

## **Environment Agency Permitting Decisions**

### **Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)**

#### **Decision document recording our decision-making process following review of a permit**

The Permit number is:                   EPR/UP3632DQ  
The Operator is:                         Tarmac Cement and Lime Limited  
The Installation is:                     Hindlow Quarry Lime Works  
This Variation Notice number is:   EPR/UP3632DQ/V002

#### **What this document is about**

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on BAT conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the production of cement, lime and magnesium oxide industry sector published on 9 April 2013 in the Official Journal of the European Union. Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the Installation. In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

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 (BATc) for the production of cement, lime and magnesium oxide as detailed in document reference 2013/163/EU. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. 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 variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions and any changes to the operation of the installation.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

## **How this document is structured**

1. Our proposed decision
2. How we reached our decision
3. The legal framework
4. Annex 1– Review of operating techniques within the Installation against BAT Conclusions.
5. Annex 2 – Review and assessment of derogation request(s) made by the operator in relation to BAT Conclusions which include an Associated Emission Level (AEL) value.
6. Annex 3 – Improvement Conditions
7. Annex 4 – Consultation responses
8. Annex 5 – Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

# 1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice.

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

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

## 2 How we reached our decision

### 2.1 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 25 April 2014 requiring the Operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document. The Notice required that where the revised standards are not currently met, the operator should provide information that

- Describes the techniques that will be implemented before 9 April 2017, which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 9 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
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 60 Notice required that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 60 Notice response from the Operator was received on 8 January 2015.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

## 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the installation we have no reason to consider that the operator will not be able to comply with the techniques and standards described in the BAT Conclusions.

## 2.3 Requests for Further Information during determination

Although we were able to consider the Regulation 60 Notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment, and issued a further information request on 22 May 2015 (response received 3 July 2015). Copies of the further information request and response were placed on our public register.

In addition to the response to our further information request, we received additional information during the determination from the Operator relating to the non-kiln emission points on 13 May 2016. We made a copy of this information available to the public in the same way as the response to our information request.

### 3 The legal framework

The Consolidated Variation Notice will be issued, under Regulations 18 and 20 of the EPR. 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 Consolidated Variation Notice, 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.

## **Annex 1: decision checklist regarding relevant BAT Conclusions**

BAT Conclusions for the production of cement, lime and magnesium oxide, were published by the European Commission on 9 April 2013. There are 69 BAT Conclusions; 1 and 2 are generally applicable, 3 – 29 apply to the cement industry, 30 – 54 apply to the lime industry, and 55 – 69 apply to the production of magnesium oxide. This annex 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 Consolidated Variation Notice.

Our assessment of the overall status of compliance with the BAT conclusion is indicated in the table as:

- NA Not Applicable
- CC Currently Compliant: we have reviewed the information available to us and consider that it provides sufficient evidence to show that the operator is currently compliant with the BAT conclusion, and we have no reason to believe that this will change before the implementation date.
- FC Compliant in the future (within 4 years of publication of BAT conclusions): we have reviewed the information available to us and consider that it provide sufficient evidence to show that the operator has suitable plans in place to ensure that they will be compliant with the BAT conclusion by the implementation date.
- NC Not Compliant

BAT Conclusion No	Summary of BAT Conclusion requirement for production of cement, lime and magnesium oxide	Status NA/CC/ FC/NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
3-29  55-69	BAT Conclusions that are not applicable to this installation	<b>NA</b>	BAT Conclusions 3 – 29 inclusive are not applicable as they apply to cement industry only. BAT Conclusions 55 – 69 inclusive are not applicable as they apply to the magnesium oxide industry only.
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.	<b>CC</b>	An EMS certified to ISO14001 is in place.
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.	<b>CC</b>	TCLL have outlined a number of techniques that they employ to reduce/minimise noise emissions. These include enclosure of noise operations, fans fitted with silencers and vacuum systems fitted with acoustic hoods. There are no noise nuisance issues relating to operations at the site, so measures are appropriate.
30	In order to reduce all kiln emissions 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.	<b>CC</b>	The kilns are controlled by a modern computer-based control system, with gas flow meters on the natural gas fuel feed, to monitor and maintain smooth and stable operations. Solids fuels are not used at Hindlow.
31	In order to prevent and/or reduce emissions, BAT is to carry out a careful selection and control of the raw materials entering the kiln.	<b>CC</b>	The only raw material is limestone, which is analysed then blended if required to ensure chemical consistency, particularly of sulphur levels. The feed stone is screened to remove fines, which reduces the amount of clay and organic material entering the kiln (which can give rise to TOC emissions) and helps prevent blockages.
32	BAT is to carry out monitoring and measurements of process parameters and emissions on a regular basis and to monitor emissions in accordance with	<b>CC</b>	BAT is in place for BAT conclusion 32 a – d, and 32 g a. all appropriate process parameters are measured and used for kiln control and to demonstrate kiln stability

