Compliance Assessment Report CAR_NRW0039161

Permit being assessed: BL3986ID.
For: Aberthaw Works EPR/BL3986ID, held by Tarmac Cement and Lime Limited
At: Aberthaw Works , East Aberthaw, Barry, Vale of Glamorgan, CF62 3ZR.

Type of assessment carried out: Report/Data Review, Reason: Routine.
On 31/12/2021 between 09:00 and 17:00.
Parts of permit assessed: Emissions control, noise, monitoring, reporting and emissions

NRW Lead Officer: Antony Leakey.
Report sent to: Daniel Bound, Environmental Coordinator on 12/01/2022.

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

Part of permitted activity assessed (criteria)	Assessment result	Permit condition
C2 - General Management - Management system and operating procedures	C3 Minor	1.1.1
F3 - Amenity - Dust/fibres/particulates and litter	C3 Minor	3.2.1
E1 - Emissions - Air	C3 Minor	3.1.2
C2 - General Management - Management system and operating procedures	C3 Minor	1.1.1
C2 - General Management - Management system and operating procedures	C3 Minor	1.1.1
C2 - General Management - Management system and operating procedures	C3 Minor	1.1.1
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	C4 No impact	4.2.3

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

Total number of non-compliances recorded	Total non-compliance score
7	24.1

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
C2	Improve the CEMs calibration management procedure	Already completed
F3	Tarmac to review operational audit processes.	30/06/2022
E1	Tarmac to review coal mill bag filter inspection and maintenance regime and burst bag detection provision to	31/03/2022

Criteria	Action needed	Complete by
	ensure that potential for offsite impact is minimised. Tarmac to provide proposals to implement improvements.	
C2	Tarmac to review coal mill bag filter inspection and maintenance regime and burst bag detection provision to ensure that potential for offsite impact is minimised. Tarmac to provide proposals to implement improvements.	31/03/2022
C2	Slow bag filter high temperature control action due to inadequately designed or tested control logic has been rectified.	Already completed
C2	Tarmac to review environmentally critical control functions and provide an update on implementation of improvements to minimise dust releases.	30/06/2022
G4	Procedures for checking and review of monitoring data before submission will be examined during the Operator Monitoring Audit.	30/11/2022

Action 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 and site incident update – 31 December 2021

Noise assessment

Environmental Operating Procedure EOP4: Noise and Vibration still requires review.

ACTION: Tarmac to review EOP4 considering the comments made previously and with reference to the latest H3 guidance and provide an update at next compliance meeting.

Consultants have undertaken a further noise monitoring exercise and issued a report, which goes some way towards helping to identify and prioritise the dominant noise sources. The report does not complete the ranking exercise and make the links with tonal noise identified at the receptors (noting that the exact frequencies were not necessarily identified – this may be a feature of the acoustic camera technology and it may be necessary to undertake onsite

FFT analysis using the same sound level meter used to identify the tones at the receptors).

Tarmac is prioritising the following improvements:

- Installation of noise suppression materials at the raw mill vent, door, louvres, and steel surrounding wall.
- New doors for raw mill blowers.
- Replacement of the two suppression cans fitted to the tops of the main cement mill fans vent stacks.
- Installation of noise suppression materials at the coal Pfister room door.
- Installation of noise suppression materials at the axial and radial blower room wall and louvres.

There remain several areas where improvements may be necessary, but solutions have not yet been identified. A follow up survey will be undertaken following completion of the priority improvements and modelling of remaining sources may be carried out to identify next priorities.

ACTION: Tarmac to prioritise noise action plan improvements and provide an update at next compliance meeting.

Dust control

Tarmac presented a review of progress on 11 January 2022 showing that significant expenditure has been made since 2018 on infrastructure improvements. Further improvements are planned for 2022, including during the imminent winter turnaround, which are expected to result in a measurable reduction in fugitive releases in combination with the improvements over the last 3 years. A review of the deposition rate data trends will be undertaken to identify if rates are now comparable with typical background levels.

ACTION: Tarmac to provide deposition rate data trends for 2021 when available.

