

# Natural Resources Wales permitting decisions

## Variation and consolidation of a bespoke permit

We have decided to issue a Natural Resources Wales initiated variation for Padeswood Cement Works operated by Castle Cement Limited.

The variation number is EPR/BL1096IB/V013.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

### Purpose of this document

This is a decision document, which accompanies a variation notice and consolidated permit being issued following a review of the permit.

It explains:

- **how** we have carried out our statutory review of the Operator's Permit;
- **why** we have decided to vary the Permit as a result of that review; and
- **why** we have included the specific conditions in the revised Permit through the variation notice we are issuing.

It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions ('BAT Conclusions') for the Production of Cement, Lime and Magnesium Oxide, which were published as a Commission Implementing Decision (2013/163/EU) in the Official Journal of the EU on 9<sup>th</sup> April 2013. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated permit takes into account and brings together in a single document all previous variations that relate to the original permit. It also modernises the entire permit to reflect the conditions contained in our current permit template, which incorporates the requirements of the Industrial Emissions Directive (IED).

This Variation is considered to be a normal variation because along with the administrative changes i.e. consolidating previous variations and moving to the new

template, some detailed technical evaluation is required. This is a more complex variation than the norm, because it is doing three different things at the same time:

- **First**, it gives effect to our decisions following the statutory review of the existing Permit, following the implementation of the IED and the publication of BAT Conclusions covering the Production of Cement, Lime and Magnesium Oxide. That is what this variation is principally about.
- **Second**, it takes the opportunity to bring earlier variations into an up-to-date, consolidated Permit. These changes have already taken place and we are not re-explaining them, but the consolidated Permit should be easier to understand and use.
- **Third**, it modernises the entire Permit to reflect our current template. The template reflects our modern regulatory permitting philosophy and was introduced because of a change in the governing legislation. This took place when the Pollution Prevention and Control (England and Wales) Regulations 2000 were replaced in 2008 by a new statutory regime under the Environmental Permitting Regulations 2010 (as amended in 2013) to effectively introduce the IED.

The introduction of new IED template conditions makes the Permit consistent with our current general approach and philosophy and also with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have disappeared because of the new regulatory approach, it does not affect the level of environmental protection achieved by the Permit in any way. We therefore explain only the statutory review and our determination of substantive issues relating to the new BAT conclusions in this document.

As the Variation will not have any negative effects on the environment it is not a substantial variation and so does not require external consultation. A fee for a normal variation based on the Operators OPRA score has been invoiced to the Operator.

## **Structure of this document**

- Summary of our decision
- The legal framework
- How we took our decision
- Key issues/Regulation 60 response
- Changes we have made
- Conclusion
- Annex 1 – Decision Checklist regarding relevant BAT Conclusions

## 1 Our decision

We have issued a Variation, which will allow the Operator to operate the Installation, subject to the conditions in the varied Permit.

The Variation does three things:

- it consolidates the original Permit to reflect changes made through earlier variations;
- it brings the Permit into line with our modern regulatory template; and
- it varies the Permit where appropriate to reflect the outcome of our statutory review and incorporate Best Available Techniques (BAT) and associated Emission Limit Values (ELV's).

We consider that, in reaching this decision, we have taken into account all relevant considerations and legal requirements and that the Permit will continue to ensure that a high level of protection is provided for the environment and human health.

The original Permit, issued on the 17<sup>th</sup> December 2004, ensured that the Installation, employed Best Available Techniques (BAT) and ensured a high level of protection for human health and the environment. We have altered the Permit as a result of the statutory review, and we are confident that the new requirements will deliver a superior level of protection to that which was previously achieved.

## 2 The legal framework

The Variation and Consolidation Notice (which includes the consolidated permit as Schedule 2) will be issued under Regulation 20 of the Environmental Permitting Regulations 2010. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Variation Notice and consolidated Permit, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

## 3 How we reached our decision

### Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under Regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 6<sup>th</sup> March 2014 requiring

the Operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Regulation 60(1) notice required the operator to:

- Describe the techniques that will be implemented before 9<sup>th</sup> April 2017, which will then ensure that operations meet the revised standard, or
- justify why standards will not be met by 9<sup>th</sup> April 2017, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- justify why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.
- Where their permitted activity involves the use, production or release of hazardous substances, as defined in Article 3(18) of the Industrial Emissions Directive, carry out a risk assessment considering the possibility of soil and groundwater contamination at the permitted installation with such substances. Where risk of such contamination is established prepare a baseline report containing information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definite cessation of the activity. Castle Cement Ltd were required to provide a copy of the risk assessment and any consequent baseline report.

The Regulation 60 Notice response from the Operator was received on 30<sup>th</sup> January 2015. However, on 26<sup>th</sup> June 2015 we subsequently requested additional information from the Operator to support their original Regulation 60(1) response, additional information was received 29<sup>th</sup> July 2015. This additional information provided further clarification on the techniques employed in respect of the following BAT conclusions: 2, 5(g), 8, 9, 14, 15, 16, 19 and 20 (see Annex 1 Decision Checklist regarding Relevant BAT Conclusions) below. On 14<sup>th</sup> March 2016 the operator provided their assessment of background (kiln) ammonia emissions and a proposal for the ammonia Emission Limit Value for emission point A8.

