

Notice of variation and consolidation with introductory note

Environmental Permitting (England & Wales) Regulations 2010

Padeswood Cement Works

Castle Cement Limited
Padeswood Works
Padeswood
Mold
Flintshire
CH7 4HB

Variation notice number
EPR/BL1096IB/V009

Permit number
EPR/BL1096IB

Padeswood Cement Works

Permit number EPR/BL1096IB

Introductory note

This introductory note does not form a part of the permit

The following notice, which is issued pursuant to regulations 18 and 20 and Part 1 of Schedule 5 of the Environmental Permitting (England and Wales) Regulations 2010, S.I.2010 No. 675 (the Regulations), gives notice of the variation of an environmental permit to operate a regulated facility/facilities and the replacement of that permit with a consolidated environmental permit.

This variation has been issued to consolidate the original permit and subsequent variations and to update some of the conditions following a statutory review of permits in the Cement & Lime Sector. At the same time the permit has been converted into the current EPR Permit format.

All of the conditions of the permit have been varied other than those indicated in Schedule 1. Schedule 2 contains a copy of the varied and consolidated environmental permit, including any site plan.

DESCRIPTION OF THE PROCESS

The Hanson Cement works at Padeswood manufactures cement from limestone, pulverised fuel ash ("PFA"), shale and sand, together with gypsum, and dispatches it in bulk tankers. The site mothballed its packing plant, which packaged some of the cement for sale in bags, in 2009 following the downturn in the industry.

The kiln is a modern design dry process kiln, with a nominal capacity of 750,000 tonnes per annum and includes a five-stage cyclone pre-heater and a pre-calciner. Its advanced technology reduces energy consumption and significantly reduces emissions to air.

Manufacturing of cement at Padeswood involves three main steps

Step 1 Crushing and blending of raw materials and additives to produce "raw meal"

Limestone brought from the nearby Cefn Mawr quarry is stored in a hopper in a purpose-built enclosure from where it is transferred to the Crane Store using a system of conveyor belts. The other raw materials are also stored here. From the Crane Store, all the raw materials (except gypsum) are taken by conveyor to the dry milling equipment.

Step 2 Clinker Manufacture

The raw meal is then dried by introducing it into the top of the pre-heater tower cyclones. The mixture descends through the cyclones where it is heated to a temperature of about 850°C. (Calcining involves breaking down the carbonates in the limestone to produce oxides). The calcined material is further heated in the rotating kiln

to produce clinker at a temperature of 1450°C. The clinker is cooled to about 100°C and discharged from the kiln's cooler into a storage building.

The calciner can be heated using Profuel (made from paper, plastic, fibre and textiles), solid reclaimed fuel (also known as SRF which is similar to Profuel but reclaimed from 'black bag' waste), meat and bone meal, shredded tyres or coal/petcoke. The substitute fuels are introduced into a separate combustion chamber, which discharges into the inlet at the base of the vertical calciner. The combustion chamber ensures stable combustion of the fuel before it enters the calciner, helping to minimise emissions.

In addition hot gas from the kiln and the clinker cooler are added to assist combustion and reduce overall energy requirements. It is at this point that the separately-milled shale is introduced.

Using the exhaust gas from the kiln in this way means that substances emitted from the kiln undergo gas/solid reactions as they pass through the calciner and many are reduced or incorporated into the clinker product. Similarly introducing the shale separately into the calciner burns off volatile compounds; again eliminating a large range of emissions.

The gases and calcined material then pass to the pre-heater where the calcined raw materials are removed from the gas stream in a cyclone and enter the rotary kiln where the clinker is formed. The burner for kiln 4 can be fuelled by Cemfuel, Profuel and the coal/petcoke mix.

The hot clinker is cooled in a grate cooler and some heated air from the clinker cooler is used as combustion air in the kiln and calciner with the rest discharging to atmosphere through a bag filter and 35m stack. The clinker is taken to the storage facility by conveyor belts.

Some hot gas from the kiln to the calciner pass through a heat exchanger into the conditioning tower, before de-dusting in a dedicated electrostatic precipitator. The dust is collected for disposal while a portion of the cooled, de-dusted gas is returned to the heat exchanger to undertake the initial quench. This eliminates the need for fresh cold air making the kiln more efficient. The remainder is returned to the downdraft calciner to take advantage of NO_x reduction within the main calciner.

Clinker can also be exported from site by lorries which are loaded in the clinker loading area.

Step 3 Cement Milling

Conveyor belts transfer the clinker from the storage facility to the feed hoppers on the cement mills, where it is mixed with gypsum and may be ground with additives such as fillers, grinding aids and strength enhancers to make the final cement product. The four cement mills each have fabric filters to minimise releases of dust to air.

The cement produced is pneumatically conveyed to the bulk silos fitted with dust filters on the vents. From these storage silos cement is extracted either directly to bulk road tankers or to the bagging plant (when in use).

Fuel - Gas oil or kerosene is used to start up the kiln which is then fuelled by coal and petcoke until stability is achieved. The coal and petcoke are stored in a largely covered stockpile area. The coal and petcoke are taken from here by mechanical shovel to the

Crane Store and then, using a series of conveyor belts, taken to be milled to a fine powder to aid combustion. They are ground in a vertical spindle mill in dry air from the exhaust gas from the cyclone pre-heater. The exhaust air from the mill is passed through its own bag filter and then to atmosphere via the main stack. (See fuels factsheet for information on alternative fuels).