Kiln dust hood release point

The kiln dust hood release point will need a variation application at some stage to incorporate it into the permit. Monitoring based upon the Mineral Products Association, CEM control chart methodology is likely to be appropriate due to the difficulty in obtaining valid CEM calibrations at low dust concentrations and because the kiln hood filter only operates normally for relatively small periods of time. For most of the time the kiln hood fan sits at idle speed until the system is required to operate during start up, shut down or kiln flush conditions.

ACTION: Tarmac to identify an appropriate opportunity to vary the new kiln hood release point into the permit.

CEMs management

NRW noted that CEM zero and span checks are carried out on a weekly and monthly basis. More typical frequencies would be daily zero and weekly span checks, especially for new instruments, although frequency can depend upon control type. Tarmac provided clarification of the justification for the frequency adopted.

Environment Agency technical guidance note M20, section 4.2.3 states the following: "If operators are using Shewhart charts, then the frequency may be based on the maintenance interval determined during testing for MCERTS certification, although we recommend using shorter intervals until sufficient data is available to lengthen the time between checks".

The ACF5000 analysers have been certified with a 12-month maintenance interval, the systems are equipped with automatic zero and span point correction for the oxygen channel and the FID, which measures TOC. Zero and span point at the oxygen channel is automatically checked and adjusted every 2 weeks. For the FID the zero and span point is automatically checked and adjusted every 3 weeks. The ACF5000 was tested and MCERT certified with this approach.

In addition to the automatic zero and span checks on the oxygen and FID, the ACF5000 system also performs a twice daily zero reference, which is carried out automatically using purified air.

The Tarmac contract with ABB includes remote diagnostics, where ABB engineers access the analysers once a month as part of preventative maintenance, this dial in will include a check on analyser integrity, including drift, a report is issued following each remote diagnostic check.

Following the installation of the new ACF5000 analysers, the plan was to perform 10 zero and span measurements in a shortened timeframe, multiples of S_{AMS} will then be used to set new warning levels and alarm levels for the Shewhart charts.

Following the initial 10 zero and span checks, extra manual weekly zero and monthly span checks will be performed in addition to the checks that the system performs automatically.

These aspects will be further examined at the Operator Monitoring Assessment audit, which is now due for Aberthaw.

Tarmac notified NRW in March 2021 that the QAL 2 2019 calibration functions for the kiln stack CEMS were not applied following that calibration exercise.

Tarmac subsequently conducted a review of the historic data with the old and new QAL 2 calibration applied, this assessment covered multiple months and all measurements returned values within the bounds of the uncertainty thresholds. Additionally, the AST assessment conducted between 24-26 June 2020, passed both the variability and calibration acceptance requirements, showing that the CEM values were still within acceptable bounds of uncertainty.

On this basis this no changes to any emission data provided during the period will be required.

The Tarmac central environmental procedure EMP9e _CEM Calibrations_V5 that covers calibrations to the BS EN 14181 standard has been reviewed and updated following the changes made to the Environment Agency technical guidance note M20 in April 2021. Section 28 has been modified to align to the new requirements in M20 and section 29 has been added to ensure that QAL 2 factors are correctly applied at the right time.

In this case the failure to apply the calibration functions did not result in misreporting of emissions data or the potential for non-compliance with ELVs and no non-compliance with permit conditions relating to monitoring requirements. However, the need to improve the CEMs calibration management procedure indicates a failure of the environmental management system and non-compliance with permit condition 1.1.1. The potential for ELVs to be significantly exceeded due to incorrect calibration is considered unlikely and therefore is a minor category 3 non-compliance. No further action is required as the procedure has already been reviewed and improved.

The EN 17255 DAHS standard will be implemented through scheduled software updates or at the next permit BAT review.

Incident summary and non-compliance scoring

24/2/21 - dust release at approximately 17:00h when a door hinge on the kiln feed elevator failed. The root cause was a blockage in the elevator which resulted in a build-up of material causing the door hinge to fail. This resulted in the door seal being broken allowing a release of dust. The elevator was immediately shutdown and door secured before re-starting. No issue after re-start. Failure of the door attachment was likely due to corrosion. Release was limited and in an enclosed area of the plant so significant offsite impacts unlikely and formal notification not required. Preventative actions identified.

