

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Tarmac Cement and Lime Limited

Aberthaw Works
East Aberthaw
Barry
Vale of Glamorgan
CF62 3ZR

Permit number
EPR/BL3986ID

Aberthaw Works

Permit number EPR/BL3986ID

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

The Aberthaw Works operates a single dry process kiln (No. 6) with a maximum annual clinker production capacity of 565,000 tonnes.

The main raw materials consist of calcareous and siliceous materials suitable for cement clinker production. The raw materials are normally stored in covered reception hoppers, or if full, on an open stockpile adjacent to the hoppers. They are blended with blast furnace slag and an iron oxide substitute before transportation to stone storage silos. Raw materials are then secondary crushed prior to being weighed and milled in a closed circuit grinding mill system to produce raw meal. Pulverized fuel ash (PFA) is weighed and added at the exit of the mill. Transport of stone is carried out on covered belt conveyors. Dust laden air from the primary and secondary crushers is treated by bag filtration before release to atmosphere via 13.5 metre and 4.2 metre stacks.

The raw meal is mechanically transported to a system of blending silos before discharge to storage silos prior to being fed to the kiln for clinker manufacture. The raw material is extracted from storage, weighed and mechanically conveyed to a four stage preheater which precedes the rotary kiln. The material is converted at the kiln to cement clinker at a production rate of typically 1720 tonnes per day. Dust laden air from the raw meal blending and storage silos and feed systems is treated by bag filtration before release to atmosphere via a 17.8 metre stack.

The kiln is fired at high temperature with pulverised fuel, usually a coal and petroleum coke mixture. The raw coal and petroleum coke are stored in open stockpiles. Distillate fuel oil is used to preheat the kiln and may also be used as a support fuel. Meat and bone meal, solid recovered fuel (SRF) and whole car and van tyres are used to substitute the fossil fuels used in cement manufacture.

The cement clinker passes through planetary coolers attached to the kiln before transportation to enclosed storage areas prior to final grinding into cement. Exhaust gases from the kiln are treated by a bag filter before discharge to atmosphere via a 100.6 metre chimney. There is no external exhaust from the coolers as all of the gases are drawn into the kiln. Dust laden gases from the clinker conveying and coal-grinding systems are treated by bag filtration systems before discharge to atmosphere via stacks of height 6.5 to 38 metres above ground level.

Clinker is then transported along bucket conveyors to the clinker store and is then extracted from beneath the clinker store and conveyed to the cement mill reception silos. Occasionally clinker is despatched directly for processing at other cement works and may be imported to the site.

A closed circuit cement mill system (3000 HP mill) grinds the cement clinker with gypsum, limestone and processed pulverised fuel ash to produce the finished cement. Dust laden air from the cement mill is treated by bag filtration systems before release to the atmosphere via stacks of height 30 and 29 metres.

Finished cement is pneumatically transported to cement storage silos which are fitted with dust extraction filters which discharge directly to atmosphere at the height of the silos. Cement is loaded from storage into road and rail tankers or bagged into 25kg paper or plastic bags in the packing plant. Dust laden air extracted from the cement bag and bulk loading facility is treated by bag filters before release to air from 25m and 15m stacks.

Point source emissions from the cement kiln including particulate matter, sulphur dioxide, Oxides of Nitrogen, Carbon dioxide and Carbon Monoxide are released from a higher level above ground. Point source particulate matter from the cement mill is emitted from an intermediate level and at lower level from a wide range of abatement plant fitted to contain emissions from other sources.

Drainage from the coal stockpile areas passes through two settling pits, fitted with surface interceptor plates, prior to mixing with other site water from the quarry in the works feed aqueduct. The combined stream is discharged to the River Kenson. Water draining from the lorry wash is discharged to the works feed aqueduct or directly to the River Thaw following successive treatment in an oil interceptor system. There are no releases to public sewers.

Off-site releases to land consist mainly of general industrial waste, cement waste, kiln bricks and general office waste. The onsite landfill is now closed and does not fall within the installation boundary.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Application BL3986ID	Duly made 28/08/01	
Response to request for further information dated 12/10/01	Received 02/01/02	Final submission of revised application on CD format
Responses to request for further information dated 10/01/02	Received 31/07/02, 15/08/02 and 06/12/02	
Response to request for information dated 03/10/02	Received 21/10/02	
Permit BL3986ID	Determined 21/01/03	
Application for variation NP3437PH to use MBM as a substitute fuel	Duly made 27/07/04	
Response to Schedule 4 notice issued 30/07/04	Received 27/08/04	
Variation NP3437PH	Determined 10/12/04	

Status log of the permit

Description	Date	Comments
Application for variation JP3134SY implementing WID requirements	Duly made 21/03/05	
Response to request for further information dated 31/08/05	Received 21/09/05	
Response to request for further information dated 24/11/05	Received 25/11/05	
Response to request for further information dated 30/11/05	Received 30/11/05	
Variation JP3134SY	Determined 08/12/05	
Application for variation YP3736LY	Duly made 29/06/06	
Variation YP3736LY	Determined 12/07/06	
Application for variation EPR/BL3986ID/V005	Duly made 15/08/08	
Additional information	Received 26/08/08	
Variation EPR/BL3986ID/V005	Determined 19/09/08	
Variation EPR/BL3986ID/V006	Determined 02/09/2010	Environment Agency generated variation to cover Cement and Lime sector review
Application for variation EPR/BL3986ID/V007 to use SRF and tyres as substitute fuels	Duly made 04/07/11	
Variation EPR/BL3986ID/V007	Determined 30/08/2011	
Part surrender application EPR/BL3986ID/S008	Duly Made 01/05/2012	Application to surrender part of the site following cessation of quarrying works
Part surrender determined EPR/BL3983ID/S008	10/05/2012	Part surrender issued
Administrative variation EPR/BL3986ID/V009	15/05/2012	Issued
Notified of change of company name	23/09/2013	Name changed to Lafarge Tarmac Cement and Lime Limited.
Administrative Variation issued EPR/BL3986ID/V010	06/11/2013	Varied permit issued to Lafarge Tarmac Cement and Lime Limited.
NRW initiated variation EPR/BL3986ID/V011 issued	09/06/2014	Permit varied to reflect IED requirement on NOx emissions.
Variation Application EPR/BL3986ID/V012	Duly made 05/06/14	Application to adopt the MPA code of practice
Variation Application EPR/BL3986ID/V012 determined	22/12/14	Variation Issued.

Status log of the permit

Description	Date	Comments
Regulation 60(1) Notice of request for information	06/03/14	Regarding Implementation of BAT conclusions under IED
Regulation 60(1) response received	30/01/15	Regarding Implementation of BAT conclusions under IED
Request for additional information to support Regulation 60(1) response	26/06/15	
Response to request for additional information received	30/07/15	Clarification on techniques employed in respect of the following BAT conclusions: 5(g), 8, 9, 14, 15, 16, 19 and 20. Also assessment of background ammonia emissions.
Additional Information requested	28/09/15	
Additional Information requested	01/10/15	Air dispersion modelling files
Additional information received	22/03/16	Updated permit introductory note including reference to Packing Plant & list of LEV emission points <10,000 m ³ /hr
Additional information received	27/04/16	Updated Site Plan and emission point clarifications.
Natural Resources Wales Cement Sector Review 2015 of Permit EPR/BL3986ID Variation issued EPR/BL3986ID/V013	19/07/16	Varied and consolidated permit issued in modern IED condition format.