BAT Conclusion No	Summary of BAT Conclusion requirement for production of cement, lime and magnesium oxide	Status NA/CC/ FC/NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	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.	FC	<ul style="list-style-type: none"> <li>b. Critical process parameters are monitored; stone is metered in via calibrated load cells and the gas fuel and air are metered.</li> <li>c. Periodic monitoring of dust, NO<sub>x</sub>, SO<sub>x</sub> and CO is carried out by an accredited testing organisation. SNCR is not used so NH<sub>3</sub> monitoring is not required.</li> <li>d. No waste is incinerated, so HCl and HF is not measured</li> <li>g. Periodic measurements of non-kiln dust emissions are undertaken by an accredited testing organisation.</li> </ul> <p>BAT 32 e and f: Monitoring of TOC, PCDD/F and metals is not routinely undertaken as “there is no permit requirement to do so”. Routine compliance assessment for TOC and PCDD/F is introduced through this variation. <b>Refer to Key Issues section 2 below.</b></p>
33	In order to reduce/minimise thermal energy consumption, BAT is to use a combination of the listed techniques.	CC	TCLL utilise a number of techniques to minimise energy consumption and state that the thermal energy consumption is well within the BAT associated levels (although achieved level not specified). Refractory thickness is monitored to identify any erosion, kiln air pressure monitored to ensure that there are no significant air leaks, specific energy consumption is monitored continually, and the process is optimised to minimise energy use.
34	In order to minimise electrical energy consumption, BAT is to use one or a combination of the listed techniques.	CC	TCLL use process optimisation and energy management techniques, including optimising feed stone size through crushing and screening and maintenance of the compressed air systems, to minimise electricity usage. A site energy policy is in place with continual improvement to reduce energy use. High efficiency variable speed fans are used.
35	In order to minimise limestone consumption, BAT is to use one or a combination of the listed techniques.	CC	TCLL quarry, crush and screen the limestone feed, and all is used in the process, with no waste.
36	In order to prevent/reduce emissions, BAT is to carry out a careful selection and control of fuels entering the kiln.	CC	TCLL use only natural gas fuel in the kilns, which is the cleanest available fuel. The process is optimised to minimise the amount of gas used.



<b>BAT Conclusion No</b>	<b>Summary of BAT Conclusion requirement for production of cement, lime and magnesium oxide</b>	<b>Status NA/CC/FC/NC</b>	<b>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</b>
37	In order to guarantee the characteristics of waste to be used as fuel in a lime kiln, BAT is to apply the listed techniques.	<b>NA</b>	TCLL does not use waste as a fuel in the kilns and therefore this conclusion is not applicable.
38	In order to prevent/reduce emissions occurring from the use of waste fuels into the kiln, BAT is to use the listed techniques.	<b>NA</b>	TCLL does not use waste as a fuel in the kilns.
39	In order to prevent accidental emissions, BAT is to use safety management for the storage, handling and feeding into the kiln of hazardous waste materials.	<b>NA</b>	TCLL does not use waste as a fuel in the kilns.
40	In order to minimise/prevent diffuse dust emissions from dusty operations, BAT is to use one or a combination of the listed techniques.	<b>CC</b>	TCLL employs a number of BAT techniques to minimise and prevent dust emissions from dusty operations, including; milling operations are undertaken within a building vented via a bag filter unit, conveyors and elevators are enclosed, preventative maintenance includes cleaning, material handling within closed systems. There is no history of dust complaints from this site.
41	In order to minimise/prevent diffuse dust emissions from bulk storage areas, BAT is to use one or a combination of the listed techniques.	<b>CC</b>	TCLL employs a number of BAT techniques to minimise and prevent dust emissions from bulk storage areas, including; water sprays on the external bulk limestone store, other bulk storage locations enclosed, adjustable conveyors to minimise drop heights, use of water sprays and bowser/road sweeper, good housekeeping practices and a wheel wash. Fugitive dust is not an issue at the site, which is generally clean and dust free.
42	In order to reduce channelled dust emissions from dusty operations other than those from kiln firing processes, BAT is to use one of the listed techniques and to use a maintenance management system which specifically addresses the performance of filters.	<b>CC</b>	Fabric filters are applied to channelled dust emissions such as bag packers, silos, conveyors, bunkers and large grinders. They are subject to both inspection and maintenance regimes. Regular inspections are carried out on the external aspects of the filter with an internal inspection and performance report at least annually. These inspections are