Upon receipt of the operator's Regulation 60(1) response and the additional information relating to BAT conclusions: 2, 5(g), 8, 9, 14, 15, 16, 19, 20 and the assessment of background ammonia emissions, we considered that the response contained sufficient information for us to commence determination of the permit review. The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response or subsequent additional information that appears to be confidential in relation to any party.

## 4 Key issues/Regulation 60 response

BAT Conclusions for the Production of Cement, Lime and Magnesium Oxide were published as a Commission Implementing Decision (2013/163/EU) in the Official Journal of the EU on 9<sup>th</sup> April 2013. There are 29 BAT Conclusions which are relevant to the cement industry. Annex 1 provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. Annex 1 should be read in conjunction with the permit/variation notice issued.

A detailed response was received from Castle Cement Ltd. Where the Operator has concluded that they have achieved BAT, and we are in agreement, no further information / justification has been sought by Natural Resources Wales.

## 5.0 Changes we have made

### 5.1 BAT-AELs and Emission Limit Values (Kiln Firing)

Table 1: Summary of Kiln Firing Emission Limit Values

Emission Point Reference	Description	Parameter	Emission Limit Value (until 08/04/17)	Emission Limit Value (from 09/04/17)
A8	Kiln 4	Particulate matter	10	10
		TOC	50	50
		HCl	10	10
		CO	1200	1200
		SO <sub>2</sub>	200	200
		NO <sub>x</sub>	500	450
		NH <sub>3</sub>	No limit	70
		Cd & Tl and their compounds (total)	0.05	0.05
		Hg (and compounds)	0.05	0.05
		Sb, As, Pb, Cr, Co, Cu, Mn, Ni & V and their compounds (total)	0.5	0.5
		Dioxins & Furans (i-TEQ)	0.1ng/Nm <sup>3</sup>	0.1ng/Nm <sup>3</sup>

**Note** All values expressed as mg/Nm<sup>3</sup> unless otherwise stated.

**5.1.1 Particulate Matter:** The existing emission limit of 10 mg/Nm<sup>3</sup> is retained and is compliant with BAT Conclusion 17.

**5.1.2 Total Organic Carbon:** The existing Total Organic Carbon (TOC) emission limit value has been retained at 50mg/Nm<sup>3</sup> in accordance with Annex VI of the Industrial Emissions Directive. TOC emissions arise from the pre heating / processing of raw meal containing volatile organic compounds.

**5.1.3 Hydrogen Chloride:** The existing hydrogen chloride (HCl) emission limit value has been retained at 10 mg/Nm<sup>3</sup>.

**5.1.4 Oxides of nitrogen (NO and NO<sub>2</sub> Expressed as NO<sub>2</sub>)** The NO<sub>x</sub> emission limit value has been reduced from 500mg/Nm<sup>3</sup> to 450mg/Nm<sup>3</sup> (applicable from 09/04/17) in accordance with the requirements of BAT Conclusion 19 for pre-heater kilns with primary NO<sub>x</sub> emissions <1000 mg/Nm<sup>3</sup>. During the 2015 background ammonia monitoring trial, the kiln was operated for an agreed period without the use NO<sub>x</sub> abatement (SNCR) and emissions with primary control techniques were shown to be <1000mg/Nm<sup>3</sup> and generally <500 mg/Nm<sup>3</sup>.

**5.1.5 Carbon Monoxide:** The carbon monoxide (CO) emission limit value has been retained at 1200 mg/Nm<sup>3</sup>.

**5.1.6 Sulphur Dioxide:** The SO<sub>2</sub> emission limit has been retained at 200mg/Nm<sup>3</sup>, within the BAT-AEL range of <50 – 400 mg/Nm<sup>3</sup>, reflecting the low sulphur content of the raw materials processed at Padeswood.

**5.1.7 Ammonia (NH<sub>3</sub>):** As well as ammonia slip associated with the Selective Non-Catalytic Reduction (SNCR), oxides of nitrogen (NO<sub>x</sub>) abatement process, ammonia releases are also associated with the use of other raw materials in the manufacturing process. The Raw Mill operation offers some abatement of these other ammonia releases when it is operational. However the Raw Mill needs to be switched off on a regular basis for maintenance and on these occasions, the abatement effect for background ammonia emissions from the process is lost.

Castle Cement Ltd have therefore completed a background NH<sub>3</sub> emissions monitoring trial in 2015 (as agreed with Natural Resources Wales) to determine the likely worst case scenario in terms of background ammonia emissions from the process. This trial recorded a peak daily average of 41mg/Nm<sup>3</sup> (Raw Mill off). As such, Castle Cement Ltd proposed a daily emission limit value of 80mg/Nm<sup>3</sup> by applying a slip value of 40 mg/Nm<sup>3</sup> to the background reading.

