ENVIRONMENT AGENCY

# Permit with introductory note

*Pollution Prevention and Control Regulations 2000*

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**CASTLE CEMENT LTD**
**PADESWOOD WORKS**
**PADESWOOD**
**MOLD**
**FLINTSHIRE**
**CH7 4HB**

Permit number

BL1096

**Environment Agency Wales**
Chester Road, Buckley, Flintshire, CH7 3AJ

# Contents

# Introductory note

**This introductory note does not form a part of the Permit**

The following Permit is issued under Regulation 10 of the Pollution Prevention and Control Regulations 2000 (S.I.2000 No.1973) ("the PPC Regulations") to operate an Installation carrying out one or more of the activities listed in Part 1 to Schedule 1 of those Regulations, to the extent authorised by the Permit.

The Permit includes conditions that have to be complied with. It should be noted that aspects of the operation of the Installation which are not regulated by those conditions are subject to the condition implied by Regulation 12(10) of the PPC Regulations, that the Operator shall use the best available techniques for preventing or, where that is not practicable, reducing emissions from the Installation.

Techniques include both the technology used and the way in which the Installation is designed, built, maintained, operated and decommissioned.

**Summary**

The purpose of the activities at the Installation is to manufacture cement from mainly limestone, shale, pulverised fuel ash ("PFA") and sand, together with gypsum, and to package it for sale in bags, or dispatch it in bulk tankers. The Installation's activities include:

- raw material handling and preparation operations
- cement clinker manufacturing and handling
- on-site storage of cement clinker
- grinding of clinker with additives to produce cement
- cement handling, storage and packaging operations
- associated fuel storage and handling operations, including the Substitute Fuels ("SFs")
- abatement of exhaust gas
- handling of wastes produced at the Installation and
- systems for controlling and monitoring the operation of the Installation.

The Installation with its current three kilns has a nominal design capacity of 500,000 tonnes per annum of clinker. The introduction of Kiln 4 to replace the existing kilns will increase the nominal capacity to 750,000 tonnes per annum. The existing kilns 1 and 2 are wet process kilns and were installed in 1948. The existing kiln 3 is a dry process kiln and was installed in 1967. Kiln 4 is to be a modern design of dry process kiln, which also incorporates a five-stage cyclone pre-heater and a pre-calciner. The advantages of this technology are a reduction in energy consumption and a significant reduction in emissions to air.

The manufacture of cement at this Installation involves 3 main steps

a) raw materials, and additives, are first crushed and blended to produce "raw meal" in both powder and slurry form.

b) The raw meal is then dried and calcined in the kiln system at a temperature of 800-900°C. (Calcining involves breaking down the carbonates in the limestone to produce oxides). The calcined material is further heated to produce clinker at a temperature of 1450°C. The clinker is then cooled to about 100°C and discharged from the kiln's cooler.

c) Finally, the clinker is milled and blended with gypsum, limestone and small quantities of additives such as grinding aids and strength enhancers to manufacture cement.

**Raw Materials**

Limestone is the principal raw material. It is brought to the site from a nearby quarry and is currently delivered to an intake hopper in a purpose–built enclosure. It is then screened and the larger material is deposited on an open stock pile from which it is reclaimed through underground conveyors and crushed in a hammer mill. The smaller material, from the screen, is transferred directly to hammer mill from which all the crushed limestone is conveyed to the Crane Store. The hammer mill is fitted with a bag filter to prevent emissions of dust. When Kiln 4 is completed the limestone will be delivered directly to the Crane Store via the existing intake facility without crushing in the hammer mill, where it is stored under cover. This will reduce the need for on-site open storage or crushing, with the attendant potential for fugitive emissions of dust.

The other raw materials (principally shale, sand, pulverised fuel ash (PFA) and gypsum) are already delivered directly into the Crane Store. From the Crane Store, all of the raw materials (with the exception of gypsum) are taken by conveyor to the wet or dry milling systems (the former for kilns 1 and 2, the latter for kiln 3). In the wet milling system the slurry is produced and held in basins before being piped into the kilns. In the dry system, raw meal is circulated in a series of silos to ensure uniformity of the raw meal, before being introduced into the kiln by a screw conveyor. Upon the introduction of kiln 4, only a dry system will be required. In the pre calciner the raw materials are heated to a temperature of 900□C where carbon dioxide from the limestone is driven off. Organic matter in the shale combusts in the calciner.

**Fuel Handling Operations**

The existing kilns are fuelled solely by coal and petcoke, which are stored in a stockpile area, most of which is covered. Gas oil or kerosene is used for start up and for periods of coal shortages on kilns 1,2 and 3.

Coal and petcoke are taken from the stockpiles by mechanical shovel to a silo, using a series of conveyor belts. From here it is ground and dried, using hot gas from a gas oil fired air heater in two identical mills, one normally supplying kilns 1 and 2 and the other supplying kiln 3. If necessary each of the mills can supply any of the kilns. The mills are sealed units to prevent dust emissions. The exhaust gas stream from the drier is drawn into the kilns where it is used as part of the combustion air and is subject to kiln abatement techniques. The pulverised fuel is removed from the hot air stream by means of a cyclone and stored in silos, from which it is extracted by screw conveyors and passed to the primary air stream to the kiln burners.

With the introduction of kiln 4, the coal and petcoke will be ground in a new vertical spindle mill. Drying air for the mill will be provided from the exhaust gas from the pre-heater. The exhaust air from the mill will be passed through its own bag filter and then to atmosphere via the main stack.

With the introduction of kiln 4, various other aspects of the fuel arrangements will change, some radically. The most obvious change will be the use of Cemfuel®, Profuel® and chipped tyres as Substitute Fuels ("SFs") up to 100% substitution. Cemfuel® is manufactured to a detailed specification from a range of waste streams including spent solvents, paint and ink residues, spent carbon absorbers and waste oils. Profuel® is manufactured from solid wastes, principally paper, plastics, fibre and textiles. All SFs are subject to specification and will be tested to ensure conformity with that specification and for suitability for use.

In addition to the introduction of new fuels, changes will be made to reflect the new technology of kiln 4. The coal handling system will be modified before kiln 4 is commissioned.

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

Profuel® is to be used at the Installation as a fuel for the calciner and the kiln. The Permit requires a detailed design for the storage and handling systems for Profuel® to be submitted to the Agency, for approval prior to the operation of the Profuel® plant.

Chipped tyres will be delivered to the Installation by road and stored in a specially designed area. The tyres will be taken from the store and fed into the bottom of the calciner (the only place in the kiln 4 system where they are used) by conveyor through a rotary valve arrangement.

Gas oil or kerosene is used for start-up purposes and for periods of coal shortages on the existing kilns and will be used similarly with kiln 4. It is stored in a tank contained within a bunded area.

**Clinker Manufacture**

The existing kilns at Padeswood use two different types of manufacturing process. In both processes, the finely ground raw meal is introduced into the long, sloping kiln at its high end, and passes slowly to the lower end as the kiln rotates. Fuel is introduced in the form of a fine powder to the burner at the lower end of the kiln. As the raw meal passes along the kiln it is heated to a temperature of approximately 1450°C during which time the calcining and clinkering reactions take place. The resulting clinker leaves the bottom of the kiln through planetary coolers, which reduce the temperature of the clinker to approximately 100-150°C. The clinker is then moved by conveyor to the enclosed clinker store. The heated air from the coolers is recycled into the kilns where it is used as combustion air, reducing the overall energy requirements of the kiln

In the wet process kilns (kiln 1 and 2) the raw meal is introduced into the kiln as slurry. In the dry kiln (kiln 3) the raw meal is introduced into the kiln as a dry powder. The dry technique is a more modern one, which avoids the energy consumption required to remove moisture from the slurry, and also forms the basis for the technology to be used in kiln 4.

In the new kiln 4 design the limestone, sand and pulverised fuel ash will be taken from the Crane Store by conveyor. The limestone and sand will be ground separately (to allow more efficient grinding) before being mixed and transferred to the kiln system. The mixture will be introduced at the top of the pre-heater tower. As the mixture descends through these pre-heater cyclones it will be heated to a temperature of about $850^0$C, by the hot exhaust gas from the calciner into which they feed.

Profuel® will be introduced to a separate combustion chamber, which will discharge into the inlet of the calciner. The combustion chamber will ensure satisfactory and stable combustion of the Profuel® before it enters the calciner, thereby helping to minimise emissions.

Chipped tyres will be fed into the bottom of the calciner by conveyor from the tyre store, through a rotary valve arrangement that will ensure a constant and steady supply to maximise combustion efficiency. As well as the heat from the Profuel® unit and the combustion from the tyres, hot gas from the kiln and the clinker cooler is also introduced here to assist combustion and reduce the overall energy requirements. It is at this point in the process as well that the separately-milled shale is introduced.

The introduction of exhaust gas from the kiln means that many of the substances emitted from the kiln that may otherwise require abatement are subjected to gas/solid reactions as they pass through the calciner to the kiln, and therefore are reduced or incorporated into the clinker product.

A staged combustion process takes place in the calciner. In the first stage a reducing atmosphere is created by the balance of fuel and oxygen, creating a reaction which takes the oxygen out (for example reducing oxides of nitrogen to nitrogen). As the heated raw materials then rise to the second stage, air is added to burn the combustible material that emanates from the first stage. As a result, the overall combustion and calcination process is both more energy-efficient and produces lower emissions, and little further calcination needs to take place in the kiln itself.

By introducing shale separately into the calciner, the volatile compounds it contains are burned off, largely eliminating a range of emissions, which are associated with the existing kilns.

The gases from the calciner are then recycled to the pre-heater. The calcined raw materials are removed from the gas stream in a cyclone and enter the rotary kiln where the clinker is formed. The kiln will be much shorter than kilns 1, 2 and 3, as the pre-heater and calciner treatment has already completed the calcining process. The burner for kiln 4 will be fuelled by Cemfuel®, Profuel® and the coal/Petcoke mix.