BAT Conclusion No	Summary of BAT Conclusion requirement for production of cement, lime and magnesium oxide	Status NA/CC/FC/NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			<p>used to define maintenance plans to ensure satisfactory performance of the filtration system. Replacement filters are designed to perform to &lt;10mg/Nm<sup>3</sup>.</p> <p>The two mills, emission points A3 and A4, are fitted with fabric filters, with 6 monthly periodic monitoring. The existing permit limit is 50 mg/m<sup>3</sup>, which will be reduced to 10mg/Nm<sup>3</sup> from 9 April 2017, in accordance with the BAT-AEL for bag filters of &lt;10 mg/Nm<sup>3</sup>. The historic monitoring results reported to the EA indicate that the abatement is capable of achieving compliance with the future lower limit, as measured results are all &lt;5mg/m<sup>3</sup>.</p> <p>The operator has supplied a list of channelled dust emission points not currently listed in the permit which are all abated by filters. None have a volumetric flow rate &gt;10,000 Nm<sup>3</sup>/hr. These are now included in permit table S3.2 as a grouped emission with the BAT-AEL of &lt;10 mg/Nm<sup>3</sup> applied as a limit. There is no means to measure particulate emissions from these discharge points. All undergo periodic inspections and any improvements or faults are reported back to the plant and entered onto the maintenance management system. <b>Refer to Key Issues sections 1 and 2 below.</b></p>
43	In order to reduce dust emissions from the flue-gases of kiln firing processes, BAT is to use flue-gas cleaning with a filter. One or a combination of the listed techniques can be used.	CC	The kilns are fitted with fabric filters, with 6 monthly periodic monitoring. The existing permit limit is 20 mg/m <sup>3</sup> , which will be reduced to 10mg/Nm <sup>3</sup> from 9 April 2017, in accordance with the BAT-AEL for bag filters of <10 mg/Nm <sup>3</sup> . The historic monitoring results reported to the EA indicate that the abatement is capable of achieving compliance with the future lower limit.
44	In order to reduce the emissions of gaseous compounds (i.e. NO <sub>x</sub> , SO <sub>x</sub> , HCl, CO, TOC/VOC, volatile metals) from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques.	CC	TCLL analyse the quarried limestone and blend if required to ensure chemical consistency eg low sulphur level. Screening of the feed stone removes some fines and organic matter (see BATC 31). The kilns are fired on natural gas, which is low in S and Cl. The periodic monitoring undertaken for NO <sub>x</sub> , CO and SO <sub>2</sub> indicates low emissions of these substances.
45	In order to reduce the emissions of NO <sub>x</sub> from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques.	CC	TCLL use natural gas fuel, which along with process control and optimisation, minimise NO <sub>x</sub> emissions from the kilns. The current permit ELV is 150mg/m <sup>3</sup> which is well within the BAT-AEL of 100-350mg/m <sup>3</sup> . The existing limit is to be retained

