind focusing and gradual degradation across the set of cooler tubes.

ACTION: Tarmac to review scope for reduced cooler tube discharge chute degradation and demonstrate implementation of identified improvements by 1 April 2025.

A site walk over on 20 May identified the cement mill door was open during operation and an air supply to a diaphragm pump was leaking potentially causing additional noise as well as wasting energy. Simple house keeping checks and a good issues reporting culture should capture these types of potential problem.

A noise complaint on 29 August 2024 alleged significant night time impacts. Damage to the raw mill door had occurred and repair could not be scheduled until 19 September. No cement works noise was perceived at Fonmon on 10 October 2024 during a visit to a resident.

No temporary screening during refractory breaking is proposed. All activity will be limited to day time and weekends/bank holidays will be avoided.

Dust control

Water bowser deployment was ensuring regular wetting of the main roads inside the site boundary during both site visits on 20 May and 10 October 2024.

The stone road dust suppression system is now operational following resolution of concerns relating to legionella safety because UV disinfection of process water is to be installed.

The stone road wheel wash has been improved to ensure sufficient vehicle cleaning when entering and leaving site.

Quarry haul road dust was noted on 20 May due to dry conditions despite use of dust suppression. A minor fugitive dust release was noted associated with a maintenance access door on a conveyor near the kiln.

A dust complaint at West Aberthaw was linked to damage of the clinker store roller shutter door and subsequent cleaning of the area to facilitate repair of the door. Dust is thought to have blown offsite due to the easterly wind at the time.

Incident and complaints summary

11/1/24 – extreme noise in early hours of the morning. No plant operational due to shut down.

Shut down work not taking place overnight.

16/1/24 - report of smoke from the cement works stack. No plant operational. Local early morning mist recorded in weather history and may have been mistaken for smoke.

4/2/24 –main stack dust emission limited exceeded during start up from scheduled shut down. Daily mean 22.9 mg/Nm3 compared to ELV of 10 mg/Nm3. There may have been break-through of the filters due to low temperatures/pressure drop during start up and deteriorated filter bags. Compartment isolated and 47 bags replaced. A full re-bag of the filter system was not undertaken during the shutdown, but 100 bags have been replaced during routine shut downs. A full re-bag was completed during May 2024.

No exceedance of AQS likely, category 3 non-compliance with permit condition 3.1.2.

Kiln dust emissions were increasing towards the end of December 2023 going into the shutdown and tighter management of the start up period might have prevented the elevated emissions.

ACTION: Tarmac to review start up from shut down emissions management and demonstrate implementation of identified improvements before restart after 2025 shut down.

Deposition gauge results do not show a significant increase for this period at any locations.

14/2/24 – dust reported at Burton Hill. Deposition gauge results do not show a significant increase for this period at Burton Hill.

5/4/24 - dust reported at Burton Hill due to vehicles leaving the cement works. Potentially associated with temporary gypsum deliveries to the quarry using a different haulier and vehicles bypassing the wheel wash facility. Deposition rate was elevated at Burton Hill during this period.

18/4/24 – Burton Hill dust deposit on roads, alleged to be hazardous when wet. Dust control measures fully operational. Deposition gauge results do not show a significant increase for this period at Burton Hill.

20/5/24 – Fontygary Road black dust/rubber deposits alleged to be from cement works. Residence is close to railway line and solid fuel flue exits near to area of deposit on window ledges. A notable proportion of the back dust was magnetic suggesting rail traffic source. Carbonaceous material likely to be associated with solid fuel burning. Deposition gauge results do not show a significant increase for this period at any locations.

20/6/24 – odour at Llancadle. There were no unauthorised emissions or non-routine events. Wind direction was NE/NNE, i.e. not from the direction of the cement works. Other potential odour sources are being investigated in the area.

22/8/24 - Burton Hill dust deposit. A number of kiln trips occurred during this period. Blustery south westerly winds and rain may have contributed to general atmospheric dust washout. Deposition rate was elevated at Burton Hill during this period.

26/8/24 - dust reported at Burton Hill. There were moderate west-south westerly winds and some rain during the period. A kiln shut down and restart took place a few days prior to the event, but no abnormal events were reported. Deposition rate was elevated at Burton Hill during this period.

29/8/24 - alleged significant night time noise impacts at Fonmon.

13/9/24 – extreme noise alleged at West Aberthaw. North easterly wind direction at time of complaint.

These complaints appear to be linked to the raw mill door damage period. The door was damaged several weeks before the complaints and effective temporary noise screens were not installed. Standard Monarflex scaffold sheeting, rather than a high attenuation specification sheeting, was used. This constitutes failure to use appropriate measures to minimise offsite noise. Although the offsite impact was not substantiated this incident is a category 3 non-compliance with permit condition 1.1.1 (failure to demonstrate use of BAT to minimise noise impacts.)