We have reviewed the results of the background NH<sub>3</sub> assessment from the operator and have conducted our own detailed air dispersion modelling using ADMS to assess the impact (nutrient nitrogen and acidity) of NO<sub>x</sub> and NH<sub>3</sub> emissions from Kiln 4 on sensitive habitats, vegetation and ecosystems.

The BAT conclusions document sets a BAT-Associated Emission Level (BAT-AEL) for ammonia slip in flue gases when SNCR is applied at <30 – 50 mg/Nm<sup>3</sup>. Based on the results of the operator's background NH<sub>3</sub> assessment and our own detailed air dispersion modelling, we have applied an ammonia emission limit value of 70mg/Nm<sup>3</sup> to Kiln 4 (applicable from 09/04/17) to control ammonia slip from the SNCR NO<sub>x</sub> abatement system in accordance with BAT Conclusion 20. This emission limit is comprised of the 40 mg/Nm<sup>3</sup> background NH<sub>3</sub> release from the process, (when the Raw Mill is not operational) and 30 mg/Nm<sup>3</sup>, to allow for the ammonia slip from the SNCR NO<sub>x</sub> abatement process. The ongoing minimisation of ammonia slip is essential to reduce the impact on sensitive habitats. Therefore, we consider that we have taken a precautionary approach by applying the lower end of the BAT-AEL range.

This represents an environmental improvement because there is currently no ammonia ELV associated with releases from Kiln 4.

In order to evaluate the efficacy of the NH<sub>3</sub> emission limit we will review the results of the monitoring for Ammonia and NO<sub>x</sub> after 12 months of operation at the new limit.

The permit requires that ammonia emissions from the kiln are monitored continuously in accordance with relevant standards.

#### **5.1.8 Metals**

**Cadmium & Thallium and their compounds (total)** The existing emission limit value has been retained at 0.05 mg/Nm<sup>3</sup>.

**Mercury and its compounds** The existing emission limit value has been retained at 0.05mg/Nm<sup>3</sup>.

**Group III Metals and their compounds (total)**. The existing emission limit value for Group III Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)), has been retained at 0.5 mg/Nm<sup>3</sup>.

All metal emissions are currently compliant with BAT Conclusion 28.

**5.1.9 Dioxins and Furans (I-TEQ)** – The existing emission limit value for Dioxins and Furans (I-TEQ) has been retained at 0.1 ng/Nm<sup>3</sup>. This is compliant with BAT Conclusion 27.

No changes have been made to the dioxin & furan monitoring requirements – these continue to be required at 6 monthly intervals in accordance with Annex VI, Part 6, Paragraph 2.1(c) of the Industrial Emissions Directive.

#### **5.1.10 Dioxin-like Polychlorinated Biphenyls (PCBs) & Polycyclic Aromatic Hydrocarbons (PAHs)**

Prior to this variation and consolidation, the permit included the requirement to monitor PCBs and PAHs from kiln 4 on a six monthly basis. No emission limit values were set for these parameters.

Since the last permit review in 2011, Schedule 13A, paragraph 4(2)(b) of The Environmental Permitting (England & Wales) (amendment) Regulations 2013, has amended paragraph 2.1(c) of Part 6, Annex VI of the Industrial Emissions Directive.

In summary paragraph 2.1(c) now requires that dioxin-like polychlorinated biphenyls and polycyclic aromatic hydrocarbons are monitored but only in the case of particular plants where the regulator can demonstrate that emissions of those substances are, or are likely to be, significant.

We have reviewed the 6 monthly PCB and PAH emissions data supplied by Castle Cement Ltd between 2007 and 2015. During this time alternative fuels were in regular use. We have used this data to complete detailed dispersion modelling and have concluded that PCB and PAH emissions are unlikely to be environmentally significant.



Natural Resources Wales does not therefore consider that PCB & PAH emissions from kiln 4 are, or are likely to be significant and has now removed the monitoring requirement from the permit with immediate effect.

### **5.1.11 Benzene, 1, 3 – Butadiene & Zinc**

Prior to this variation and consolidation, the permit included the requirement to monitor benzene, 1,3 butadiene and zinc. These parameters are not prescribed by the BAT conclusions document nor directly by the Industrial Emissions Directive. These parameters were included in the original permit to allow for the collection of emissions data from Kiln 4 with the objective of a review at a later date. No emission limit values were set for these parameters.

We have now reviewed the 6 monthly benzene, 1,3 butadiene and zinc emissions data supplied by Castle Cement Ltd between 2007 and 2015. During this time alternative fuels were in regular use. We used this data to complete detailed dispersion modelling and have concluded that emissions are unlikely to be environmentally significant.

Natural Resources Wales does not therefore consider that emissions of benzene, 1,3 butadiene and zinc from kiln 4 are, or are likely to be environmentally significant and we have now removed the monitoring requirement from the permit with immediate effect..