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number

EPR/BL3986ID

The Natural Resources Body for Wales (“Natural Resources Wales”) authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Tarmac Cement and Lime Limited (“the operator”),

whose registered office is

**Portland House Bickenhill Lane
Solihull
Birmingham
B37 7BQ**

company registration number **00066558**


to operate an installation at

**Aberthaw Works
East Aberthaw
Barry
Vale of Glamorgan
CF62 3ZR**

to the extent authorised by and subject to the conditions of this permit.

Signed

Date

	19 July 2016
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Eirian Macdonald, Principal Permitting Team Leader

Authorised on behalf of Natural Resources Wales

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
- (b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.1.4 The Operator shall comply with the MPA code of practice, dated October 2014.

1.2 Energy efficiency

1.2.1 The operator shall:

- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
- (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
- (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
- (b) maintain records of raw materials and water used in the activities;
- (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
- (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by Natural Resources Wales.
- (b) If notified by Natural Resources Wales that the activities are giving rise to pollution, the operator shall submit to Natural Resources Wales for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.
- 2.3.2 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.3 Waste shall be accepted only if:
- (a) it is of a type listed in schedule 2 table S2.1, S2.2; and
 - (b) it conforms to the description in the documentation supplied by the producer and holder.

- 2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
- (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazard classification associated with the waste; and
 - (e) the waste code of the waste.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.
- 2.3.6 (a) The operator shall only use those waste derived fuels and alternative raw materials listed in table S2.2 of schedule 2 and within the specification ranges specified in table S2.1.
- 2.3.7 All waste derived fuels used at the installation are subject to the following conditions:
- (a) No radioactive materials or radioactive wastes (as defined by sections 1 and 2 of the Radioactive Substances Act 1993) shall be included.
 - (b) No substances with PCB concentrations greater than 10mg/kg shall be included.
 - (c) No substances with PCP concentrations greater than 100mg/kg shall be included.
 - (d) No pharmaceutical products, pesticide products, biocide products and iodine compounds shall be included except as constituents of other materials and at levels that are minimised as far as reasonably practicable.
 - (e) No dioxins or furans shall be included except as constituents of other materials and at levels that are minimised as far as reasonably practicable.
 - (f) No medical/clinical waste shall be included.
- 2.3.8 Any waste derived fuels not listed in Schedule 2 Table S2.2 shall not be used for the purposes of carrying out a feasibility trial without obtaining the prior written approval from Natural Resources Wales in each case. Any such feasibility trials will be limited to a maximum of 100 tonnes of the fuel and a maximum duration of 14 days.
- 2.3.9 Any waste derived raw materials not listed in schedule 2 Table S2.2 shall not be used without prior written approval from Natural Resources Wales. ,and shall be subject to the specification in table S2.1 of schedule 2 or otherwise agreed in writing with Natural Resources Wales.
- 2.3.10 The operator shall ensure that prior to accepting waste derived fuels subject to condition 2.3.2 at the site, it has obtained sufficient information about the wastes to be burned as fuel to demonstrate compliance with the characteristics described in condition 2.3.2.
- 2.3.11 The operator shall take representative samples of all waste derived fuels delivered to the site unless otherwise agreed in writing with Natural Resources Wales and test a representative selection of these samples to verify conformity with the information obtained as required by condition 2.3.7. These samples shall be retained for inspection by Natural Resources Wales for a period of at least 1 month after the material is burned and results of any analysis made of such samples will be retained for at least 2 years after the material is burned.

- 2.3.12 Waste derived fuels shall not be burned, or shall cease to be burned, if:
- (a) the kiln is in start up (or as otherwise agreed in writing with Natural Resources Wales); or
 - (b) the kiln is in the process of shutting down (or as otherwise agreed in writing with Natural Resources Wales); or
 - (c) kiln feed rate is less than 80 tonnes/hr; or
 - (d) the combustion chamber temperature is below, or falls below, 850°C when using non-hazardous waste or hazardous waste where the content of halogenated organic substances (as chlorine) does not exceed 1%; or
 - (e) the combustion chamber temperature is below, or falls below, 1100°C when using hazardous waste where the content of halogenated organic substances (as chlorine) exceeds 1%; or
 - (f) any continuous emission limit value in schedule 3 table S3.1 is exceeded due to disturbances or failures of the abatement systems, other than under “Chapter IV abnormal operating conditions”; or
 - (g) monitoring results required to demonstrate compliance with any continuous emission limit value in schedule 3 table S3.1 are unavailable other than under “Chapter IV abnormal operating conditions”.
- 2.3.13 The operator shall record the beginning and end of each period of “Chapter IV abnormal operating conditions”, and shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.
- 2.3.14 Where, during “Chapter IV abnormal operating conditions”, any of the following situations arise, the operator shall, as soon as is practicable, cease the burning of waste derived fuels until normal operation can be restored:
- (a) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 due to disturbances or failures of the abatement systems, or continuous emission monitor(s) for a total of four hours uninterrupted duration;
 - (b) the cumulative duration of “Chapter IV abnormal operating conditions” periods over one calendar year exceeds 60 hours on the kiln.
- 2.3.15 The operator shall interpret the end of the period of “Chapter IV abnormal operating conditions” as the earliest of the following:
- (a) when the failed equipment is repaired and brought back into normal operation;
 - (b) when the operator initiates a shut down of the waste derived fuels, as described in the application or as agreed in writing with Natural Resources Wales;
 - (c) when a period of four hours has elapsed from the start of the “Chapter IV abnormal operation conditions”;
 - (d) when, in any calendar year, an aggregated period of 60 hours “Chapter IV abnormal operating conditions” has been reached.
- 2.3.16 Hazardous waste derived fuels containing more than 1% Halogenated organic substances (as chlorine) shall only be burnt in the main burner of the kiln.

Waste storage and treatment

- 2.3.17 Hazardous waste shall not be mixed, either with a different category of waste or with other waste, substances or materials, unless it is authorised by schedule 1 table S1.1 and appropriate measures are taken.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by Natural Resources Wales.
- 2.4.2 Except in the case of an improvement which consists only of a submission to Natural Resources Wales, the operator shall notify Natural Resources Wales within 14 days of completion of each improvement

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil to the protocol agreed with Natural Resources Wales under Improvement Condition 6, unless such monitoring is based on a systematic appraisal of the risk of contamination.
- 3.1.4 Process waste dusts produced at the site shall, as a minimum, be sampled and analysed in accordance with schedule 3 table S3.5. Additional samples shall be taken and tested and appropriate action taken, whenever:
- (a) disposal or recovery routes change; or
 - (b) it is suspected that the nature or composition of the waste has changed such that the route currently selected may no longer be appropriate.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

- 3.2.2 The operator shall:
- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution, submit to Natural Resources Wales for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

- 3.3.1 The operator shall, unless otherwise agreed in writing by Natural Resources Wales, undertake the monitoring specified in the following tables in schedule 3 to this permit:
- (a) point source emissions specified in tables S3.1, S3.2 and S3.3;
 - (b) process monitoring specified in table S3.4;
 - (c) process waste monitoring specified in table S3.5
- 3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.3.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by Natural Resources Wales. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 1.5 times the daily emission limit value (ELV) specified in schedule 3 tables S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges.
- 3.3.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2 and S3.3 unless otherwise agreed in writing by Natural Resources Wales.