BAT Conclusion No	Summary of BAT Conclusion requirement for production of cement, lime and magnesium oxide	Status NA/CC/FC/NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			within the permit as it is achievable. Periodic monitoring for NO <sub>x</sub> is carried out 6 monthly and results are generally <70mg/m <sup>3</sup> .
46	When SNCR is used, BAT is to achieve efficient NO <sub>x</sub> reduction, while keeping the ammonia slip as low as possible, by using the listed technique.	NA	SNCR is not used – this BATC only applicable to Lepol rotary kilns.
47	In order to reduce the emissions of SO <sub>x</sub> from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques.	CC	The kilns are fired on natural gas which has a low sulphur content. Limestone is analysed and blended to ensure consistent chemistry with low sulphur levels for the raw material feed to the kilns. The current permit ELV is 50mg/m <sup>3</sup> which is well within the BAT-AEL of 50-200mg/m <sup>3</sup> . The existing limit is to be retained within the permit as it is achievable. Historical monitoring demonstrates very low SO <sub>x</sub> emissions in the flue gases, generally < 10mg/m <sup>3</sup> .
48	In order to reduce the emissions of CO from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques.	CC	Limestone feed stone is crushed and screened and has low organic matter content. Combustion is well controlled. Historical monitoring demonstrates very low CO emissions in the flue gases, generally <30mg/m <sup>3</sup> , well within the BAT-AEL range of <500mg/m <sup>3</sup> . The existing permit limit of 500mg/m <sup>3</sup> limit is retained.
49	In order to minimise the frequency of CO trips when using electrostatic precipitators, BAT is to use the listed techniques.	NA	Only applicable to kilns with ESPs. There are no ESPs at Hindlow.
50	In order to reduce the emissions of TOC from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques.	CC	General primary techniques are applied; limestone feedstock is crushed and screened, and contains low levels of organic matter. As emissions have not been regularly monitored for TOC, there is limited available data to assess compliance against the BAT-AEL, however one result from 2010 measured 18mg/m <sup>3</sup> , within the BAT-AEL range of <30mg/Nm <sup>3</sup> (for PFRK). The permit will include a limit of 30mg/Nm <sup>3</sup> from 9 April 2017, with a requirement for annual compliance monitoring. <b>Refer Key Issues sections 1 and 2 below, and Annex 3.</b>
51	In order to reduce the emissions of HCl and the emissions of HF from the flue-gas of kiln firing	NA	TCLL does not use waste as a fuel in the kilns.

BAT Conclusion No	Summary of BAT Conclusion requirement for production of cement, lime and magnesium oxide	Status NA/CC/FC/NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	processes, when using waste, BAT is to use the listed primary techniques.		
52	In order to prevent or reduce the emissions of PCDD/F from the flue-gas of kiln firing processes, BAT is to use one or a combination of the listed primary techniques.	CC	The only fuel used is natural gas, which has negligible chlorine and copper content, thereby minimising dioxin-formation conditions. The feedstock and fuel are of high quality and therefore inputs to the kiln will not be capable of generating significant emissions of PCDD/F emissions. As PCDD/F emissions have not been regularly monitored, there is limited available data to assess compliance against the BAT-AEL, however monitoring in 2011 gave results between 0.00972 and 0.01678ng/Nm <sup>3</sup> , within the BAT-AEL range of <0.05-0.1ng PCDD/F I-TEQ/Nm <sup>3</sup> . The permit will include a limit of 0.05ng/Nm <sup>3</sup> from 9 April 2017, with a requirement for an annual compliance check. <b>Refer Key Issues sections 1 and 2 below.</b>
53	In order to minimise the emissions of metals from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques.	CC	The only fuel used is natural gas, which has a low metal content. No waste fuels are used. Efficient bag filters provide effective dust removal. No limit for emissions of metals will be set in the permit as the relevant BAT-AELs apply only when using wastes.
54	In order to reduce the solid wastes from the lime manufacturing processes and to save raw materials, BAT is to use the listed techniques.	CC	Dust is recovered at the site where possible, and the use of landfill (at a Mining Waste facility) is a last resort. Material which is too fine for these kilns is used in the fine lime kiln at Tunstead, and dust and other particulate matter generated from the process is recovered or used in the feed for Tunstead cement plant.

## Key Issues

Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.

We have reviewed the limits and monitoring requirements for all emissions at the installation to ensure that they are in accordance with the requirements of the BATCs. We considered all emission points, many fairly small and not listed in the permit.

The Operator provided a list of all channelled dust emissions, with an indication of volumetric flow rate. The general approach is that dust emissions >10,000 Nm<sup>3</sup>/h are listed individually, have a dust limit applied (in accordance with the BAT-AEL for the type of abatement) with a monitoring requirement to demonstrate compliance. Dust emissions <10,000 Nm<sup>3</sup>/h, which are deemed “small sources” by the BATCs, are included as group.