### **5.2 BAT-AELs and Emission Limit Values (Cooling & Milling Processes)**

BAT Conclusion 18 applies a particulate emission limit value for emission points associated with cooling and milling processes (raw meal, coal and clinker). The relevant emission points and associated emission limit values are detailed in tables 2 and 3 below. Note, kiln firing has been addressed in the section above.

There are no emission points for the raw milling or coal milling processes at Padeswood.

Table 2: Clinker Cooler Emission Limit Values

<b>Emission Point Reference</b>	<b>Description</b>	<b>Parameter</b>	<b>Emission Limit Value (until 08/04/17)</b>	<b>Emission Limit Value (from 09/04/17)</b>
A9	Clinker Cooler	Particulate matter	50	20*

**Note** All values expressed as mg/Nm<sup>3</sup>

Table 3: Cement Milling Processes Emission Limit Values

<b>Emission Point Reference</b>	<b>Description</b>	<b>Parameter</b>	<b>Emission Limit Value (until 08/04/17)</b>	<b>Emission Limit Value (from 09/04/17)</b>
A3	Cement Mill 1	Particulate matter	30	20*
A4	Cement Mill 2	Particulate matter	30	20*
A5	Cement Mill 3	Particulate matter	30	20*
A6	Cement Mill 4	Particulate matter	30	20*
A7	Cement Mill 4 classifier	Particulate matter	30	20*

**Note** All values expressed as mg/Nm<sup>3</sup>

\*The Emission Limit Value is set at 20mg/Nm<sup>3</sup> for milling and cooling processes. Improvement Condition IC3 requires Castle Cement Ltd to review the operational capability of the existing bag plants. Where a lower particulate emission is achievable the emission limit will be revised down by 09/04/17. Any substantial (future) upgrades to the bag plants shall achieve 10mg/Nm<sup>3</sup>.

Castle Cement Ltd has not applied for a derogation for particulate emissions for any emission point.

### **5.3 Emission Limit Values Dusty Operations**

#### **5.3.1 Particulate Emission Sources >10,000 Nm<sup>3</sup>/hr**

Two existing emission points arising from the de-dusting of operations (excluding kiln firing, milling or cooling activities) have been identified with a volumetric discharge rate exceeding 10,000 Nm<sup>3</sup>/hr.

These are as follows;

- a) 'Clinker Dome Filter' – new emission point reference A11
- b) 'Arodo Packer Filter' – new emission point reference A12

Castle Cement Ltd have confirmed that these emission points will be capable of meeting an emission limit value of 10mg/Nm<sup>3</sup> as required by BAT Conclusion 16 by 09/04/17.

#### **5.3.2 Particulate Emission Sources <10,000 Nm<sup>3</sup> / hr**

A list of small particulate emission sources (bag filters with a volumetric flow rate less than 10,000 Nm<sup>3</sup>/hr) has been provided by Castle Cement Ltd and incorporated into the permit. These sources typically include filters fitted to storage silos and conveyer change over points.

Castle Cement Ltd have confirmed that these emission points will be capable of meeting an emission limit value of 10mg/Nm<sup>3</sup> as required by BAT Conclusion 16 by 09/04/17.

#### **5.4 Emissions Monitoring - Air**

- Continuous Emissions Monitoring Systems (CEMs) will be retained on all existing emission points, periodic extractive monitoring of kiln 4 will continue to be completed on a six monthly basis.
- Emissions monitoring standards within schedule 3 have been reviewed and updated where necessary.
- Monitoring standard BS EN 14181 currently applies to continuous emissions monitoring of the kiln. To ensure CEMs provide reliable monitoring data the principles of BS EN 14181 will also apply to CEMs installed on other sources (milling and cooling activities) from 09/04/17. A reduced number of parallel measurements may be acceptable as agreed with the site inspector.
- Permit condition 3.5.5(a) has been amended to include a 95% confidence interval for ammonia. This has been set at 40% as per hydrogen chloride - both parameters are monitored using the same technique.
- Permit condition 3.5.5(a) has also been amended so that it references Table S3.2 as well as S3.1. This change ensures consistency in the uncertainty budget for particulate monitoring using CEMs. Therefore both the kiln and the cement mills have been allocated the same uncertainty budget of 30% for particulate matter based on the 95% confidence intervals of a single measured result at the daily emission limit value.
- For clarity, the kiln start up and shut down definitions have been added to Schedule 6 of the permit (previously subject to agreement in writing). The definitions may be subject to amendment (as agreed in writing with NRW) where the operator can provide suitable justification on a site specific basis.

#### **5.5 Emissions Monitoring – Water**

The emissions monitoring requirements for W1 remain unchanged, methods for existing monitoring have been updated (suspended solids BS EN 872).

An additional emission point 'W2' has been added to the permit that discharges surface water to a tributary of Black Brook. The discharge consists of road drainage from the A5118 adjacent to the site's main entrance and surface water from the site access road and areas between of the site access road and the western boundary including numerous workshops / stores and the lorry re-fuelling area. The permit requires that site surface water from Castle Cement Ltd's operations shall consist of

clean and uncontaminated surface water. No monitoring requirements have been added to the permit.

