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/BP3731VJ
The Operator is:	Hope Cement Limited
The Installation is:	Hope Cement Works
This Variation Notice number is:	EPR/BP3731VJ/V004

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 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 issued 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 that updates the whole permit.

As part of our decision we have decided to grant the Operator's request for a derogation from the requirements of BAT Conclusion 21 as identified in the production of cement, lime and magnesium oxide BAT Conclusions document. The way we assessed the Operator's request for derogation and how we subsequently arrived at our conclusion is recorded in Annex 2 to this document.

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 30 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 that the response did not contain sufficient information for us to commence determination of the permit review. We therefore issued a further information request to the Operator. Suitable further information was provided by the Operator on 1 July 2015 (a document which was later revised and resubmitted on 9 June 2016) and 9 June 2016.

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 further information requests on 22 May 2015 and 8 June 2016. Copies of the further information requests were placed on our public register.

In addition to the responses to our further information requests, we received additional information during the determination:

- 6 May 2016 (email with confirmation of certain process details)
- 15 December 2016 (volumetric flow of emissions from mills)
- 1 February 2017 (regarding compliance with BATC 11)

We made a copy of this information available to the public in the same way as the responses to our information requests.

We have consulted on our minded to issue decision document from 02/03/2017 to 30/03/2017. A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 4.

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 the Consolidated Variation Notice will ensure that the operation of the Installation continues to comply 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
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.	**CC**	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.	**CC**	HCL have outlined a number of techniques that they employ to reduce/minimise noise emissions. These include enclosure of noisy operations, such as the ball mills which are within buildings, vibration damping, and screening using trees and hedges. Noise reduction measures are implemented where plant is identified as being a significant noise source.
3	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.	**CC**	The kilns are operated using a modern computer based control system and solid fuel feed systems: all use modern gravimetric techniques to ensure the process is optimised, emissions are reduced and energy is used efficiently. Kiln operations are covered by site management systems and various parameters are taken into consideration, such as temperature and pressure, to monitor and maintain smooth and stable operations.
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.	**CC**	Procedures are in place to manage kiln inputs, and to monitor and control any impact on emissions. These procedures are part of the Quality Management System which is certified to ISO9001. The local sourcing of natural raw materials places a constraint on choice. There are specific management procedures in place relating to the use of waste materials. The consideration of new materials includes a risk assessment and mass balance to ensure emissions are reduced and managed, including those mentioned in BAT 24 to 28, i.e. TOC, HCl, HF, dioxins and metals.
5	BAT is to carry out monitoring and measurement 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	**CC**	a. all appropriate process parameters are measured and used for kiln control and to demonstrate stability, including temperature, pressure, oxygen and flow rate. Primary and total airflows are also monitored and checked via internal balances/audits.

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	not available, ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality, including the following: a. Continuous measurements of process parameters demonstrating the process stability, such as temperature, O_2 content, pressure and flowrate. b. Monitoring and stabilising critical process parameters, i.e. homogenous raw material mix and fuel feed, regular dosage and excess oxygen c. Continuous measurements of NH_3 emissions when SNCR is applied d. Continuous measurements of dust, NOx , SOx , and CO emissions e. Periodic measurements of PCDD/F and metal emissions f. Continuous or periodic measurements of HCl, HF and TOC emissions. g. Continuous or periodic measurements of dust	**CC/FC by 2017**	b. Consistent quality control procedures are applied to ensure homogenous raw material mix by the use of performance monitoring against targets for each process stage. Feed and fuels are controlled and delivered via calibrated feed devices. HCL sample and test all raw materials and fuels to ensure they meet the relevant specification. Excess oxygen is monitored and checked. c. Ammonia is continuously monitored, as a permit requirement. d. Dust, NOx, SOx, and CO emissions are all measured continuously using MCERTS-certified analysers which are calibrated to the CEN standard BS EN14181 by an accredited testing organisation. Ongoing Continuous Emissions Monitoring (CEM) quality control is provided by the plants trained and competent personnel following the QAL 3 requirements of BS EN 14181. e. PCDD/F and metal emissions are sampled 6 monthly, in accordance with permit requirements. Testing is performed by an accredited testing organisation, employing certified engineers in accordance with ISO 17025. f. TOC and HCl are continuously monitored and HF is periodically measured, in accordance with permit requirements. These are carried out as detailed above in d and e. g. Dust emissions from the clinker coolers, cement mills and coal mills are all monitored continuously. We are changing the compliance monitoring requirement for dust from the cement and coal mills from continuous to periodic. **See Key Issues section 2b for the details.** Other dust emissions are either periodically tested, receive indicative monitoring or have a maintenance management system. The monitoring requirements set in the permit will ensure that HCL are compliant. Techniques d (except for CO), e, and f are all requirements of the current permit and ensure compliance with chapter IV of the IED.
6	In order to reduce energy consumption, BAT is to use a dry process kiln with multistage preheating and precalcination.	**NA**	This BAT conclusion is applicable to new plants and major upgrades. The kilns were installed in the early 1970s and each have a multistage cyclone preheater, but no calciner.

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7	In order to reduce/minimise thermal energy consumption, BAT is to use a combination of the listed techniques.	**CC**	HCL utilise a number of the listed techniques to minimise energy consumption. Each kiln has a preheater (no calciner) and operation is optimised to ensure effective preheating of the raw meal feed. A modern PLC system is employed to monitor and control operations, including the gravimetric solid fuel feeding systems. All hot air from the kin cooling zone is used in the kiln, and cooled exit gases, via the preheater, are used for raw material drying in the raw mill. Bypass flows are minimised as HCL do not operate a bypass system.
8	In order to reduce primary energy consumption, BAT is to consider the reduction of the clinker content of cement and cement products.	**CC**	HCL carry out clinker substitution in accordance with the relevant limits set by European standards. The materials are added at the cement grinding stage and quality assurance measures are in place.
9	In order to reduce primary energy consumption, BAT is to consider cogeneration/combined heat and power plants.	**CC**	HCL has considered co-generation and CHP options, including the possibility of utilising waste heat from the clinker-making process to generate electricity. As yet none have been identified as being viable, however options remain under review.
10	In order to reduce/minimise electrical energy consumption, BAT is to use one or a combination of the listed techniques.	**CC**	HCL employ a number of techniques to reduce/minimise electrical energy usage, including power management systems and monitoring (such as condition based monitoring which identify adverse trends). Grinding & electricity based equipment is designed, operated and maintained to be as energy efficient as possible, using proven industry methodologies. Process control is maintained & optimised by a dedicated on site team who focus on energy efficiency throughout the operation.
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: - Apply QA systems to guarantee the characteristics of wastes and to analyse any waste that is to be used as a raw material or fuel for constant quality, physical criteria, chemical criteria	**CC**	HCL provided information (1 Feb 2017) demonstrating compliance with BATC 11 techniques. Waste materials used at the site have to meet a defined specification, for example <2% Cl and <2%S. Procedures are in place to ensure waste is tested before use of material commences (to fully characterise the waste) and on an ongoing routine basis to ensure compliance with specification.

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	- Control the amount of relevant parameters for any waste that is to be used as raw material or fuel - Apply QA systems for each waste load.		
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.	**CC**	The relevant listed BAT techniques are all employed by HCL. These techniques are requirements of IED ch IV and compliance is achieved through the EPR permit conditions. Note that 12 d) does not apply; Hope does not burn hazardous waste with a content >1% of halogenated organic substances. Local procedures are in place to ensure waste materials are fed consistently and the kiln is operated in such a way that gases resulting from the use of wastes are managed and controlled even during unstable kiln conditions. Specific procedures are implemented detailing actions to be taken for the start-up or shut-down of the feed of waste materials to the kiln in these conditions, during planned and unplanned kiln shut-downs and start-ups.
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.	**CC**	There is only one hazardous waste material used at Hope Works, as a raw material; no hazardous waste is used as a fuel. Safety management is employed; a risk assessment for the material was carried out. Going forward, the introduction of any hazardous materials will be covered by the MPA Code of Practice for the use of Waste Materials. This includes conducting a detailed risk assessment and ensuring that appropriate controls are identified and implemented. The methods for the labelling of stored hazardous materials, along with the sampling & testing requirements are detailed in written procedures, in compliance with obligations imposed by the Environment Permit and the Greenhouse Gas Permit. All such procedures are implemented through the site's environmental management system.
14	In order to minimise/prevent diffuse dust emissions from dusty operations, BAT is to use one or a combination of the listed techniques.	**CC**	HCL employ a number of BAT techniques to minimise and prevent emissions from dusty operations, including; • enclosure of dusty operations and conveyors/elevators, • dust filters to minimise fugitive releases, • maintenance systems to minimise air leakages and spillages,