3.3.5 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 tables S3.1 and S3.2; the Continuous Emission Monitors shall be used such that;

- (a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:
- Carbon monoxide 10%
 - Sulphur dioxide 20%
 - Oxides of nitrogen (NO & NO₂ expressed as NO₂) 20%
 - Particulate matter 30%
 - Total organic carbon (TOC) 30%
 - Hydrogen chloride 40%
 - Ammonia 40%
- (b) valid half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.3.5;
- (c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour period, the half-hourly average shall in any case be considered valid if measurements are available for a minimum of 20 minutes during the half-hour period. The number of half-hourly averages so validated shall not exceed 5 per day;
- (d) Daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value shall be considered valid if no more than five half-hourly average values in any day have been determined not to be valid;
- (e) no more than ten daily average values per year shall be determined not to be valid.

3.3.6 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1:

- (a) a QAL2 test as specified in BS EN 14181 shall be performed at least every three years or whenever there are significant changes to either the process, the fuel used or to the CEMs themselves;
- (b) an Annual Surveillance Test (AST) shall be performed at least annually, as specified within BS EN 14181;
- (c) the operator shall have a procedure to apply the QAL3 requirements of EN 14181.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4.2 The operator shall:

- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to odour, submit to Natural Resources Wales for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
- (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

3.5 Noise and vibration

3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.5.2 The operator shall:

- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to noise and vibration, submit to Natural Resources Wales for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
- (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by Natural Resources Wales, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by Natural Resources Wales.

4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by the permit to Natural Resources Wales using the contact details supplied in writing by Natural Resources Wales.
- 4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:
- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
 - (b) the performance parameters set out in schedule 4 table S4.2 using the forms specified in table S4.3 of that schedule.
 - (c) the functioning and monitoring of the plant involved with the burning of waste derived fuels, in a format agreed with Natural Resources Wales. The report shall, as a minimum requirement (as required by Chapter iv of the Industrial Emissions Directive (IED)) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED.
- 4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by Natural Resources Wales, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:
- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
 - (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.3 ; and
 - (c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to Natural Resources Wales, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.
- 4.2.5 Within 1 month of the end of each quarter, the operator shall submit to Natural Resources Wales using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter, if during that quarter the total amount accepted exceeds 100 tonnes of non-hazardous waste or 10 tonnes of hazardous waste.
- 4.2.6 Within 1 month of the end of each quarter, the operator shall submit to Natural Resources Wales, using the form specified by Natural Resources Wales for the purpose, the information specified on the form, relating to the types of waste Alternative Raw Materials and Waste-Derived Fuels that the Operator has used in that quarter.

4.3 Notifications

- 4.3.1 (a) In the event that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
- (i) inform Natural Resources Wales,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
- (b) in the event of a breach of any permit condition the operator must immediately—
- (i) inform Natural Resources Wales, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
- (c) in the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.
- 4.3.2 Any information provided under condition 4.3.1(a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.
- 4.3.3 Where Natural Resources Wales has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform Natural Resources Wales when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to Natural Resources Wales at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 Natural Resources Wales shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:
- Where the operator is a registered company:
- (a) any change in the operator's trading name, registered name or registered office address; and
 - (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.
- Where the operator is a corporate body other than a registered company:
- (a) any change in the operator's name or address; and
 - (b) any steps taken with a view to the dissolution of the operator.
- In any other case:
- (a) the death of any of the named operators (where the operator consists of more than one named individual);
 - (b) any change in the operator's name(s) or address(es); and

- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.
- 4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:
 - (a) Natural Resources Wales shall be notified at least 14 days before making the change; and
 - (b) the notification shall contain a description of the proposed change in operation.
- 4.3.6 Natural Resources Wales shall be given at least 14 days notice before implementation of any part of the site closure plan.
- 4.3.7 Where the operator has entered into a climate change agreement with the Government, Natural Resources Wales shall be notified within one month of:
 - (a) a decision by the Secretary of State not to re-certify the agreement;
 - (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
 - (c) any subsequent decision by the Secretary of State to re-certify such an agreement.
- 4.3.8 Unless otherwise agreed in writing, the operator shall provide Natural Resources Wales with 7 days written notice prior to the introduction of a new waste derived fuel or raw material listed in the Mineral Products Association's Code of Practice. The introduction of a new waste derived fuel or raw material does not require prior consent from Natural Resources Wales.

4.4 Interpretation

- 4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.
- 4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "Immediately", in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
A1	3.1 A(1)(a)	<p>Producing cement clinker in a rotary kiln with a production capacity exceeding 500 tonnes per day.</p> <p>R01 – Use principally as a fuel or other means to generate energy</p> <p>R05 – Recycling / Reclamation of other inorganic materials</p> <p>R11 – Use of waste obtained from any other operations numbered R01 – R10</p> <p>R13 – Storage of wastes pending recovery operations R01 – R12 (excluding temporary storage, pending collection, on the site where it is produced).</p>	<p>Recovery of raw materials from the quarry floor and receipt on site of raw materials and fuels, through storage, crushing, milling, pulverising, drying, blending, other processing and feeding into the kiln system through to transfer of cooled clinker to the clinker store, and emissions to air from the chimney or other process vents.</p> <p>Mixing of hazardous waste (approved alternative raw materials) with raw materials for the production of clinker.</p>
A2	3.1 A(2)(a)	4 Lines - Grinding cement clinker in cement mills.	Receipt of clinker from the kiln and import facility through storage and transfer to the cement mills. Receipt, on site of all other raw materials (e.g.gypsum), through storage, blending and feeding, to the cement mills through to discharge of cement to storage silos. Emissions to air from process vents.
A3	Section 3.1 part B (a)	Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.	Cement and clinker storage, bulk loading, unloading and dispatch. Emissions to air from process vents.
A4	Section 3.1 part B (b)	2 Lines - 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.	Blending and bagging of cement products. Emissions to air from process vents.
Directly Associated Activities			
A5	Waste storage and handling		From waste generation, storage and monitoring to waste despatch.

Table S1.2 Operating techniques		
Description	Parts	Date Received
PPC Application BL3986ID	All management and control techniques described in the application	Duly made 28/08/01
Response to request for further information dated 12/10/01	All management and control techniques described in the further information	Received 02/01/02
Responses to request for further information dated 10/01/02	All management and control techniques described in the further information	Received 31/07/02, 15/08/02 and 06/12/02
Response to request for information dated 03/10/02	All management and control techniques described in the further information	Received 21/10/02
Application for variation NP3437PH to use MBM as a waste derived fuel	All management and control techniques described in the application	Duly made 27/07/04
Response to Schedule 4 notice issued 30/07/04	All management and control techniques described in the response	Received 27/08/04
Application for variation JP3134SY implementing Chapter iv of IED requirements	All management and control techniques described in the application	Duly made 21/03/05
Response to request for further information dated 31/08/05	All management and control techniques described in the further information	Received 21/09/05
Response to request for further information dated 24/11/05	All management and control techniques described in the further information	Received 25/11/05
Response to request for further information dated 30/11/05	All management and control techniques described in the further information	Received 30/11/05
Application for variation YP3736LY	All management and control techniques described in the application	Duly made 29/06/06
Application for variation EPR/BL3986ID/V005	All management and control techniques described in the application	Duly made 15/08/08
Further information	All management and control techniques described in the further information	Received 26/08/08
Application for variation EPR/BL3986ID/V007	All management and control techniques described in the application	Duly made 04/07/11
Mineral Products Association Code of Practice for the Use of Waste Materials in Cement and Dolomitic Lime Manufacture	All	05/06/14
Information received in support of Natural Resources Wales Cement Sector Permit Review 2014	All parts of operator response to Regulation 60 (1) notice sent 06/03/14	30/01/15
Information received in support of Natural Resources Wales Cement Sector Permit Review 2014	All parts of operator response to Regulation 60 (1) notice sent 26/06/15	30/07/15

