Notice of variation and consolidation with introductory note

Environmental Permitting (England & Wales) Regulations 2010

Aberthaw Works

Lafarge Cement UK Ltd
East Aberthaw
Barry
Vale of Glamorgan
CF62 3ZR

Variation notice number

EPR/BL3986ID/V006

Permit number

EPR/ BL3986ID

Aberthaw Works
Permit Number EPR/BL3986ID

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.

Brief description of the installation:

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 and then blended with PFA 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. 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 pulverised fuels are stored in open stockpiles. Distillate fuel oil is used to preheat the kiln and may also be used as a support fuel. MBM a non-hazardous waste derived fuel may also as a partial coal/petcoke replacement.

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 and limestone 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 unitary fabric filters which discharge directly to atmosphere at the height of the silos. Cement is loaded from storage into road and rail tankers or bagged. 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.

Particulate matter is released at high level from the cement kiln, relatively high level from the cement mill and at lower level from a wide range of abatement plant fitted to contain emissions from other sources. Sulphur dioxide, oxides of nitrogen, carbon dioxide and carbon monoxide are also released at high level from the cement kiln chimney.

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 three oil interceptor systems. 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.

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.

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**	**Comments**
Application BL3986ID	Duly made 28/08/01	
Response to request for further information dated 12/10/01	Received 02/01/02	
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 issued30/07/04	Received 27/08/04	
Variation NP3437PH	Determined 10/12/04	
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

End of Introductory note

Notice of variation and consolidation

Environmental Permitting
(England and Wales) Regulations 2010

Permit number

EPR/BL3986ID

Variation notice number

EPR/BL3986ID/V006

Operator

Lafarge Cement UK PLC

whose registered office is

Granite House
Granite Way
Watermead Park
Syston
Leicester
LE7 1PL

Company registration number

66558

Regulated facility

Aberthaw Works
East Aberthaw
Barry
Vale of Glamorgan
CF62 3ZR

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 02/09/2010.

Name	Date
Thomas Ruffell	02/09/2010

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 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 S2.1 and 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 The operator shall burn only those waste derived fuels listed in table S2.1 of schedule 2 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 by 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 Unless otherwise agreed in writing by the Environment Agency, the operator shall take representative samples of all waste derived fuels (as defined in the WID) delivered to the site 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 shall 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 the process of starting up (as agreed in writing by the Environment Agency); or

(b) the kiln is in the process of shutting down (as agreed in writing by the Environment Agency); or

(c) the kiln raw meal feed rate is less than 85 tonnes/hr or as agreed in writing by the Environment Agency; or

(d) the temperature in the kiln as indicated by the surrogate thermocouple in stage 4 of the preheater tower is below or falls below 850°C when using non-hazardous waste: or

(e) 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

(f) 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:

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 monitors are out of service, as the case may be, for a total of four hours uninterrupted duration;

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 by 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.

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, S3.3 and S3.4.

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Process waste dusts produced at the site shall, as a minimum, be sampled and analysed in accordance with schedule 3 table S3.6. 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 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 the Environment Agency, 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.

3.4.2 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, S3.3 and S3.4;

(b) process monitoring specified in table S3.5;

(c) process waste monitoring specified in table S3.6

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 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.

3.5.4 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, S3.3 and S3.4 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	20%
Particulate matter	30%
Total organic carbon	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 (a);

(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 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) 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; and

(b) an Annual Surveillance Test (AST) shall be performed at least annually, as specified within BS EN 14181; and

(c) 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 annual production /treatment data set out in schedule 4 table S4.2; and