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			• cleaning regimes, • loading of powder materials via enclosed systems.
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.	**CC**	HCL use a combination of BAT techniques to minimise and prevent dust releases from bulk storage areas, such as storage of materials in buildings or bays, paved main roads with regular cleaning, and use of water sprays on stockpiles, paved and unmade roads.
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. BAT-AEL <10 mg/Nm^3	**CC**	Fabric filters are applied to channelled dust emissions such as powder silos, large crushers, and coal mills, and are subject to both inspection and maintenance regimes. Regular inspections are carried out on the external aspects of the filters with an internal inspection and performance report at least annually. These inspections are used to define maintenance plans to ensure satisfactory performance of the filtration system. There is no statement that all channelled dust emissions are currently compliant with the BAT-AEL however the operator states that replacement filters are designed to perform to <10mg/Nm^3. A list of 157 dust emission points was supplied with the response to the RFI, with 149 of these <10,000Nm^3/hr ie small sources. The 8 which are >10,000Nm^3/hr are listed in the permit already and are subject to BATcs 17 and 18; there are no new emission points to be listed individually. **Refer to Key Issues section 1a below.**
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. BAT-AEL <10-20 mg/Nm^3 (daily average)	**CC**	Fabric filters are installed on both kiln systems, routinely achieving an average <5 mg/Nm^3 daily average, which is below the BAT-AEL for dust from kiln-firing processes of 10 mg/Nm^3. The BAT-AEL is now included as a limit in the permit for these emission points (A1 and A2), applied from the compliance date of 9 April 2017, and the current ELV of 30 mg/Nm^3 will apply until then.
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.	**CC**	Electrostatic precipitators are installed on both clinker coolers, routinely achieving an average <10 mg/Nm^3 daily average, which is below the BAT-AEL of 20 mg/Nm^3 for dust from cooling and milling processes. The BAT-AEL is now included as a limit in

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	BAT-AEL <10-20 mg/Nm^3 (daily average or periodic)		the permit for these emission points (A3 and A4), applied from the compliance date of 9 April 2017, and the current ELV of 45 mg/Nm^3 will apply until then. Fabric filters are installed on the two cement mills and two coal mills, routinely achieving an average <10 mg/Nm^3 daily average, which is below the BAT-AEL for dust from cooling and milling processes of 10 mg/Nm^3. The BAT-AEL is now included as a limit in the permit for these emission points (A5 – A8), applied from the compliance date of 9 April 2017, and the current ELV of 40 mg/Nm^3 for the cement mills and 20 mg/Nm^3 for the coal mills will apply until then.
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 listed techniques. BAT-AEL (preheater kilns) <200-450 mg/Nm^3 (daily average)	**CC**	Two listed techniques for NOx reduction are applied at Hope works: process optimisation (a primary technique) and selective non-catalytic reduction (SNCR). In June 2014, the NOx ELV was reduced from 800 mg/m^3 to 500 mg/m^3 to comply with the requirements of ch IV of the IED. NOx emissions are controlled by SNCR through dosing of aqueous ammonia and HCL are compliant with the 500 mg/Nm^3 limit. The NOx emissions after primary techniques alone (ie without SNCR) have been measured as >1000 mg/Nm^3, (typically c1500 mg/Nm^3 on kiln 1 and 1870 mg/Nm^3 on kiln 2. Consequently the BAT-AEL for both kilns is 500mg/Nm^3 as prescribed by the footnote to table 2 in section 1.2.6.1 (BATC 19). The ELV for NOx will therefore remain 500 mg/Nm^3 after the compliance date.
20	When SNCR is used, BAT is to achieve efficient NOx reduction, while keeping the ammonia slip as low as possible, by using the listed technique. Ammonia slip BAT-AEL <30-50 mg/Nm^3 (daily average)	**CC**	SNCR is used at Hope works to control NOx emissions to <500mg/m^3. The BAT-AEL for ammonia slip is <30-50 mg/Nm^3 when SNCR is applied. A trial was conducted in Nov 2014 to establish NH_3 and NOx emissions without SNCR operating. The results of the trial have been presented as part of the Reg 60 Notice submission and indicate that there is not a significant degree of ammonia slip (unreacted ammonia in the kiln emissions) and it is within the BAT-AEL. HCL propose that this figure is added to the calculated background ammonia concentration to establish an appropriate ELV, and their submission proposed a daily average ELV of 110mg/m^3. This is not accepted as the proposal does not assess

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			environmental impact of ammonia emissions at this level on the nearby sensitive ecological receptors in the vicinity of the works. Consequently no ammonia ELV is included in the permit and an improvement condition IP13 is set for the operator to propose an ELV and conduct an impact assessment of emissions at the ELV on nearby sensitive ecological sites. **Refer to Key Issues/Annex 3 section for more details.**
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 listed techniques. BAT-AEL <50-400 mg/Nm^3	**NC**	Emissions of SOx from the kilns are above the BAT-AEL of <50-400 mg/Nm^3 due to the levels of pyritic sulphur in their locally quarried shale. HCL cannot comply with the BAT-AEL and requested a time-limited derogation from the BAT-AEL for SOx until 31 March 2019. The derogation request has been considered in detail by the EA and accepted. The current ELV of 1760 mg/Nm^3 will reduce to 850 mg/Nm^3 on the compliance date, and then will reduce further to 400 mg/Nm^3 on 1 April 2019. **For details, refer Annex 2: Assessment, determination and decision where an application for Derogation from BAT Conclusions with achievable emission levels (AEL) has been requested.**
22	In order to reduce SO_2 emissions from the kiln, BAT is to optimise the raw milling processes. (no BAT-AEL)	**CC**	HCL operate and manage their raw mills to provide some SO_2 abatement using the techniques listed. Raw material moisture content and mill temperature are monitored, and mill performance controlled to optimise the process and ensure quality of raw meal production. The mills are, however, only operated for around 85% of the kiln operating time, due to demand and maintenance requirements, so continual abatement is not possible. Note also, that the abatement provided by the mills is not sufficient to provide for compliance with BATC21.
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. (no BAT-AEL)	**CC**	HCL has ESPs only on the clinker coolers. ESP downtime is minimised through the optimisation of the operation and the control of the combustion process, organic content of raw materials and quality of fuels and the fuel feeding. There have been no CO trips at Hope Cement Works in the past 15 years.

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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. no BAT-AEL	**CC**	A risk assessment process is in place to assess whether new alternative raw materials (waste derived) would affect TOC emissions. Quality control procedures are in place to manage kiln inputs, and to monitor and control any impact on emissions, including those of TOC. These procedures are managed as part of the QMS, which is certified to ISO9001. There is no BAT-AEL for emissions of TOC. These are covered by IED Annex VI, which gives an ELV of 10 mg/Nm^3 and states that the competent authority may grant derogations from this ELV where TOC emissions do not result from the co-incineration of waste. This has been the case for Hope works, whose ELV has been 150 mg/Nm^3 since WID was implemented in Nov 2005. This ELV allows generous head room and so we are reducing the ELV from 9 April 2017 (to be consistent with other limit changes) to 120 mg/Nm^3 with the consent of the Operator. **Refer Annex 5 for more details.**
25	In order to 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. BAT-AEL <10 mg/Nm^3	**CC**	Raw materials and fuels are sampled and analysed to ensure that the chlorine content does not exceed the specification and to ensure that the chemical balance entering the kiln is appropriate. Coal and waste derived fuels are used, with a specification for each fuel. Chlorine content is managed and controlled through an EMS procedure. Emissions of HCl are continuously monitored, and HCL are compliant with the BAT-AEL of 10mg/Nm^3, which is the current permit limit. This limit is 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.	**CC**	The same controls are in place for Fluorine and HF emissions as for Chlorine and HCl – see assessment against BATC 25. Emissions of HF are periodically monitored, and HCL are compliant with the BAT-AEL of 1mg/m^3, which is the current permit limit.
27	In order to prevent emissions of PCDD/F or to keep the emissions of PCDD/F from the flue-	**FC by 2017**	General primary techniques are applied; kiln inputs, both raw materials and fuels, and notably for Cl, are monitored and controlled, chlorine cycles are monitored, and waste fuels are not burnt during start-up or shutdown.