This is a second incident associated with damage to access doors by internal vehicle movements causing offsite impacts (dust and noise). Tarmac will need to consider implementing improvements to reduce the frequency of damage.

ACTION: Tarmac to review protection of damage to infrastructure by internal vehicle movements and demonstrate implementation of identified improvements by 1 April 2025.

Waste-derived fuel trials

Verification of compliance with permit condition 2.3.12 to show that the residence time is sufficient before the gas temperature drops below 850^{o}C in the riser/cyclone 4 gas path, or to establish alternative process conditions, has not been undertaken during 2024 and will need to be completed at a future inspection.

Significant work has been undertaken on the proposed use of waste still bottom residue from terphenyl manufacture as a waste derived fuel for injection into the kiln hot end using the existing Polychip (previously meat and bone meal) fuel handling system.

The waste processor supplying the fuel has claimed waste coding EWC 19 12 11* “other wastes (including mixtures of materials) from mechanical treatment of wastes containing dangerous substances”, which is currently permitted for use under the waste code of practice at Aberthaw. The original waste code allocated by the waste originator EWC 07 01 08* “other still bottoms and reaction residues” may be the most appropriate code because there is no significant change in chemical composition.

However, the permit allows limited duration and tonnage trials to take place and the suitability of the existing fuel handling system was assessed further in relation to dust explosion prevention during 2024 ahead of a trial using 10 tonnes of granular waste resin.

Advice was obtained from an HSE process safety specialist regarding management of dust explosions:

The hazard arises from a combustible material, fine enough to form a dust cloud, in the presence of an ignition source where there is oxygen and confinement.

Increasing particle size and not pneumatically conveying the material potentially will decrease the likelihood of a dust cloud forming and conveying rather than pneumatically transferring it will also potentially reduce the risk of additional static charge build up. There is no specific guidance on what particle size is safe. HSG130 – "Safe handling of combustible dusts" refers in paragraph 14 to "Only weak explosions are likely where the mean particle size of the dust exceeds 200 microns". However, HSG130 points to the duty holder providing an adequate risk assessment rather than relying on maintaining a particular particle size distribution due to the potential for degradation of larger particles to form finer dust.

Therefore, with the larger conveyed particles to reduce the likelihood of an explosible cloud forming, the existing explosion panel, combined with a suitable and sufficient assessment of risk under DSEAR Regulation 5, and an updated HAC assessment under DSEAR Regulation 7(1), the duty holder may now have reduced the health and safety risk so far as is reasonably practicable, at least for a short-term trial.

Improved containment below the walking floor to capture fine material and reinstatement of ATEX provisions on the MBM fuel handling system was considered sufficient risk control for a limited trial of the granular waste to proceed. The trial was completed in March 2024, although spillage through the walking floor was a problem resulting the material needing to be discharged directly into the feed silo.

A further trial of 90 tonnes of finer material was proposed using pneumatic conveying which necessitated further risk assessment of dust explosion hazard.

A revised DSEAR risk assessment was undertaken and provided reassurance that the original MBM waste fuel handing system is suitable in most respects for the waste resin.

However, the minimum ignition energy of the dust was identified as being relatively low (5-6 mJ). Unless the system can provide full explosion pressure containment or provision is made to inert the system Tarmac will need to undertake static charge accumulation and dissipation testing before processing any dusty material, even with fully ATEX rated plant, because the Minimum Ignition Energy (MIE) is so low. The revised DSEAR risk assessment was inconclusive in this respect:

Section: "4.13.15. The Minimum Ignition Energy (MIE) of [the] Resin (waste still bottom residue) is considerably lower when compared to MBM and although making it more susceptible to ignition, it is thought that this is unlikely to have any major effect in terms of physical changes to the plant." – does not address or explain the above point in terms of potential for static charge generation within a dust cloud itself which could result in an explosion due to the low MIE regardless of plant earthing integrity. There may be scope to modify any tendency for self-accumulation of static charge by controlling the air humidity or ionisation level in the system if inerting is not possible, because full containment will not be possible unless the silo pressure rating is increased.

General advice for powders with low MIE values (typically less than 30 mJ), suggests that it

may be necessary to further characterise the electrostatic properties of the material (since the powder itself may be capable of accumulating sufficient charge to produce an incendive discharge). In such circumstances, it is necessary to know how easily the material acquires charge (Chargeability test) and how easily a material dissipates charge (Powder Volume Resistivity and Charge Relaxation Time tests).

Tarmac should obtain competent specialist advice on the need for powder chargeability and powder charge relaxation testing in this case. The low MIE and potential for powder chargeability due to the hydrocarbon nature of the resin was flagged by NRW when Tarmac first proposed the trial in the MBM system in 2023.

NRW is not able to provide Tarmac with definitive guidance on the safety of the material or the intended processing, but will check that Tarmac is following relevant good practice for prevention of accidents that may have human health and environmental impact and seek explanation where Tarmac is not following good practice.