Section 1 covers emission limits and section 2 covers monitoring.

### 1. Emission limit changes: BATc 42, 43, 50 and 52

Changes to some emission limits and the introduction of new ones are required to ensure compliance with the BAT Conclusions. All the new and revised limits apply from 9 April 2017, the compliance date.

The following table provides an overview of emission limits within permit tables S3.1 and S3.2, with changes highlighted in bold text:

#### **Overview of changes to emission limit values:**

<b>Kiln emissions (permit table S3.1):</b>			
<b>Parameter</b>	<b>Previous ELV: mg/Nm<sup>3</sup></b>	<b>New Limit: mg/Nm<sup>3</sup></b>	<b>BAT-AEL mg/Nm<sup>3</sup></b>
<b>Dust (fabric filter)</b>	20	<b>10</b>	<10
NOx	150	150	100 – 350
SOx	50	50	<50 – 200
CO	500	500	<500
<b>TOC</b>	No previous limit	<b>30</b>	<30
<b>Dioxin &amp; furans PCDD/F</b>		<b>0.1ng/Nm<sup>3</sup></b>	<0.05-0.1 ng/Nm <sup>3</sup>
<b>BATC 42 Non-kiln dust emissions (permit table S3.2):</b>			
<b>A3, A4 (fabric filters)</b>	50	<b>10</b>	<10
<b>All other channelled dust emissions abated by fabric filters (&lt;10,000Nm<sup>3</sup>hr)</b>	No previous limit	<b>10</b>	10

Historic monitoring results indicate that all emissions should comply with the new limits.

**a. TOC and PCDD/F (A1 and A2):**

The BAT conclusions introduce BAT-AELs for TOC (BATC 50) and dioxins/furans (BATC 52) in kiln emissions, despite the fact that we do not expect to find these parameters in significant quantities due to the nature of the process and fuel used. A limit is now included for each parameter in line with the BAT-AEL, applied from the compliance date.

All other kiln parameters (NOX, SOx and CO) have existing limits which are well within the BAT-AEL, so these limits are retained.

**b. Dust:**

Dust emissions are all abated by filters and hence every dust limit is reduced to 10 mg/Nm<sup>3</sup>, in line with the BAT-AEL for fabric filters set by BATC 42 and 43, non-kiln and kiln emissions.

There are no additional dust emissions to be listed in table S3.2 as a result of the permit review. All dust emissions with a volumetric flowrate >10,000Nm<sup>3</sup>/h are already included in the permit.

The group “*all other channelled dust emissions abated by filters*” is provided as a catch-all for non-listed “small source” emission points provided with abatement as these need a dust emission limit set in line with BATC 42. This group consists of 23 abated emissions from conveyors, bunkers and crushing/milling plant, with volumetric flow all <10,000 Nm<sup>3</sup>/h. The list is available as Appendix 1 to document “Hindlow comments on draft IED Permit” submitted on 13 May 2016, and is reproduced below for transparency.

<b>Maerz Kiln:</b>	<b>Ground Lime Plant Dust Units:</b>
Kiln 1 feeder/discharge	Ground lime plant bunkers G1 to 4
Kiln 2 feeder/discharge	Ground lime plant bunkers G5
Conveyor 22/23	Ground lime plant bunkers G6-7
Conveyor 24/25	Ground lime plant bunkers G8-9
Conveyor 23/30	Ground lime plant bunkers G21
Conveyor No30 and Morgensen sizer	Ground lime plant bunkers G22
Maerz lime kiln sampling equipment	Ground lime plant bunkers G23
Maerz Lime crusher	Ground lime plant bunkers G24
Screened lime bunkers	Ground lime plant bunkers G25
Maerz kiln dust silo	Crushed lime elevator
	Head end Conveyor No 2
	Ground lime bunkers G3
	Alpine mill

**2. BATC32 Frequency of monitoring**

The basis for choosing a frequency and method (continuous or periodic) of monitoring of emissions included reference to the BATC, an assessment of the mass of release, potential impacts, previous compliance history and process variability. The results are summarised here and reflect the permit conditions.