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	gases of the kiln firing processes low, BAT is to use one or a combination of the listed techniques.		The BAT-AEL of 0.1ng/m^3 is the current permit limit. Contrary to the statement made in the initial Reg60 Notice submission, compliance with the PCDD/F limit has not been consistent. Because of this, HCL have worked to ensure that BAT techniques are in place to minimise PCDD/F emissions. A significant investigation has been initiated to understand the source and origins of the PCDD/F in Hope's emissions, in order to identify management controls and appropriate abatement techniques. It is likely that temperature management and use of activated carbon will be identified as the appropriate control techniques. HCL state that consistent compliance with the BAT-AEL will be achieved as a result of the implementation of the agreed controls and abatement techniques.
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.	**FC by 2017**	Emissions of metals are minimised through several techniques; kiln inputs are monitored and controlled, and waste materials are subject to screening and monitoring of trace elements. Effective dust removal from emissions is also in place. Despite this, HCL have had exceedances of their metals limits, notably that for Cadmium and Thallium. The investigation into PCDD/F emissions (see BATC 27) has also considered Group II metals (Cd & Tl) in order to manage accumulation in the kiln process. HCL state that compliance with the BAT-AEL for Grp II Metals will be consistent as a result of the implementation of agreed controls and abatement techniques. The BAT-AELs for other metals (mercury, Group III metals) are already in the permit as limits and compliance is in place.
29	In order to reduce solid waste from the cement manufacturing process along with raw material savings, BAT is to: - reuse collected dusts within the process, wherever practicable - utilise these dusts in other commercial products, when possible	**CC**	HCL does not produce any excess dusts. The kilns do not have bypasses. Any material produced within the process is generally reused within the process.

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30-69	BAT Conclusions that are not applicable to this installation	**NA**	BAT Conclusions 30 – 54 inclusive are not applicable as they apply to lime industry only. BAT Conclusions 55 – 69 inclusive are not applicable as they apply to the magnesium oxide industry only.

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^3/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^3/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 16 - 28

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:

Parameter	**ELVs (mg/Nm^3)**		
Kiln emissions (permit table S3.1):	**Previously: Variation V003**	**New Limit: (Variation V004)**	**BAT-AEL mg/Nm^3**
Dust (fabric filter)	30	**10**	<10
NOx	500	500	<200 – 450 (500)
CO	2,200	2,200	-
SOx	1,760	850 then 400	<50 - 400
Ammonia slip	-	TBA	<30 - 50
TOC	150	**120**	-
HCl, HF	10, 1	10, 1	<10, <1
Metals – Gp I, II	0.05	0.05	<0.05
Metals – Gp III	0.5	0.5	<0.5
Dioxin & furans PCDD/F	0.1	0.1ng/Nm^3	<0.05-0.1 ng/Nm^3
BATC 16, 17 Non-kiln dust emissions (permit table S3.2):			
Clinker coolers A3, A4 (ESPs)	45	**20** (daily avg)	<20 (daily avg or avg over sampling period)
Cement mills A5, A6 (bag filters)	40	**10 (avg over sampling period)**	<10 (daily avg or avg over sampling period)

Coal mills A7, A8 (bag filters)	20	**10 (avg over sampling period)**	<10 (daily avg or avg over sampling period)
All other channelled dust emissions abated by filters (<10,000Nm^3/hr)	No previous limit	**10**	<10
Vents on ammonia system	No previous limit	No limit set	-

a. Dust limits (BATCs 16, 17, 18):
HCL supplied a list (received 9 June 2016) of 157 channelled dust emissions of which 8 are >10,000Nm^3/hr and already listed in the permit. There are therefore no new dust emission sources to be listed in the permit as a result of the permit review.

BATC16: 149 emissions of the 157 listed are <10,000Nm^3/hr, and therefore deemed "small source" emissions by the BAT Conclusions; most are abated with fabric filters. The abated emissions are now included in the permit as a new emission group "*all other channelled dust emissions abated by filters*" and the BAT-AEL is applied as a dust limit of 10 mg/Nm^3 (in accordance with BATC 16). **See also p14, BATc 16.**

BATCs 17 and 18 contain a composite BAT-AEL: <10 – 20 mg/Nm^3, with a footnote "*when applying fabric filters or new or upgraded ESPs, the lower level is achieved"*. In line with this, we have applied a limit of 10mg/Nm^3 to emissions from kilns, coolers and mills which are abated by bag filters, and a limit of 20mg/Nm^3 to such emissions abated by (existing) ESPs.

BATC17: kiln emissions, at A1 and A2, are abated by bag filters so the dust limits are reduced from 30 to 10 mg/Nm^3. Historic monitoring results indicate that the emissions will comply with the new limit. **See also p15**

BATC18 (see also p15): clinker cooler emissions, at A3 and A4, are abated by electrostatic precipitators so the dust limits are reduced from 45 to 20 mg/Nm^3. Historic monitoring results indicate that the emissions will comply with the new limit.

Cement mill emissions, at A5 and A6, are abated by bag filters so the dust limits are reduced from 40 to 10 mg/Nm^3. Historic monitoring results indicate that the emissions will comply with the new limit.

Coal mill emissions, at A7 and A8, are abated by bag filters so the dust limits are reduced from 20 to 10 mg/Nm^3. Historic monitoring results indicate that the emissions will comply with the new limit.

All emission limits apply for the specified monitoring reference period – **see section 2 below,** regarding detail of monitoring of these emissions.

b. NOX (BATC 19)
The kilns' NOx emissions after primary techniques alone (ie without SNCR) are >1000mg/Nm^3 and hence the applicable BAT-AEL is 500 mg/Nm^3 in line with the footnote to the BAT-AEL table. There is therefore no change to the NOx limit which is already 500mg/Nm^3. **See also p15**

c. Ammonia (BATC 20)
BATC 20 sets a BAT-AEL for ammonia slip, when using SNCR, of <30 – 50mg/Nm^3 (daily average). A total ammonia limit will be derived using the ammonia slip BAT-AEL added to

background ammonia levels. Although HCL have proposed a limit for total ammonia, a limit cannot be set until it has been demonstrated that emissions at this level would have no significant environmental impact and this has not been done for the proposed limit. An improvement condition has been set (IP13) requiring HCL to propose appropriate limits for each kiln having assessed the environmental impact of ammonia emissions. **See also p16 and Annex 3.**

d. Oxides of Sulphur SOx (BATC 21)
Emissions of SOx from the kilns have been typically above the BAT-AEL and HCL requested a time limited derogation from this BAT-AEL. **Refer Annex 2**

e. CO (BATC 23)
BATC 23 does not set a BAT-AEL for emissions of CO. We have reviewed historic monitoring which indicates that CO emissions have occasionally risen and that there is no headroom to reduce this limit. The existing limit for CO of 2,200mg/Nm^3 is retained.

f. TOC (BATC 24):
There is no BAT-AEL for TOC; instead IED Annex VI applies. We have reduced the TOC limit, **refer Annex 5 section 5**.

All other kiln parameters (HCl, HF, Gp I, II & III metals and dioxins/furans PCDD/F) have existing limits which are in line with the BAT-AEL, so these limits are retained unchanged.

2. Monitoring: BATC5
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.

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, the frequency of sampling and the expected concentration. 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.

Referring to BATC 5c-g, there are some specific regulatory requirements defined for monitoring of kiln processes, which also fall under IED ch IV and Annex VI as waste is co-incinerated. For non-kiln activities, there are no specific monitoring requirements other than the statement “continuous or periodic” for dust emissions. 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.

a. Kiln parameters - all (BATC 5c, d, e and f):
The type of monitoring (continuous/periodic), the reference period and frequency of monitoring of the kiln emissions are all unchanged from the previous variation for all parameters. As waste fuels are burned, the permit implements the requirements of IED Annex VI and these are in line with the requirements of BATC 5. No changes to kiln monitoring are required in order to comply with the BATCs. The monitoring method is updated to BS EN 14181, which is the required standard for continuously monitored emissions from a co-incinerator.

b. Non-kiln dust (BATC 5g):
We are retaining the requirement for continuous monitoring on the clinker coolers (A3, A4), which are abated by ESPs, as these are significant continual emissions.

BATC 5 allows for continuous or periodic monitoring of dust from non-kiln activities. We are changing the required monitoring on the cement and coal mills from continuous to periodic. The two cement mills (A5, A6) and two coal mills (A7, A8) are all fitted with bag filters. The volumetric releases at A5 – A8 are relatively small (and smaller in size than the regulated lime kilns on which dust is monitored periodically) and consequently pose a lower risk. We are setting a frequency of quarterly for the cement mills which have a larger emission and 6 monthly for the coal mills. The continuous monitors previously used for compliance will now be used indicatively to assess performance of the abatement plant, and establish any performance problems. Environmental protection will be maintained as this variation reduces the ELV for releases from all mills to 10mg/m^3 (from 40 and 20 mg/Nm^3 respectively). Historic monitoring data indicates that emissions will consistently meet the new 10mg/Nm^3 limits, as the results are consistently <5mg/m^3 as a daily average.