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IC1	<p>Particulate emission data (Continuous Emissions Monitors) for emission points A2 & A3 shall be corrected to standard reference conditions (as detailed in Schedule 6) from 09/04/17 onwards. Pre-determined correction factors for each emission point may be acceptable as an alternative to upgraded CEMS where the operator can demonstrate that these parameters are stable and consistent, providing historical data as evidence.</p> <p>In line with BS EN 15259, historic moisture and temperature measurements would need to be shown to not vary above or below 10%, (as a guide value), of the statistical mean from available data derived from periodic measurements. The Operator shall provide a report to Natural Resources Wales confirming (for agreement) how particulate emissions data will be corrected.</p>	31/10/16
IC2	<p>The Operator shall provide a written report detailing the proposed monitoring technique to be employed to demonstrate compliance with the ELV of 10mg/Nm³ at emission points A5, A6 and A7.</p> <p>If the Operator proposes the use of an alternative technique (i.e. not extractive or continuous measurement in accordance with recognised standards), then evidence must be provided to prove the technique will demonstrate compliance with the ELV to an equivalent level of certainty.</p>	31/10/16
IC3	<p>The operator shall assess the potential human health impact associated with the proposed new emission limit of 1500 mg/Nm³ for carbon monoxide releases from emission point A1. The assessment shall use the Environment Agency H1 Software Tool or an equivalent method. The assessment together with a written report summarising the conclusions of the assessment shall be submitted to Natural Resources Wales for approval.</p>	31/10/16
IC4	<p>In order for Natural Resources Wales to set the appropriate emission limit values, the Operator shall submit a report detailing the operational capability (expressed as mg/Nm³ of particulate released) of each bag filter plant associated with emission points A1, A2, A3 & A4. The report shall include:</p> <ol style="list-style-type: none"> I. A statistical analysis of at least two years of particulate monitoring data for each emission point (where data is available) with supporting graphs demonstrating individual values, averages and standard deviations. II. Design specification of each bag plant. III. Details on all maintenance (including filter bag changes) carried out for each bag filter plant during the monitoring period, including dates and times of each maintenance. 	30/11/16

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IC5	<p>If storing Priority Hazardous Substances on site, the Operator must carry out the following assessments with reference to the Environment Agency’s guidance “How to carry out a risk assessment if you’re applying for a bespoke permit that includes discharging hazardous pollutants to surface water”:</p> <p>Phase 1 Part A screening tests for mercury, cadmium, nickel, lead, benzene, polyaromatic hydrocarbons and any other relevant priority hazardous substances.</p> <p>Phase 1 Part B screening tests for mercury, cadmium, polyaromatic hydrocarbons and any other relevant priority hazardous substances.</p> <p>For any substance which is not screened out by the Phase 1 Part A or Part B screening tests the Operator will also need to carry out Phase 2 modelling, as described in “How to carry out a risk assessment if you’re applying for a bespoke permit that includes discharging hazardous pollutants to surface water”.</p> <p>The Operator must provide Natural Resources Wales with the results of the emissions monitoring, the results from the screening tests and the results from any Phase 2 modelling. The Operator may use the Environment Agency’s H1 electronic screening tool to present the emissions data and to carry out the Phase 1 screening tests.</p> <p>Note: With regard to the Phase 1 Part A screening - a full list of priority hazardous substances is provided in the Environment Agency guidance “How to carry out a risk assessment if you’re applying for a bespoke permit that includes discharging hazardous pollutants to surface water” under the section entitled “Screening test: priority hazardous pollutants”. The Operator must review the list and carry out the screening for any substances, in addition to those specified above, that may be present in the installations discharges to surface water. With regard to the Phase 1 Part B screening for priority hazardous pollutants, the section entitled “Screening test: priority hazardous pollutants” provides a full list of relevant priority hazardous substances and their associated annual significant loads.</p>	30/06/17
IC6	<p>The Operator shall submit a report on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in the application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.</p>	30/09/17
IC7	<p>The Operator shall submit the written protocol referenced in condition 3.1.3 for the monitoring of soil and groundwater for approval by Natural Resources Wales. The protocol shall demonstrate how the Operator will meet the requirements of Articles 14(1) (b), 14(1) (e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from Natural Resources Wales.</p>	31/12/17

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Waste Specifications								
Parameters	Waste Derived Fuels (WDF)							Alternative Raw Materials (ARM)**
	PSP	SRF	MBM	Tyres	WLF	RFO	Wood	
Units	mg/kg (unless stated otherwise)							
Gross Calorific Value (MJ/kg)	10-40	10-40	10-40	15-40	10-42	30-48	10-40	<10
Sulphur	≤2.00%	≤2.00%	≤2.00%	≤2.00%	≤2.00%	≤2.00%	≤2.00%	-
Chlorine	≤2.00%	≤2.00%	≤2.00%	-	≤2.00%	≤2.00%	≤2.00%	≤1% halogenated organic substances
Total Fluorine, Bromine & Iodine	-	≤1.50%	-	-	≤1.50%	-	≤1.50%	-
Mercury	≤10	≤10	-	-	≤20	≤10	≤10	≤2
Total Group ii Metals (Cd & Tl)	≤30	≤30	-	-	≤40	≤40	≤30	≤50
Maximum replacement	-	-	-	-	40%*	-	-	-
Minimum Mineral Content	-	-	-	-	-	-	-	80% dry weight (w/w)

* Maximum thermal input as required by Article 46(2) of the Industrial Emissions Directive (2010/75/EU).

** No materials which are defined as carcinogens for the purposes of the COSHH Regulations 2002 (as amended) shall be used.

Table S2.2 Permitted Waste Derived Fuels and Alternative Raw Materials

Waste code	Description	WDF or ARM
01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS	
01 01	wastes from mineral excavation	
01 01 01	wastes from mineral metalliferous excavation	ARM
01 01 02	wastes from mineral non-metalliferous excavation	ARM
01 04	wastes from physical and chemical processing of non-metalliferous minerals	
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07	ARM
01 04 09	waste sand and clays	ARM
01 04 13	wastes from stone cutting and sawing other than those mentioned in 01 04 07	ARM
02	WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING	
02 01	wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing	
02 01 04	waste plastics (except packaging)	WDF
02 01 07	wastes from forestry	WDF
02 02	wastes from the preparation and processing of meat, fish and other foods of animal origin	
02 02 03	materials unsuitable for consumption or processing	WDF
02 04	wastes from sugar processing	
02 04 01	soil from cleaning and washing beet	ARM
02 04 02	off-specification calcium carbonate	ARM
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD	
03 01	wastes from wood processing and the production of panels and furniture	
03 01 01	waste bark and cork	WDF
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04	WDF
03 03	wastes from pulp, paper and cardboard production and processing	
03 03 01	waste bark and wood	WDF
03 03 05	de-inking sludges from paper recycling	WDF
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard	WDF
03 03 08	wastes from sorting of paper and cardboard destined for recycling	WDF
03 03 09	lime mud waste	ARM
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation	WDF
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES	
04 01	wastes from the leather and fur industry	
04 01 02	liming waste	ARM
04 01 09	wastes from dressing and finishing	WDF
04 02	wastes from the textile industry	
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)	WDF
04 02 21	wastes from unprocessed textile fibres	WDF
04 02 22	wastes from processed textile fibres	WDF
05	WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL	
05 06	wastes from the pyrolytic treatment of coal	
05 06 03*	other tars	WDF