The hot clinker leaving kiln 4 will be cooled in a grate cooler of a modern and efficient design. The heated air from the clinker cooler is used as combustion air in the kiln and calciner. Any surplus air is discharged to atmosphere through a separate bag filter and stack. The clinker is taken to the existing facility by conveyor for storage.

### Cement Milling

For the existing kilns and kiln 4, the clinker is/will be taken from the storage facility by a series of conveyor belts and transferred to the feed hoppers on the cement mills, where it is mixed with gypsum and ground with additives to make the final cement product. There are four cement mills, each fitted with fabric filters to minimise releases of dust to air. The grinding aids are stored in drums adjacent to the cement mills.

### Bulk Storage, Packing and Despatch

The product cement is pneumatically conveyed to the bulk silos fitted with dust filters on the vents. From the storage silos cement is extracted either directly to bulk road tankers or to the bagging plant.

### Emissions

#### Air

The existing wet process kilns (numbers 1 and 2) are each fitted with electrostatic precipitators to minimise the release of particulates and discharge to air through a common stack with a single flue 61metres high. The existing dry kiln (number 3) discharges to air through its own electrostatic precipitator and 76 metre stack.

With kiln 4, a portion of the hot gas leaving the kiln through the riser will be extracted. This by pass gas passes through a heat exchanger then a conditioning tower, before dedusting in a dedicated electrostatic precipitator (EP). The dust collected in the EP is transferred to dedicated silos. A portion of the cooled, dedusted gas from the EP is returned to the heat exchanger to undertake the initial quench, thereby eliminating the need for fresh cold air thus making the kiln more efficient. The remainder is returned to the downdraft calciner to take advantage of $NO_x$ reduction within the main calciner. There are no direct emissions to air from the by pass system.

The clinker cooler has its own 35 metre stack fitted with a bag filter.

The existing coal mills exhaust into the primary air system for the kilns. The exhaust air from the coal mill for kiln 4 will be discharged through the main bag filter and stack.

#### Water

### *Cooling Water & Site Drainage*

Cooling water is recycled through dedicated cooling systems. Surface water drainage is passed through oil/water separators into a lagoon. From the lagoon water can be pumped back to the process, with any excess being discharged to the tributary of the Black Brook.

### Waste

The Cement Kiln Dust from the existing kilns is made up of dust emitted from the kilns, which is caught in the electrostatic precipitators and then stored in silos before being removed for disposal. The by pass dust from kiln 4 will be classified as hazardous waste and have to be disposed of to a suitable facility. Bag filter dust from kiln 4 will be recycled into the process.

Other wastes produced at the Installation are stored in designated storage areas before being taken for disposal.

### Emissions Monitoring

The two existing stacks, serving kilns 1 and 2 and kiln 3 are monitored and recorded continuously for the following parameters;

Oxides of Nitrogen

Sulphur Dioxide

Particulates

Each gas stream leaving the kilns is monitored for Oxygen and Carbon Monoxide

These parameters are recorded along with the information on the process.

In addition the four other emission points from the cement mill system are monitored for bag filter failure.

The main stack on kiln 4 will be monitored and recorded continuously for the following parameter;

Oxides of Nitrogen

Sulphur Dioxide

Particulates

Carbon Monoxide

Oxygen

Volatile Organic Compounds (VOCs reported as TOC)

Hydrogen Chloride.

In addition there is a programme of periodic extractive monitoring for the above parameters, plus hydrogen fluoride, dioxins and furans, dioxin-like PCBs, PAHs and heavy metals.

There will be a programme of extended monitoring during the commissioning of Kiln 4, covering all fuel firing options.

| Other PPC Permits relating to this installation | | |
|---|---|---|
| **Permit holder** | **Permit Number** | **Date of Issue** |
| None | | |

| Superseded Licences/Consents/Authorisations relating to this installation | | |
|---|---|---|
| **Holder** | **Reference Number** | **Date of Issue** |
| Castle Cement Ltd-IPC Authorisation | AI0349 | 30-9-1993 |

Talking to Us

If you contact the Agency about this Permit please quote the Permit Number.

The Operator should use the Emergency Hotline telephone number (0800 80 70 60) or any other number notified to it to give a notification under condition 5.1.1.

Confidentiality

The Permit requires the Operator to provide information to the Agency. The Agency will place the information onto the public registers in accordance with the requirements of the PPC Regulations. If the Operator considers that any information provided is commercially confidential, it may apply to the Agency to have such information withheld from the register as provided in the PPC Regulations. To enable the Agency to determine whether the information is commercially confidential, the Operator should clearly identify the information in question and should specify clear and precise reasons.

Variations to the permit

This Permit may be varied in the future. The Status Log within the Introductory Note to any such variation will include summary details of this Permit, variations issued up to that point in time and state whether a consolidated version of the Permit has been issued.

Surrender of the permit

Before this Permit can be wholly or partially surrendered, an application to surrender the Permit has to be made. For the applicant to be successful, they would have to be able to demonstrate to the Agency, in accordance with Regulation 19 of the PPC Regulations, that there is no pollution risk and that no further steps are required to return the site to a satisfactory state.

Transfer of the permit or part of the permit

Before the Permit can be wholly or partially transferred to another person, a joint application to transfer the Permit has to be made by both the existing and proposed holders, in accordance with Regulation 18 of the PPC Regulations. A transfer will be allowed unless the Agency considers that the proposed holder will not be the person who will have control over the operation of the Installation or will not ensure compliance with the conditions of the transferred Permit. If the Permit authorises the carrying out of a specified waste management activity, then there is a further requirement that the transferee is considered to be a "fit and proper person" to carry out that activity.

Status Log

| Detail | Date | Comment |
|---|---|---|
| Application BL1096 | Received 29/08/01<br>Duly made 31/08/01 | |
| First Schedule 4 Information Notice | Notice dated 17/12/01 | Consolidated application incorporating response received 05/06/02 |
| 2nd Sch 4 Notice | Notice Dated 11/04/03 | Response received 06/06/03 |
| 3rd Sch 4 Notice | Notice dated 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 10/5/04 | |
| Permit Issued | 17/12/04 | |

**End of introductory Note.**

**Permit**
*Pollution Prevention and Control Regulations 2000*

ENVIRONMENT AGENCY

# Permit

Permit number
**BL1096**

The Environment Agency (the Agency) in exercise of its powers under Regulation 10 of the Pollution Prevention and Control Regulations 2000 (S.I. 2000 No. 1973), hereby authorises
**Castle Cement Ltd ("the Operator"),**

Whose Registered Office is
**Park Square**
**3160 Solihull Parkway**
**Birmingham Business Park**
**Birmingham**
**B37 7YN**

Company registration number 2182762

to operate an Installation at
**Padeswood Works**
**Padeswood**
**Mold**
**Flintshire**
**CH7 4HB**