The periodic dust monitoring has a reference period of 30 minutes (minimum). This is considered to be an appropriate minimum period for these emissions.

For the "small sources" emission group "*all other channelled dust emissions abated by fabric filters",* we are requiring a performance check based on a maintenance management system, as allowed by BAT 5g. Periodic monitoring is not required to demonstrate compliance with the new 10mg/Nm^3.

Summary of monitoring requirements:

Emission point	Parameter	Type of monitoring	Frequency	Reference period
A1, A2 (kilns)	Dust, NOx, SO_2, CO, TOC, HCl, ammonia	continuous	-	Daily average
	HF	periodic	6 monthly	Min 1 hour
	metals	periodic	6 monthly	Min 30 minutes
	PCDD/F	periodic	6 monthly	6 – 8 hour
A3, A4	particulates	continuous	-	Daily average
A5, A6	particulates	**periodic**	**Quarterly**	**Min 30 minutes**
A7, A8	particulates	**periodic**	**6 monthly**	**Min 30 minutes**
All other abated emission points	particulates	**Maintenance schedule**		

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

c. Table S3.5 Process Monitoring requirements
This table (which was also Table S3.5 in V003) has been updated and a number of parameters added or removed:

- Electricity and water usage removed, as we no longer require these to be reported;
- Raw meal feed rate – condition 2.3.12(c) states a threshold below which WDFs cannot be burned, and it is also a critical process parameter specified in BATC 5b;
- Fuels feed rate – BATC 5b specifies this as a critical process parameter for monitoring;
- Monitoring of oxygen and water vapour at A1 and A2, to standard BS EN 14181, is added, along with temperature and pressure, traceable to national standards, to allow reliable correction of monitoring data to reference conditions.
- At emission points A5, A6, A7 and A8, the indicative use of continuous dust monitors, previously used for compliance purposes, to reflect abatement performance and manage maintenance.

Process waste monitoring requirements
Table S3.6 in V003 has been removed as no process waste dusts are produced at Hope cement works.

Other Monitoring aspects

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 Standard Temperature and Pressure (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 IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

"*By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:*

(a) the geographical location or the local environmental conditions of the installation concerned; or

(b) the technical characteristics of the installation concerned.

The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed."

A summary of any derogation granted is also recorded in an Annex to conditions of the Consolidated Variation Notice, in accordance with the requirement of IED Article 15(4) as described above.

As part of their Regulation 60 Notice response, the operator requested a derogation from compliance with the AEL values included in the following BAT Conclusion;

- from BAT conclusion 21 which sets a BAT-AEL for cement kiln emissions of oxides of sulphur (SOx) of <50 - 400mg/Nm^3 (daily average). The request is time limited, to March 2019, two years beyond the compliance date. The derogation criteria are the geographical location of the works and the local environmental conditions.

Although information was provided in their submission to allow us to commence assessment of the derogation request it was insufficient to enable us to complete the determination and further information was requested and subsequently supplied on:

- 15 July 2015 – revised derogation request report
- 1 October 2015 – response to queries regarding the derogation request

On review and assessment of this information we have decided to grant the derogation requested by the operator in respect to the AEL values described in BAT Conclusion 21, but have included an interim Emission Limit Value in the Consolidated Variation Notice that will ensure suitable protection of the environment.

As part of their response they stated that the reason for their derogation request was:

- To allow sufficient time to progress and complete the planning process for increased shale replacement material import volumes and traffic movements. Submission of the planning application was due to be made in mid-2016, and it is not possible to predict exactly when this process would be completed.

- To allow sufficient time to secure consistent material supplies and remove seasonality vulnerability.

The way in which we have considered, assessed and determined the derogation request is detailed in the section below.

2.1 Overview of the site and installation

Hope Cement Works is located in Derbyshire, within the Peak District National Park, and has two kilns each producing around 2000 tonne per day of cement clinker. The installation operates 24 hours per day, 7 days per week with planned annual shutdowns for maintenance, repair and upgrade work. It is the only cement manufacturing facility owned by Hope Cement Limited and produces around 15% of cement manufactured in the UK.

The main raw materials are limestone (83%) and shale (17%) sourced from on-site quarries. They are mixed together, ground and dried then fed into the kilns where they are heated to around 1450ºC and converted into cement clinker. Fuels including coal, waste tyres and other non-hazardous waste-derived fuels are delivered to site by road and rail. Exhaust gases from the kiln are released to atmosphere via bag filters (which capture dust but not SOx) and a tall stack. The cooled clinker is stored prior to milling with further raw materials such as gypsum, to produce cement which is despatched by road and rail.

The shale quarry only has about 8 years of usable reserves (with no substitution). In 2010 HCL started to use Pulverised Fly Ash (PFA), a waste from coal-fired power stations, as a partial substitute for shale, to extend the life of their shale quarry. The current PFA substitution rate is 5 – 8% of the total raw mix and HCL aim to gradually increase this to around 10%. It is not possible, for quality reasons, to increase this to 17% which would fully substitute shale with PFA.

The shale substitute has low sulphur content so increasing substitution reduces the SOx emissions. There are also other environmental benefits, including reduced emissions of dioxins and furans and recovery of waste PFA.

The environmental disadvantage of importing a shale substitute is the increase in traffic movements, which have already reached the maximum allowed by HCL's current planning permission. At the time of application, HCL was preparing an application for planning permission covering the future working and restoration schemes for both quarries. The permitted tonnage of imported shale replacement and the associated rail and road movements was an element of the application. The pre-submission process was started in 2014 with submission expected in mid-2016 (at the time of the derogation request submission).

2.2 Derogation from BAT conclusion 21

HCL requested one derogation; from BAT conclusion 21 which sets a BAT-AEL for cement kiln oxides of sulphur (SOx) emissions of <50 - 400mg/Nm^3 (daily average). They requested a time limited derogation, to March 2019, two years beyond the compliance date.

The current permit has a SOx emission limit of 1760mg/Nm^3 (daily average) which was based on using shale only. The current level of shale substitution has reduced

emissions to 600-800mg/Nm^3 so HCL have proposed a limit of 850 mg/Nm^3 for the 2 years duration of the derogation.

Increasing the substitution of shale will benefit HCL by increasing the life of their remaining shale reserves and benefit the environment by decreasing SOx emissions to below the BAT-AEL.

2.2.1 Derogation criteria

The request is based on geographical location and local environmental conditions.

The geographical location is related to the use of shale from a local quarry, which is high in pyritic sulphur and is the cause of the high SOx emissions from the kilns. The quarry only has limited reserves, so in 2010 HCL started to use Pulverised Fly Ash (PFA), as a partial substitute for shale, to extend the life of the quarry. PFA has low sulphur content, so substituting with PFA has the added benefit of reducing SOx emissions.

The local environmental conditions are related to the installation being within the Peak District National Park, so obtaining changes to planning permission takes longer than would otherwise be the case. Transporting a shale substitute to the site has increased the number of rail and road movements to the maximum allowed by their current planning permission. HCL have requested a 2 year derogation to give them time to obtain planning permission then install the equipment needed to transport and store increased quantities of a shale substitute.

2.2.2 Options considered

The BAT conclusions identify three techniques to reduce/minimise emissions of SOx in kiln flue gases. The primary technique is to select appropriate raw materials and fuels and the two abatement techniques are to use a wet scrubber or absorbent addition. All 3 techniques have been considered, along with the additional option of temporarily shutting down 1 or both kilns for 2 years as an alternative to being granted a 2 year derogation.

<u>Primary technique – selection of appropriate raw materials and fuels</u>
Any sulphur in the fuels is burnt to form SO_2 (which is acidic) and is absorbed by the hot calcined material inside the kiln (which is alkaline), so the sulphur in fuels largely ends up in the cement product. Using a low sulphur fuel will therefore have little benefit in terms of reducing SOx emissions.

Sulphur in raw materials, notably the shale, breaks down in the top of the pre-heater soon after the raw materials enter the kiln, releasing SOx. The SOx is not absorbed at this stage because the materials inside the kin are below the calcination temperature, so the sulphur in the shale largely ends up as SOx in the exhaust gases which are released to atmosphere.

In 2010 HCL started to use an imported waste material as a partial substitute for shale, to extend the life of their shale quarry. The material has a low sulphur content so substituting it for shale has the benefit of reducing SOx emissions. The current permit has a SOx emission limit of 1760mg/Nm^3 (daily average) which was based on using shale only. The current level of substitution has reduced emissions to 600-800mg/Nm^3 so HCL have proposed a limit of 850 mg/Nm^3 for the duration of the derogation. HCL intend to increase substitution further to extend the life of their shale quarry which will result in the SOx emissions falling below the BAT-AEL. This

is their preferred option, as it is in HCL's business plan and will go ahead providing planning permission is given.