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

(d) the functioning and monitoring of the plant involved with the burning of waste derived fuels, in a format agreed in writing by 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 S4.4 ; 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 listed in Schedule 1 of the EP Regulations	**Description of specified activity**	**Limits of specified activity**
3.1 A(1) (a) Producing cement clinker or producing and grinding cement clinker.	Producing cement clinker on the cement kiln system.	Recovery of raw materials from the quarry floor and receipt on site of other 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.
	All cement milling.	Receipt of clinker from the kiln and import facility through storage and transfer to the cement mills and export off site. Receipt, on site of all other raw materials, through storage, blending and feeding, to the cement mills through to discharge of cement to storage and emissions to air from process vents.
Directly Associated Activity	All cement storage, blending, packing and loading.	Receipt of cement, through bulk storage to discharge to road and rail transport or bagging, storage and loading to road transport.
	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 issued30/07/04	All management and control techniques described in the response	Received 27/08/04
Application for variation JP3134SY implementing WID 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

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IP01	The operator shall produce and submit a project plan setting out how releases of SO_2 in the exhaust gases from the kiln will be minimised and reduced to a target value less than 400 mg/m^3 as a daily average by the target date of 30 June 2014. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	31 January 2012
IP02	The operator shall produce and submit a project plan setting out how releases of NO_x in the exhaust gases from the kilns will be minimised and reduced to a target value <500 mg/m^3 as a daily average by the target date of 30 June 2014. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	31 January 2012
IP03	The operator shall assess and submit a report on the impacts of the ammonia emissions from the kiln stacks, in particular on non-statutory sites such as local wildlife sites, and SSSI's within 2km of the installation and Natura 2000 and Ramsar habitat sites within 10km of the installation. The assessment shall cover both background NH_3 emissions and the maximum ammonia slip when SNCR is optimised for NO_x abatement.	31 January 2012
IP04	The operator shall produce and submit a project plan setting out how releases of particulates in the exhaust gases from the kilns will be minimised and reduced to a target value <10 - 20 mg/m^3 as a daily average by the target date of 30 June 2014. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	31 July 2011
IP05	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 reduced to a target value <10 - 20 mg/m^3 as a daily average by the target date of 30 June 2014. The plan will have a prioritised approach for reducing particulate releases from these sources. The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.	31 July 2011

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	
Distillate fuel oil	Sulphur	0.1% (w/w) (max)
MBM	EWC Number	02 02 03
	Gross CV	10 – 40 MJ/kg
	Sulphur	2.0% (w/w) (max)
	Chlorine	2.0% (w/w) (max)
New waste derived fuel for feasibility trials	Specification to be agreed in writing by the Environment Agency.	
Wastes used as raw materials (not as fuels)	Minimum mineral content	At least 80% dry weight (w/w)
	Organic materials content	Organic materials as measured by net CV should be less than 10MJ/kg dry weight
	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 fuel (WDF)	Burned with WDF at a rate that constitutes less than 1.0% by mass of the WDF feed rate.	

Table S2.2 Permitted waste fuel types and quantities		
Waste Fuel Type	**Where used and % of Total Thermal Input**	**Total Usage Rates**
MBM	Main kiln burner only 0 - 22%	0 – 2.6 te/hour 0 - 22,000 te/ year

Schedule 3 – Emissions and monitoring

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/m^3	Daily average	Continuous	BS EN 15267-3
	Oxides of nitrogen	800 mg/m^3			
	Sulphur dioxide	800 mg/m^3			
	Carbon monoxide	1,000 mg/m^3			
	Total organic carbon (TOC)	50 mg/m^3			
	Hydrogen chloride	10 mg/m^3			
	Ammonia	No limit set			
	Hydrogen fluoride	1 mg/m^3	periodic average value over minimum 1-hour period	Bi-annual	ISO 15713
	Cadmium & thallium and their compounds (total)	0.05 mg/m^3	periodic average value over minimum 30 minute, maximum 8 hour period		BS EN 14385
	Mercury and its compounds	0.05 mg/m^3			BS EN 13211
	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3			BS EN 14385
	Dioxins / furans (I-TEQ)	0.1 ng/m^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			
	PCBs [Dioxin-like PCBs (WHO-TEQ Humans / Mammals / fish / birds)]	No limit set			BS EN 1948 parts 1, 2 and 3 BS EN/TS 1948 part 4
	PAHs Specific individual poly-cyclic aromatic hydrocarbons.	No limit set			BS ISO 11338 parts 1 and 2