Referring to BATC 32 c-g, there are no specific regulatory requirements defined in the BREF other than the statement “continuous or periodic” for the parameters dust, NO<sub>x</sub>, SO<sub>x</sub>, CO, TOC, HCl and HF. For PCDD/F and metals, it is periodic only. Each emission point has been assessed to decide if it should be monitored continuously or periodically, and if the latter, the frequency of sampling has been decided based upon risks posed. We have taken into account the history of compliance as well as the scale and impact of a potential release in setting the monitoring requirements.

The length of sampling period can vary from ½ hour to 6-8 hours depending on the sampling strategy and standard used. For compliance purposes the selection of sampling period reflects the likelihood of variance, potential impacts and the frequency of sampling. In general terms smaller releases with limited potential for impact have sampling frequencies as low as ½ hour. Larger releases, or where compliance is based on infrequent sampling, have a longer sampling period to allow it to be more representative.

**a. Kiln dust, NO<sub>x</sub>, SO<sub>x</sub> and CO (BATC 32c):**

The frequency of periodic monitoring for dust, NO<sub>x</sub>, SO<sub>x</sub> and CO is retained at 6 monthly, as this is an appropriate frequency.

**b. Kiln TOC, Dioxins/Furans and metals (BATC 32e, f):**

The BATc description states that for periodic measurements of PCDD/F, TOC and metal emissions “*a frequency appropriate to the raw materials and fuels that are used in the process should be applied*”. Due to the nature of the raw material (high purity, clean limestone) and fuel (natural gas), we do not expect high levels of these pollutants to be emitted. This was confirmed for PCDD/F with a sampling exercise carried out after the last permit review.

IED article 14(d) requires a demonstration of compliance at least annually against permit conditions. As an ELV is being set for PCDD/F, an annual compliance check is required, so we are setting a compliance check at a minimum frequency – **annual**.

In the UK, dioxin monitoring trials have taken place at many different lime kilns and the highest concentration recorded was 0.017 ng I-TEQ/Nm<sup>3</sup>, which is only 17% of the relevant BAT AEL. Most results were much lower than this. UK plants use natural gas as a fuel and do not burn any waste materials, and so the chloride input and the risk of high dioxin emissions is minimal. A risk-based approach would suggest that frequent dioxin monitoring is not required at lime kilns in the UK, unless there is a significant change in fuel, raw materials or residence time in the critical 300°C to 400°C temperature window.

An alternative protocol for dioxin monitoring, taking into account the known risk factors leading to dioxin formation has been adopted. A dioxin and furans PCDD/F test by an approved MCERTS contractor will be carried out on one kiln of each type per site. Provided the result is well below the limit of 0.1 ng/Nm<sup>3</sup> and the fuel type (natural gas) and stone feed type does not change and there are no significant kiln process changes (e.g. new type of burner, change in physical configuration of the kiln which affects internal kiln gas flow) then that result will stand for a maximum of four years. A report will be written confirming the “no change in operation” and issued to the Environment Agency on an annual basis. Any changes will require a new dioxin baseline year to be established.

This protocol (a combination of a baseline measurement to prove that current emissions are well below the ELV and assessment of surrogate parameters to

ensure that the risk of high dioxin concentrations remains minimal) will be adequate to demonstrate compliance with the ELV, without the cost burden of annual monitoring for each kiln.

There is no limit for emissions of metals when not burning waste, so monitoring is not required.

**c. Non-kiln dust (BATC 42):**

We have applied a periodic monitoring frequency appropriate to the scale of the release:

A3 and A4 have a maximum volumetric flow rate of 20,000 Nm<sup>3</sup>/hr however as the actual flow is below this and the mills do not run continuously 24/7, we have reduced the monitoring frequency to annual, as the scale of risk is not significant. Historic monitoring has shown the releases to be consistently <5mg/m<sup>3</sup>. The monitoring reference period is maintained at a minimum of 30 minutes.

For all emissions <10,000 Nm<sup>3</sup>/h (the emission group in table S3.2), no periodic monitoring is set as these are regarded as “small sources” by BATC 32 which states that “*for small sources, the frequency of the measurements should be based on a maintenance management system*”. Hence we are requiring that compliance with the limit is ensured via a maintenance management system.