06	WASTES FROM INORGANIC CHEMICAL PROCESSES	
06 09	wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes	
06 09 04	calcium-based reaction wastes other than those mentioned in 06 09 03	ARM
06 11	wastes from the manufacture of inorganic pigments and opacifiers	
06 11 01	calcium-based reaction wastes from titanium dioxide production	ARM
07	WASTES FROM ORGANIC CHEMICAL PROCESSES	
07 02	wastes from the MFSU of plastics, synthetic rubber and man-made fibres	
07 02 13	waste plastic	WDF
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY	
09 01	wastes from the photographic industry	
09 01 08	photographic film and paper free of silver or silver compounds	WDF
10	WASTES FROM THERMAL PROCESSES	
10 01	wastes from power stations and other combustion plants (except 19)	
10 01 01	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)	ARM
10 01 02	coal fly ash	ARM
10 01 03	fly ash from peat and untreated wood	ARM
10 01 05	calcium-based reaction wastes from flue-gas desulphurisation in solid form	ARM
10 01 07	calcium-based reaction wastes from flue-gas desulphurisation in sludge form	ARM
10 01 15	bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14	ARM
10 01 16*	fly ash from co-incineration containing dangerous substances	ARM
10 01 17	fly ash from co-incineration other than those mentioned in 10 01 16	ARM
10 02	wastes from the iron and steel industry	
10 02 10	mill scales	ARM
10 02 13*	sludges and filter cakes from gas treatment containing dangerous substances	ARM
10 09	wastes from casting of ferrous pieces	
10 09 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05	ARM
10 09 08	casting cores and moulds which have undergone pouring other than those mentioned in 10 09 07	ARM
10 10	wastes from casting of non-ferrous pieces	
10 10 06	casting cores and moulds which have not undergone pouring, other than those mentioned in 10 10 05	ARM
10 10 08	casting cores and moulds which have undergone pouring, other than those mentioned in 10 10 07	ARM
10 11	wastes from manufacture of glass and glass products	
10 11 03	waste glass-based fibrous materials	ARM
10 12	wastes from manufacture of ceramic goods, bricks, tiles and construction products	
10 12 03	particulates and dust	ARM
10 12 06	discarded moulds	ARM
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)	ARM
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them	
10 13 01	waste preparation mixture before thermal processing	ARM
10 13 04	wastes from calcination and hydration of lime	ARM
10 13 06	particulates and dust (except 10 13 12 and 10 13 13)	ARM
10 13 11	wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10	ARM
10 13 12*	solid wastes from gas treatment containing dangerous substances	ARM
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12	ARM

10 13 14	waste concrete and concrete sludge	ARM
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS	
12 01	wastes from shaping and physical and mechanical surface treatment of metals and plastics	
12 01 05	plastics shavings and turnings	WDF
12 01 13	welding wastes	WDF
13	OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	
13 07	wastes of liquid fuels	
13 07 01*	fuel oil and diesel	WDF
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED	
15 01	packaging (including separately collected municipal packaging waste)	
15 01 01	paper and cardboard packaging	WDF
15 01 02	plastic packaging	WDF
15 01 03	wooden packaging	WDF
15 01 05	composite packaging	WDF
15 01 06	mixed packaging	WDF
15 01 09	textile packaging	WDF
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST	
16 01	end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)	
16 01 03	end-of-life tyres	WDF
16 01 19	plastic	WDF
16 01 22	components not otherwise specified	WDF
16 08	spent catalysts	
16 08 03	spent catalysts containing transition metals or transition metal compounds not otherwise specified	ARM
16 08 04	spent fluid catalytic cracking catalysts (except 16 08 07)	ARM
16 08 07*	spent catalysts contaminated with dangerous substances	ARM
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	
17 01	concrete, bricks, tiles and ceramics	
17 01 01	concrete	ARM
17 01 02	bricks	ARM
17 01 03	tiles and ceramics	ARM
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	ARM
17 02	wood, glass and plastic	
17 02 01	wood	WDF
17 02 03	plastic	WDF
17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil	
17 05 04	soil and stones other than those mentioned in 17 05 03	ARM
17 05 06	dredging spoil other than those mentioned in 17 05 05	ARM
17 05 08	track ballast other than those mentioned in 17 05 07	ARM
17 08	gypsum-based construction material	
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01	ARM

19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE	
19 01	wastes from incineration or pyrolysis of waste	
19 01 06*	aqueous liquid wastes from gas treatment and other aqueous liquid wastes	ARM
19 01 13*	fly ash containing dangerous substances	ARM
19 02	wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)	
19 02 03	premixed wastes composed only of non-hazardous wastes	ARM
19 02 04*	premixed wastes composed of at least one hazardous waste	ARM
19 02 08*	liquid combustible wastes containing dangerous substances	WDF
19 02 10	combustible wastes other than those mentioned in 19 02 08 and 19 02 09	WDF
19 08	wastes from waste water treatment plants not otherwise specified	
19 08 05	sludges from treatment of urban waste water	ARM
19 09	wastes from the preparation of water intended for human consumption or water for industrial use	
19 09 02	sludges from water clarification	ARM
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified	
19 12 01	paper and cardboard	WDF
19 12 04	plastic and rubber	WDF
19 12 07	wood other than that mentioned in 19 12 06	WDF
19 12 08	textiles	WDF
19 12 09	minerals (for example sand, stones)	ARM
19 12 10	combustible waste (refuse derived fuel)	WDF
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances	ARM
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	ARM & WDF
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	
20 01	separately collected fractions (except 15 01)	
20 01 01	paper and cardboard	WDF
20 01 10	clothes	WDF
20 01 11	textiles	WDF
20 01 38	wood other than that mentioned in 20 01 37	WDF
20 01 39	plastics	WDF

Schedule 3(a) – Emissions and monitoring until 8th April 2017

Table S3.1 Kiln and Raw mill - Exhaust Emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 Main stack on preheater tower	Particulate matter	30 mg/Nm ³	Daily average	Continuous	BS EN 14181
	Oxides of nitrogen (NO & NO ₂ expressed as NO ₂)	500 mg/Nm ³			
	Sulphur dioxide	800 mg/Nm ³			
	Carbon monoxide	1000 mg/Nm ³ Note 1			
	VOC as Total organic carbon (TOC)	50 mg/Nm ³			
	Hydrogen chloride	10 mg/Nm ³			
	Ammonia	No limit set			
	Hydrogen fluoride	1 mg/Nm ³	Periodic average value over minimum 1-hour period	6 monthly	ISO 15713
	Cadmium & thallium and their compounds (total)	0.05 mg/Nm ³	Periodic average value over minimum 30 minute, maximum 8 hour period		BS EN 14385
	Mercury and its compounds	0.05 mg/Nm ³			BS EN 13211
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/Nm ³		BS EN 14385		
Dioxins / furans (I-TEQ)	0.1 ng/Nm ³	Periodic average value over minimum 6 hours, maximum 8 hour period	BS EN 1948 parts 1, 2 and 3		
Dioxins / furans (WHO-TEQ) Humans / Mammals / fish / birds	No limit set				

Note 1: An ELV of 1500 mg/Nm³ applies following completion of IC3 and subsequent written approval from Natural Resources Wales.