ACTION: Tarmac to provide an update on implementation at next compliance meeting.

25/2/21 - Burton Hill resident reported fine brown gritty dust on cars. Investigations found dust blowing from clean stone road. The wheel wash was switched off as it was faulty, but no one had reported it. Bowser was deployed to damp down the road while repairs were made. This is indicative of poor ownership by plant operating or contractor staff of problems that may cause environmental impacts. A report in June 2021 of drivers not waiting for the wheel wash to activate before leaving site supports this. Detection of such problems and their earlier rectification will be improved by use of audits to check that correct procedures and operating practices are being followed. The failure to report the wheel wash failure so that alternative measures could be put in place is a minor category 3 non-compliance with permit condition 3.2.1.

ACTION: Tarmac to review operational audit processes and provide an update on implementation of improvements at next compliance meeting.

25/3/21 – hole formed in kiln shell near backend seal due to burn through of lifter. Dust release during controlled shut down leading to compliant. Lifter reinforced to prevent recurrence. It is unclear if more rigorous inspection of kiln internals during shutdowns might prevent such occurrences.

ACTION: Tarmac to review kiln internal inspection procedure and provide an update on implementation of improvements at next compliance meeting.

9/4/21 - Burton Hill residents reported dust deposition following cleaning operations on clinker conveyor building to allow replacement of sheeting. Vacuum system was in use, but some dust escaped. Further measures are unlikely to have been feasible and this event is

compliant with permit condition 3.2.1.

13/9/21 – coal mill bag filter failure, ELV exceeded – bags replaced but the inspection and maintenance regime frequency still does not appear to detect deterioration between emissions testing intervals and needs revision. The ELV exceedance is a minor non-compliance with permit condition 3.1.2 because estimates indicate that air quality standards would not be exceeded at the emissions level recorded. Failure to implement an adequate maintenance regime to prevent or minimise dust releases is a category 3 non-compliance with permit condition 1.1.1 due to the limited potential for more serious dust emission levels to continue undetected for at least 8 weeks. Previous coal mill bag plant failures in September and October 2020 resulted in actions for Tarmac to consider an improved maintenance regime and burst bag detection. These actions have not been closed out adequately to prevent further issues with this plant and justifies the higher non-compliance level and a further time bound action.

ACTION: Tarmac to review coal mill bag filter inspection and maintenance regime and burst bag detection provision to ensure that potential for offsite impact is minimised. Tarmac to provide proposals to implement improvements by 31 March 2022.

Kiln trips/starts

The following unplanned kiln stops were reported:

11/6/21 - raw mill air slide blockage resulted in a kiln and main ID fan trip with fugitive dust release. Kiln trip was caused by slow bag filter high temperature control action due to inadequately designed or tested control logic. This has been rectified. Review and testing of critical control systems is important to prevent and minimise emissions. The need to improve the control logic indicates a failure of the environmental management system and non-compliance with permit condition 1.1.1. The potential for significant fugitive dust releases due to incorrect implementation of control systems is considered unlikely and therefore is a minor category 3 non-compliance.

4/7/21 - cyclone 4 high level tripped the kiln. Investigations identified blockage above stage 4 flap.

5/7/21 - trip caused by preheater bearing failure.

7/7/21 - trip caused by cyclone blockage.

14/7/21 – trip due to cyclone 4 blockage. Well Road complaints.

15/7/21 – trip caused by a clinker conveyor problem. Well Road complaints.

16/8/21 - kiln feed system failure leading to dust release from kiln rear end and cooler end. Human error led to kiln feed overload when using back up feed system with different control arrangements. No overfeed control system in place. Temporary operating changes should be designed with the same rigour as normal operating systems or suitable management of change processes put in place to ensure that changes do not introduce higher risk of environmental impact. This indicates a failure of the environmental management system and non-compliance with permit condition 1.1.1. The potential for significant fugitive dust releases

due to incorrect implementation of temporary systems is considered unlikely and therefore is a minor category 3 non-compliance.