**Summary of monitoring requirements:**

Emission point	Parameter	Type of monitoring	Previous frequency	Frequency	Reference period
A1, A2 (kilns)	Particulates	periodic	6 monthly	6 monthly	Min 30 min
	NOx, SOX, CO	periodic	6 monthly	6 monthly	Min 30 min
	TOC	periodic	-	annually	Min 30 min
	PCDD/F	periodic	-	annually	6 – 8 hr
A3, A4	particulates	periodic	6 monthly	annually	Min 30 min
All other abated emission points	particulates	None		Maintenance schedule	

We have set monitoring methods according to our monitoring guidance note, M2.

**3. Monitoring - Reference conditions**

The reference conditions for reporting measured emissions from non-combustion sources has been changed by the BATCs from no correction required for temperature, pressure, oxygen or water vapour content, to reporting **dry at STP** with no correction for oxygen. The Schedule 6 interpretation has been updated for this change.



**Annex 2: Assessment, determination and decision where an application(s) for Derogation from BAT Conclusions with associated emission levels (AEL) has been requested.**

The Operator did not request derogation from compliance with any AEL included within the BAT Conclusions as part of their Regulation 60 Notice response.

### Annex 3: Improvement Conditions

Based on the information in the Operator's Regulation 60 Notice response and our own records of the capability and performance of the installation at this site, we do not consider that we need to set improvement conditions in order that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation.

The previous variation contained improvement conditions arising from the previous permit review in 2010. These have been completed and have been removed from the permit. A copy of the IC table is reproduced below.

Reference	Improvement Condition	Completion date
IC 1	The operator shall produce and submit a project plan setting out how releases of particulates from all significant non-kiln sources will be minimised and at least reduced to <10 mg/m <sup>3</sup> for bag filters averaged over the sampling period (spot measurements for at least half an hour), by the target date of 30 <sup>th</sup> June 2014. The plan will have a prioritised approach for reducing particulate releases from these sources, and will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent. This condition applies to particulate releases from the mills only.	<b>Deemed complete 2 Oct 2013</b>
IC 2	The operator shall carry out an exercise, agreed in writing with the Environment Agency, to characterise the releases of NO <sub>x</sub> , CO, particulates and SO <sub>2</sub> in the exhaust gases from Maerz Kilns No 1 & 2 and submit a risk based plan describing any changes to monitoring arrangements that will be taken including consideration of installing continuous monitors, or more frequent periodic monitoring as described in the Sector Guidance Note for the Lime Sector (EPR 3.01b).	<b>Deemed complete 2 Oct 2013</b>
IC 3	The Operator shall carry out a sampling exercise to monitor dioxins and furans from one representative lime kiln on site, and send the results of the monitoring to the Environment Agency. The results of monitoring for dioxin and furans on the kiln obtained in the previous 12 months prior to this variation may be submitted instead of carrying out this sampling exercise. The results will be used to decide whether any future monitoring is required.	<b>Deemed complete 2 Oct 2013</b>

During the permit review, the operator highlighted potential issues with the monitoring of TOC from PFRKs due to the cyclical nature of the process. An IC is set to allow further work by the operator to establish a reliable technique for monitoring.

IC4	The operator shall provide a report summarising an investigation into the factors affecting the uncertainty of TOC measurements from PFRK kilns. The investigation shall consider the practical application of the relevant standard when dealing with cyclical process associated with PFRK operation. Where appropriate, the operator may undertake stack sampling outside normal compliance testing to further the investigation. The final report may suggest adjustments to the method to ensure uncertainties can be minimised.	31/07/17
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#### **Annex 4: Advertising and Consultation on the draft decision**

No public consultation is required on this permit variation as the Operator has not requested a derogation.

## **Annex 5: Review and assessment of changes that are not part of the BAT Conclusions derived permit review.**

### **1. Permit transfer September 2016**

During the period of the permit review, the Hindlow Quarry operator, then Tarmac Trading Limited, applied for a (limited change of management) transfer of the permit to Tarmac Cement and Lime Limited. The transfer was issued on 12 September 2016. This has also changed the permit reference number from EPR/XP3134UZ to EPR/UP3632DQ. The new operator submitted a letter, on 19 October 2016, taking ownership of all previous submissions in relation to the Regulation 60 Notice response. The following were all submitted by the previous operator and are now considered valid for the new operator:

- Regulation 60 Notice response
- Additional information in response to the Reg 60 Notice

Refer to the Status log table within the permit Introductory Note for specific dates of the submissions.