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-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				

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			BS6068-2.50
	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		Each time of discharge at W2	BS EN 872
	pH		9 max 6 min			BS6068-2.50
	Oil or grease		None visible			Visual check

Table S3.4 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (incl. Unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
-	-	-	-	-	-	-

Table S3.5 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 S3.6 Process waste monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Process waste dust.	Group I, Group II and Group III metals and zinc and their compounds.	6 Monthly	Environment Agency ash sampling protocol for cement.	None
	Dioxins/furans and dioxin-like PCBs			
	Halides (chloride, bromide and fluoride)			
	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 - 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 and A3	Continuous: Every 3 Months	1 January, 1 April, 1 July, 1 October
	A2 and A3	Periodic: Every 12 months	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

Table S4.2: Reporting of annual production/treatment	
Parameter	**Units**
-	**-**

Table S4.3 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 S4.4 Reporting forms		
Media/parameter	**Reporting format**	**Date of form**
Air	Forms air 1 to 10 or other forms as agreed in writing by the Environment Agency	31/08/10
Fuel Usage Summary	Form fuel 1 or other form as agreed in writing by the Environment Agency	31/08/10

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	**EPR/ BL3986ID**
Name of operator	**Lafarge Cement UK PLC**
Location of Regulated Facility	**Aberthaw Works**
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 Lafarge Cement UK PLC

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.

"a*bnormal operation*" means any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices.

"*annual average*" means the average of all daily averages in a calendar year.

"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.

"*background concentration*" means such concentration of that substance as is present in:

(a) for emissions to surface water, the surface water quality up-gradient of the site; or

(b) for emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge; or

(c) for emissions to land, the ground water and subsoil quality below the site.

"*bi-annual*" means twice per year with at least four months between tests;

"*CEM*" means continuous emission monitor

"*CEN*" means European Committee for Standardisation.

"*COSHH Regulations 2002 (as amended)*" means The Control of Substances Hazardous to Health Regulations 2002 (as amended) (SI 2002 No. 2677).

"*Climate Change Agreement*" means an agreement made between the Secretary of State and the operator, either directly or through the offices of any association of which he is a member, in which he agrees to secure energy efficiency improvements as set out in a plan agreed with the Secretary of State in that agreement in return for a discount from the amount he would otherwise pay as a Climate Change Levy.

"*commissioning*" relates to the period after construction has been completed or when a modification has been made to the plant or the raw materials when the Permitted Installation process is being tested and modified to operate according to its design.

"*daily*" means a 24 hour period commencing at 12:00 hrs (midday).

"daily average" for releases of substances to air means the average of valid half-hourly averages over consecutive discrete periods of 24 hours as agreed in writing by the Environment Agency during normal operation.

"*dioxins and furans*" means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans listed in the table below.

"ELV" means emission limit value.

"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**.**.

"*EWC Code*" means the code number from the European Waste Catalogue.

"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), and Vanadium (V)

"*H1*" means the Environment Agency's H1 Risk Assessment Framework version 2.0 April 2010

"*half-hour or half-hourly*" means a 30 minute period commencing on the hour or at half past the hour.

"*hourly*" means a 60 minute period commencing on the hour.

"ISO" means International Standards Organisation*.*

"*kiln flush*" refers to a kiln upset due to a surge of feed material into the kiln which passes through without reacting fully.

"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*.*

"*management system*" means Environmental Management System (EMS) complying with the Environment Agency's Horizontal Guidance Note H6, Environmental Management Systems published April 2010.

"monitoring" includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

"*oxides of nitrogen (NO_x)*" means nitric oxide (NO) plus nitrogen dioxide (NO_2) expressed as NO_2

"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, Dibenzo[ah]anthracene, Dibenzo[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.