Wet Scrubber

The wet scrubber is the most commonly used technique for coal-fired power station flue-gas desulphurisation, and it is an established technique for cement manufacturing, being employed at two UK cement works. Wet scrubbing systems provide the highest removal efficiencies for soluble acid gases, achieving up to a 95% reduction in SO_2, and can cope with high SO_2 input. They have the lowest solid waste production rate, and reductions in emissions of HCl, dust, metals and NH_3 are also achieved. For a cement works with an unlimited supply of (high sulphur) shale, this is likely to be the preferred option to achieve significant and reliable reductions in SO_2 emissions. HCL presented a justification for installing two wet scrubbers, one for each kiln.

Absorbent Addition

Lime can be dosed into the exhaust gases to absorb SO_2. It is a proven technology used at a number of European cement works and is suitable for modest SO_2 reductions. HCL already undertake lime injection to reduce hydrogen chloride (HCl) emissions but they have rejected this as an option for meeting the SOx BAT-AEL as they have observed that lime dosing has little effect on SO_2 emissions because the lime preferentially absorbs the HCl. HCL believe that the technique would not provide guaranteed compliance with the BAT-AEL under all plant operating conditions especially if there were periods of high pyritic sulphur input. We agree with their reasons for rejecting this option.

Activated Carbon

There is one further technique which has not been considered by HCL; the use of Activated Carbon for control of SO_2 emissions. This is described in the BREF but is not listed as an option under BAT21. The technique is only used at one plant in Europe and the BREF does not include a great deal of data. We decided that this is not a proven technology so we would not require HCL to consider it.

Temporary closure of both kilns

Because HCL requested a time limited derogation, we have considered the scenario of stopping cement production for the period of the derogation request (two years) as a comparative option within the CBA. The costs include importation of an equivalent quantity of cement, instead of making it. We appreciate that this is not a realistic scenario, however it is included for comparison and perspective. Importing the equivalent quantity of cement, instead of making it, would also require planning permission. Hope's cement is high quality and a distinct colour, and it may not be possible to purchase a substitute to import on the open market.

Option 4 – Temporary closure of one kiln

Mothballing one kiln would allow the partial substitution rate to be increased on the other kiln to a level which would allow the SO_2 emissions to consistently meet the BAT-AEL. Again this option is a theoretical possibility, included for perspective and not considered a realistic scenario.

2.2.4 Environmental benefits (damage costs)

We have used actual emissions to calculate the environmental benefit, as follows:

	Actual/expected SO_2 emissions (mg/Nm^3)	Estimated annual mass SO_2 emission (tonnes)
Current	600 – 800	2030
Operation with wet scrubber	50	150
Operation with shale substitution at 10% PFA	250 - 350	870

Granting the derogation would mean an additional emission of 2030- 870 = 1160 tonnes of SO_2 each year for 2 years from April 2017 to March 2019.

2.2.5 Environmental consequences of allowing a derogation

We have reviewed the modelling carried out for Hope Works in 2011 and agree with their conclusions that the predicted maximum SO_2 concentrations for all scenarios are well below the relevant Air Quality Standards (AQSs) for protection of human health and will not result in any exceedances.

The background SO_2 concentration has reduced since the modelling report was written. We calculated the maximum Predicted Environmental Concentration (PEC) and compared it to the relevant AQSs. For all scenarios the PEC is less than the AQS and therefore we can conclude, as per our guidance, that there will be no adverse effect from the SO_2 emissions continuing at current levels.

The results show that there will only be a small improvement in PEC by achieving the BAT-AEL compared to the current emissions.

There are no Air Quality Management Areas for SO_2 in the area and there are no Short Term EALs for protection of vegetation.

It should be noted that compliance with the BAT-AEL through installation of wet scrubbers would have a number of indirect environmental impacts, including:

- Increased water consumption
- Increased power consumption (plant operation and reheating exit gases)
- Visible plume from the tall stack
- Visible infrastructure
- Increase in CO_2 emissions (both direct, from the desulphurisation reaction, and indirect, increased energy use)

The scrubbers would only be required until planning approval is given and PFA import infrastructure is installed, when they would become redundant. This would create “waste” plant.

The main environmental impact associated with the increased import of a shale substitute is the rise in road and/or rail import traffic into Hope Works. This is a land-use planning issue to be considered by the Peak District National Park Authority.

The increased use of PFA instead of shale has the potential to reduce emissions of dioxins and furans which are formed during the combustion of organic materials present in the shale.

2.2.6 Biodiversity, Heritage, Landscape and Nature Conservation Habitats

The assessment of the environmental impact of SO_2 emissions against the long term Environmental Action Level (EAL) for the protection of ecosystems is important because the Hope works is close to numerous conservation sites.

The modelling based on the 2010 emissions predicted that emissions will not cause damage at any of the nearby conservation sites. Therefore continuing to emit at the lower current levels will not result in environmental harm.

The emissions of SO_2 will not affect any sites of heritage, landscape or nature conservation, and/or protected species or habitat.

The HCL modelling also makes an assessment of acid deposition from the installation. The data indicates that the installation will not result in acidification of identified nature conservation sites.

Summary – Environmental consequences

If we grant the derogation request the environmental impacts of the additional emissions of SO_2 over a two year period are not significant and are not predicted to cause an impact. Air dispersion modelling indicates that even at 2010 emission levels, SO_2 was not having an impact on local air quality or nearby nature conservation sites. Overall emissions of SO_2 have reduced since 2010 due to the introduction of PFA as a shale substitute.

2.2.7 Cost Benefit Analysis

HCL provided detailed costs for the derogation case and the installation of wet scrubbers. They calculated a Present Value and an equivalent annual cost for these two options, along with the cost of damage based on the ELVs (present, proposed and BAT-AEL).

We used their costs within the CBA tool to calculate an Net PV, based on actual emissions to quantify the environmental benefit of SO_2 reduction achieved with each option, as current emissions are significantly below the present permit ELV. We consider this to be more realistic than HCLs approach of using the ELVs.

Rank	CBA scenarios	Description	NPV
1	Option 1	Increase partial substitution rate **(Derogation case)**	**-£0.0M**
2	Option 2	Install wet scrubbers (includes increase substitution rate) **BAT-AEL**	**-£30.7M**
3	Option 5	Install wet scrubbers, no increase in substitution rate	**-£37.2M**
4	Option 4	Closure of one kiln for 2 years	**-£59.0M**
5	Option 3	Closure of both kilns for 2 years	**-£114.0M**

Note that the CBA tool uses the derogation option as the baseline against which to compare all other options. This is because it is what the company is intending to do without any regulatory intervention. The result of this is that the NPV of the derogation option is always zero and the NPVs of all the other options are relative to zero.

Option 1, which is the Operator's preferred option, clearly has the highest NPV and this supports their case for a derogation. The significant negative NPV associated with the BAT-AEL option of installing scrubbers (-£30.7M) demonstrates that this is disproportionately costly compared with the derogation case.

2.2.8 Conclusion for BAT conclusion 21 derogation assessment

We have reviewed the derogation request and concluded:

- HCL have demonstrated that their derogation request is based on their geographical location and local environmental conditions. They are the only cement producer located in a National Park which gives them unique constraints on their operations and increases the time taken to implement new developments.

- HCL are part-way through implementing a plan to replace shale with an imported substitute. Whilst this plan is primarily driven by business need, it has the added environmental benefit of reducing SOx emissions. We accept their argument that increased substitution will achieve compliance with the BAT-AEL. They have requested a 2 year derogation to give them time to obtain planning permission then install the equipment needed to transport and store increased quantities of shale substitute.

- HCL have considered all of the techniques for meeting the BAT-AEL that are described in the BAT Conclusions: installing wet scrubbers; temporary closure of one or both cement kilns; and absorbent addition. They presented a Cost Benefit Analysis (CBA) which we have assessed and modified to use our latest template – which allocates a Net Present Value of zero to the derogation option chosen by the operator. The other options have NPVs in the range of -£30.7M to -£114M. Granting the derogation is the best option with the highest NPV and we consider the costs of the other options to be disproportionate to the environmental benefits. The actual costs of the derogation option are a capex of £1.35m and opex of £0.04M per annum.

- Air dispersion modelling has confirmed that the current level of SO_2 emissions do not cause any exceedances of Air Quality Standards set for the protection of human health and the environment. These emission levels will be maintained throughout the 2 year derogation period then emissions will fall to below the BAT-AEL from April 2019.