Waste - Bypass dust is classified as hazardous waste and has to either be disposed of in a suitable facility or washed for subsequent use in the process. Bag filter dust is recycled into the process. Other wastes produced at the Installation are stored in designated storage areas before being taken for disposal.

ALTERNATIVE FUELS

Gas oil or kerosene is used to start up the kiln which is then fuelled by coal and petcoke until stability is achieved. The coal and petcoke are stored in a largely covered stockpile area. The coal and petcoke are taken from here by mechanical shovel to the Crane Store and then, using a series of conveyor belts, taken to be milled to a fine powder to aid combustion. They are ground in a vertical spindle mill in dry air from the exhaust gas from the cyclone pre-heater. The exhaust air from the mill is passed through its own bag filter and then to atmosphere via the main stack.

Kiln 4 is permitted to use up to 100% of a range of Substitute Fuels ("SFs") instead of coal and petcoke. These include:

Chipped used motor vehicle tyres that are delivered to the works by road in specially designed vehicles. The tyres are taken directly from the delivery vehicle and fed by a conveyor into the top of the calciner. They are delivered to the calciner combustion chamber through a system of two screw conveyors and a chute. The chute is a process improvement over the previously installed double flap valves and is designed to swing into/out of position as required in order to provide a stable flow of material and break the fuel pathway when necessary.

Cemfuel, manufactured to a detailed specification from a range of waste streams including spent solvents, paint and ink residues, spent carbon absorbers and waste oils.

The Cemfuel is delivered by road and stored in steel tanks in bunded areas. The tanks are vented to atmosphere through an activated carbon filter system and fitted with level and overflow control systems. Cemfuel is used only on the main burner of kiln 4 and is not introduced into the calciner.

Profuel, is manufactured from solid wastes, principally paper, plastics, fibre and textiles. Profuel may be used as a fuel for both the calciner and the kiln although it has only been used on the calciner thus far.

SRF (Solid Recovered Fuel) is bio-degraded and shredded combustible waste mainly consisting of paper and plastics from household sources. Delivery to the works is by specially designed road vehicles. SRF is fed to the calciner using the same system as for chipped tyres and Profuel. SRF is manufactured off-site using a form of MBT (Mechanical and Biological Treatment).

MBM (Meat and Bone Meal) is a non-hazardous bio-fuel produced by sterilising and grinding abattoir waste. MBM is delivered to site in special road vehicles and then transferred to a storage silo equipped with an activated carbon filter system. MBM may

be used as a fuel for both the calciner and the kiln although it has only been used on the calciner thus far.

Each of the SFs have a specification and are tested to ensure conformity with that specification and suitability for use.

Emissions Monitoring

Emissions from the kiln stacks are continuously monitored for total particulate matter (TPM), carbon monoxide (CO), sulphur dioxide (SO₂), hydrogen chloride (HCl), oxygen (O₂), nitrogen oxides (as NO₂) and volatile organic compounds (as TOC). In addition spot samples will be carried out twice per year for metals [cadmium (Cd), thallium (Tl), mercury (Hg), antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni) & vanadium (V)], dioxins, hydrogen fluoride (HF), and PAHs.

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

| Status Log of the permit | | |
|---|-----------------------|--|
| Detail | Date | Response Date |
| Application BL1096 | Received 29/08/01 | |
| Notice requiring further information | Request sent 17/12/01 | Consolidated application incorporating response received 05/06/02 |
| Notice requiring further information | Request sent 11/04/03 | Response received 06/06/03 |
| Notice requiring further information | Request sent 17/07/03 | Response dated 11/08/03 |
| Additional information from Applicant: revised site plan and confirmation that landfill is not part of the installation | Received 24/10/03 | |
| Additional information from applicant | Received 10/05/04 | |
| Permit Determined BL1096 | 17/12/04 | |
| Application for landfill variation | Received 15/04/05 | |
| Notice requiring further information | Request sent 21/07/05 | Response received 23/09/05 Response received 09/01/06 |
| Notice requiring further information | Request sent 02/06/06 | Response received 03/08/06 Response received 14/08/06 Response received 19/09/06 |
| Variation Determined YP3438 | 08/11/07 | |
| Application for MBM variation | Duly made 30/03/07 | |
| Notice requiring further information | Request sent 27/06/07 | Response received 20/07/07 |
| Additional information from applicant | Received 20/12/07 | |
| Request to amend fuel specification to Standard Waste Derived Fuel Specification for the Cement Sector | Received 21/02/07 | |
| Additional information from applicant | Received 20/02/08 | |
| Variation Determined KP3338UC | 03/04/08 | |
| Application for SRF variation | Received 03/07/07 | |
| Notice requiring further information | Request sent 31/07/07 | Response received 28/08/07 |
| Additional information from applicant | Received 10/03/08 | |
| Variation Determined AP3134UN | 17/04/08 | |
| Application for landfill variation | Duly made 27/05/08 | |
| Additional information from applicant | Received 21/08/08 | |

| Status Log of the permit | | |
|---|-------------------|----------------------|
| Detail | Date | Response Date |
| Variation Determined EA/EPR/BL1096IB/V005 | 09/10/08 | |
| Partial surrender application | Received 18/12/09 | |
| Variation Determined EA/EPR/BL1096IB/S007 | 06/04/10 | |
| Environment Agency Cement and Lime Sector Review Variation determined EPR/BL1096IB/V009 | 03/08/10 | |

End of Introductory note

Notice of variation and consolidation
Environmental Permitting
(England and Wales) Regulations 2010