1/9/21 – bag filter purge failure due to logic sequence problem. Dust release and complaints.

13/9/21 - trip due to cyclone 4 blockage.

ACTION: Tarmac to review environmentally critical control functions and provide an update on implementation of improvements to minimise dust releases at next compliance meeting.

Kiln planned stop and restart on morning of 1/5/21 resulted in dust complaint from Burton Hill. The kiln stop was due to a damaged backend seal and the dust on restart was linked to this problem.

Kiln planned stop and restart on afternoon shift of 31/5/21 resulted in dust release. No complaints received. It is unclear why a dust release occurred on routine restart.

Controlled Kiln stop on 16/7/21 due to a shell failure inside the kiln (refractory brick loss).

ACTION: Tarmac to review kiln restart process and provide an update on implementation of improvements to minimise dust releases at next compliance meeting.

Waste-derived fuel trial

Tarmac has proposed a trial of a waste derived fuel (WDF) already covered by the permitted list of waste codes and currently deployed in the cement sector. In principle the trial and subsequent routine operation using this WDF are covered by the Mineral Products Association Waste Code of Practice.

The site location of the proposed trial pumping plant was visited and HazOp study record reviewed. NRWs perception is that the HazOp study has been used, at least in part, to identify detailed design requirements, rather than critically assess a mature design. NRW now understands that the proposed trial will be proceeding in May 2022. For the trail to progress Tarmac will need to provide more detail, such as the proposed P&ID for the pump and delivery system, the pump and pipework specifications and an outline of the control and instrumentation system, before approval either via variation application or under the waste code of practice is sought.

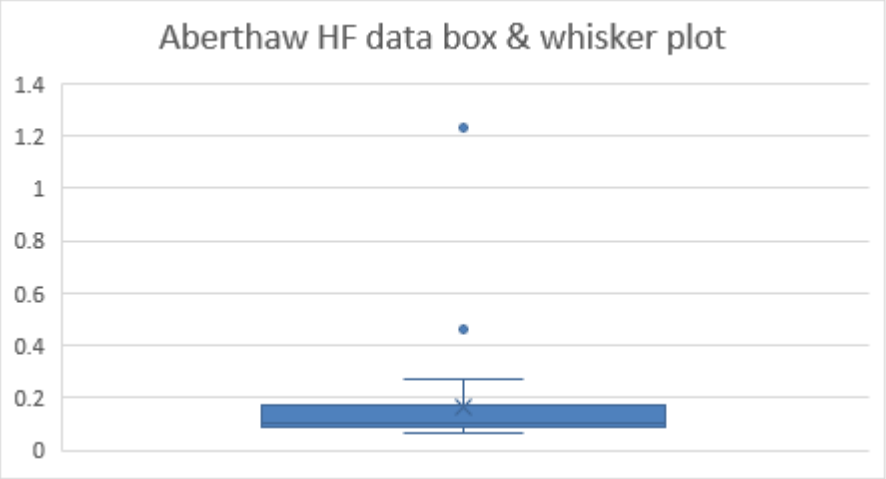
Emissions review

The works has operated with a scheduled shutdown in May 2021 to replace a cooler tubes and pre-heater tower ductwork. Both replacements will improve fugitive emissions and the latter may also reduce noise levels.

The February 2021 monthly CEM concentration data showed zero emissions from 4th until 23rd, the same period as the shutdown in January. This report required resubmission following a query regarding whether this represented actual emissions during the period and constitutes a no impact category 4 non-compliance with permit condition 4.2.3. Procedures

for checking and review of monitoring data before submission will be examined during the Operator Monitoring Audit that is due for the Aberthaw works.