We have granted the derogation requested by the Operator in respect to the BAT AEL value described in BAT 21, subject to the following conditions in the variation:

- Set an interim ELV of 850 mg/Nm^3 for the period of the derogation
- Set an improvement condition to provide progress reports towards meeting BAT21:

The operator shall submit a report to the Environment Agency (for approval in writing) detailing progress towards compliance with BAT conclusion 21, which sets a BAT-AEL for cement kiln oxides of sulphur (SOx) emissions of <50-400mg/Nm^3 (daily average), for which a derogation has been requested and granted. The report shall include, but not be limited to, the following: 1. current performance against the BAT-AEL; 2. progress towards achieving planning permission and installing the necessary infrastructure for increasing shale substitution by PFA or other alternative; 3. any alterations to the initial plan, together with proposals for amended timescales; 4. the level of substitution of PFA or other alternative achieved at the time of report submission.	Progress reports by: 30/04/17 30/09/17 31/03/18 30/09/18

The permit also includes an improvement condition to do further environmental impact assessment work for all kiln emissions, which may require an In Combination assessment. This is required following work at site to increase the capacity of the kilns. We will use the data produced for an appropriate assessment, for agreement with Natural England.

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 consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These improvement conditions are set out below - justifications for them is provided at the relevant section of the decision document (Annex 1 or Annex 2).

We also consider that we need to set improvement conditions relating to changes in the permit not arising from the review of compliance with BAT conclusions. The justifications for these are provided in Annex 5 of this decision document.

If the consolidated permit contains existing improvement conditions that are not yet complete or the opportunity has been taken to delete completed improvement conditions then the numbering in the table below will not be consecutive as these are only the improvement conditions arising from this permit variation.

Completed Improvement conditions:
The following table lists the improvements conditions deemed complete which are being removed from the permit. The permit now contains improvement conditions commencing at number IP13.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IP01	The operator shall carry out a technical evaluation of the burning of PSP as a waste derived fuel in kilns L1 and L2 The technical evaluation programme shall comply with the requirements of the "Technical Evaluation of the burning of PSP as a Cement Kiln Fuel - Hope Works" document produced by the Environment Agency.	Complete
IP02	The operator shall submit a written report for approval by the Environment Agency on the technical evaluation of the burning of PSP as a waste derived fuel in kilns L1 and L2. The report shall explain how the use of PSP on a permanent basis at the levels used during the evaluation represents the use of Best Available Techniques. It will also include an assessment of the environmental performance of the kilns while burning PSP and a comparison of emissions with and without using PSP. Data obtained during routine operation prior to the evaluation, or in previous technical evaluations of other waste derived fuels in the same kiln may be included for comparison.	Complete
IP03	The operator shall produce and submit a project plan setting out how releases of SO_2 in the exhaust gases from kilns L1 and L2 will be minimised and at least reduced to < 400 mg/m^3 as a daily average by the target date of 30 June 2015. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	Complete
IP04	The operator shall produce and submit a project plan setting out how releases of NO_x in the exhaust gases from kilns L1 and L2 will be minimised and at least reduced to <500 mg/m^3 as a daily average by the target date of 30 June 2014. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	Complete
IP06	The operator shall produce and submit a project plan setting out how releases of particulates in the exhaust gases from the kilns will be minimised and at least reduced to <10 - 20 mg/m^3 as a daily average by the target date of 30 June 2014. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	Complete

IP07	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 - 20 mg/m^3 as a daily average by the target date of 30 June 2014. The plan will have a prioritised approach for reducing particulate releases from these sources. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	Complete
IP09	The operator shall carry out a technical evaluation of the burning of tyre fluff as a waste derived fuel in kilns L1 and L2 The technical evaluation programme shall comply with the requirements of the "Technical Evaluation of the burning of Tyre Fluff as a Cement Kiln Fuel - Hope Works" document produced by the Environment Agency, dated 28/10/11 or otherwise agreed in writing with the Environment Agency. The technical evaluation shall be carried out as soon as possible following the first use of the fuel on the kiln after allowing a short period to optimise process conditions and reach stability. The technical evaluation must be completed within six months from the first use of the fuel.	Complete
IP10	The operator shall submit a written report for approval by the Environment Agency on the technical evaluation of the burning of tyre fluff as a waste derived fuel in kilns L1 and L2. The report shall explain how the use of tyre fluff on a permanent basis at the levels used during the evaluation represents the use of Best Available Techniques. It will also include an assessment of the environmental performance of the kilns while burning tyre fluff and a comparison of emissions with and without using tyre fluff. Data obtained during routine operation prior to the evaluation, or in previous technical evaluations of other waste derived fuels in the same kiln may be included for comparison.	Complete
IP11	The Operator shall carry out a technical evaluation of the burning of SWF as a waste derived fuel in cement kilns L1 and L2. The technical evaluation programme as agreed in writing with the Environment Agency, shall be carried out as soon as possible following the first use of the fuel on the kiln after allowing a short period to optimise process conditions and reach stability. The technical evaluation must be completed within six months from the first use of the fuel.	Complete
IP12	The Operator shall submit a written report for approval by the Environment Agency on the technical evaluation of the burning of SWF as a waste derived fuel in cement kilns L1 and L2. The report shall explain how the use of SWF on a permanent basis, at the levels used during the evaluation, represents the use of Best Available Techniques. It will also include an assessment of the environmental performance of the kiln while burning SWF and a comparison of emissions with and without using SWF. Data obtained during routine operation prior to the evaluation, or in previous technical evaluations of other waste derived fuels in the same kiln since December 2005 may be included for comparison.	Complete

Superseded Improvement conditions:
The following are the improvement conditions removed from the permit by the permit review, although these two ICs **are not closed out**. The requirements of these ICs have been superseded:

- For **IP05**, by the need to set an ammonia ELV, as required by BATc 20, requirements of old IC now covered by **IP13**
- For **IP08**, by the proposed increase in capacity of the kilns necessitating a review of the predicted impacts of the installation's emissions, requirements of old IC now covered by **IP14**.

Ref	Detail of IC	Current status
IP05	The operator shall assess and submit a report on the impacts of the ammonia emissions from kilns L1 and L2 stacks, in particular on non-statutory sites such as local wildlife sites, and SSSI's within 2km of the installation and Natura 2000 and Ramsar habitat sites within 10km of the installation. The assessment shall cover both background NH_3 emissions and the maximum ammonia slip when SNCR is optimised for NO_x abatement.	Response received and under assessment by the Environment Agency
IP08	Following the submission of project plans and report required by improvement conditions IP03, IP04 and IP05, the operator shall submit a written report to the Environment Agency for approval. The report shall contain **the results of an appropriate assessment** of the proposed maximum emissions to air from kilns L1 and L2 of substances, capable of causing acidification and eutrophication through wet and dry deposition or by direct exposure, on Natura 2000 sites within 10km of the installation. The assessment methodology shall be agreed in advance in writing by the Environment Agency.	Response received and under assessment by the Environment Agency

New Improvement conditions:

IP13: Ammonia ELV and associated environmental impact assessment
BAT conclusion 20 includes a BAT-AEL for ammonia slip when using SNCR of <30 – 50 mg/Nm^3. We are therefore required to set an ELV for ammonia, which, since slip cannot be measured directly, must be for total ammonia (background plus slip). The operator proposed an ammonia ELV of 110mg/Nm^3 daily average (Appendix 1 of Reg 60 Notice submission). Due to the location of Hope works in the Peak District National Park with a number of sensitive ecological receptors within 10km, the environmental impact of ammonia emissions at this level should be assessed, and demonstrated as having no impact, prior to such a level of emission inserted into the permit. (see also next paragraph for issues with Habitats assessment) Refer also Annex 1 table, BATc 20 and Key Issues.

IP13	The operator shall submit a report to the Environment Agency proposing an Ammonia Emission Limit Value (ELV) for each kiln, for written approval by the Environment Agency. The report shall include the following, as a minimum: • Assessment of ambient (background) ammonia levels. • Assessments of ammonia slip emissions arising from the use of SNCR (selective non-catalytic reduction) operations and at varying operational conditions. • Assessment of impacts (Predicted Environmental Concentrations) at the proposed ELV. The assessment of impacts shall be undertaken using emission rates without confidence correction applied (IED ch IV), and shall be calculated at the maximum production capacity, or any future maximum capacity, if a further increase is planned (in order to ensure that worst case scenario is covered). The assessment shall consider the impacts at discrete receptors, including non-statutory sites such as Local Wildlife sites and SSSIs within 2km and European sites within 10km of the installation. Following the completion of this condition, the Environment Agency will set an ELV for inclusion within table S3.1.	6 months after permit issue

IP14: Environmental impact assessment of emissions

HCL are working to increase the clinker production capacity of the plant, and at the request of the Operator, the permit Introductory Note now states that the capacity is 1.45 million tonnes of clinker per year. This is an increase of 11.5%, over the previous stated capacity of 1.3 million tonnes per year. Air dispersion modelling was last carried out in 2011. We are not confident that the conclusions of this environmental impact assessment hold for operation at the current or planned clinker production capacity, which is >10% of the previous stated capacity.