Permit number
EPR/BL1096IB

Variation notice number
EPR/BL1096IB/V009

Operator
Castle Cement Limited

of/ whose registered office/or principal office is
Hanson House
14 Castle Hill
Maidenhead
Berkshire
SL6 4JJ

Company registration number/limited liability partnership
2182762

Regulated facility
Padeswood Works
Padeswood
Mold
Flintshire
CH7 4HB

The Environment Agency in exercise of its powers under Regulations 18 and 20 and Part 1 of Schedule 5 of the Environmental Permitting (England and Wales) Regulations 2010 (SI 2010 No 675) varies the environmental permit as set out below and replaces it with a consolidated environmental permit, and all the conditions of that permit other than those indicated in Schedule 1 are varied and the permit is replaced with a consolidated permit in the form set out in Schedule 2.

The notice shall take effect from 3rd August 2010.

| Name | Date |
|-----------------------|------------|
| Thomas Ruffell | 03/08/2010 |

Authorised on behalf of the Environment Agency

Schedule 1

All conditions were replaced with new template conditions.

Schedule 2 – varied and consolidated permit

Please see attached.

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.

1.2 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:

- (a) take appropriate measures to ensure that the waste produced by the activities is avoided or reduced, or where waste is produced it is recovered wherever practicable or otherwise disposed of in a manner which minimises its impact on the environment;
- (b) review and record at least every four years whether changes to those measures should be made; and
- (c) 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 the Environment Agency.

(b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

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 only be accepted if:

- (a) it is of a type and quantity listed in schedule 2 table(s) S2.1 and S2.3; 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 The operator shall burn only those waste derived fuels at the locations specified in table S2.2 of schedule 2 and within the usage ranges specified in that table.

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 No new waste derived fuels shall be used for the purposes of carrying out a feasibility trial without obtaining the Environment Agency's prior written approval 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 No new waste materials shall be used as raw materials in the process except with the prior written approval of the Environment Agency, and shall be subject to the specification in table S2.1 of schedule 2 or otherwise agreed in writing with the Environment Agency.
- 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 the Environment Agency and test a representative selection of these samples to verify conformity with the information obtained as required by condition 2.3.10. These samples shall be retained for inspection by the Environment Agency 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 (as agreed in writing with the Environment Agency); or
 - (b) the kiln is in the process of shutting down (as agreed in writing with the Environment Agency); or
 - (c) Kiln feed rate is less than 120 tonnes/hr; or
 - (d) the calciner 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 kiln temperature is below, or falls below, 1100°C when using hazardous waste or 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 "WID 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 "WID abnormal operating conditions".
- 2.3.13 The operator shall record the beginning and end of each period of "WID abnormal operation", and shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.

- 2.3.14 Where, during “WID abnormal operation”, 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) or continuous effluent monitoring device(s)] are out of service, as the case may be, for a total of four hours uninterrupted duration;
 - (b) the cumulative duration of WID abnormal operation periods over one calendar year exceeds 60 hours on each kiln.
- 2.3.15 The operator shall interpret the end of the period of “WID abnormal operation” 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 the Environment Agency;
 - (c) when a period of four hours has elapsed from the start of the “WID abnormal operation”;
 - (d) when, in any calendar year, an aggregated period of 60 hours “WID abnormal operation” has been reached for a given kiln.

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 the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

- 2.5.1 The activities shall not be brought into operation until the measures specified in schedule 1 table S1.4 have been completed.

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 Process Wastes produced at the site shall, as a minimum, be sampled and analysed in accordance with schedule 3 table S3.8. 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 the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 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 Odour

- 3.3.1 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 the Environment Agency, 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.
- 3.3.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;

- (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

- 3.4.1 The level of noise emitted from the site shall not exceed 50dB, expressed as an $L_{Aeq,T}$ between 07:00 and 23:00 and 45dB at any other time, as measured or assessed at the sensitive property boundaries identified in section 2.9 of the Application. The locations shall be chosen and the measurements and assessments made according to BS 4142:1997.
- 3.4.2 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;
 - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency

3.5 Monitoring

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, 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) emissions to sewer as specified in table S3.4;
 - (c) noise specified in table S3.5;
 - (d) ambient air monitoring specified in table S3.6;
 - (e) process monitoring specified in table S3.7;
- 3.5.2 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.
- 3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Environment Agency. 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 table 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.
- 3.5.4 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 the Environment Agency.
- 3.5.5 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; 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%

- (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 3.5.5;
- (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.

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

- 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;
- an Annual Surveillance Test (AST) shall be performed at least annually, as specified within BS EN 14181;
- the operator shall have a procedure to apply the QAL3 requirements of EN 14181.

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 the Environment Agency, 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 the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) 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 the Environment Agency. The report shall, as a minimum requirement (as required by Article 12(2) of the Waste Incineration Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the WID.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, 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 the Environment Agency, 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 the Environment Agency 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.

4.3 Notifications

- 4.3.1 The Environment Agency shall be notified without delay following the detection of:
- (a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;
 - (b) the breach of a limit specified in the permit; or
 - (c) any significant adverse environmental effects.
- 4.3.2 Any information provided under condition 4.3.1 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 the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 The Environment Agency 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.
- 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) the Environment Agency 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 The Environment Agency 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, the Environment Agency 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.