## **5.6 New listed activities**

Table S1.1 of the permit has been updated to include the following listed activities:

- Activity Reference A2: S3.1 A(2)(a), Grinding cement clinker in cement mills 1, 2, 3, & 4.
- Activity Reference A3: S3.1 B(a), Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.
- Activity Reference A4: S3.1 B(b), Blending cement in bulk or using cement in bulk other than at a construction site, including the bagging of cement and cement mixtures, the batching of ready-mixed concrete and the manufacture of concrete blocks and other cement products.

These activities are existing activities at the installation. However, activity A2 was previously captured within the envelope of the main S3.1A1(a) listed activity (i.e. producing cement clinker on No. 4 cement kiln) and Activities A3 and A4 previously formed a directly associated activity covering all cement storage, blending, packing and loading.

The amendment to table S1.1 has been necessary to reflect the fact that grinding cement clinker is recognised as a listed activity in its own right in the Environmental Permitting (England and Wales) Regulations 2013. The original directly associated activity of cement storage, blending, packing and loading, has been removed and these activities have been correctly listed as individual S3.1 part B activities in line with the Environmental Permitting Regulations (England and Wales) 2010. Finally a new directly associated activity has been added to the permit which covers waste storage and handling at the installation.

## **5.7 Improvement Conditions**

Based on the information provided in the Regulation 60 response, we consider that we need to set improvement conditions. These conditions are set out below. We are using these conditions to require the operator to provide Natural Resources Wales with details that need to be established or confirmed during operations.

### **5.7.1 Improvement Condition IC1 requires that:**

- *Particulate emission data (Continuous Emissions Monitors) for emission points A3, A4, A5, A6 & A9 shall be corrected to standard reference conditions (as detailed in Schedule 6) from 09/04/17 onwards.*

*Pre-determined correction factors for each emission point may be acceptable as an alternative to upgraded CEMS where the operator can demonstrate that these parameters are stable and consistent, providing historical data as evidence.*

*In line with BS EN 15259, historic moisture and temperature measurements would need to be shown to not vary above or below 10%, (as a guide value), of the statistical mean from available data derived from periodic measurements. The Operator shall provide a report to Natural Resources Wales confirming (for agreement) how particulate emissions data will be corrected.*

In accordance with the BAT Conclusions document, emissions monitoring data shall be corrected to standard conditions. The correction requirements for kiln emissions remain unchanged but as of 09/04/17 particulate emissions monitoring data from cooling and milling processes must be corrected to dry gas at a temperature of 273k, a pressure of 101.3 kPa with no correction for oxygen.

We have set Improvement Condition IC1 to ensure that particulate emission data from the above non-kiln emission points is corrected to the standard reference conditions that apply from 9<sup>th</sup> April 2017. IC1 requires Castle Cement Ltd to inform Natural Resources Wales how this emissions data will be corrected. This may include the use of predetermined 'correction factors', where conditions allow, for each respective emission point.

Schedule 6 of the permit has been amended to include data correction requirements before and after 09/04/16.

The Operator's response to Improvement condition 1 is required to be submitted by 31<sup>st</sup> October 2016.

#### **5.7.2 Improvement Condition IC2 requires that:**

- *The Operator shall provide a written report detailing the proposed monitoring technique to be employed to demonstrate compliance with the particulate matter ELV of 10 mg/Nm<sup>3</sup> at emission points A11 & A12.*

*If the Operator proposes the use of an alternative technique (i.e. not extractive or continuous measurement in accordance with recognised standards), then evidence must be provided to prove the technique will demonstrate compliance with the ELV to an equivalent level of certainty.*

From 9<sup>th</sup> April 2017 emission points A11 & A12 must be monitored to demonstrate compliance with the emission limit value of 10 mg/Nm<sup>3</sup>. BAT Conclusion 5 specifies either periodic or continuous monitoring for non-kiln sources and as a default the permit now requires 6 monthly extractive sampling.

However, it is recognised that these emission points may require significant modification to reach the required standard for extractive monitoring and pose a relatively low risk to the environment.

If the operator cannot provide a suitable alternative technique, they will be required to monitor these emission points in accordance with Schedule 3(b), Table S3.2 of the permit.

The Operator's response to IC2 is required to be submitted by 31<sup>st</sup> October 2016.

### **5.7.3 Improvement Condition IC3 requires that:**

- *In order for Natural Resources Wales to set the appropriate emission limit values, the Operator shall submit a report detailing the operational capability (expressed as mg/Nm<sup>3</sup> of particulate released) of each bag filter plant associated with emission points A3, A4, A5, A6, A7 & A9. The report shall include:*
  - I. A statistical analysis of at least two years of particulate monitoring data for each emission point with supporting graphs demonstrating individual values, averages and standard deviations.*
  - II. Design specification of each bag plant.*
  - III. Details on all maintenance (including filter bag changes) carried out for each bag filter plant during the monitoring period, including dates and times of each maintenance*

The purpose of IC3 is as described in the section on BAT-AELs and Emission Limit Values (Cooling & Milling Processes) above.