Full assessment of the impacts of the site's emissions on nearby sensitive ecological receptors has not yet been fully completed and signed off by Natural England, despite considerable work by the Site Inspector (SI), the Operator and Natural England. NE did not agree with the conclusions of the Appendix 11 consultation form submitted by the SI, and identified a number of issues with the modelling work used for the assessment (Bureau Veritas report, dated Nov 2011). NE is of the opinion that an in combination assessment (appendix 12) should be undertaken.

We are therefore setting an improvement condition (IP14) requiring further impact assessment work to be carried out, to be used to undertake an in combination assessment, and if required, an appropriate assessment. This work should use emission rates based on the kilns operating at the planned future maximum capacity.

IP14	The Operator shall submit a report to the Environment Agency, for approval in writing, detailing the findings of an assessment of predicted impacts for emissions to air of all parameters listed in table S3.1. The assessment shall use emission rates which: • Are calculated without confidence correction applied (IED ch IV), • Are based upon maximum clinker production rates (as stated within the introductory note to this notice) or any future maximum capacity, if a further increase is planned. The report shall consider impacts at both peak concentration and discrete receptors, including non-statutory sites such as Local Wildlife sites and SSSIs within 2km and European sites within 10km of the installation, and shall consider nitrogen and acid deposition in addition to the Predicted Environmental Concentrations. Where the impact assessment concludes a likely significant effect, the Operator shall carry out an In Combination assessment. The Environment Agency will use the data produced for an appropriate assessment, for agreement with Natural England, and may change ELVs within table S3.1 and/or impose annual limits following completion of this condition.	6 months after permit issue

IP15: Revalidation of IED chapter IV temperature and residence time requirements

This condition is included to ensure that the requirement of IED ch IV are met following the increase in throughput of the kilns.

IP15	The operator shall submit a report to the Environment Agency demonstrating how the temperature and residence time requirements of Article 50(2) of the IED chapter IV are met while operating at either the current maximum capacity, or any planned future maximum capacity, and under the most unfavourable conditions.	12 months after permit issue

IP16: progress towards achieving BAT-AEL for SOx emissions

Improvement condition 16 is set to report on progress towards meeting the BAT-AEL for SOx emissions, through the period of derogation from BATC 21, for emissions of oxides of sulphur from emission points A1 and A2. Refer also Annex 2.

IP16	The operator shall submit a report to the Environment Agency (for approval in writing) detailing progress towards compliance with BAT conclusion 21, which sets a BAT-AEL for cement kiln oxides of sulphur (SOx) emissions of <50-400mg/Nm^3 (daily average), for which a derogation has been requested and granted. The report shall include, but not be limited to, the following: 1. current performance against the BAT-AEL; 2. progress towards achieving planning permission and installing the necessary infrastructure for increasing shale substitution by PFA or other alternative; 3. any alterations to the initial plan, together with proposals for amended timescales; 4. the level of substitution of PFA or other alternative achieved at the time of report submission.	Progress reports by: 30/04/17 30/09/17 31/03/18 30/09/18

Annex 4: Advertising and Consultation on the draft decision

This section reports on the outcome of the public consultation on our draft decision.

This is an Environment Agency led variation and therefore no application exists for advertising and consultation. We have however advertised our draft decision on https://www.gov.uk/government/publications) in accordance with the Environment Agency's Public Participation Statement on consulting on our draft permit and decision document. This has been carried out because we have decided to grant a derogation as part of this Environment Agency led variation process.

The advertisement of our draft permit and decision document was carried out between 2nd March 2017 and 30th March 2017.

The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our decision is summarised in this Annex. Copies of all consultation response have been placed on the Environment Agency public register.

Summary of responses to our web publication

Response received from
Mineral Products Association
Brief summary of issues raised
1. Inclusion of Fire Prevention Plan conditions 2. Requirement for ongoing monitoring of PCBs and PAHs 3. Changes to Activities listed in Table S1.1 and associated fees 4. Calibration of CEMs at low emission levels
Summary of actions taken or show how this has been covered
1. Fire prevention conditions The requirement to include the FPP condition is in line with the National Environment Agency approach for Installations. As part of this requirement the Environment Agency has included FPP conditions within permits during such permit review. *The FPP condition included within the permit states that the operator will need to produce an FPP when requested to do so by the EA*. The installation both stores waste and utilises various wastes as waste derived fuels. **2. Requirement for ongoing monitoring of PCBs and PAHs** This requirement was implemented as part of the Waste Incineration Directive in order to gather information for on PCBs and PAHs, to which limited data was available. The Waste Incineration Directive was subsequently superseded by the Industrial Emissions Directive, during the consultation of which this specific point was previously raised (16.4). 16.4 - the Regulations laid before Parliament and the National Assembly for Wales are such that PCB and PAH monitoring at the same frequency as the Directive requires for dioxins and furans remains obligatory except where the regulator is satisfied that the requirement can be lowered or dispensed with. Regulators will be expected to consider data already acquired, along with

other information about the operation, in reaching a view on whether to lower or dispense with the requirement in each case.

As the EA has not conducted an assessment of the data that has been collected and as such is not satisfied that the requirement can be lowered or dispensed with. An assessment is planned during the Q1-Q2 (April – September) 2017. This assessment will include collating the acquired data for previous monitoring returns, consider the variability and possible future impacts of differing fuels and raw materials and a comparison to any relevant Environmental standards. The paper produced from this will be subject to consultation with PHE and other relevant regulators.

3. Changes to Activities listed in Table S1.1 and associated fees

The changes in the activity schedules have been done in accordance with changes made to the Environmental Permitting Regulations (2013) to ensure that the permit reflects listed activities in line with the regulations.

Any permit review includes an evaluation of activity references and the relevant costs.

The charge for the site will be made against the current Environment Agency's charging scheme to which all Installation permits are charged against.

4. Compliant calibration of CEMs at low emission levels

The Environment Agency accepts that increasing uncertainties in calibration will result where the normal releases are very low, typically below 5mg/Nm^3. These uncertainties are site specific and dependant on a large number of variables. This impact will be applicable to both kiln and non-kiln sources. Existing guidance on monitoring is available and will apply until such times as is replaced. Any site specific issues relating to accuracy levels being outside the acceptable range can be raised with the local teams. QAL tests will remain a requirement if appropriate to the relevant standard.

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

1. Change of Company Details

This variation changes the company name and registered address, following the purchase of Hope Construction Materials Ltd by the Breedon Group in August 2016. The new company name is Hope Cement Limited. The company registration number, and hence the legal entity, remains unchanged.

2. 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.

3. Permit conditions

Condition 2.3.16

This is a new standard template condition for all sites using waste.

Condition 3.5.5(a) Ammonia confidence levels

A confidence level of 40% for continuous monitoring of ammonia has been set based on guidance from EA monitoring teams. This value could be lower depending on the techniques employed. However, as we gather more information on the continuous monitoring of ammonia on cement works, the % uncertainty figure may be reduced.

Section 3.6 Fire Prevention conditions

Conditions 3.6.1 & 2 are now standard template conditions for all installations that store combustible wastes. New installations storing combustible wastes are required to have an FPP in place. For existing installations, there is no automatic requirement to submit an FPP when a permit is varied or as a result of a permit review, however an FPP will be required under certain conditions, eg if there is a fire at the installation, or a change on site which increases the risk of a fire.

4. Schedule 1 Changes to Table S1.1

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 Hope cement works Table S1.1, specifically:

- Amended the kiln activity description to reflect EPR Sch 1 activity wording,
- Revised the listed activities, to include additional part A(2) and (B) activities,
- Added Directly Associated Activities (DAAs) to ensure that all activities (listed and non-listed) at the installation are included,
- Amended the Limits of Specified Activity for all activities to ensure they are clearly defined,
- Assigned Activity Reference numbers to listed and directly associated activities.