### **2. Change of Installation name**

The installation name has been changed from Hindlow Quarry to **Hindlow Quarry Lime Works**, in order that the name reflects the activity for which the site is permitted, as well as the location. This is in line with our approach to designating installation names.

### **3. Introductory Note**

The installation description has been updated to a consistent format applied across the cement and lime sector. We have included additional information such as the installation NGR, kiln production capacity, details of process wastes and emissions to air and water, and local sensitive receptors.

The permit status log table has been edited to make it clearer and more presentable; retaining only key information and dates, adding in Operator names as permit has been transferred or company name changed, and correcting the effective date for V002.

### **4. Table S1.1 Activities**

We have reviewed Table S1.1 for all CLM sector permits, to ensure these accurately reflect the activities on each site.

We have reviewed and revised Hindlow Quarry lime works Table S1.1, specifically:

- Amended the kiln activity description to indicate more clearly that there is one kiln (with a pair of shafts),
- Added a Directly Associated Activity (DAA) for ground lime production,
- Amended the Limits of Specified Activity for all activities to ensure they are clearly defined.

The amended Table S1.1 is reproduced below with new and revised text identified by shaded sections:

<b>Table S1.1 activities</b>		
<b>Activity listed in Schedule 1 of the EP Regulations</b>	<b>Description of specified</b>	<b>Limits of specified activity</b>
Section 3.1 Part A(1)(b)	Producing lime in a parallel flow regenerative kiln ("PFRK") with a production capacity of >50 tonnes per day.	From the receipt, storage, screening and feed of limestone and fuel into the kiln through to the despatch of finished product, by road. Includes associated releases to air and abatement plant.
<b>Directly Associated Activity</b>		
Ground lime production	Grinding of lime in one of 3 Mills to produce a fine lime product	Intermediate storage, crushing and milling of lime, including storage and use of additives, through to despatch of finished product by road, including associated air releases.
Water discharge to controlled waters	Discharge of site drainage water from settlement lagoon	Collection and treatment of surface water drainage, including reuse in site activities, through to discharge to underground strata

The DAA "Ground lime production" has been added back in. This DAA had been included in the original PPC permit and then removed at the last permit review in 2010. Grinding of lime to produce a fine quicklime product should be listed as a DAA, as not all product undergoes this process.

##### **5. Schedule 6 Interpretation**

Schedule 6 has been revised to include interpretations which are now relevant, such as the Industrial Emissions Directive (IED), Lime and lime products, SSSI, dioxins/furans and TOC. The standard tables for TEF Schemes for dioxins and furans has been added as monitoring for PCDD/F is now required for lime works regardless of whether a waste-derived fuel is burned. The monitoring reference conditions for non-combustion sources has been updated.

##### **6. Schedule 7 Site Plan**

The site plan in Schedule 6 has been amended to show the location of key emission points.

##### **7. Other permit changes:**

**IED standard conditions:** this variation includes the latest IED permit template conditions: 1.4.1 (waste), 3.1.4 (soil and groundwater monitoring) and 4.3.1 (notifications). Other new conditions include 2.3.3, re raw material/fuel specifications in Sch 2, and 3.1.3 re background concentrations.

**Table S3.4 Annual limits:** this table is retained in line with the approach for other CLM sector permits, however no limits are set.

**Tables S3.1 and S3.2:** in line with current permit formatting, kiln emissions are in a separate table to non-kiln source emissions.

#### **8. Site condition and IED compliance**

Question 4 of the Regulation 60 Notice requested provision of information relating to site condition, to ensure that the requirements of IED article 22(2) are fulfilled.

The Operator provided a summary report as part of their response to the Notice, submitted 8 January 2015, which referred to an original site report (phase 1A and phase 1B) completed in August 2001 for the PPC application, and a 2008 report which updated the August 2001 report.

We have assessed the summary report, along with the original data and reports, and are satisfied that this information fulfils IED requirements for Hindlow Quarry lime works by providing an adequate baseline report.