The Operator's response to IC3 is required to be submitted by 30<sup>th</sup> November 2016.

### **5.7.4 Improvement Condition IC4 requires that:**

- *If storing Priority Hazardous Substances on site, the Operator must carry out the following assessments with reference to the Environment Agency's guidance "How to carry out a risk assessment if you're applying for a bespoke permit that includes discharging hazardous pollutants to surface water":*
  - *Phase 1 Part A screening tests for mercury, cadmium, nickel, lead, benzene, polyaromatic hydrocarbons and any other relevant priority hazardous substances.*
  - *Phase 1 Part B screening tests for mercury, cadmium, polyaromatic hydrocarbons and any other relevant priority hazardous substances.*

*For any substance which is not screened out by the Phase 1 Part A or Part B screening tests the Operator will also need to carry out Phase 2 modelling, as described in "How to carry out a risk assessment if you're applying for a bespoke permit that includes discharging hazardous pollutants to surface water".*

*The Operator must provide Natural Resources Wales with the results of the emissions monitoring, the results from the screening tests and the results from any Phase 2 modelling. The Operator may use the Environment Agency's H1 electronic screening tool to present the emissions data and to carry out the Phase 1 screening tests.*

*Note: With regard to the Phase 1 Part A screening - a full list of priority hazardous substances is provided in the Environment Agency guidance "How to carry out a risk assessment if you're applying for a bespoke permit that*

*includes discharging hazardous pollutants to surface water” under the section entitled “Screening test: priority hazardous pollutants”. The Operator must review the list and carry out the screening for any substances, in addition to those specified above, that may be present in the installations discharges to surface water. With regard to the Phase 1 Part B screening for priority hazardous pollutants, the section entitled “Screening test: priority hazardous pollutants” provides a full list of relevant priority hazardous substances and their associated annual significant loads.*

We have set IC4 to ensure that the installation meets Water Framework Directive requirements going forward for screening dangerous substances.

The Operator’s response to IC4 is required to be submitted by 30<sup>th</sup> June 2017.

#### **5.7.5 Improvement Condition IC5 requires that:**

- *The Operator shall submit a report on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.*

This improvement condition requires information supplementary to that already provided in the application site report, which is needed to meet the information requirements of Article 22(2) of IED. Specifically, any relevant hazardous substances which are used, produced or released by the installation need to be identified and additional baseline monitoring undertaken if relevant hazardous substances are associated with the installation.

The Operator’s response to IC5 is required to be submitted by 30<sup>th</sup> September 2017.

#### **5.7.6 Improvement Condition IC6 requires that:**

- The Operator shall submit the written protocol referenced in condition 3.1.3 for the monitoring of soil and groundwater for approval by Natural Resources Wales. The protocol shall demonstrate how the Operator will meet the requirements of Articles 14(1) (b), 14(1) (e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from Natural Resources Wales.

Improvement Condition 6 has been set with the purpose of defining the procedure by which monitoring of groundwater and soil required by new permit condition 3.1.3 will be conducted. (Permit condition 3.1.3 has been added to deliver the requirements of the Industrial Emissions Directive). The written protocol developed by the Operator will be used to deliver compliance with permit condition 3.1.3 in terms of the monitoring regime to demonstrate continued protection of the soil and groundwater.

The Operator’s response to IC6 is required to be submitted by 31<sup>st</sup> December 2017.

## **5.8 Site Specific Updating Changes**

The following changes have been made as a result of this variation:

- Permit introductory note updated
- Waste recovery code R5 “Recycling / Reclamation of other Inorganic Materials” added to Table S1.1, Activity reference 3.1A(i)a, to reflect use of Alternative Raw Materials (ARM).
- Partial update to Table S1.2 “Operating Techniques”
- Table S3.1: the following text relating to monitoring of dioxins / furans (I-TEQ) has been removed from the table, as it is not required: “Reported as a range. All congeners <LOD assumed to be zero and all congeners >LOD assumed to be at the detection limit as a max”. Methods of calculation and reporting of dioxins / furans (I-TEQ) are covered by Schedule 6, Interpretation.
- Schedule 3(a) Table S3.5 updated to match table S3.5 in Schedule 3(b). This change was necessary to reflect process monitoring that the operator is already doing in line with IED, Chapter IV requirements.
- Schedule 3(b) Table S3.2 updated to capture emission points A13 and A14 serving the Ammonia Storage Tank Scrubber and Cemfuel tanks carbon adsorbers respectively. These are existing emission points which were omitted from the original permit. There are no monitoring requirements or emission limits associated with these emission points.
- Schedule 6, Interpretation has been updated as follows:
  - “Chapter IV abnormal operating conditions” definition amended to include reference to IED, article 45 1(f);
  - Text on determination and reporting of toxic equivalence concentration (I-TEQ & WHO-TEQ for dioxins / furans, WHO-TEQ for dioxin-like PCBs) updated to include the following additional text: “However the minimum value should be used when assessing compliance with the emission limit value in table S3.1”.
  - The two tables of Toxic Equivalence Factors has been updated by new versions in line with our permit template. In the tables, the 1997/8 WHO-TEFs for humans / mammals have been replaced by the later 2005 WHO-TEFs.
- Schedule 7, Site plan updated to show all permitted emission points.