Table S3.2 Non-kiln point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A2 Cement Mills dust filter	Particulate matter	Cement Mills	30 mg/m ³	Daily average	Continuous and annual periodic (as CEMs check)	BS EN 15267-3
A3 Cement Mills separator						
A4 to A18 and A20 to A23 Other process vents	No parameters set	Storage silos and conveyor lines	No limit set			Permanent sampling access not required
A19 Vent on ammonia system		Ammonia storage				
Vents on liquid fuels storage tanks		Liquid fuels storage				
SRF handling filter vent		SRF handling				

Table S3.3 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 Release to River Kenson estuary at NGR ST 0313 6758	Total suspended solids as defined by Directive 91/271/EEC	Cooling water and site drainage. Also from shale quarry.	50 mg/l	Spot	Monthly	BS EN 872
	pH		9 max 6 min			BS ISO 10523
	Oil or grease		None visible			Visual check
W2 River Thaw estuary at NGR ST 0303 6738	Total suspended solids as defined by Directive 91/271/EEC	Shale quarry drainage	70 mg/l	Spot	Each time of discharge at W2	BS EN 872
	pH		9 max 6 min			BS ISO 10523
	Oil or grease		None visible			Visual check

Table S3.4 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Electricity usage	MWh	Monthly	-	-
Fuels usage	Tonnes		-	-
Waste derived fuels usage	Tonnes		-	-
Water usage	m ³		-	-
Relative thermal input of waste derived fuels	%		-	-
Ammonia usage	Tonnes		-	-
Stage 4 of the preheater tower	Temperature deg C	Continuous	-	-

Table S3.5 Process waste monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
CKD/Bypass dust if produced.	Group I, Group II and Group III metals and zinc and their compounds. Dioxins/furans and dioxin-like PCBs Halides (chloride, bromide and fluoride)	6 Monthly	Environment Agency ash sampling protocol for cement.	None
	Total soluble fraction for Group I, Group II and Group III metals and zinc and their compounds.	Before use of a new disposal or recovery route		

Schedule 3(b) – Emissions and monitoring from 9th April 2017

Table S3.1 Kiln and Raw mill - Exhaust Emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 Main stack on preheater tower	Particulate matter	20 mg/Nm ³ Note1	Daily average	Continuous	BS EN 14181
	Oxides of nitrogen (expressed as NO ₂)	500 mg/Nm ³			
	Sulphur dioxide	400 mg/Nm ³			
	Carbon monoxide	1000 mg/Nm ³ Note 2			
	Total organic carbon (TOC)	50 mg/Nm ³			
	Hydrogen chloride	10 mg/Nm ³			
	Ammonia	80 mg/Nm ³			
	Hydrogen fluoride	1 mg/Nm ³	periodic average value over minimum 1-hour period	6 monthly	ISO 15713
	Cadmium & thallium and their compounds (total)	0.05 mg/Nm ³	periodic average value over minimum 30 minute, maximum 8 hour period		BS EN 14385
	Mercury and its compounds	0.05 mg/Nm ³			BS EN 13211
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/Nm ³	BS EN 14385			
Dioxins / furans (I-TEQ)	0.1 ng/Nm ³	periodic average value over minimum 6 hours, maximum 8 hour period	BS EN 1948 parts 1, 2 and 3		
Dioxins / furans (WHO-TEQ) Humans / Mammals / fish / birds	No limit set				

Note1: Subject to response to IC4.

Note 2: An ELV of 1500 mg/Nm³ applies following completion of IC3 and subsequent written approval from Natural Resources Wales.

Table S3.2 Non-kiln point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A2 Cement mills dust filter	Particulate matter	Cement mills	20 mg/Nm ³ Note 1	Daily average	Continuous	BS EN 14181 Note 2
A3 Cement mills separator	Particulate matter	Cement mills	20 mg/Nm ³ Note 1			
A4 Coal Mills	Particulate matter	Coal Mills 1 to 4 de-dusting	20 mg/Nm ³ Note 1	Periodic spot sample for a minimum of 30 minutes	6 monthly	BS EN 13284-1
A5 Primary Crusher	Particulate matter	Transfer point de-dusting	10 mg/Nm ³	Periodic spot sample for a minimum of 30 minutes Note 3	6 monthly Note 3	BS EN 13284-1 Note 3
A6 Raw Meal Handling Dust Plant	Particulate matter	Silo, elevator and airslide de-dusting	10 mg/Nm ³	Periodic spot sample for a minimum of 30 minutes Note 3	6 monthly Note 3	BS EN 13284-1 Note 3
A7 Polychip walking floor transfer point	Particulate matter	Polychip walking floor transfer point de-dusting	10 mg/Nm ³	Periodic spot sample for a minimum of 30 minutes Note 3	6 monthly Note 3	BS EN 13284-1 Note 3
A19 Vent on ammonia system	No parameters set	Ammonia storage	No limit set			
Vents on liquid fuels storage tanks		Liquid fuels storage				
Vents as listed in document reference: "Aberthaw cement works_Site LEV systems_IED permit submission V2 22 03 2016.xls"	Particulate Matter	Small sources of particulate matter (< 10,000 Nm ³ /h) from dusty operations other than cooling and the main milling processes	10 mg/Nm ³	The frequency of measurements or performance checks must be based on a maintenance management system.		

Note 1: Subject to response to IC4.

Note 2: The principles of EN 14181 shall be applied (subject to agreement with Natural Resources Wales). See NRW Guidance Note "Application of BS EN 14181 to CEMs on non-IED Installations" for further information.

Note 3: Monitoring requirements subject to the completion of IC2 and as agreed in writing with Natural Resources Wales..

Table S3.3 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 Release to River Kenson estuary at NGR ST 0313 6758	Total suspended solids as defined by Directive 91/271/EEC	Cooling water and site drainage. Also from shale quarry.	50 mg/l	Spot	Monthly	BS EN 872
	pH		9 max 6 min			BS ISO 10523
	Oil or grease		None visible			Visual check
W2 River Thaw estuary at NGR ST 0303 6738	Total suspended solids as defined by Directive 91/271/EEC	Shale quarry drainage	50 mg/l	Spot	Each time of discharge at W2	BS EN 872
	pH		9 max 6 min			BS ISO 10523
	Oil or grease		None visible			Visual check

Table S3.4 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Stage 4 of the preheater tower	Temperature deg C	Continuous	Traceable to National Standards	-
Kiln exhaust (close to the combustion chamber inner wall)	Temperature deg C	Continuous	Traceable to National Standards	-
A1 – Main Stack	Temperature deg C, pressure, oxygen content and water vapour content	Continuous	Traceable to National Standards	-
Weather station	Wind speed and direction	Continuous	-	-

Table S3.5 Process waste monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
CKD/Bypass dust if produced.	Group I, Group II and Group III metals and zinc and their compounds. Dioxins/furans and dioxin-like PCBs Halides (chloride, bromide and fluoride)	6 monthly	Environment Agency ash sampling protocol for cement.	None
	Total soluble fraction for Group I, Group II and Group III metals and zinc and their compounds.	Before use of a new disposal or recovery route		