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

Signed

**Authorised to sign on behalf of the Environment Agency**

Date

17th December 2004

# Conditions

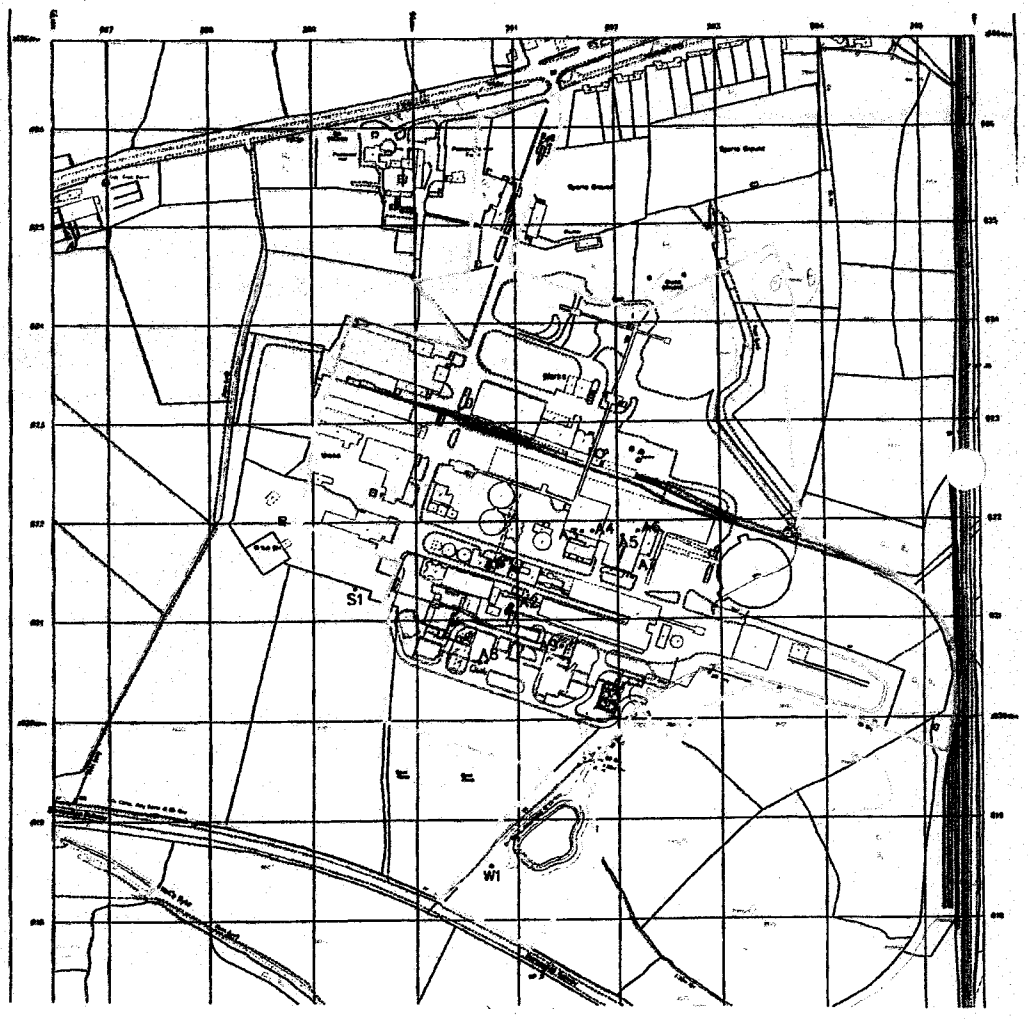
## 1 The Permitted Installation

1.1 The Operator is authorised to carry out the activities and/or the associated activities specified in Table 1.1.

Table 1.1

| Activity under Schedule 1 of the Regulations/ Associated Activity | Description of specified activity | Limits of specified activity |
|---|---|---|
| All raw materials storage, handling and preparation. | Receive raw materials from suppliers, including checking for suitability for use in line with the Integrated Management System ("IMS"). Preparation and storage of raw materials or process feedstocks. | Receipt on site through storage, crushing, blending, other processing and feeding materials to the kiln systems. |
| All fuel handling, storage and preparation. | Coal & petcoke storage, handling and blending systems.<br>Gas Oil or kerosene receipt and storage.<br>Profuel®, Cemfuel® and Tyres storage and handling systems. | Receipt on site through storage, crushing, blending, other processing and feeding materials to the kiln system. This includes the use of gas oil or kerosene as a start-up fuel. |
| Cement kiln No 1, 2, 3, 4 and associated coolers. | Operation of cement kiln systems. | Feed of all materials and fuels into kiln system through to discharge of clinker from the cooler and discharges to air from the stack. |
| All cement clinker storage and associated milling. | Clinker handling, storage and milling. | Feed of clinker from clinker coolers or import facility, receipt of grinding aids, all storage, transport, milling and blending activities through to discharge from cement milling area to export facilities. |
| All cement storage, blending, packing and loading. | Cement handling, storage, packing and dispatch. | All transport, bulk storage through to bulk discharge to road transport or bagging, storage and loading to road transport. |
| All waste storage and handling. | Waste storage and handling. | From the on site generation of waste through to dispatch for recovery or disposal. |

1.2 **The activities authorised under condition 1.1 shall not extend beyond the Site, being the area shown edged in yellow on the plan below;**




"Reproduced from the Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office ©Crown Copyright 2000. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings."

1.3 **Kiln 4 shall not be brought into operation until the following measures have been completed and the Agency has been notified in writing of this.**

a **Prior to commissioning kiln 4, the Operator shall conduct a baseline soil and moss bag survey to assess dioxins/ furans, dioxin-like PCBs and heavy metals contamination in the vicinity of the Installation to a specification to be approved in writing by the Agency. The Operator shall prepare and submit a report to the Agency setting out full details of the survey, its findings and proposals for future monitoring, and obtain the Agency's written confirmation that the report is satisfactory, before commissioning of kiln 4 begins.**

b The Operator shall complete the Hazard and Operability ("HAZOP") studies listed in Section 13 of the additional Information dated 7 May 2004, together with that for Cemfuel® once the detailed process and instrumentation design of kiln 4 has been completed. Modifications to the design involving changes to the Application shall not be made unless agreed in writing with the Agency.

c The Operator shall provide to the Agency a study of the combustion gas flow conditions in kiln 4 and the kiln 4 calciner in order to demonstrate that the temperature and residence time meets the requirements of the Waste Incineration Directive ("WID"). A Computational Fluid Dynamics study or an alternative valid methodology to be approved by the Agency must be used to establish that the flow conditions are sufficiently uniform to ensure that efficient combustion will take place within the kiln and calciner. The Operator shall submit a report to the Agency, and obtain the Agency's written confirmation that the report is satisfactory, before commissioning of kiln 4 begins.

d The Operator shall propose, for written approval by the Agency before commissioning of kiln 4 begins, a detailed programme of commissioning, including the use of substitute fuels ("SFs"), demonstrating how the applicable technical requirements of section 4 of the Agency's Substitute Fuels Protocol ("SFP") and the applicable requirements of the Waste Incineration Directive ("WID") will be satisfied. The programme (as approved by the Agency) shall be implemented during commissioning or as otherwise agreed in writing with the Agency.

e The Operator shall propose, for written approval by the Agency before commissioning of kiln 4 begins, a detailed programme of monitoring which shall satisfy the applicable technical requirements of section 4 of the SFP and the applicable requirements of the WID, and shall be designed to ensure that the results are representative and that it can be clearly demonstrated that the kiln is operating optimally . The programme (as approved by the Agency) shall be implemented during commissioning or as otherwise agreed in writing with the Agency.

f The Operator shall, before SFs are first delivered to the Installation:

(i) review arrangements for the fire protection of the storage of SFs;

(ii) submit to the Agency a detailed design for the storage and handling systems for Profuel® and tyres, for written approval by the Agency, and carry out the approved works;

and shall in each case submit a written report to the Agency on the completion of each of the above and receive the Agency's written approval.

g Full details of written operating instructions and demonstrating compliance with the applicable requirements of the Agency's SFP and the WID must be approved by the Agency and put in place to the Agency's satisfaction (expressed in writing), and staff must be trained in accordance with the Operator's IMS before commissioning begins.

h The Operator shall develop a written protocol for representative sampling and analysis of the kiln residues (e.g. kiln by-pass dust) to establish the physical and chemical characteristics and the pollution potential. The protocol shall be submitted in writing to the Agency for approval. The protocol (as approved by the Agency) shall be implemented from commissioning onwards or as otherwise agreed in writing with the Agency.

i The Operator shall, before commissioning of kiln 4 begins, provide details to the Agency of the proposed disposal route(s) for bypass

dust from kiln 4 and obtain the Agency's written approval for its proposals. The disposal route(s) (as approved by the Agency) shall be implemented from commissioning onwards or as otherwise agreed in writing with the Agency.

j The Operator shall propose a format and content of interim and final commissioning reports to the Agency for its written approval before commissioning of kiln 4 begins.

k The Operator shall notify the Agency in writing two weeks in advance of the start of commissioning of kiln 4.

1.4 The existing kilns 1,2 and 3 shall not operate when the wind direction indicated on the works monitor is between 0 and 60 degrees or between 170 and 190 degrees, except as agreed in writing with the Environment Agency.

# 2 Operational Matters

## 2.1 Management techniques and control

2.1.1 The Permitted Installation shall, subject to the conditions of this Permit, be managed and controlled as described in the documentation specified in Table 2.1.1, or as otherwise agreed in writing by the Agency.

Table 2.1.1 : Management and control

| Description | Parts | Date Received |
|---|---|---|
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.1 Management Techniques. | 5/06/2002 |
| The Additional Information May 2004 | Section 17 | 10/05/2004 |

2.1.2 All plant, equipment and technical means used in operating the Installation shall be maintained in good operating condition.

2.1.3 The Permitted Installation shall at all times be supervised by staff who are suitably trained and fully conversant with the requirements of this Permit.

2.1.4 A copy of this Permit and those parts of the application referred to in this Permit shall be available, at all times, for reference by all staff carrying out work subject to the requirements of the Permit.

2.1.5 All staff shall be fully conversant with those aspects of the Permit conditions, which are relevant to their duties and shall be provided with appropriate training and written operating instructions to enable them to carry out their duties.

## 2.2 Raw materials (including fuel and water)

2.2.1 The Operator shall, subject to the conditions of this Permit, use raw materials (including water) as described in the documentation specified in Table 2.2.1, or as otherwise agreed in writing by the Environment Agency.

| Table 2.2.1 : Raw materials (including water) | | |
|---|---|---|
| **Description** | **Parts** | **Date Received** |
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.2. and 2.3 | 5/06/2002 |
| The Response to the Sch-4 Notice Issued 11 April 2003 | The response given to questions 6, 7, 10, 14 & 15. | 6/06/2003 |
| The Additional Information May 2004 | Sections 3, 4, 11,12, 14,16 and 18. | 10/05/2004 |

2.2.2 Gas oil shall contain less than 0.2% sulphur content by weight.

2.2.3 The blended Coal and Petcoke burned in the kilns shall contain less than 2.5% sulphur content by weight.

2.2.4 Used tyre chips used as fuel in kiln 4 shall contain less than 2.0% sulphur by weight.

2.2.5 The raw materials detailed in Table 2.2.5 shall be stored in the location and manner specified in that table.

Table 2.2.5: Raw Material Storage

| Material | Location of Storage on site | Storage Conditions |
|---|---|---|
| Limestone (kilns 1, 2 and 3 only) | Stockpile | Open Stockpile |
| Limestone | Crane Store | Enclosed Building |
| Shale | Crane Store | Enclosed Building |
| Sand | Crane Store | Enclosed Building |
| Pulverised Fuel Ash | Crane Store | Enclosed Building |
| Petcoke | Coal Store | Covered Area |
| Coal | Coal Store | Covered Area |
| Gypsum | Crane Store | Enclosed Building |
| Gas oil or kerosene | Oil storage tank | Within bunded area |
| Tyres | Tyres Storage Facility | Bunded area |
| Cemfuel® | Cemfuel® Storage Facility | Bunded Storage Tanks |
| Profuel® | Profuel® Storage Facility | Enclosed Building |
| Lubricating oils and other maintenance fluids. | As detailed in application. | Bunded storage points. |
| Fuel oil for site vehicles. | As detailed in application. | Double walled tank |
| Grinding aids and air entrainers. | As detailed in application. | Receipt containers |
| Ferrous sulphate | As detailed in application | Dedicated hopper |

2.2.6 No new raw materials shall be used unless otherwise agreed in writing with the Environment Agency.

2.2.7 Cemfuel® delivered to, and used at, the Installation shall be described by the European Waste Catalogue (EWC) Code 19 02 08 and comply with the limits specified in Table 2.2.7.