## **5.9 Changes to Reporting**

The following changes have been made in relation to Schedule 4, Reporting:

- Table S4.1 “Reporting of Monitoring Data” updated to capture the process waste reporting requirements associated with Cement Kiln 4 by-pass dust. In addition, this table has been amended to reflect the fact that periodic 6-monthly reporting will be required for emissions to air from emission points A11 and A12 from 9<sup>th</sup> April 2017.



- Table S4.3 “Reporting Forms” updated to capture the requirement to report on Other Performance Indicators, Process Waste and Waste Subject to Condition 4.2.5. In addition, the version of Table S4.3 which applies from 9<sup>th</sup> April 2017 has been updated to include a new reporting form for ammonia releases from emission point A8. It also includes reference to a new reporting form (Air 15) for periodic monitoring of particulate from emission points A11 and A12.

## **6 Conclusion**

We have reviewed the existing permit for the Padeswood Cement Works installation and we are satisfied that the operator is either currently achieving or will achieve compliance with the relevant BAT conclusions for cement by 9<sup>th</sup> April 2017. We therefore believe this permit variation provides a sound basis for ongoing regulation of the Installation.

We believe that we have ensured compliance with all relevant legal requirements in carrying out this review and making our determination on the Variation.

## **Annex 1 - Decision Checklist regarding relevant BAT Conclusions.**

This checklist provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Variation Notice and Consolidated Permit.

All BAT Conclusions arising are listed by number in order below.

<b>BAT Conclusion No</b>	<b>Summary of BAT Conclusion requirement</b>	<b>Page number in Operators Regulation 60 Response</b>	<b>Status</b> <b>One of the following:</b> Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
<p><b>General BAT conclusions</b></p> <p>The Best Available Techniques (BAT) mentioned in this section apply to all installations covered by these BAT conclusions (cement, lime and magnesium oxide industry).</p>			
1.	In order to improve the overall environmental performance of the plants/installations producing cement, lime and magnesium oxide, production BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the listed features	6	<b>Currently Compliant</b>
2.	In order to reduce/minimise noise emissions during the manufacturing processes for cement, lime and magnesium oxide, BAT is to use a combination of the listed techniques	7 - 9 (additional information received 29/07/15 page 2)	<b>Currently Compliant</b>
<p><b>BAT conclusions for the cement industry</b></p> <p>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all installations in the cement industry.</p>			
3.	In order to reduce emissions from the kiln and use energy efficiently, BAT is to achieve a smooth and stable kiln process, operating close to the process parameter set points by using the listed techniques	9	<b>Currently Compliant</b>
4.	In order to prevent and/or reduce emissions, BAT is to carry out a careful selection and control of all substances entering the kiln	9 & 10	<b>Currently Compliant</b>

BAT Conclusion No	Summary of BAT Conclusion requirement	Page number in Operators Regulation 60 Response	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
5.	BAT is to carry out the monitoring and measurements of process parameters and emissions on a regular basis and to monitor emissions in accordance with the relevant EN standards or, if EN standards are not available, ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality, including those listed.	10 & 11	<b>Currently Compliant</b> Technique (g) For emission points A11 & 12, periodic monitoring will be required by 09.04.17, subject to improvement condition IC2.
6.	In order to reduce energy consumption, BAT is to use a dry process kiln with multistage preheating and pre-calcination.	11 & 12	<b>Currently Compliant</b> (Note - energy consumption levels associated with this BATC relate to new plant and major upgrades only).
7.	In order to reduce/minimise thermal energy consumption, BAT is to use a combination of the listed techniques.	12 - 15	<b>Currently Compliant</b>
8.	In order to reduce primary energy consumption, BAT is to consider the reduction of the clinker content of cement and cement products	15 (additional information received 29/07/15 page 6)	<b>Currently Compliant</b>
9.	In order to reduce primary energy consumption, BAT is to consider cogeneration/combined heat and power plants.	15 – 16 (additional information received 29/07/15 page 6 & 7)	<b>Currently Compliant</b> (Considered by Operator – not currently feasible).
10.	In order to reduce/minimise electrical energy consumption, BAT is to use one or a combination of the listed techniques.	16 & 17	<b>Currently Compliant</b>
11.	In order to guarantee the characteristics of the wastes to be used as fuels and/or raw materials in a cement kiln and reduce emissions, BAT is to apply the listed techniques.	17	<b>Currently Compliant</b>