The main concern even with suitably sized explosion relief provision to protect the plant from catastrophic failure is the potential for unabated dispersion of hazardous waste resin and partial combustion products offsite via the relief panel in the event of a dust explosion in the main silo.

Tarmac has not taken the 90 tonne trial further at this time.

Tyre feed rate has been reduced from 1.5 to 1 tonne per hour from August 2024 to improve blockage performance at the preheater stage 4 cyclone.

Clinker storage

On 3 July 2024 Tarmac notified NRW by email that external storage of clinker at the quarry had commenced due to UK ETS constraints requiring historic activity production level to be maintained to avoid losing free carbon credit allocation.

A dust management plan and operations log for the stockpile construction were subsequently provided for review. The following points were raised for further improvement:

- Rate of clinker stockpile accumulation – accelerated rate of stockpile construction while weather conditions were more favourable so that the completed stockpile could be covered and protected before adverse autumn weather allowing scope for the clinker store to be used to continue stock accumulation later in the year.
- Stockpile protection – constructed hard windbreaks higher than the planned pile height should be considered instead of, or as well as, covers if the stock is likely to be held for a prolonged period.
- Wind direction action criteria – previous experience with operations on the PFA landfill in the North Quarry area has shown that strong westerly winds can cause significant dust impacts at Fonmon village. The topography and perceived shelter provided by storing clinker on the floor of the quarry may not be sufficient to prevent offsite impact under some conditions. Consideration should be given to a wind direction and speed trigger to cease operations to protect Fonmon.
- Weather station location – the weather station on the cement mill may not be sufficiently representative of conditions in the quarry. Tarmac should consider

installing a weather station in the quarry or “calibrating” the quarry windsock against the cement mill station or a handheld anemometer.

- Recording wind speed – as a wind speed trigger is to be used to take protective action the actual wind speed needs to be recorded in the environmental log – the example provided only recorded “slight” wind strength. As above, a means to measure or infer wind direction and strength in the quarry is needed. Where wind speeds are expected to ramp up during operations it may be necessary to record the wind speed more than twice a day, particularly when significant gust speeds are possible between measurement times.
- Weather forecast – there was no record of prior review of the expected weather and actions taken in the environmental log.

Some improvements were made to the operating procedure and no substantiated complaints were made during the period of stockpile construction.

Subsequently issues with the location of the stockpile adjacent to monitoring boreholes associated with the PFA landfill and within the landfill permit boundary were identified. It was also established that the Tarmac installation and landfill boundaries overlap for historic reasons that may relate to the original lease for access to the PFA landfill area.

No management of change process appears to have been followed by Tarmac ahead of implementing the additional storage of clinker in the quarry and the decision was made without prior discussion with NRW regarding the need for a permit variation application or written approval in accordance with permit condition 4.3.5. The subsequent need to improve the dust management arrangements and observation of several events on 6 December 2024 where dust plumes rose up to Port Road during clinker tipping at the quarry suggests that prior notification and discussion should have taken place. Wind speeds were below the threshold for ceasing tipping, but there appeared to be a problem with thermal buoyancy lifting the dust to a significant height. Tarmac confirmed that this will be controlled by use of a pre-cooling and conditioning area in the middle of the works before tipping at the quarry. The fugitive dust emissions are also exacerbated when off-spec (friable, dusty) clinker is being tipped.

Implementation of the weather forecasting and wind direction/speed limitations will have limited the impact of clinker dust fugitive emissions due to thermal buoyancy during tipping since June 2024 over which period up to 27,000 tonnes of clinker will have been moved into the quarry. The proportion of off-spec material overall is unknown, but is expected to be around 10%. This suggests a minor category 3 non-compliance with conditions 4.3.5 (failure to notify NRW 14 days before implementation of a change in operation which may have consequences for the environment) and 3.2.1 (failure to use appropriate measures – pre-cooling – to minimise fugitive emissions of clinker dust during tipping at the quarry).

Action in respect of non-compliance with condition 3.2.1 has already been taken. Tarmac will need to review and update notification procedures to ensure future compliance with condition 4.3.5.

ACTION: Tarmac to review, confirm and demonstrate implementation of revised NRW notification procedures by 1 April 2025.

Emissions review

A review of PAH emissions data was undertaken to establish if tyre firing at the kiln back end has had any impact upon other emissions in addition to the increase in carbon monoxide identified in the original trial report in 2012. The data suggest that the average results may have increased slightly but there is significant variability over time and the data are consistent with wider cement industry results. Correlation with feed rate may provide greater insight.

Monitoring data for Q1, Q2, Q3, Q4 and annual report 2024 have been reviewed and no breach of permit conditions was identified other than those already addressed in previous sections of this report. The 2024 QAL2 outcomes are also noted and will be followed up at the next Operator Monitoring Assessment.

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.