| Table 2.2.7 Cemfuel® batch specifications | |
|---|---|
| Parameter | mg/kg – maximum unless otherwise stated |
| Calorific Value (range allowed) | 15 – 42 MJ/kg (gross) |
| Sulphur | 1.0% w/w |
| Chlorine | 3.5% w/w |
| Fluorine | 0.5% w/w |
| Bromine | 0.5% w/w |
| Iodine | 120 |
| Mercury | 24 |
| Cadmium and Thallium in total | 40 |
| Antimony | 360 |
| Arsenic | 60 |
| Chromium | 600 |
| Cobalt | 120 |
| Copper | 720 |
| Lead | 720 |
| Manganese | 300 |
| Nickel | 360 |
| Tin | 120 |
| Vanadium | 60 |
| Total Group III Metals | 2160 |
| Solids | 30%w/w |
| Ash | 8%w/w |
| Water | 20%w/w |

2.2.8 All Profuel® delivered to, and used at, the Installation shall be described by the EWC Code 19 02 10 and comply with the limits specified in Table 2.2.8

| Table 2.2.8 Profuel© Batch Specification | |
|---|---|
| Parameter | mg/kg – maximum unless otherwise stated |
| Calorific Value (minimum ) | 15 MJ/kg (gross) |
| Sulphur | 0.5% w/w |
| Chlorine | 0.9% w/w |
| Total Fluorine, Bromine & Iodine | 0.25% w/w |
| Mercury | 10 |
| Zinc | 500 |
| Silver | 100 |
| Cadmium | 20 |
| Thallium | 20 |
| Antimony | 100 |
| Arsenic | 50 |
| Chromium | 100 |
| Cobalt | 75 |
| Copper | 200 |
| Lead | 200 |
| Manganese | 100 |
| Nickel | 100 |
| Tin | 50 |
| Vanadium | 100 |
| Total Group III Metals | 800 |

2.2.9 Each new material being introduced for use in Profuel® shall be agreed in writing with the Agency before use. The Agency shall be notified in writing at least one month prior to any proposal to use any new material.

2.2.10 All SFs used at the Installation are subject to the following conditions:

**a** No radioactive materials or radioactive wastes (as defined by Sections 1 and 2 respectively 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 Operating Techniques

2.3.1 The Permitted Installation shall, subject to the conditions of this Permit, be operated using the techniques and in the manner described in the documentation specified in Table 2.3.1, or as otherwise agreed in writing by the Environment Agency.

**Table 2.3.1: Operating techniques**

| Description | Parts | Date Received |
|---|---|---|
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.3 | 5/06/2002 |
| The Response to the Sch-4 Notice Issued 11 April 2003 | The response given to questions 8,9,11,12,13,14,15,16,17,18 & 39 | 6/06/2003 |
| The Additional Information May 2004 | Sections 7, 8, 9, 13, 15, 17 and 18. | 10/05/2004 |

2.3.2 Only the SFs described in Table 2.3.2 and in the quantities specified in Table 2.3.2, may be used on kiln 4 at the Installation.

**Table 2.3.2: Permitted Substitute Fuels**

| Description | European Waste Catalogue Number (where available) or other specification | Maximum input at any time. |
|---|---|---|
| Tyres | Chipped tyres only<br>Catalogue No 16 01 03 | Calciner<br>25% Thermal Input<br>3.08 tonnes/hr |
| Cemfuel® | Catalogue Number 19 02 08 | Kiln<br>100% Thermal Input<br>8.54 tonnes/hr |
| Profuel® | Catalogue Number 19 02 10 | Calciner<br>75% Thermal Input<br>11.1 tonnes/hr<br>Kiln<br>20% Thermal Input<br>2.47 tonnes/hr. |

2.3.3 Prior to accepting delivery of a substitute fuel the operator shall

**a** Determine the mass of the material, if possible according to the EWC.

**b** For any hazardous waste used as fuel at the Installation, have information available about each such waste for the purpose of verifying compliance with the Permit conditions. This information shall cover :

i) the administrative information on the generating process

contained in the documents referred to in condition 2.3.3 (c) (i)

ii) the physical and chemical composition of the waste and any other information necessary to evaluate its suitability as agreed in writing with the Agency

iii) the hazardous characteristics of the waste, the substances with which the waste cannot be mixed, and the precautions to be taken in handling the waste.

**c** For any hazardous waste used as fuel at the Installation:

i) check those documents required by Directive 91/689/EEC and where applicable, those required by Council Regulation (EEC) No. 259/93 of 1st February 1993 on the supervision and control of shipments of waste within, into and out of the European Community and by dangerous goods transport regulations.

ii) Take representative samples, as far as possible before unloading, to verify conformity with the information provided for in condition 2.3.3 (b) above. Samples obtained in relation to this condition shall be kept for at least one month in such a manner as to prevent any potential contamination and to prevent any degradation.

2.3.4 In the case of breakdown the operator shall reduce or close down operations as soon as practicable until normal operations can be restored.

2.3.5 SF shall not be burned on kiln 4 during periods of unstable plant operation, plant malfunction or periods when the raw meal feed rate is less than 120 tonnes per hour of dry raw feed.

2.3.6 In the case of abnormal operation the Operator shall cease burning all SFs on Kiln 4 as soon as practicable until normal operation can be restored, where:

a) continuous measurement of particulates exceed the half hourly emission limit value in Table 6.1.3 for a period of one hour uninterrupted duration; or

b) continuous emission monitor(s) is (are) out of service for a period of 4 hours uninterrupted duration: and

c) the cumulative duration of abnormal operation periods as specified in 2.3.6(a) above and 2.3.6(b) above, over one calendar year reaches 60 hours.

2.3.7 The Operator shall continuously monitor and record on-site wind speed & direction. These records shall be made available to the Environment Agency upon request and kept for a minimum period of two years.

2.3.8 The Operator shall adopt procedures and practices to monitor and control litter.

2.3.9 The Operator shall inform the Agency of the date of commissioning of all SFs at least two weeks before the date proposed.

2.3.10 Kiln 3 shall be decommissioned before commissioning of Kiln 4 begins. Kilns 1 and 2 shall be decommissioned within 12 months of the completion of the commissioning of Kiln 4. Neither Kiln 1 or Kiln 2 shall be operated at the same time as Kiln 4 except with the prior written agreement of the Agency.

2.3.11 The Operator shall control the oxygen concentration in the smoke boxes on Kilns 1, 2 and 3 in order to maintain a minimum oxygen concentration of 2% expressed as an hourly average.

## 2.4 Groundwater protection

2.4.1 The Permitted Installation shall, subject to the conditions of this Permit, be controlled as described in the documentation specified in Table 2.4.1, or as otherwise agreed in writing by the Environment Agency.

Table 2.4.1: Groundwater protection

| Description | Parts | Date Received |
|---|---|---|
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.4 | 5/06/2002 |

2.4.2 There shall be no direct or indirect release of List 1 substances (as defined in the Groundwater Regulations 1998 (S.I. 1998 No.2746)) to groundwater from the Installation

2.4.3 There shall be no direct or indirect release of List II substances (as defined in the Groundwater Regulations) to groundwater from the Permitted Installation.

## 2.5 Waste handling and storage

2.5.1 The Operator shall, subject to the conditions of this Permit, handle and store waste as described in the documentation specified in Table 2.5.1, or as otherwise agreed in writing by the Agency.

Table 2.5.1: Waste handling and storage

| Description | Parts | Date Received |
|---|---|---|
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.5 | 5/06/2002 |
| The Additional Information May 2004 | Section 8 & 9 | 10/05/2004 |

2.5.2 Where waste material is specified in Table 2.5.2, it shall be stored on the Installation only in the location and manner specified in that Table.

| Table 2.5.2: Waste stored on site | | | |
|---|---|---|---|
| **Description of Waste** | **Location of Storage on Site** | **Manner of Storage** | **Storage Conditions** |
| Cement Kiln Dust from Kilns 1, 2 and 3.<br>Bypass Dust from Kiln 4. | Crumbleiser Plant adjacent to Kiln 3 Redecam Filter. | Dedicated enclosed storage silo. | As a dry powder then conditioned with water for transport. |
| Other waste | As detailed in Application, and the sites IMS. | As detailed in Application, and the sites IMS | As detailed in Application, and the sites IMS |

2.5.3 Collection, intermediate storage and transport of cement kiln dust or by-pass dust shall take place only in closed containers or transport systems.

2.5.4 Water conditioned cement kiln dust or by-pass dust shall be loaded directly into lorries in enclosed buildings and immediately and securely sheeted.

## 2.6 Waste recovery and disposal

2.6.1 The Operator shall, subject to the conditions of this Permit, recover or dispose of waste as described in the documentation specified in Table 2.6.1, or as otherwise agreed in writing by the Environment Agency.

| Table 2.6.1: Waste recovery and disposal | | |
|---|---|---|
| Description | Parts | Date Received |
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.6 | 5/06/2002 |
| The Response to the Sch-4 Notice Issued 11 April 2003 | The response given to question 23 | 6/06/2003 |
| The Additional Information May 2004 | Section 9. | 10/05/2004 |

2.6.2 Wastes produced at the Installation shall, as a minimum, be sampled and analysed in accordance with Table 2.6.2, to determine their ongoing suitability for the selected disposal routes. Additional samples shall be taken and tested and appropriate action taken, whenever:

**a** disposal or recovery routes change

**b** it is suspected that the nature or composition of the waste has changed such that the route selected may no longer be appropriate

Copies of such analyses shall be forwarded to the Environment Agency in accordance with Table M/WA/1 Section 3. The methods for analysis shall be supplied to the Agency within 1 month of the issue of the Permit, or whenever the method changes.

| Table 2.6.2: Waste sampling and analysis | | | |
|---|---|---|---|
| Waste Description | Parameters to be measured | | Frequency |
| Kiln 1,2,3 CKD and Kiln 4 by-pass dust for disposal | Metals | Sb, As, Cd, Cr(VI), Cu, Pb, Hg, Ni, Se & Sn | 6 monthly |
| | Halides | Chloride, Bromide, Fluoride | 6 monthly |
| | Sulphate | | 6 monthly |
| | Free Lime | | 6 monthly |
| | pH | | 6 monthly |

## 2.7 Energy Efficiency

2.7.1 The Operator shall, subject to the conditions of this Permit, use energy as described in the documentation specified in Table 2.7.1, or as otherwise agreed in writing by the Environment Agency.

| Table 2.7 1: Energy efficiency | | |
|---|---|---|
| Description | Parts | Date Received |
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.7 | 5/06/2002 |

2.7.2 The Operator shall have an energy management plan, so as to secure energy efficiency, taking into account the Agency's Energy Efficiency Horizontal Guidance note H2 as amended. The plan shall be updated annually.