"*PCP*" means pentachlorophenol.

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

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

"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.

"*SNCR*" means selective non catalytic reduction.

"*SSSI*" means a site of special scientific interest designated under the Wildlife and Countryside Act 1981 being a site in the UK which is of particular importance because of its geology, topography, or ecology.

"shut down" or *"shutting down"* is any period where the plant is being returned to a non-operational state and there is no waste being burned as described in the application or agreed in writing by the Environment Agency.

"start up" is any period, where the plant has been non-operational, after igniting the auxiliary burner until waste derived fuel has been fed to the kiln in sufficient quantity to initiate steady-state conditions as described in the application or agreed in writing by the Environment Agency.

"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 kiln burner inputs. Maximum thermal substitution of hazardous waste shall not exceed 40% to comply with WID co-incineration requirements. Hazardous waste may only be substituted as a main kiln burner input due to WID minimum thermal operating requirements

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

"*waste oil*" has the same meaning as in Directive 75/439/EC on the disposal of waste oils (O.J.L 194, 25.07.1075)

"*WHO*" means the World Health Organisation

"*WDF*" means waste derived fuel.

"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;

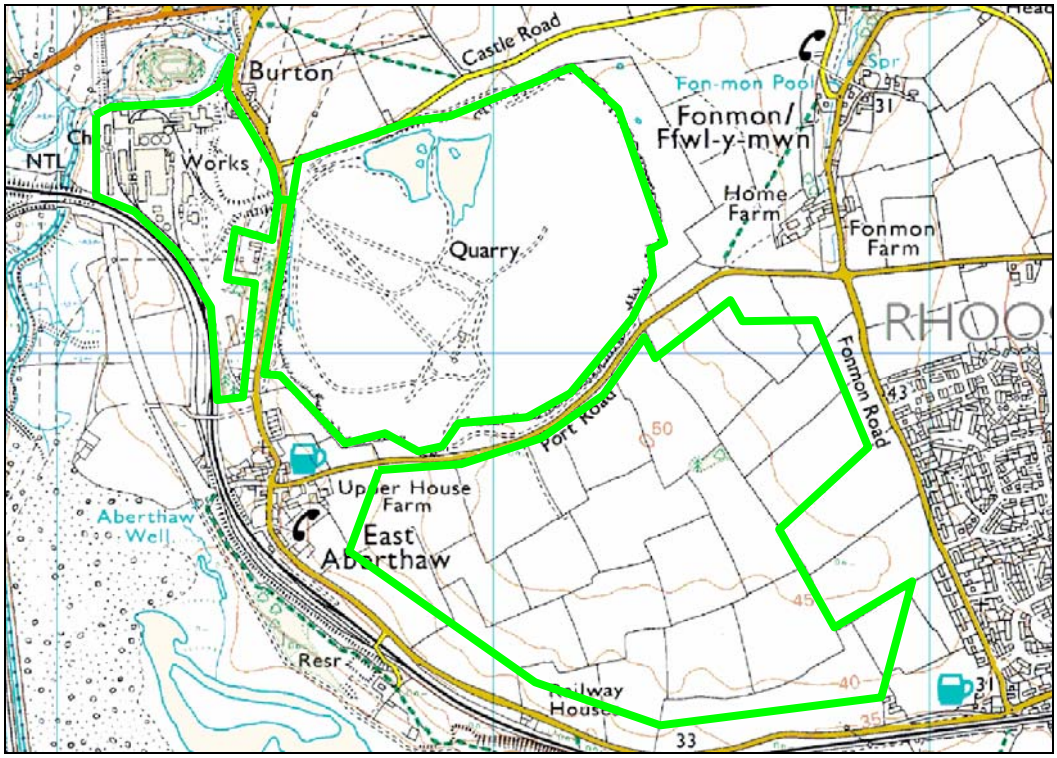
(b) in relation to emissions from non-combustion sources, no correction is required for temperature, pressure, oxygen or water vapour content.

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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End of variation