An elevated hydrogen fluoride (HF) extractive monitoring result on 23rd March 2021 of 1.2 mg/m^3, over the emission limit value (ELV) of 1 mg/m^3, has been shown to be an outlier result using non-parametric and robust statistical outlier tests on data for Aberthaw dating back to 2005. Typical results are below 0.2 mg/m^3 and this appears to be the case for cement plants across the UK and Europe. The data are best illustrated using a standard "box and whisker" plot, clearly showing at least two suspected outlier results in the data set:



An investigation by the monitoring contractor found no identifiable cause for the outlying result. However, no process chemistry basis has been provided explaining why elevated HF levels could not be present in the flue gas due to exceptional fluorine levels in raw materials or fuels. Nevertheless, statistically the current data set suggests that the result is an anomaly and has not been considered a valid exceedance of the ELV in this instance. Future data will be kept under review.

A delayed kiln restart on the morning of the 1st November 2021 resulted in an elevated oxides of nitrogen emissions (NOx) value (845 mg/m^3 half hour average at 1130h) for the limited remainder of the day (up to midday). Examination of the emissions data for the following 24 hours confirms that the daily average for the 31st October, using the MPA roll forward rule, was compliant at 365 mg/m^3. The high NOx emissions were due to the kiln instability during the start up period preventing tyre feed being established. This reduced the temperature at the SNCR ammonia injection points below the optimum for NOx abatement resulting in high emissions.

Monitoring data for Q4 and annual report for 2020 and Q1, Q2 and Q3 2021 has been reviewed and no breach of permit conditions was identified other than those already addressed in previous sections of this report.

NRW recommends that future annual reports address the following:

The NRW Public Register is at

Public register - Customer Portal (naturalresources.wales)

and you should not refer to the EA PR.

In the CEMs section it would be useful to include the current QAL2 factors and their date of implementation, as well as the test dates, plus valid calibration range, extended VCR, variability, and validity data and similarly for ASTs for each pollutant and peripherals.

Also, QAL3 alarm and warning limits should be included for each pollutant.

It would be useful to summarise briefly the non-compliances (Sch. 5 and actions taken to close them out).

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.

What are suspended scores?
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 and Waste action criteria (used in section 1 and 2):

A: Permitted activities
- A1 Specified by permit

B: Infrastructure
- B1 Infrastructure – Engineering for prevention and control of emissions
- B2 Infrastructure – Closure and decommissioning
- B3 Infrastructure – Site drainage engineering (clean and foul)
- B4 Infrastructure – Containment of stored materials
- B5 Infrastructure – Plant and equipment

C: General management
- C1 General management – Staff competency/training
- C2 General management – Management system and operating procedures
- C3 General management – Materials acceptance
- C4 General management – Storage, handling, labelling and segregation

D: Incident management
- D1 Incident management – Site security
- D2 Incident management – Accidents, emergency and incident planning

E: Emissions
- E1 Emissions – Air
- E2 Emissions – Land and groundwater
- E3 Emissions – Surface water
- E4 Emissions – Sewer
- E5 Emissions – Waste

F: Amenity
- F1 Amenity – Odour
- F2 Amenity – Noise
- F3 Amenity – Dust/fibres/particulates and litter
- F4 Amenity – Pests/birds and scavengers
- F5 Amenity – Deposits on road

G: Monitoring and records, maintenance and reporting
- G1 Monitoring and records, maintenance and reporting – Monitoring of emissions and environment
- G2 Monitoring and records, maintenance and reporting – Records of activity, site diary/journal/events
- G3 Monitoring and records, maintenance and reporting – Maintenance records
- G4 Monitoring and records, maintenance and reporting – Reporting and notification to Natural Resources Wales

H: Resources efficiency
- H1 Resource efficiency – Efficient use of raw materials
- H2 Resource efficiency – Energy efficiency

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

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

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

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

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

Disclosure of information – this report will be available to view on-line
If you think this report contains commercially confidential information that should not be placed on our public register, you must contact your local Natural Resources Wales office within **fifteen working days** of receiving this report, using the contact details in the accompanying email or letter. You must give a full explanation of why it should not be added to our public register, including specifying which information is commercially confidential. We will assess your request and respond to you within 20 working days to let you know if we agree to your request.

What do I do if I disagree with the report or have a complaint?
If you disagree with this compliance assessment report, you should contact the lead officer without delay to discuss your concerns.

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

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

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