## 2.8 Accident prevention and control

2.8.1 The Operator shall, subject to the conditions of this Permit, prevent and limit the consequences of accidents as described in the documentation specified in Table 2.8.1, or as otherwise agreed in writing by the Environment Agency.

| Table 2.8.1 : Accident prevention and control | | |
|---|---|---|
| Description | Parts | Date Received |
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.8 | 5/06/2002 |
| The Response to the Sch-4 Notice Issued 11 April 2003 | The Response to Questions 25, 26, 27 & 28. | 6/06/2003 |
| The Additional Information May 2004 | Section 13. | 10/05/2004 |

## 2.9 Noise and vibration

2.9.1 The Operator shall, subject to the conditions of this Permit, control noise and vibration as described in the documentation specified in Table 2.9.1, or as otherwise agreed in writing by the Environment Agency.

| Table 2.9.1 : Noise and vibration | | |
|---|---|---|
| Description | Parts | Date Received |
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.9 | 5/06/2002 |
| The Response to the Sch-4 Notice Issued 11 April 2003 | Section 2.9 | 6/06/2003 |
| The Additional Information – May 2004 | Section 10 | 10/05/2004 |

2.9.2 The Operator shall maintain a Noise Management Plan within the Installation's Integrated Management System.

2.9.3 Emergency generators/ alarms/ sirens/ relief valves shall only be tested between the hours of 10.00 and 17.00 Monday to Friday and not on any Public Holiday.

## 2.10 Monitoring

2.10.1 The Operator shall, subject to the conditions of this Permit, carry out, evaluate and assess monitoring as described in the documentation specified in Table 2.10.1, or as otherwise agreed in writing by the Environment Agency.

| Table 2.10.1 : Monitoring | | |
|---|---|---|
| Description | Parts | Date Received |
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.10 | 5/06/2002 |
| The Response to the Sch-4 Notice Issued 11 April 2003 | The Response to Question 29, | 6/06/2003 |

2.10.2 The Operator shall implement and maintain an emissions monitoring programme which ensures that (a) emissions are monitored from the specified points, for the parameters listed in, and to the frequencies and methods described in, Tables 6.1.2, 6.1.3, 6.1.4 and 6.3.2, unless otherwise agreed by the Agency in writing, and (b) that the results of such monitoring are assessed by the Operator. The programme shall ensure that monitoring is carried out under an appropriate range of expected and likely operating conditions.

2.10.3 There shall be provided:

**a** safe and permanent means of access to enable sampling/monitoring to be carried out in relation to the emission points specified in Schedule 2 to this Permit, unless otherwise specified in that Schedule and

**b** safe means of access to other sampling/monitoring points when required by the Environment Agency.

2.10.4 Sampling ports shall comply with the requirements of relevant Environment Agency Guidance.

2.10.5 Measurements for the determination of concentrations of substances specified in this Permit shall be carried out representatively.

2.10.6 With regard to the Kiln 4 exhaust, the following parameters shall be continuously monitored and recorded at representative locations agreed in writing with the Agency:

**a** temperature near the inner wall of combustion chambers or as otherwise agreed in writing with the Agency.

**b** exhaust gas oxygen concentration, temperature, pressure, water vapour content (the last is not required if gases are dried before analysis) and exhaust gas flow rate.

2.10.7 The Operator shall carry out off-site observations of plume dispersion from the kiln stack(s) along with prevailing weather conditions at least twice in each 24 hour period (00.00-23.59) and at intervals of no greater than 15 hours or as otherwise agreed in writing with the Environment Agency. The observations shall be recorded in writing in a format agreed with the Environment Agency and shall be Specified Records.

2.10.8 Where requested in writing by the Agency, the Operator shall provide at least 14 days advance notice of undertaking periodic monitoring or sampling.

## 2.11 Decommissioning

2.11.1 The Operator shall, subject to the conditions of this Permit, make provision for decommissioning the Installation as described in the documentation specified in Table 2.11.1, or as otherwise agreed in writing by the Environment Agency.

Table 2.11.1 : Decommissioning

| Description | Parts | Date Received |
|---|---|---|
| The Consolidated Response to the Sch-4 Notice issued 17 December 2001 | Section 2.11 | 5/06/2002 |

2.11.2 A site closure plan shall be maintained such that, upon definitive cessation of activities, the necessary measures are taken to avoid any pollution risk and to return the site of the Installation to a satisfactory state.

## 2.12 Multi-operator installations

2.12.1 This is not a multi-operator installation.

# 3 Records

3.1.1 A record (a "Specified Record") shall be made of:-

**a** any malfunction, breakdown or failure of plant, equipment or techniques (including down time and any short term and long term remedial measures) that may have, has had or might have had an effect on the environmental performance of the Permitted Installation. These records shall be kept in a log maintained for that purpose;

**b** all monitoring and sampling taken or carried out (this includes 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;

**c** other Specified Records for the Installation/sector, including those set out in Table S2.2.

3.1.2 There shall be made available for inspection by the Agency at any reasonable time:

**a** Specified Records;

**b** any other records made by the Operator in relation to the operation of the Permitted Installation ("Other Records")

3.1.3 A copy of any Specified or Other Records shall be supplied to the Agency on demand and without charge

3.1.4 Specified Records and Other Records shall:-

**a** be legible;

**b** be made as soon as reasonably practicable; and

**c** indicate any amendments which have been made and shall include the original record wherever possible.

3.1.5 Specified Records and Other Records shall be retained for a minimum period of *4* years from the date when the records were made.

3.1.6 For all waste received at or produced from the Permitted Installation, the Operator shall record (and shall retain such records for a minimum of 4 years)

**a** its composition, or as appropriate, description;

**b** the best estimate of the quantity produced;

**c** its disposal routes; and

**d** the best estimate of the quantity sent for recovery.

3.1.7 A record shall be made at the Permitted Installation of any complaints concerning the Installation's effect or alleged effect on the environment. The record shall give the date of complaint, time of complaint, a summary of any investigation and the results of such investigation. Such records shall be made in a log kept for this purpose.

# 4 Reporting

4.1.1 All reports and notifications required by this Permit, or by Regulation 16 of the PPC Regulations, shall be sent to the Agency at the address notified in writing to the Operator by the Environment Agency.

4.1.2 The Operator shall report the parameters listed in Table S2.1 to Schedule 2 to this Permit as follows:

**a** in respects of the emission points specified;

**b** for the reporting periods specified in Table S2.1 to Schedule 2 to this Permit and using the forms specified in Table S3.1 to Schedule 3 to this Permit;

**c** giving the information from such results and assessments as may be required by the forms specified in those tables; and

**d** sending the report to the Agency within 28 days of the end of the reporting period.

4.1.3 The Operator shall submit a report on potential environmental improvements to the Permitted Installation. For each of the subject areas identified in Section 2 of the appropriate technical guidance, the report shall assess the costs and benefits of alternative techniques that may provide environmental improvement. This shall include, but not be limited to, those techniques listed in guidance. The methodologies used should be based on those given in Agency guidance note H1 and should justify, against the BAT criteria, where potential improvements are not planned to be implemented. As part of their management system the Operator shall submit an updated report every 36 months with the first report due 6 months from the completion of commissioning of Kiln 4.

4.1.4 Fugitive emissions shall be reviewed on an annual basis and a summary report on this review shall be prepared detailing such releases and the measures taken to reduce them.

4.1.5 By 31 January each year the Operator shall submit to the Agency an annual report in writing on quantities of waste arisings from the Installation, their destinations and their components/compositions, which have been disposed of or recycled in the previous calendar year. The report shall review (with regard to BAT) opportunities for minimising waste and/or increasing waste recovery over the coming year and report on progress with those identified in the previous years report.

4.1.6 By 31 March each year submit an annual report on the functioning and monitoring of the plant to include an evaluation of emissions into air compared with the emission standards in the Waste Incineration Directive

# 5 Notifications

5.1.1 The Operator shall notify the Agency **without delay** of:-

**a** the detection of an emission of any substance which exceeds any limit or criteria in this Permit specified in relation to the substance;

**b** the detection of any fugitive emission which has caused, is causing or may cause significant pollution unless the quantity emitted is so trivial that it would be incapable of causing significant pollution;

**c** the detection of any malfunction, breakdown or failure of plant or techniques which has caused, is causing or may have the potential to cause significant pollution; and

**d** any accident which has caused, is causing or may have the potential to cause significant pollution.

5.1.2 The Operator shall submit written confirmation to the Agency of any notification under condition 5.1.1 of this Permit by sending:-

**a** the information listed in Part A of Schedule 1 to this Permit within 24 hours of such notification; and

**b** the more detailed information listed in Part B of that Schedule as soon as practicable thereafter;

5.1.3 The Operator shall give written notification as soon as practicable, of any of the following

**a** permanent cessation of the operation of any part of or all of the Permitted Installation;

**b** cessation of the operation of any part of or all of the Permitted Installation for a period, likely to exceed 1 year; and

**c** resumption of the operation of any part of or all of the Permitted Installation after a cessation notified under 5.1.3(b).

5.1.4 The Operator shall notify the following matters to the Agency, in writing, within 14 days of their occurrence:

**a** where the Operator is a registered company:

**i** any change in the Operator's trading name, registered name or registered office address;

**ii** a change to any particulars of the Operator's ultimate holding company (including details of an ultimate holding company where the Operator has become a subsidiary);

**iii** any steps taken with a view to the Operator going into administration, entering into a company voluntary arrangement or being wound up.