BAT Conclusion No	Summary of BAT Conclusion requirement	Page number in Operators Regulation 60 Response	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
12.	In order to ensure appropriate treatment of the wastes used as fuel and/or raw materials in the kiln, BAT is to use the listed techniques.	18	<b>Currently Compliant</b>
13.	BAT is to apply safety management for the storage, handling and feeding of hazardous waste materials, such as using a risk-based approach according to the source and type of waste, for the labelling, checking, sampling and testing of waste to be handled.	19	<b>Currently Compliant</b>
14.	In order to minimise/prevent diffuse dust emissions from dusty operations, BAT is to use one or a combination of the listed techniques	19-21 (additional information received 29/07/15 page 7)	<b>Compliant in the Future</b> (Subject to the completion/implementation of additional control measures as identified in the site dust management plan submitted to NRW June 2015)
15.	In order to minimise/prevent diffuse dust emissions from bulk storage areas, BAT is to use one or a combination of the listed techniques.	21 (additional information received 29/07/15 page 7)	<b>Compliant in the Future</b> (Subject to the completion/implementation of additional control measures as identified in the site dust management plan submitted to NRW June 2015)
16.	In order to reduce channelled dust emissions, BAT is to apply a maintenance management system which especially addresses the performance of filters applied to dusty operations, other than those from kiln firing, cooling and main milling processes. Taking this management system into account, BAT is to use dry flue-gas cleaning with a filter.	22 (additional information received 29/07/15 page 8)	<b>Compliant in the Future</b> (Fabric filters and maintenance system in place, BAT-AEL will be met by 09/04/17)
17.	In order to reduce dust emissions from flue-gases of kiln firing processes, BAT is to use dry flue-gas cleaning with a filter.	23	<b>Currently Compliant</b> (existing Emission Limit Value of 10mg/Nm <sup>3</sup> retained)

BAT Conclusion No	Summary of BAT Conclusion requirement	Page number in Operators Regulation 60 Response	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
18.	In order to reduce dust emissions from the flue-gases of cooling and milling processes, BAT is to use dry flue-gas cleaning with a filter.	23	<b>Compliant in the Future</b> Fabric filters in use are capable of achieving upper BAT-AEL of 20mg/Nm <sup>3</sup> . Improvement condition IC3 response requires operator to assess if a lower limit can be achieved for individual fabric filters.
19.	In order to reduce the emissions of NOx from the flue gases of kiln firing and/or preheating/precalcining processes, BAT is to use one or a combination of the following techniques.	24-27 (plus background ammonia emission report – primary NOx data)	<b>Compliant in the Future</b> (Emission Limit Value of 450 mg/Nm <sup>3</sup> from 09/04/17)
20.	When Selective Non-Catalytic Reduction (SNCR) is used, BAT is to achieve efficient NO x reduction, while keeping the ammonia slip as low as possible, by using the given technique.	27 – 29	<b>Compliant in the Future</b> Ammonia Emission Limit Value of 70mg/Nm <sup>3</sup> included in permit (kiln 4) from 09/04/17 to account for slip and background ammonia from process.
21.	In order to reduce/minimise the emissions of SOx from the flue-gases of kiln firing and/or preheating/precalcining processes, BAT is to use one of the given techniques.	30	<b>Currently Compliant</b> (existing Emission Limit Value of 200 mg/Nm <sup>3</sup> retained)
22.	In order to reduce SO <sub>2</sub> emissions from the kiln, BAT is to optimise the raw milling processes.	31	<b>Currently Compliant</b>
23.	In order to minimise the frequency of CO trips and keep their total duration to below 30 minutes annually, when using electrostatic precipitators (ESPs) or hybrid filters, BAT is to use the listed techniques in combination.	32	<b>Not Applicable</b> (fabric filters used)
24.	In order to keep the emissions of TOC from the flue-gases of the kiln firing processes low, BAT is to avoid feeding raw materials with a high content of volatile organic compounds (VOC) into the kiln system via the raw material feeding route.	32	<b>Currently Compliant</b>

BAT Conclusion No	Summary of BAT Conclusion requirement	Page number in Operators Regulation 60 Response	Status One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
25.	In order prevent/reduce the emissions of HCl from flue-gases of the kiln firing processes, BAT is to use one or a combination of the listed primary techniques.	33	<b>Currently Compliant</b> (existing Emission Limit Value retained)
26.	In order to prevent/reduce the emissions of HF from the flue-gases of the kiln firing processes, BAT is to use one or a combination of the listed primary techniques.	33	<b>Currently Compliant</b> (existing Emission Limit Value retained)
27.	In order to prevent emissions of PCDD/F or to keep the emissions of PCDD/F from the flue-gases of the kiln firing processes low, BAT is to use one or a combination of the listed techniques.	33 & 34	<b>Currently Compliant</b> (existing Emission Limit Value retained)
28.	In order to minimise the emissions of metals from the flue-gases of the kiln firing processes, BAT is to use one or a combination of the listed techniques.	35	<b>Currently Compliant</b> (existing Emission Limit Values retained)
29.	In order to reduce solid waste from the cement manufacturing process along with raw material savings, BAT is to use the techniques listed in the table.	36	<b>Currently Compliant</b>