4.4 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 "without delay", 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 | Limits of specified activity |
| A1 | 3.1 A(1)a | Producing cement on No. 4 cement kiln | <p>Recovery of raw materials from the quarry floor or receipt on site through crushing, blending, other processing and feeding materials to the kiln system Receipt, storage and feed of all materials and fuels (including substitute fuels) into kiln system through to discharge of clinker from the cooler and discharge from the chimney or other process vents.</p> <p>Feed of clinker from clinker cooler or import facility, all transport, milling and blending activities through to discharge from clinker silos/storage tent or export facilities</p> <p>Receipt on site through crushing, blending, other processing and feeding materials to the kiln system. This includes the use of gas oil as a start-up & shutdown fuel</p> |
| Directly Associated Activity | | | |
| A2 | All cement storage, blending, packing and loading. | Cement handling, storage, packing and dispatch | Discharge from clinker silos, all transport, bulk storage through to bulk discharge to road transport or bagging, storage and loading to road transport. |

| Table S1.2 Operating techniques | | |
|--|---|---------------------------|
| Description | Parts | Date Received |
| Consolidated response to Information Notice dated 17/12/01 | Sections 2.1 to 2.11 | 05/06/02 |
| Response to Information Notice dated 11/04/03 | The response given to questions 6 to 18, 23, 25 to 29 & 39 | 06/06/03 |
| Additional Information May 2004 | Sections 3,4, 7 to 18 | 10/05/04 |
| Variation application YP3438s | The response to questions 2.1 to 2.5 in part B of the variation application form | 15/04/05 |
| Response to Information Notice dated 21/07/05 | The response to questions A19, A20, A23, A29, A65, A66,A70, A79 and A81 | 23/09/05 |
| Response to Information Notice dated 02/06/06 | The response to questions B4, B8, B21 and B23 | 03/08/06 & 14/08/06 |
| Variation Application KP3338UC | C2.1 to C2.9, C2.10 (except 2.10.17 to 2.10.20, 2.10.23 and table 2.10.2), C2.11 | 30/03/07 |
| Response to Information Notice dated 27/06/07 | The response given to questions 1,2 and 3 | 20/07/07 |
| Additional Information February 2008 | Alternative fuel maximum tonnage per hour amendments | 20/02/08 |
| Variation Application AP3134UN | C2.1 to C2.9, C2.10 (except 2.10.18 to 2.10.21, 2.10.24 and table 2.10.2), C2.11 | 03/07/07 |
| Response to information Notice dated 31/06/07 | The response given to questions 1 & 4 to 7 | 28/08/07 |
| Additional Information March 2008 | SRF maximum tonnage per hour amendment | 10/03/08 |
| Additional Information August 2008 | Use of SNCR (selective non-catalytic reduction) | 21/08/08 |
| Variation Application EA/EPR/BL1096IB/S007 | Partial surrender of permit to remove the operation of a hazardous waste landfill from permit | 18/12/09 |

| Table S1.3 Improvement programme requirements | | |
|--|---|--|
| Reference | Requirement | Date |
| IC1 | <p>The Operator shall carry out a technical evaluation of the burning of MBM as a waste derived fuel in kiln 4.</p> <p>The technical evaluation programme shall in accordance with Environment Agency document "Technical Evaluation Programme for the Burning of MBM on cement Kiln 4, at Padeswood Cement Works" and 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.</p> <p>The technical evaluation must be completed within six months from the first use of the fuel.</p> | 3 February 2012 |
| IC2 | <p>The Operator shall submit a written report for approval by the Environment Agency on the technical evaluation of the burning of MBM as a waste derived fuel in kiln 4.</p> <p>The report shall explain how the use of MBM 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 MBM and a comparison of emissions with and without using MBM.</p> <p>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.</p> | Within 3 months after completing the technical evaluation programme in IC1 |
| IC3 | <p>The Operator shall carry out a technical evaluation of the burning of SRF as a waste derived fuel in kiln 4.</p> <p>The technical evaluation programme shall in accordance with Environment Agency document "Technical Evaluation Programme for the Burning of SRF on cement Kiln 4, at Padeswood Cement Works" and 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.</p> <p>The technical evaluation must be completed within six months from the first use of the fuel.</p> | 3 February 2012 |
| IC4 | <p>The Operator shall submit a written report for approval by the Environment Agency on the technical evaluation of the burning of SRF as a waste derived fuel in kiln 4.</p> <p>The report shall explain how the use of SRF 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 SRF and a comparison of emissions with and without using SRF.</p> <p>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.</p> | Within 3 months after completing the technical evaluation programme in IC3 |
| IC5 | <p>The Operator shall assess and submit a report on the impacts of the ammonia emissions from the kiln stack, in particular on non-statutory sites such as local wildlife sites, and SSSIs within 2km of the installation and Natura 2000 and Ramsar habitat sites within 10km of the installation.</p> <p>The assessment shall cover both background NH₃ emissions and the maximum ammonia slip when SNCR is optimised for NO_x abatement.</p> | 3 February 2012 |

| Table S1.3 Improvement programme requirements | | |
|--|--|---------------|
| Reference | Requirement | Date |
| IC6 | <p>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 – 20mg/m³ as a daily average by the target date of 30 June 2014.</p> <p>The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.</p> | 3 August 2011 |

| Table S1.4 Pre-operational measures for future development | | |
|---|--|--|
| Reference | Operation | Pre-operational measures |
| 1 | Use of SRF & Profuel [®] as alternative fuels on the main kiln burner | The Operator shall provide details of the transport system to the main burner and monitoring programmes for agreement by the Environment Agency. |