5.1.5 Where the operator has entered into a Climate Change Agreement with the Government, the operator shall notify the Agency within one month of: -

**a** A decision by the Secretary of State not to re-certify that Agreement.

**b** A decision by either the operator or the Secretary of State to terminate that Agreement; and

**c** Any subsequent decision by the Secretary of State to re-certify such an agreement

5.1.6 Where the Operator has entered into a Direct Participant Agreement in the Emissions Trading Scheme which covers emissions relating to the energy consumption of the activities, the operator shall notify the Agency within one month a decision by the Operator to withdraw from or by the Secretary of State to terminate the Direct Participant Agreement.

# 6 Emissions

## 6.1 Emissions into air

6.1.1 Emissions to air from the emission point(s) specified in Table 6.1.1 shall only arise from the source(s) specified in that Table.

**Table 6.1.1: Emission points into air**

| Emission point reference/description | Source | Location of emission point |
|---|---|---|
| A1 | Kilns 1& 2 via a 61m high stack | Point on site plan |
| A2 | Kiln 3 via 76 metre high stack | Point on site plan |
| A3 | Cement Mill 1 via 17.5 metre high stack | Point on site plan |
| A4 | Cement Mill 2 via 17.5 metre high stack | Point on site plan |
| A5 | Cement Mill 3 via 27 metre high stack | Point on site plan |
| A6 | Cement Mill 4 Mill filter via 16.7 metre high stack | Point on site plan |
| A7 | Cement Mill 4 Classifier via a 21.5 metre high stack | Point on site plan |
| A8 | Kiln 4 via a 112 metre high stack | Point on site plan |
| A9 | Kiln 4 Cooler Exhaust via a 35 metre stack | Point on site plan |

6.1.2 The limits for emissions to air for the parameters and the emission points set out in Tables 6.1.2, 6.1.3 and 6.1.4 shall not be exceeded.

6.1.3 The Operator shall carry out monitoring of the parameters listed in Table 6.1.2, from the emission point and at least at the frequencies specified in that Table. All data will be reported to reference conditions 273 K, 101.3 kPa, 10% v/v oxygen, dry gas

**Table 6.1.2 Emission limits into air for release point A1 and A2**

| | Emission Points A1 and A2 | | | |
|---|---|---|---|---|
| | Units | Daily Average A1 | Daily Average A2 | Frequency and duration |
| Particulate matter | mg/m³ | 83 | 66 | Continuous Note 1 and quarterly periodic measurement: average value over at least 1 hour sample period determined in accordance with BS EN 13284 or ISO 9096 – 2003 as appropriate. Note 2 |
| VOCs as Total Organic Carbon (TOC) | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period over at least 1 hour sample period determined in accordance with BS EN 12619. Note 2 |

| | | | | |
|---|---|---|---|---|
| Hydrogen chloride | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement: average value over at least 1 hour sample period determined in accordance with BS EN 1911. |
| Sulphur dioxide | mg/m³ | 4510<br>3000 note 9 | 3850<br>3500 note 9 | Continuous Note 1 and bi-annual periodic measurement: average value over at least 1 hour sample period. Notes2 |
| Oxides of nitrogen (NO and $NO_2$ expressed as $NO_2$) | mg/m³ | 2200 | 2200 | Continuous Note 1 and bi-annual periodic measurement: average value over at least 1 hour sample period. Notes2 |
| Hydrogen fluoride | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Cadmium & thallium & their compounds (total) Note 3 | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Mercury and its compounds Note 3 | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) Note 3 | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Dioxins & furans I-TEQ Note 7 | ng/m³ | 0.1 | 1.0 | Bi-annual periodic measurement. Average value over sample period of between 6 and 8 hours. Determination in accordance with BS EN 1948. |
| PAHs Note 8 | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Benzene | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| 1,3 Butadiene | mg/m³ | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |

6.1.4 The Operator shall carry out monitoring of the parameters listed in Table 6.1.3, from the emission point and at least at the frequencies specified in that Table. All data will be reported to reference conditions 273 K, 101.3 kPa, 10% v/v oxygen, dry gas

**Table 6.1.3. Emission limits into air for release point A8**

| Parameters | Units | Periodic monitoring | Daily Average | Half Hourly Average | Frequency and duration Note 2 |
|---|---|---|---|---|---|
| Particulate matter | $mg/m^3$ | No Limit | 15 | 30 | Continuous Note 1 and bi-annual periodic measurement: average value over at least 1 hour sample period determined in accordance with BS EN 13284. Note 2 |
| VOCs as Total Organic Carbon (TOC) | $mg/m^3$ | No Limit | 60 | 60 | Continuous Note 1 and bi-annual periodic measurement: at least 4 hour sample period, data to be reported as half- hourly averages determined in accordance with BS EN 12619. Notes 2 |
| Hydrogen chloride | $mg/m^3$ | No Limit | 10 | 20 | Continuous Note 1 and bi-annual periodic measurement: average value over at least 1 hour sample period determined in accordance with BS EN 1911. Note 2 |
| Carbon monoxide | $mg/m^3$ | No Limit | 1200 | 3000 | Continuous Note 1 and bi-annual periodic measurement: at least 4 hour sample period, data to be reported as half- hourly averages . Notes 2 |
| Sulphur dioxide | $mg/m^3$ | No Limit | 200 | 500 | Continuous Note 1 and bi-annual periodic measurement: at least 4 hour sample period, data to be reported as half- hourly averages. Notes 2 |
| Oxides of nitrogen (NO and $NO_2$ expressed as $NO_2$) | $mg/m^3$ | No Limit | 500 | 1500 | Continuous Note 1 and bi-annual periodic measurement: at least 4 hour sample period, data to be reported as half- hourly averages. Notes 2 |
| Hydrogen fluoride Note 5 & 8 | $mg/m^3$ | 1.0 | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Cadmium & thallium & their compounds (total) Note 3, 5 & 8 | $mg/m^3$ | 0.05 | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Mercury and its compounds Note 3, 5 & 8 | $mg/m^3$ | 0.05 | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Zinc and its compounds Note 3, 5, & 8 | $mg/m^3$ | No Limit | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |

| | | | | | |
|---|---|---|---|---|---|
| Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) Note 3 & 5 | mg/m³ | 0.5 | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Dioxins & furans I-TEQ Note 5 & 8 | ng/m³ | 0.1 | No Limit | No Limit | Bi-annual periodic measurement Average value over sample period of between 6 and 8 hours. Determination in accordance with BS EN 1948. |
| Dioxin & furans WHO-TEQ Note 5 & 8 | ng/m³ | No Limit | No Limit | No Limit | Bi-annual periodic measurement Average value over sample period of between 6 and 8 hours. |
| Dioxin-like PCBs WHO-TEQ Note 5 & 8 | ng/m³ | No Limit | No Limit | No Limit | Bi-annual periodic measurement Average value over sample period of between 6 and 8 hours. |
| PAHs Note 8 | mg/m³ | No Limit | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| Benzene Note 8 | mg/m³ | No Limit | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |
| 1,3 Butadiene Note 8 | mg/m³ | No Limit | No Limit | No Limit | Bi-annual periodic measurement. Average value over sample period of between 30 minutes and 8 hours. |

**Notes on Tables 6.1.2. and 6.1.3:**

1. Daily average values used to check against emission limit. Half-hourly average values of continuous measurements used to calculate daily average.
2. Periodic measurements to be used to check CEM calibration.
3. Metals include both gaseous, vapour and solid phases as well as their compounds (expressed as the metal or total as specified).
4. Reference measurement monitoring techniques shall be in accordance with the conditions and tables in section 2.10 of this Permit.
5. Quarterly periodic measurement in first 12 months of operation.
6. The respective TEQ sum of the equivalence factors to be reported as a range based on:
   All congeners less than the detection limit assumed to be zero; and
   All congeners less than the detection limit assumed to be at the detection limit.
7. PAH's are defined as polycyclic aromatic hydrocarbons. The full set required to be sampled and analysed are given in the table below.

| | | |
|---|---|---|
| Anthanthrene | Benzo(c)phenanthrene | Cyclopenta(c,d)pyrene |
| Benzo[a]anthracene | Benzo[ghi]perylene | Dibenz[ah]anthracene |
| Benzo[b]fluoranthene | Benzo[a]pyrene | Fluoranthene |
| Benzo[k]fluoranthene | Cholanthrene | Indeno [1,2,3-cd] pyrene |
| Benzo(b)naph(2,1-d)thiophene | *Chrysene* | Napthalene |

8. Where no emission limit value is set the emissions are limited by other conditions within the Permit or the emissions are to be evaluated.
9. Limit to apply when using PFA

6.1.5 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme in condition 2.10.2 of this Permit shall have either MCERTS certification or equivalent (as appropriate) unless otherwise agreed in writing.

6.1.6 The appropriate installation and the functioning of the automated monitoring equipment for emissions into air and water shall be subject to control and to an annual surveillance test by the Operator. Calibration shall be carried out by means of parallel measurements with the reference methods at least every three years.

6.1.7 Sampling and analysis of all pollutants including dioxins and furans as well as measurement methods to calibrate automated, continuous, measurement systems shall be carried out as specified by the appropriate CEN-standards. If CEN standards are not available, ISO standards, national or international standards which will ensure the provision of data of an equivalent scientific quality, as agreed in writing with the Environment Agency, shall apply. The reference measurements used shall be agreed in writing with the Environment Agency. The results of the assessment shall be submitted, to the Environment Agency in writing, within one month of the completion of the assessment.