Schedule 4(a) – Reporting until 8th April 2017

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.3.1	A1, A2 and A3	Continuous monitoring every 3 months	1 January, 1 April, 1 July, 1 October
	A1	Periodic monitoring every 6 months	1 January, 1 July
Emissions to water (other than sewer) and land Parameters as required by condition 3.3.1	W1	Every 3 Months	1 January, 1 April, 1 July, 1 October
	W2	Each time of discharge	1 January
Functioning and monitoring of the plant involved in the burning of waste derived fuels, as required by condition 4.2.2	-	Every 12 months	1 January
Waste ARM and Waste Derived Fuel Parameter required by condition 1.1.4	List of ARM and WDF permitted at the installation under the COP.	Every 3 months	1 January, 1 April, 1 July, 1 October

Table S4.2 Performance parameters		
Parameter	Frequency of assessment	Units
Fuels usage	Quarterly	Tonnes
Waste derived fuels usage	Quarterly	Tonnes
Relative thermal input of substitute fuels	Quarterly	%

Table S4.3 Reporting forms		
Media/parameter	Reporting format	Date of form
Air	Forms air 1 to 10 or other forms as agreed in writing by Natural Resources Wales	31/08/10
Water and land	Form Water 1 or other form as agreed in writing by Natural Resources Wales	19/07/16
Fuel Usage Summary	Form fuel 1 or other form as agreed in writing by Natural Resources Wales	30/08/11
Waste Derived Fuels Usage	Form WDF 1 or other form as agreed in writing by Natural Resources Wales	19/07/16
Waste Alternative Raw Materials Usage	Form ARM 1 or other form as agreed in writing by Natural Resources Wales	19/07/16

Schedule 4(b) – Reporting from 9th April 2017

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission monitoring point/reference	or Reporting period	Period begins
Emissions to air Parameters as required by condition 3.3.1	A1, A2 and A3	Continuous monitoring every 3 months	1 January, 1 April, 1 July, 1 October
	A1, A4, A5, A6 and A7	Periodic monitoring every 6 months	1 January, 1 July
Emissions to water (other than sewer) and land Parameters as required by condition 3.3.1	W1	Every 3 Months	1 January, 1 April, 1 July, 1 October
	W2	Each time of discharge	1 January
Functioning and monitoring of the plant involved in the burning of waste derived fuels, as required by condition 4.2.2	-	Every 12 months	1 January
Fuel Usage/waste ARM and Waste Derived Fuel Parameter required by condition 1.1.4	List of ARM and WDF permitted at the installation under the COP.	Every 3 months	1 January, 1 April, 1 July, 1 October

Table S4.2 Performance parameters		
Parameter	Frequency of assessment	Units
Fuels usage	Quarterly	Tonnes
Waste derived fuels usage	Quarterly	Tonnes

Table S4.3 Reporting forms		
Media/parameter	Reporting format	Date of form
Air	Forms air 1 to 10 or other forms as agreed in writing by Natural Resources Wales	31/08/10
Air: periodic monitoring of particulate for A4, A5, A6 and A7	Form Air 11 or other form as agreed in writing by Natural Resources Wales	19/07/16
Water and land	Form Water 1 or other form as agreed in writing by Natural Resources Wales	19/07/16
Fuel Usage Summary	Form fuel 1 or other form as agreed in writing by Natural Resources Wales	30/08/11
Waste Derived Fuels Usage	Form WDF 1 or other form as agreed in writing by Natural Resources Wales	19/07/16
Waste Alternative Raw Materials Usage	Form ARM 1 or other form as agreed in writing by Natural Resources Wales	19/07/16

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any activity that gives rise to an incident or accident which significantly affects or may significantly affect the environment	
To be notified Immediately	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a permit condition	
To be notified immediately	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) In the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment:	
To be notified immediately	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

“abatement system” means equipment dedicated to the removal of polluting substances from releases from the installation to air.

“*accident*” means an accident that may result in pollution.

“*Annex I*” means Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*Annex II*” means Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*annually*” means once every year.

“*application*” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“*ARM*” means Alternative Raw Materials (waste derived materials that replace virgin materials in the manufacture of clinker)

“*authorised officer*” means any person authorised by Natural Resources Wales under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“*Chapter IV Abnormal operating conditions*” means any technically unavoidable stoppages, disturbances, or failures of the abatement systems or the measurement devices, during which the concentrations in the discharges into air or waste water of the regulated substances may exceed the normal emission limit values, IED article 45 1(f).

“*daily average*” unless otherwise specified within the permit, for releases of substances to air means the average of valid half-hourly averages over a calendar day during normal operation.

“*dioxin and furans*” means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

“*disposal*”. Means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*emissions to land*” includes emissions to groundwater.

“*EP Regulations*” means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“*emissions of substances not controlled by emission limits*” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit..

“*groundwater*” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“*Group I metals*” means mercury (Hg).

“*Group II Metals*” means Cadmium (Cd) and Thallium (Tl).

“*Group III Metals*” means Antimony (Sb), Arsenic (As), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Manganese (Mn), Nickel (Ni), & Vanadium (V).

“*Hazardous Waste*” has the meaning given in the Hazardous Waste (England & Wales) Regulations 2005 (as amended)

“*Industrial Emissions Directive*” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

“*ISO*” means International Standards Organisation.

“*MCERTS*” means the Environment Agency’s Monitoring Certification Scheme.

“*MBM*” means Meat and Bone Meal. It is produced at animal rendering plants during the high temperature processing of animal remains comprising mainly abattoir waste arising in the course of preparing meat for consumption. It is a granular solid residue that is left after extracting fat (tallow) during the rendering process. The waste for rendering may contain Specified Risk Material (SRM) such as brain and spinal cords from animals. MBM is classified as a non-hazardous waste by the waste code 02 02 03, defined as “Wastes from the preparation and processing of meat, fish and other foods of animal origin” and the sub-clause “Materials unsuitable for consumption or processing”. MBM cannot contain raw or unprocessed meat, bones or animal parts, or any other waste of agricultural, horticultural or industrial origin.

“*MPA Code of Practice*” means the MPA Code of Practice for the use of waste materials in Cement and Dolomitic Lime Manufacture

“*PCB*” means Polychlorinated Biphenyl. Dioxin-like PCBs are the non-ortho and mono-ortho PCBs listed in the table below.

“*PCP*” means pentachlorophenol

“*permitted installation*” means the activities and the limits to those activities described in Table S1.1 of this Permit.

“*PFA*” means pulverised fuel ash and is the fine ash recovered from the gas stream from combustion of pulverised coal in coal fired power stations.

“*PSP*” means processed sewage pellets.

“*quarter*” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“*R*” means a recovery operation provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*recovery*” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*RFO*” means recovered fuel oil

“*shut down*” means (a) any period when the kiln is being returned to a non-operational state and no waste is being burned. Emission limit values do not apply during shutdown once the raw meal feed rate falls below 80 tonnes per hour, or (b) as otherwise agreed in writing with Natural Resources Wales.

“*Six monthly periodic monitoring*” means periodic monitoring in each 6 month period, January to June & July to December with at least 4 months between sampling dates.