Schedule 2 - Waste types, raw materials and fuels

| Table S2.1 Raw materials and fuels | | |
|---|--|---------------------|
| Raw materials and fuel description | Specification | |
| Coal / Petcoke mix | Sulphur Content | 2.5% w/w |
| | | |
| Chipped Tyres | EWC Number | 16 01 03 |
| | Gross CV | 15 – 40 MJ/kg |
| | Sulphur | 2.0% w/w |
| | | |
| Meat & Bone Meal | EWC Number | 02 02 03 |
| | Gross CV | 10 – 40 MJ/kg |
| | Sulphur | 2.0% w/w |
| | Chlorine | 2.0% w/w |
| | | |
| Profuel® & SRF | EWC Number | 19 12 10 & 19 02 10 |
| | Gross CV | 10 – 40 MJ/kg |
| | Sulphur | 2.0% w/w |
| | Chlorine | 2.0% w/w |
| | Total Fluorine, Bromine & Iodine | 1.5% w/w |
| | Mercury | 10 mg/kg |
| | Group II Metals :- (Total Cadmium & Thallium) | 30 mg/kg |
| | Group III Metals :- | |
| | Copper | 500 mg/kg |
| | Lead | 300 mg/kg |
| | Total Group III Metals | 800 mg/kg |
| | | |
| Cemfuel® | EWC Number | 19 02 08* |
| | Gross CV | 10 – 42 MJ/kg |
| | Sulphur | 2.0% w/w |
| | Chlorine | 2.0% w/w |
| | Total Fluorine, Bromine & Iodine | 1.5% w/w |
| | Mercury | 20 mg/kg |
| | Group II Metals :- (Total Cadmium & Thallium) | 40 mg/kg |
| | Group III Metals :- | |
| | Copper | 1000 mg/kg |
| | Lead | 800 mg/kg |
| | Total Group III Metals | 1800 mg/kg |
| | | |
| New waste derived fuel for feasibility trials | Specification to be agreed in writing with the Environment Agency. | |
| | | |

| Table S2.1 Raw materials and fuels | | |
|--|--|---|
| Raw materials and fuel description | Specification | |
| Wastes used as raw materials (not as fuels) | Minimum Mineral content | At least 80% dry weight (w/w) |
| | Organic Materials | Organic materials as measured by net CV should be <10MJ/kg dry weight (w/w) |
| | No materials which are defined as carcinogens for the purposes of the COSHH Regulations 2002 (as amended) shall be used | |
| Waste generated on-site in connection with the handling and storing of waste derived fuels | Burnt with Cemfuel [®] at a rate that constitutes less than 1.0% by mass of the Cemfuel [®] feed rate. | |

| Table S2.2 Permitted waste fuel types and quantities | | |
|--|---|--|
| Waste Fuel Type | Where used and % of Total Thermal Input | Total Usage Rates |
| Cemfuel [®] | Main burner only 40% | 0 - 40% thermal input 0 – 14.80 tonnes/hour |
| Chipped Tyres | Calciner only 25% | 0 - 25% thermal input 0 – 6.17 tonnes/hour |
| MBM | Calciner 60% Main burner 24% | 0 – 84% thermal input 0 – 31.08 tonnes/hour |
| Profuel [®] | Calciner 45% Main burner 10% | 0 - 55% thermal input 0 – 20.35 tonnes/hour |
| SRF | Calciner 60% Main burner 8% | 0 – 68% thermal input 0 – 25.2 tonnes/hour |

Schedule 3 – Emissions and monitoring

| Table S3.1 Kiln Exhaust Emissions to air – emission limits and monitoring requirements | | | | | | |
|---|--|---------------|--|--|-----------------------------|--------------------------------------|
| Emission point ref. | Parameter | Source | Limit (including unit) | Reference period | Monitoring frequency | Monitoring standard or method |
| A8 | Particulate matter | Kiln 4 | 10 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A8 | VOC as total organic carbon (TOC) | Kiln 4 | 50 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A8 | Hydrogen chloride | Kiln 4 | 10 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A8 | Carbon monoxide | Kiln 4 | 1200 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A8 | Sulphur Dioxide | Kiln 4 | 200 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A8 | Oxides of nitrogen | Kiln 4 | 500 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A8 | Ammonia | Kiln 4 | Limits to be set depending on BAT assessment | | Continuous measurement | BS EN 15267-3 |
| A8 | Hydrogen fluoride | Kiln 4 | 1mg/m ³ | Periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | USEPA Method 26/26A |
| A8 | Cadmium & thallium and their compounds (total) | Kiln 4 | 0.05 mg/m ³ | Periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | BS EN 14385 |
| A8 | Mercury and its compounds | Kiln 4 | 0.05 mg/m ³ | Periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | BS EN 13211 |
| A8 | Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) | Kiln 4 | 0.5 mg/m ³ | periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | BS EN 14385 |
| A8 | Zinc and its compounds | Kiln 4 | No limit set | periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | |

| Table S3.1 Kiln Exhaust Emissions to air – emission limits and monitoring requirements | | | | | | |
|---|---|---------------|-------------------------------|---|-----------------------------|--|
| Emission point ref. | Parameter | Source | Limit (including unit) | Reference period | Monitoring frequency | Monitoring standard or method |
| A8 | Dioxins / furans (I-TEQ) (Reported as a range. All congeners <LOD assumed to be zero and all congeners >LOD assumed to be at the detection limit as a max. | Kiln 4 | 0.1 ng/m ³ | Periodic average value over minimum 6 hours, maximum 8 hour period | Bi-annual | BS EN 1948 Parts 1, 2 and 3 |
| A8 | Dioxins / furans (WHO-TEQ Humans / Mammals) /((fish)/ (birds) | Kiln 4 | No limit set | Periodic average value over sample period of between 6 and 8 hours. | Bi-annual | BS EN/TS 1948-4 |
| A8 | PCBs [Dioxin-like PCBs (WHO-TEQ Humans / Mammals / fish / birds)] | Kiln 4 | No limit set | Periodic measurement average value over sample period of between 6 and 8 hours. | Bi-annual | BS EN/TS 1948-4 |
| A8 | PAHs Specific individual poly-cyclic aromatic hydrocarbons (PAHs) | Kiln 4 | No limit set | Periodic measurement average value over sample period of between 6 and 8 hours. | Bi-annual | Procedure shall use BS ISO 11338-1 and BS-ISO 11338-2. |
| A8 | Benzene | Kiln 4 | No limit set | periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | |
| A8 | 1,3-Butadiene | Kiln 4 | No limit set | periodic over minimum 30 minute, maximum 8 hour period | Bi-annual | |

| Table S3.2 Non-kiln point source emissions to air – emission limits and monitoring requirements | | | | | | |
|--|--------------------|----------------------------------|-------------------------------|-------------------------|-----------------------------|--|
| Emission point ref. | Parameter | Source | Limit (including unit) | Reference period | Monitoring frequency | Monitoring standard or method |
| A3 | Particulate matter | Cement Mill 1 | 30 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A4 | Particulate matter | Cement Mill 2 | 30 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A5 | Particulate matter | Cement Mill 3 | 30 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A6 | Particulate matter | Cement Mill 4 mill filter | 30 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A7 | Particulate matter | Cement Mill 4 Classifier | 30 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A9 | Particulate matter | Kiln 4 cooler exhaust | 50 mg/m ³ | Daily average | Continuous measurement | BS EN 15267-3 |
| A10 | No parameter set | MBM storage vessel | No limit set | | | Permanent sampling access not required |
| Vents on storage silos and conveyor lines | No parameter set | storage silos and conveyor lines | No limit set | | | |

| Table S3.3 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements | | | | | | |
|---|------------------|---|--|----------------------------------|-----------------------------|-------------------|
| Emission point ref. | Parameter | Source | Limit (incl. unit) | Ref period | Monitoring frequency | Monitoring |
| W1 on drawing number 401.00-11-0016-P00 emission to tributary of Black Brook | Suspended solids | Site surface water drainage via the settlement lagoon | 50 mg/l | | Weekly spot sample | |
| W1 on drawing number 401.00-11-0016-P00 emission to tributary of Black Brook | pH | Site surface water drainage via the settlement lagoon | 6 min 9.5max 6 min 9.5max | Instantaneous Spot sample | Continuous Weekly | |
| W1 on drawing number 401.00-11-0016-P00 emission to tributary of Black Brook | BOD | Site surface water drainage via the settlement lagoon | 10mg/l | Spot sample | Weekly | |
| W1 on drawing number 401.00-11-0016-P00 emission to tributary of Black Brook | Temperature | Site surface water drainage via the settlement lagoon | 23°C 23°C | Instantaneous Spot sample | Continuous Weekly | |

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

| Emission point ref. | Parameter | Source | Limit (incl. unit) | Ref period | Monitoring frequency | Monitoring |
|--|---------------|---|--------------------|---------------|----------------------|------------|
| W1 on drawing number 401.00-11-0016-P00 emission to tributary of Black Brook | Flow | Site surface water drainage via the settlement lagoon | No limit set | Instantaneous | Continuous | |
| W1 on drawing number 401.00-11-0016-P00 emission to tributary of Black Brook | Oil or grease | Site surface water drainage via the settlement lagoon | None visible | Spot Sample | Weekly | |

Table S3.4 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements

| Emission point ref. | Parameter | Source | Limit (incl. Unit) | Reference period | Monitoring frequency | Monitoring standard or method |
|--|-----------|--|--------------------|------------------|----------------------|-------------------------------|
| S1 on drawing number 401.00-11-0016-P.00 | | Vehicle wash water via catch pit and oil/water separator | No limit set | | | |

Table S3.5 Noise monitoring requirements

| Location or description of point of measurement | Parameter | Monitoring frequency | Monitoring standard or method | Other specifications |
|--|-----------|----------------------|-------------------------------|----------------------|
| Perimeter survey as detailed in Application section 2.9. | Noise | Monthly | BS 4142:1997 | |

| Table S3.6 Ambient air monitoring requirements | | | | |
|--|---|-----------------------------|--------------------------------------|---|
| Location or description of point of measurement | Parameter | Monitoring frequency | Monitoring standard or method | Other specifications |
| Penyffordd and Penymynydd Bowling Club, Park Crescent, Off Abbots Lane, Penyffordd, NGR SJ 302 612 | Particulate matter, sulphur dioxide, & nitrogen dioxide | Continuous | | Data collected and ratified according to the guidelines used in the UK Automatic Urban and Rural Network (AURN) and those outlined in Technical Guidance Note LAQM.TG(03) |

| Table S3.7 Process monitoring requirements | | | | |
|--|--|-----------------------------|--------------------------------------|-----------------------------|
| Emission point reference or source or description of point of measurement | Parameter | Monitoring frequency | Monitoring standard or method | Other specifications |
| Weather station cement silo 6 | Wind speed and direction | Continuous | | |
| Cyclone pre-heater | Temperature and pressure | Continuous | | |
| Kiln inlet | Carbon monoxide content and oxygen content | Continuous | | |
| Tertiary air | Temperature | Continuous | | |
| Clinker cooler | Temperature | Continuous | | |
| Kiln exit | Temperature | Continuous | | |
| Calcliner | Temperature | Continuous | | |
| A6 (Kiln 4 stack) | Temperature, pressure, oxygen content and water vapour content | Continuous | As described in the application | |
| Kiln exhaust (close to the combustion chamber inner wall) | Temperature | Continuous | Traceable to National Standards | |