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

Table S1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
AR1, AR2	Section 3.1 Part A(1)(a)	Producing cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other kilns with a production capacity exceeding 50 tonnes per day.	Kilns L1 and L2 From the transport of raw materials and fuels from bulk storage, the preparation (including blending of raw materials listed in table S2.1, in order to produce raw meal) and feeding of all materials into the kiln systems L1 and L2, through to discharge of cooled clinker to the clinker store, and emissions to air from the main stack and other process vents.
AR3	Section 3.1 Part A(2)(a)	Grinding cement clinker	Cement mills CM1 and CM2 The transport of clinker, including imported clinker, from the clinker store and handling of raw materials from bulk storage, through milling in two mills CM1 and CM2, and blending to storage of cement, including emissions to air from the mill stacks and other process vents.
AR4	Section 3.1 Part B(a)	Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.	Storage and dispatch of cement clinker and cement in bulk by road or rail.
	Directly Associated Activity		
AR5	Raw materials storage and handling	Raw materials receipt, transport, preliminary preparation and bulk storage	From the recovery of raw materials from the quarry floors, the crushing, screening and other preparations, and the receipt on site of other raw materials, including alternative raw materials, through to bulk storage.
AR6	Fuels storage and handling	Delivery and bulk storage of fuels	Offloading of waste-derived and fossil fuels, and transfer to bulk storage
AR7	Clinker import	Bulk import of cement clinker by road and rail	Offloading of cement clinker imported to site by road and rail and transfer to the clinker stores.
AR8	Waste storage and handling	Waste storage and handling	From waste generation, storage and monitoring through to dispatch off site.
AR9	Water discharge to controlled waters	Management of site drainage and process water	Collection of surface water drainage, including reuse in site activities, through to discharge to controlled waters.

Listed Activities – producing clinker and grinding clinker:

Until this review, Cement and Lime permits listed the activity Section 3.1 Part A(1)(a) as ***producing and grinding cement clinker*** in accordance with the Environmental Permitting Regulations **2010**, which stated the following:

Part A(1) *(a) Producing cement clinker or producing and grinding cement clinker.*

(b) Producing lime—

(i) in kilns or other furnaces with a production capacity of more than 50 tonnes per day;

or

(ii) if the activity is likely to involve the heating in any 12-month period of 5,000 or more tonnes of calcium carbonate or calcium magnesium carbonate or both in aggregate.

Part A(2) *(a) Unless falling with Part A(1) of this Section, grinding cement clinker.*

(b) Unless falling within Part A(1) of Section 2.1 or 2.2, grinding metallurgical slag in plant with a grinding capacity of more than 250,000 tonnes in any 12-month period.

Part B *(a) Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.*

(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.

Under the EPR 2010, the activity 3.1 **A(2)(a)** covers only the grinding of cement clinker where this is undertaken at a different location from that of clinker production. In 2013, the Regulations were amended and moved the activity of grinding cement clinker to Section 3.1 Part **A(2)(a)** regardless of where the grinding takes place; .

Part A(1) *(a) Producing cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other kilns with a production capacity exceeding 50 tonnes per day.*

(b) Producing lime or magnesium oxide in kilns with a production capacity of more than 50 tonnes per day.

Part A(2) *(a) Grinding cement clinker*

(b) Activities deleted by EPR amendment SI 2013 No. 390.

Part B *(a) Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.*

(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.

In Hope's previous permit, although cement milling was included on a separate row in table S1.1, it was still part of the listed activity S3.1 A(1)(a). Table S1.1 has been revised to reflect the legislative changes; the 3.1A(1)(a) activity covers producing cement clinker only and an additional activity 3.1A(2)(a) has been included to cover all grinding activities.

We are assigning **one** A(2) activity (reference AR3), for clinker grinding at this installation, to cover all cement mills processing clinker manufactured on site and imported. The Regulations do not define capacity or aggregation rules for 3.1A(2)(a) and having consulted EA permitting guidance, including RGN2 Appendix 2, we consider that multiple cement mills do not operate entirely independently and we can therefore regard them as one activity, incurring one part A(2) fee. Regarding each mill as a separate A(2) activity would increase charges per site in a manner disproportionate with the regulatory effort required.

There is however, one 3.1A(1)(a) activity for each kiln with a production capacity above the listed threshold of 500 t/d, which for Hope works is two (activity ref AR1 and AR2).

An additional part B activity is now included (activity AR4) for Storing, loading or unloading cement in bulk following the Regulations' amendment. This covers bulk storage of clinker and cement and loading into road and rail tankers (bulk transport). This activity is not covered by any other activity (listed or directly associated) following amendments to the Regs and is listed as a part B in its own right.

Other changes to Table S1.1:
Previously Tbl S1.1 contained only two DAAs; for cement storage, blending, packing & loading (now a part B activity), and for waste storage and handling. In line with our RGN2 guidance, the following activities have been included as DAAs, in order to ensure all appropriate activities at the installation are covered:

- Raw materials storage and handling,
- Fuels storage and handling (fossil and Waste derived),
- Clinker import,
- Discharge to controlled waters, including drainage and ponds.

We have revised the Limits of Specified Activity descriptions, to ensure that the activities are clearly defined.

5. Schedule 3 Emissions

Table S3.1 TOC ELV:
The BAT conclusions do not include a BAT-AEL for TOC emissions, instead Annex VI of IED applies. This prescribes a limit of 10 mg/Nm^3 and allows for a derogation from this where TOC emissions do not result from the co-incineration of waste. Hope's ELV has been 150 mg/Nm^3 since WID was implemented in Nov 2005. Emissions are typically around 40 mg/Nm^3 (daily average), with peaks of up to 60 mg/Nm^3. With the agreement of the operator, we are reducing the ELV to 120 mg/Nm^3 to remove excessive headroom and move closer to the prescribed limit. A review of reported TOC emission data over recent years indicates that a limit of 120 mg/Nm^3 allows retains satisfactory headroom without jeopardising compliance.

Table S3.3 Emissions to water:
Grid references of the emission points to water are now included, and the monitoring method for pH is updated.

Table S3.4 Annual Limits:
Table S.34 is retained within the permit although no limits are set. Due to the location of Hope cement works, with numerous sensitive ecological receptors nearby, it is likely that annual emission limits will be imposed at a later date, following improvement conditions IP13 and IP14 for environmental impact assessment. Such limits will control total emissions and prevent a creeping increase of emissions beyond the level modelled for impact assessment.

6. Schedule 4 Reporting
The requirement to report monitoring of emissions to water has been included, following an incident in 2013 involving low pH in the surface water ponds. This reporting requirement should be reviewed at the next variation.

7. Schedule 6 Interpretation

Schedule 6 has been revised to remove interpretations which are no longer relevant, amend existing and introduce new ones. The monitoring reference conditions are updated in line with the BAT conclusions (refer Key Issues section)

Chapter IV abnormal operating conditions: "abnormal operating conditions" has been prefixed with "chapter IV" to emphasise that these conditions relate to specific circumstances outlined in IED ch IV, for plants burning waste derived fuels. Prior to IED, this was termed "WID abnormal operating conditions".

Management System: the guidance previously referenced, the EA's Horizontal guidance Note H6, Environmental Management systems, has now been withdrawn. The .gov.uk website provides guidelines on what a management system should cover when operating a regulated industry. https://www.gov.uk/guidance/develop-a-management-system-environmental-permits It is no longer considered necessary to define management system in the interpretation section. The EMS system has also been reviewed as part of the BATC1.

Chipped tyres: included to clarify that this type of WDF includes shredded rubber conveyor belts.

Kiln shut down: this is revised to include an Operator-agreed feed rate of 100 tonne per hour.

Kiln start up: this is revised in line with current definition for start up, removing the reference to use of WDFs to determine end of start up, and instead including an agreed threshold figure (100 tph) of raw meal feed into the kiln. We are now allowing an option to calculate the first daily average emission value using the 24 hour period after the end of kiln start up (ie when the kiln reaches a pre-determined feed rate). This is to avoid the anomaly which allowed for a daily average emission to be calculated from only a few hours of data if start up was achieved late in a 24 hour period, when emissions may still be higher than typical. Emissions may take a while to stabilise as feeding of WDFs can only commence after start up is complete. Higher emissions initially are compensated for over a 24 hour period, with lower emissions once kiln stability is established, however this cannot be the case if only a few hours are used to derive a 24 hour period, leading to possible compliance issues.

8. Schedule 7 New site plan

A new version of the site plan has been included in Schedule 7, replacing the previous one, which was too small a scale to use and denoted the site ownership boundary, not the installation boundary which ran within the ownership boundary. The new site plan has been taken from the original PPC application site plan showing the installation boundary. Condition 2.2.1 has been amended to reflect that the site plan has a red, not green, line around the installation.

9. 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 1 July 2015 (and resubmitted 9 June 2016) which referred to an original site condition report submitted to the EA in October 2001 as part of the PPC application to provide a characterisation of site condition.

This summary report, along with the original data and reports, has been assessed by a technical expert in the Groundwater and Contaminated Land team.

We are satisfied that this information fulfils IED requirements for Hope Cement works by providing an adequate baseline report.

End of Decision Document.