“*SRF*” means Solid Recovered Fuel

“*start-up*” means (a) the process of bringing the kiln into normal operation. Start-up commences when raw meal is introduced into the kiln and may continue until the kiln feed rate reaches 80 tonnes per hour and the kiln is stable, or (b) as otherwise agreed in writing with Natural Resources Wales.

“*TOC*” means Total Organic Carbon. In respect of releases to air, this means the gaseous and vaporous organic substances, expressed as TOC.

“*Thermal input*” refers to the combined pre-calciner and main burner inputs. Maximum thermal substitution of hazardous waste shall not exceed 40% to comply with IED co-incineration requirements.

“*Waste code*” means the six digit code referable to a type of waste in accordance with the list of wastes established by Commission Decision 2000/532/EC as amended from time to time (the “List of Wastes Decision”) and in relation to hazardous waste, includes the asterisk.

“*Waste Framework Directive*” or “*WFD*” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.

“*WLF*” means Waste Liquid Fuels

“*year*” means calendar year ending 31 December.

Unless otherwise stated, up until (and including) 08/04/17, any references in this permit to concentrations of substances in emissions into air means:

- (a) in relation to emissions from cement kilns, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 10% dry for all fuels;
- (b) in relation to emissions from non-kiln sources, no correction is required for temperature, pressure, oxygen or water vapour content.

Unless otherwise stated, from 09/04/17, any references in this permit to concentrations of substances in emissions into air means:

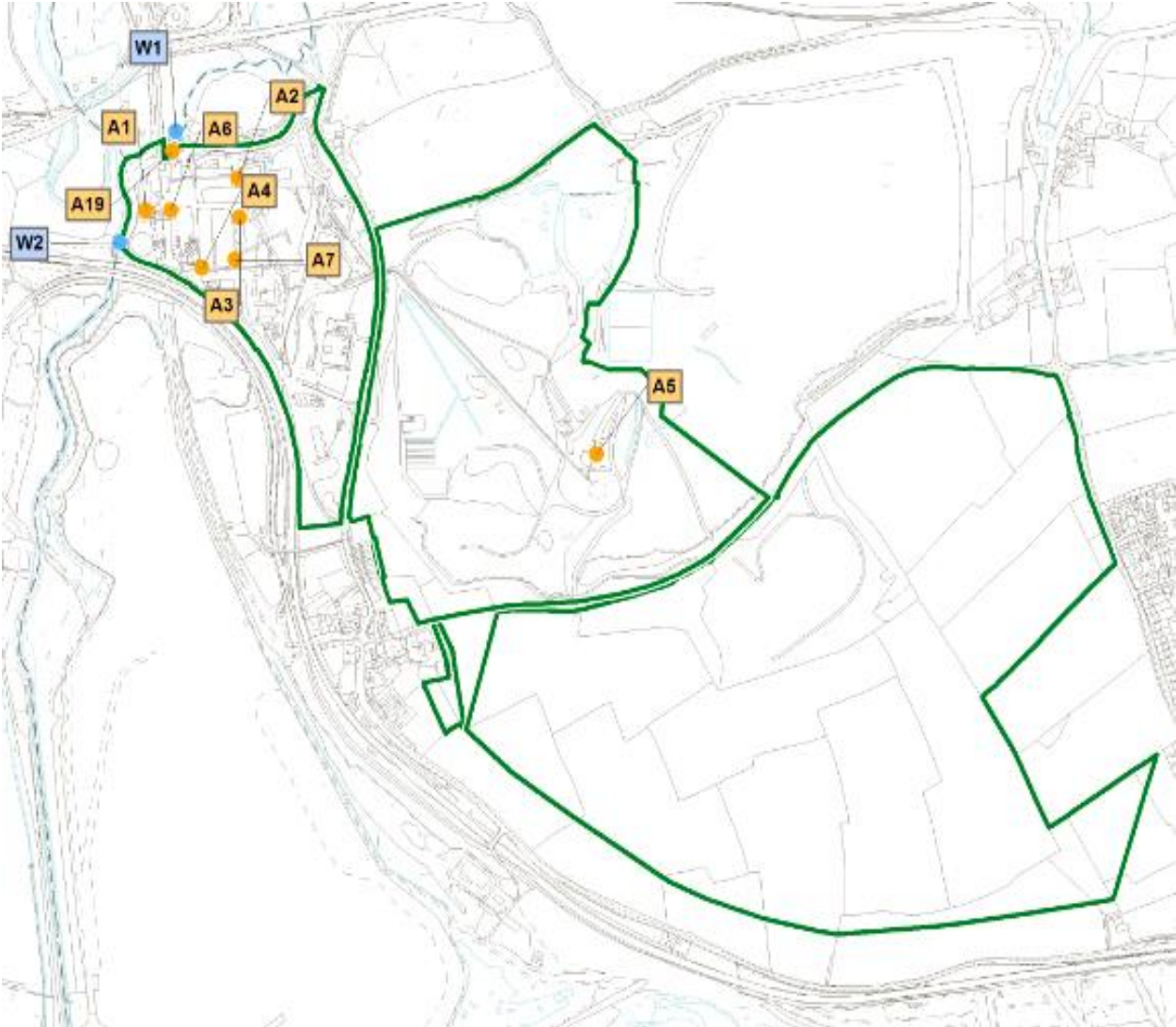
- (a) in relation to emissions from cement kilns, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 10% dry for all fuels;
- (b) in relation to emissions from non-kiln sources, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with no correction for oxygen.

For dioxins/furans and dioxin-like PCBs the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing. When reporting on measurements of dioxins/furans and dioxin-like PCBs, the toxic equivalence concentrations should be reported as a range based on: all congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum. However the minimum value should be used when assessing compliance with the emission limit value in table S3.1.

TEF schemes for dioxins and furans				
Congener	I-TEF	WHO-TEF		
	1990	2005	1997/8	
		Humans / Mammals	Fish	Birds
Dioxins				
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	0.5	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.001	<0.001
OCDD	0.001	0.0003	-	-
Furans				
2,3,7,8-TCDF	0.1	0.1	0.05	1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.1
2,3,4,7,8-PeCDF	0.5	0.3	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.01
OCDF	0.001	0.0003	0.0001	0.0001

TEF schemes for dioxin-like PCBs			
Congener	WHO-TEF		
	2005	1997/8	
	Humans / mammals	Fish	Birds
Non-ortho PCBs			
3,4,4',5-TCB (81)	0.0001	0.0005	0.1
3,3',4,4'-TCB (77)	0.0003	0.0001	0.05
3,3',4,4',5 - PeCB (126)	0.1	0.005	0.1
3,3',4,4',5,5'-HxCB(169)	0.03	0.00005	0.001
Mono-ortho PCBs			
2,3,3',4,4'-PeCB (105)	0.00003	<0.000005	0.0001
2,3,4,4',5-PeCB (114)	0.00003	<0.000005	0.0001
2,3',4,4',5-PeCB (118)	0.00003	<0.000005	0.00001
2',3,4,4',5-PeCB (123)	0.00003	<0.000005	0.00001
2,3,3',4,4',5-HxCB (156)	0.00003	<0.000005	0.0001
2,3,3',4,4',5'-HxCB (157)	0.00003	<0.000005	0.0001
2,3',4,4',5,5'-HxCB (167)	0.00003	<0.000005	0.00001
2,3,3',4,4',5,5'-HpCB (189)	0.00003	<0.000005	0.00001

Schedule 7 - Site plan



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End of Permit