Table S3.8 Process Waste

| Emission point reference or source or description of point of measurement | Parameter | Monitoring frequency | Monitoring standard or method | Other specifications |
|--|---|---|--------------------------------------|-----------------------------|
| Cement Kiln 7 and 8 by-pass dust. | Total soluble fraction, free lime content and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions | Before use of a new disposal or recycling route | BS EN196 | |
| Cement Kiln 7 and 8 by-pass dust. | Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds. | 6 Monthly | BS EN 196 | |

Schedule 4 - Reporting

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 or monitoring point/reference | Reporting period | Period begins |
| Emissions to air Parameters as required by condition 3.5.1 | A1, A2, A3, A4, A5, A6 & A7 | Continuous monitoring: Every 3 Months Periodic: Every 6 months | 1 January 1 April 1 July 1 October |
| Noise monitoring Parameters as required by condition 3.5.1 | As detailed in section 2.9 of the application | Monthly | 1 January |
| Ambient air monitoring Parameters as required by condition 3.5.1 | As detailed in Table S3.5 | Continuous monitoring: Every 6 months | 1 January 1 July |
| 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 |

| Table S4.2 Performance parameters | | |
|--|--------------------------------|--------------|
| Parameter | Frequency of assessment | Units |
| Total substitute fuels burned | Annually | Tonnes |
| Total hazardous substitute fuels burned | Annually | Tonnes |
| Potable water used | Annually | Cubic metres |
| Non potable water used | Annually | Cubic metres |

| Table S4.3 Reporting forms | | |
|---|-------------------------|---------------------|
| Media/parameter | Reporting format | Date of form |
| Air: 6 monthly periodic monitoring on kiln 4 | Form: S4 / A1 | Permit issue date |
| Air: Continuous monitoring of particulate matter | Form: S4 / A2 | Permit issue date |
| Air: Continuous monitoring of TOC | Form: S4 / A3 | Permit issue date |
| Air: Continuous monitoring of hydrogen chloride | Form: S4 / A4 | Permit issue date |
| Air: Continuous monitoring of carbon monoxide | Form: S4 / A5 | Permit issue date |
| Air: Continuous monitoring of sulphur dioxide | Form: S4 / A6 | Permit issue date |
| Air: Continuous monitoring of oxides of nitrogen | Form: S4 / A7 | Permit issue date |
| Air: Continuous monitoring of particulate matter for A1 | Form: S4 / A8 | Permit issue date |
| Air: Continuous monitoring of particulate matter for A2 | Form: S4 / A9 | Permit issue date |
| Air: Continuous monitoring of particulate matter for A3 | Form: S4 / A10 | Permit issue date |
| Air: Continuous monitoring of particulate matter for A4 | Form: S4 / A11 | Permit issue date |
| Air: Continuous monitoring of particulate matter for A5 | Form: S4 / A12 | Permit issue date |
| Air: Continuous monitoring of particulate matter for A7 | Form: S4 / A13 | Permit issue date |

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 Regulated Facility | |
| Time and date of the detection | |

| | |
|---|--|
| (a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution | |
| To be notified within 24 hours of detection | |
| 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 limit | |
| To be notified within 24 hours of detection unless otherwise specified below | |
| 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) Notification requirements for the detection of any significant adverse environmental effect | |
|---|--|
| To be notified within 24 hours of detection | |
| 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 regulated facility in the preceding 24 months. | |

| | |
|------------------|--|
| Name* | |
| Post | |
| Signature | |
| Date | |

* authorised to sign on behalf of Castle Cement Limited

Schedule 6 - Interpretation

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

“*abatement equipment*” means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.

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.

“*authorised officer*” means any person authorised by the Environment Agency 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.

“*CEN*” means Comité Européen de Normalisation

“*daily average*” for releases of substances to air means the average of valid half-hourly averages over [a calendar day] [consecutive discrete periods of 24 hours as described in the application / agreed with the Environment Agency] during normal operation.

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

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 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)

“*ISO*” means International Standards Organisation.

$L_{Aeq,T}$ means the equivalent continuous A-weighted sound pressure level in dB determined over a time period T.

“*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 EWC 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.

"*MCERTS*" means the Environment Agency's Monitoring Certification Scheme.

"*PAH*" means Poly-cyclic aromatic hydrocarbon, and comprises Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[b]naph(2,1-d)thiophene, Benzo[c]phenanthrene, Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta[c,d]pyrene, Dibenz[a,h]anthracene, Dibenz[a,i]pyrene, Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene

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

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

"*quarterly*" for reporting/sampling means after/during each 3 month period, January to March; April to June; July to September and October to December and, when sampling, with at least 2 months between each sampling date.