6.1.8 With regard to the emissions monitoring programme in condition 2.10.2 and condition 6.1.3 of this Permit, the calibration of continuous emission monitors, at the daily emission limit value, the values of the 95% confidence intervals of a single measured result shall not exceed the following percentages of the emission limit values:

| | |
|---|---|
| Carbon monoxide | 10% |
| Sulphur dioxide | 20% |
| Oxides of nitrogen (NO & $NO_2$ expressed as $NO_2$) | 20% |
| Particulate matter | 30% |
| Total organic carbon | 30% |
| Hydrogen Chloride | 40% |

6.1.9 With regard to the emissions monitoring programme in condition 2.10.2, condition 6.1.3 and condition 6.1.4 of this Permit, valid daily average value shall be calculated from half-hourly averages. No more than 5 half-hourly average values in any day shall be discarded due to malfunction or maintenance of the continuous measurement system. No more than ten daily average values per year shall be discarded due to malfunction or maintenance of the continuous measurement system.

6.1.10 For continuous emission monitors, the half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods if no waste is being burned) from the measured values after having subtracted the 95% confidence intervals as specified in Condition 6.1.8 above. The daily average values shall be determined from those validated average values.

6.1.11 For periodic measurements, compliance shall be determined from the measured value after having subtracted the uncertainty error for the selected method of sampling and analysis for each relevant pollutant in accordance with condition 6.1.7.

6.1.12 The Operator shall carry out monitoring of the parameters listed in Table 6.1.4, from the emission point and at least at the frequencies specified in that Table. All data will be reported to reference conditions 273 K, 101.3 kPa and no correction for moisture or oxygen.

Table 6.1.4 Emission Limits into Air

| Parameters | Total Particulate Matter | | |
|---|---|---|---|
| | Units | Hourly Average | Frequency and duration |
| Emission Point A3 | mg/m³ | 50 | Continuous |
| Emission Point A4 | mg/m³ | 50 | Continuous |
| Emission Point A5 | mg/m³ | 50 | Continuous |
| Emission Point A6 | mg/m³ | 50 | Continuous |
| Emission Point A7 | mg/m³ | 50 | Continuous |
| Emission Point A9 | mg/m³ | 50 | Continuous |

6.1.13 All emissions to air from the Installation shall be free from offensive odour and persistent haze, as perceived by an Authorised Officer of the Agency outside of the Installation boundary, except that the Operator shall not be taken to have breached this condition if the Operator has used BAT to prevent, or where that is not practicable, to reduce, such emissions.

## 6.2 Emissions to land

6.2.1 There shall be no emission to land from the Permitted Installation.

6.2.2 The Operator shall notify the Agency, as soon as practicable, of any information concerning the state of the Site which affects or updates that information provided to the Agency as part of the Site Report submitted with the application for this Permit.

## 6.3 Emissions to water [other than emissions to sewer]

6.3.1 Emissions to water from the emission point(s) specified in Table 6.3.1 shall only arise from the source(s) specified in that Table.

Table 6.3.1 Emissions to Water

| Emission Point Reference. | Source | Receiving Water |
|---|---|---|
| W1 | Site surface water drainage via the settlement lagoon | Tributary of the Black Brook |

6.3.2 Limits for the emissions to water for the parameter(s) and emission point(s) set out in Table 6.3.2 shall not be exceeded.

6.3.3 The Operator shall carry out monitoring of the parameters listed in Table 6.3.2, from the emission points and at least at the frequencies specified in that table.

Table 6.3.2 Emission limits into water

| Parameter | Emission Point W1 | | | |
|---|---|---|---|---|
| | Units | Continuous | Periodic | Monitoring Frequency |
| pH minimum | | 6.0 | 6.0 | Continuous when discharging and weekly periodic monitoring |
| pH maximum | | 9.5 | 9.5 | Continuous when discharging and weekly periodic monitoring |
| Temperature maximum | Celcius | 23 | 23 | Continuous when discharging and weekly periodic monitoring |
| Volumetric Flow | $m^3$/day | No Limit | No Limit | Continuous when discharging and weekly periodic monitoring |
| Suspended solids | mg/l | No Limit | 50 | Weekly periodic monitoring |
| Biochemical Oxygen Demand | mg/l | No Limit | 10 | Weekly periodic monitoring |
| Oil or Grease | | | None visible | Weekly periodic monitoring |

6.3.4 There shall be no emission into water from the Permitted Installation of any substance prescribed in Schedule 5 to the PPC Regulations for water for which no limit is specified in Table 6.3.2 except in a concentration which is no greater than the background concentration.

## 6.4 Emissions to sewer

6.4.1 Emissions to sewer from the emission point specified in Table 6.4.1 shall only arise from the source specified in that Table.

Table 6.4.1: Emission points to sewer

| Emission point reference | Sources | Sewer |
|---|---|---|
| S1 | Vehicle wash water via catchpits and oil/water separator | Dwr Cymru Cyf. |

6.4.2 There shall be no emission into sewer from the Permitted Installation of any substance prescribed in Schedule 5 to the PPC Regulations for water except in a concentration which is no greater than the background concentration.

## 6.5 Emissions of heat

6.5.1 There are no conditions specific to emissions of heat.

## 6.6 Emissions of noise and vibration

6.6.1 On completion of the commissioning of kiln 4 the level of noise emitted from the Installation shall not exceed 50 dB, expressed as an LAeq,T, between 0700 hrs and 2300 hrs and 45 dB expressed as an LAeq,T at any other time, as measured at the Sensitive Property Boundaries identified in section 2.9 of the Application. The locations shall be chosen and the measurements and assessment made according to BS 4142:1997.

# 7 Transfer to effluent treatment plant

7.1 No transfers to effluent treatment plant are controlled under this part of this Permit. Emissions to water are controlled under 6.3 and 6.4

# 8 Off site conditions

8.1 The Operator shall operate an air quality monitoring station at Penyffordd & Penymyndd Bowling Club, Park Crescent, Off Abbots Lane, Penyfordd, grid reference SJ302612 to continuously monitor sulphur dioxide, nitrogen dioxide and $PM_{10}$. The data shall be 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). The operator shall report any exceedences of the objectives in the Air Quality (Wales) 2000, Statutory Instrument No 1940. (W.138), to the Agency, as soon as they are identified. The Operator shall ensure that the monitor is operated for a minimum of 12 months from the completion of commissioning of kiln 4 or as otherwise agreed in writing by the Agency. A summary report of the monitoring data shall be provided to the Agency on a quarterly basis.

# 9 Improvement programme

9.1 The Operator shall complete the requirements specified in Table 9.1. by the date specified in that Table, and shall send written notification of the date of completion of each requirement to the Agency, at the Reporting Address, within 14 days of the completion of each such requirement.

**Table 9.1.: Improvement programme requirements**

| Reference | Requirement | Date |
|---|---|---|
| 9.1.01 | The Operator shall carry out tests to verify the temperature, residence time and oxygen content of the combustion gas in the Kiln 4 and calciner under the most unfavourable normal operating conditions. The results shall be submitted in writing to the Agency. | Within 6 months of completion of commissioning. |
| 9.1.02 | The Operator shall develop a programme to identify the major species of Volatile Organic Compounds (VOCs), present in the emissions to air from A8. The significance of the emissions of relevant VOCs shall be assessed using available assessment criteria. A report outlining the programme and complete with an implementation plan to be forwarded to the Agency. | Within 6 months of completion of commissioning |
| 9.1.03 | *The Operator shall submit a post commissioning report to the Agency. The report shall include an assessment of Installation performance against all Permit conditions.* | *Within 3 months of completion of commissioning* |
| 9.1.04 | The Operator shall carry out tests on kiln 4 to determine the size distribution of the particulate matter in the exhaust gas emissions from Emission Points A8 and A9, identifying the fractions within the $PM_{10}$ and $PM_{2.5}$ ranges. The results shall be submitted in writing to the Agency. | Within 6 months of completion of commissioning |
| 9.1.05 | The Operator shall review the techniques for continuous measurements for heavy metals, dioxins/furans, and dioxin-like PCBs, including cost, availability, accuracy, detection limits and submit a written report to the Agency. | Within 12 months of completion of commissioning kiln 4 and every 3years thereafter. |
| 9.1.06 | On completion of the commissioning of kiln 4 a noise survey shall be carried out to measure the impact of the Installation at sensitive locations, following the guidance in Agency Guidance H3. A written report shall be submitted to the Agency. The report shall include a programme of work to address any measures highlighted from the monitoring. | Within 3 Months of completion of commissioning. |
| 9.1.07 | The operator shall submit a report on the results of the trial use of PFA on kilns 1 and 2. | Within three months of the date of this permit. |
| 9.1.08 | The operator shall complete a comprehensive audit including monitoring of all low level point source, and fugitive, emissions of particulates from the Installation. The operator shall then use the findings of the audit to assess the combined impact of the emissions on air quality for both short term and long term scenarios. The operator shall then review BAT for preventing or minimising any such emissions. A report outlining the assessment, its conclusions and measures to address any issues raised is to be forwarded to the Agency. | Within 12 months of completion of commissioning of kiln 4. |
| 9.1.09 | The operator shall complete a comprehensive audit of the arrangements for loading and transport of waste from the Installation with a view to identifying measures further to reduce fugitive emissions from such transport. The operator shall develop BAT proposals for any remedial work required and a report outlining the assessment, its | Within 6 months of the completion of commissioning of kiln 4. |

| | | |
|---|---|---|
| | conclusions and measures to address any issues raised is to be forwarded to the Agency | |
| 9.1.10 | Using the information obtained from condition 2.10.7 and other operational records the Operator shall make a quantitative and qualitative assessment of the visual impact of the plume from A8 and review options for reducing the visible impact. A report outlining the assessment, its conclusions and measures to address any issues raised is to be forwarded to the Agency. | Within 18 months from completion of commissioning of kiln 4. |
| 9.1.11 | The Operator shall investigate possible re-use of bypass dust from kiln 4 and submit a report to the Agency on its findings. | 12 months from completion of commissioning of kiln 4. |
| 9.1.12 | The Operator shall carry out a study to identify those techniques which can be applied to reduce the emissions of particulate matter from the existing cement mills to the indicative BAT level of 30 $mg/m^3$. A report, including justification of the proposed BAT and a timetable for its implementation shall be submitted to the Agency | Within 6 months of the date of this permit. |
| 9.1.13 | The Operator shall carry out a programme of monitoring of the exhaust gas from the calciner and in the pre-heater to establish the concentrations and proportions of VOCs, CO and $SO_2$ measured at emission point A8, which result from the burning of substitute fuel. | 6 months from completion of commissioning of kiln 4 using substitute fuel. |
| 9.1.14 | The Operator shall complete the Hazard and Operability ("HAZOP") studies for Profuel® and tyres storage and handling once the detailed process and instrumentation design has been completed and submit them to the Agency. | Prior to commencement of the construction of the Profuel® and tyres systems. |