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

"*Waste code*" means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"*Waste Incineration Directive*" means Directive 2000/76/EC on the incineration of waste (O.J. L 332, 28.12.2000)

"*WID abnormal operation*" means any technically unavoidable stoppages, disturbances, or failures of the abatement plant 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.

"*year*" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

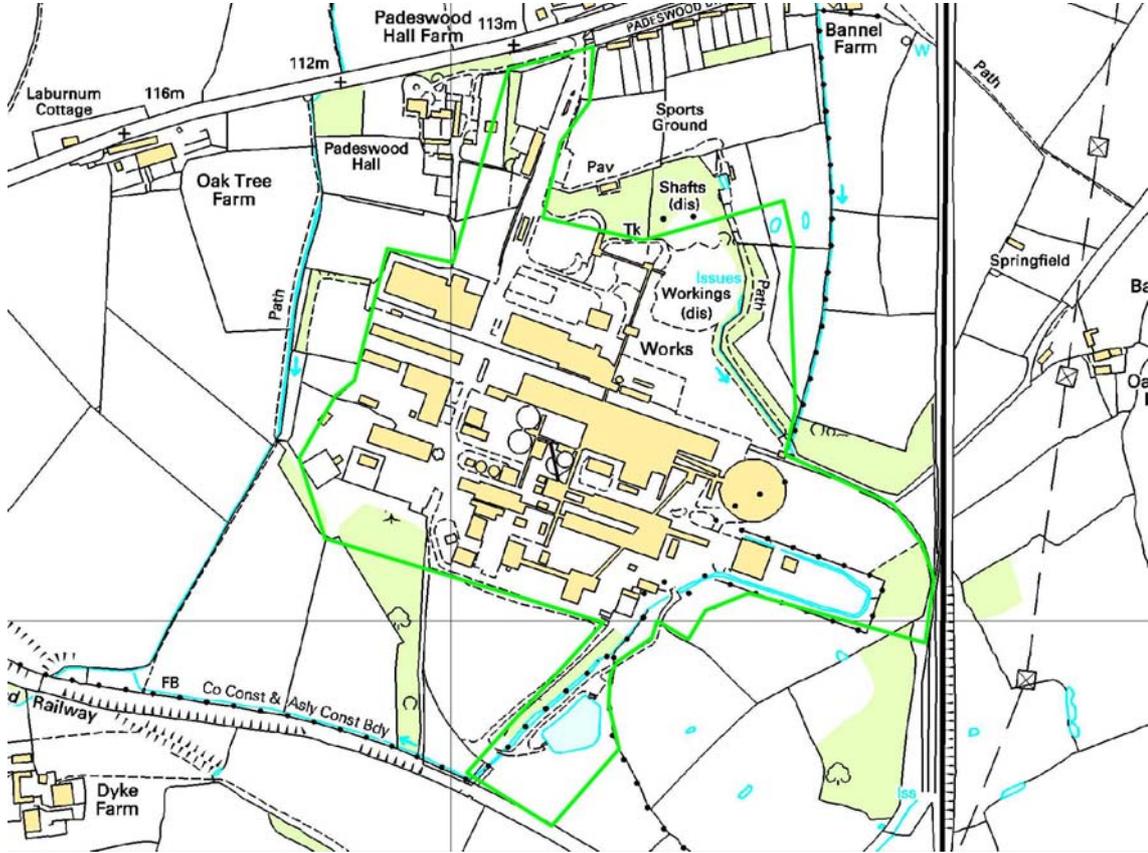
- (a) in relation to emissions from cement kilns, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 10% dry for all fuels;
- (b) in relation to emissions from lime kilns, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry for all fuels;
- (c) in relation to emissions from non-combustion sources, no correction is required for temperature, pressure, oxygen or water vapour content.

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.

| TEF schemes for dioxins and furans | | | | |
|---|--------------------|-------------------------|-------------|--------------|
| Congener | I-TEF(1990) | WHO-TEF (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 | 0.0001 | - | - |
| Furans | | | | |
| 2,3,7,8-TCDF | 0.1 | 0.1 | 0.05 | 1 |
| 1,2,3,7,8-PeCDF | 0.05 | 0.05 | 0.05 | 0.1 |
| 2,3,4,7,8-PeCDF | 0.5 | 0.5 | 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 | 0.0001 | 0.0001 | 0.0001 |

| TEF schemes for dioxin-like PCBs | | | |
|---|-------------------------|-------------|--------------|
| Congener | WHO-TEF (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) | 0.0001 | 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) | 0.01 | 0.00005 | 0.001 |
| Mono-ortho PCBs | | | |
| 2,3,3',4,4'-PeCB (105) | 0.0001 | <0.000005 | 0.0001 |
| 2,3,4,4',5-PeCB (114) | 0.0005 | <0.000005 | 0.0001 |
| 2,3',4,4',5-PeCB (118) | 0.0001 | <0.000005 | 0.00001 |
| 2',3,4,4',5-PeCB (123) | 0.0001 | <0.000005 | 0.00001 |
| 2,3,3',4,4',5-HxCB (156) | 0.0005 | <0.000005 | 0.0001 |
| 2,3,3',4,4',5'-HxCB (157) | 0.0005 | <0.000005 | 0.0001 |
| 2,3',4,4',5,5'-HxCB (167) | 0.00001 | <0.000005 | 0.00001 |
| 2,3,3',4,4',5,5'-HpCB (189) | 0.0001 | <0.000005 | 0.00001 |

Schedule 7 - Site plan



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