# 10 Interpretation

10.1 In this Permit, the following expressions shall have the following meanings:

*"Abnormal operation"*
*means any technically unavoidable stoppages, disturbances, or failures of purification devices or the measurement devices.*

*"Application"*
*means the application for this Permit, together with any responses to a notice served under Schedule 4 to the PPC Regulations, any additional information supplied by the Operator and detailed in the status log in the Introductory note to this Permit and any operational change agreed under the conditions of this permit.*

*"Authorising 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, powers specified in Section 108(4) of that Act.*

*"Background concentration"*
*means the same as "background quantity" as defined in paragraph 11 to Part 2 to Schedule1 of the PPC Regulations.*

*"Bi-annual"*
*means twice per year with at least five months between tests;*

*"Commissioning"*
*relates to the period after construction has been completed when the Permitted Installation process is being made ready to operate;*

*"Decommissioned"*
*means permanently de-activated*

*"Dioxin and Furans"*
*The term dioxins and furans is used to denote a family of compounds known chemically as polychlorinated dibenzo-para-dioxins and polychlorinated dibenzofurans. There are 75 dioxin compounds and 135 furan compounds, each differing in the number and position of chlorine atoms. Each individual dioxin and furan compound is termed a congener of which there are 210 in total. Dioxins shall be reported as International Toxic Equivalent defined by the standard NATO/CCMS (1988) and by the WHO*

*"European Waste Catalogue" "EWC"*
*means EWC 1994, Commission Decision 94/3/EC.*

*"Fugitive emission"*
*means an emission from any point other than those specified in the Tables in part 6 of this Permit.*

*"Group III metals"*
*means antimony (Sb), arsenic (As), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), nickel (Ni), tin (Sn) and vanadium (V)*

*"H1"*
*means Agency horizontal guidance note H1 "Environmental Assessment and Appraisal of BAT"*

*"H3"*
*means Agency horizontal guidance note H3 "Noise Guidance"*

*"IMS"*
*means the site Integrated Management System, which replaces the site Safety Health and Environment System ("SHEMS")*

*"Kiln 4"*
*means the new kiln 4, including the calciner and pre-heater with all directly associated activities.*

*"LAeq"*
*means the A-weighted equivalent continuous equal energy level (dBA)*

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

*"Permitted Installation"*
*means the activities and the limits to those activities described in Table 1.1.1 of this Permit.*

*"PCB"*
*means polychlorinated biphenyl compounds PCBs shall be reported using WHO-TEFs for dioxin-like PCBs.*

*"PPC Regulations"*
*means the Pollution Prevention and Control Regulations 2000 (S.I. 2000 No. 1973) (as amended) and words and expressions defined in the PPC Regulations shall have the same meanings when used in this Permit.*

*"Release point"*
*followed by the letter A, W, E or S means respectively a point shown on a map or plan forming part of the Application for the release from the Permitted Installation into the air, into controlled waters, into an on-site effluent treatment plant or into a sewer.*

*"Reporting Address"*
*means the address, from time to time notified to the Operator, for that purpose by the Environment Agency in writing.*

*"Site Plan"*
*means the Castle Cement Site plan, drawing number 401.00-11-0016-P.00*

*"SFP"*
*means the Agency's Substitute Fuels Protocol for Use on Cement and Lime Kilns*

*"Staff"*
*includes employees, directors or other officers of the Operator, and any other person under the Operator's direct or indirect control, including contractors.*

*"Substances prescribed for water"*
*means those substances mentioned in paragraph 13 of Part 2 of Schedule 1 to the PPC Regulations.*

*"Substitute Fuel" "SF"*
*means a fuel other than "conventional fuels". Conventional fuels are coal, petroleum coke, natural gas or oil.*

*"Waste Incineration Directive ("WID")"*
*means Waste Incineration Directive, 2000/76/EC*

*"WHO"*
*means World Health Organisation*

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

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

10.3 References in this Permit to concentrations of substances in emissions into air from Emission Points A1, A2 and A8 means the concentration in dry gas at a temperature of 273K, at a pressure of 101.3kPa and with an oxygen concentration of 10%. For other emission points there shall only be correction for temperature of 273K and at 101.3kPa.

# 11 Written agreement to changes

11.1.1 When the qualification "or as otherwise agreed in writing" is used in a condition of this Permit, the Operator shall seek such agreement in the following manner:

**a** the Operator shall give the Agency written notice of the details of the proposed change, indicating the relevant part(s) of this Permit; and

**b** such notice shall include an assessment of the possible effects of the proposed change (including waste production) on risks to the environment from the Permitted Installation.

11.1.2 Any change proposed according to condition 11.1.1 and agreed in writing by the Agency, shall not be implemented until the Operator has given the Agency prior written notice of the implementation date for the change. As from that date, the Operator shall operate the Permitted Installation in accordance with that change, and any relevant documentation referred to in this Permit shall be deemed to be amended.

# Schedule 1 Confirmation of condition 5.1.1 notifications, in accordance with condition 5.1.

This Schedule outlines the information that the Operator must provide to the Agency to satisfy condition 5.1.2 of this Permit.

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

Returns should contain

**Part A**

☐ Name of Operator.

☐ Permit Number

☐ Location of Installation.

☐ Date information provided.

☐ Time, date and location of the emission.

☐ Identity and details of the substance[s] emitted to include:-

☐ Best estimate of the quantity or the rate of emission, and the time during which the emission took place.

☐ Environmental medium into which the emission took place.

☐ Measures taken, or intended to be taken, to stop the emission.

**Part B**

☐ Any more accurate information on the matters notified 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 or harm which has been or may be caused by the emission.

☐ The dates of any Part A notifications within in the previous 24 months.

☐ Name ☐ Post.....

☐ Signature ☐ Date

☐ Statement that signatory is authorised to sign on behalf of Castle Cement Ltd.

# Schedule 2 Reporting of monitoring data

Parameters for which reports shall be made, in accordance with conditions 4.1.2 of this Permit, are listed below.

**Table S2.1: Reporting of monitoring data**

| Parameter | Emission point | Frequency | Reporting period | Form Number |
|---|---|---|---|---|
| *Particulates* | *A1 and A2* | *Continuous and bi-annual* | *Monthly* | *M/A1 & M/A2* |
| *Oxides of Nitrogen as $NO_2$* | *A1 and A2* | *Continuous and bi-annual* | *Monthly* | *M/A1 & M/A2* |
| *$SO_2$* | *A1 and A2* | *Continuous and bi-annual* | *Monthly* | *M/A1 & M/A2* |
| *Volatile Organic Compounds as Total Organic Carbon* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Hydrogen chloride* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Hydrogen fluoride* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Cadmium & thallium & their compounds (total)* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Mercury and its compounds* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Dioxins and furans as I-TEQ and WHO-TEQ and dioxin-like PCBs as WHO-TEQ* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *PAH* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Benzene* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *1,3 Butadiene* | *A1 and A2* | *Bi-annual* | *Bi-annual* | *M/A3 & M/A4* |
| *Particulates* | *A8* | *Continuous and bi-annual*[1] | *Monthly* | *M/A5 & M/A6* |
| *Oxides of Nitrogen as $NO_2$* | *A8* | *Continuous and bi-annual* | *Monthly* | *M/A5 & M/A6* |
| *$SO_2$* | *A8* | *Continuous and bi-annual* | *Monthly* | *M/A5 & M/A6* |
| *Volatile Organic Compounds as Total Organic Carbon* | *A8* | *Continuous and bi-annual* | *Monthly* | *M/A5 & M/A6* |
| *Carbon Monoxide* | *A8* | *Continuous and bi-annual* | *Monthly* | *M/A5 & M/A6* |
| *Hydrogen chloride* | *A8* | *Continuous and bi-annual* | *Monthly* | *M/A5 & M/A6* |
| *Hydrogen fluoride* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *Cadmium & thallium & their compounds (total)* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *Mercury and its compounds* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |

| | | | | |
|---|---|---|---|---|
| *Zinc and its compounds* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *Dioxins and furans as I-TEQ and WHO-TEQ and dioxin-like PCBs as WHO-TEQ* | *A8* | *Bi-annual*[1] | *Bi-annual* | *M/A6* |
| *Polycyclic aromatic hydrocarbons* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *Benzene* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *1,3 Butadiene* | *A8* | *Bi-annual* | *Bi-annual* | *M/A6* |
| *Particulates* | *A3 to A7 and A9* | *Continuous* | *Annually* | *M/A7* |
| *pH* | *W1* | *Weekly* | *Quarterly* | *M/W1* |
| *Temperature* | *W1* | *Weekly* | *Quarterly* | *M/W1* |
| *Volumetric flow* | *W1* | *Weekly* | *Quarterly* | *M/W1* |
| *Suspended solids* | *W1* | *Weekly* | *Quarterly* | *M/W1* |
| *BOD* | *W1* | *Weekly* | *Quarterly* | *M/W1* |
| *By Pass Dust* | *Crumbleiser* | *Bi-annual* | *Bi-annual* | *M/WA/1* |

*Note 1 Quarterly periodic monitoring required during the first year of operation of Kiln 4*

| Table S2.2: Recording of Process monitoring data For Kiln 4 | |
|---|---|
| *Cyclone pre-heater temperatures and pressure* | *Calciner temperature* |
| *Kiln inlet temperature* | *Fuel rates(including SFs when being used)* |
| *Teritiary air temperatures* | *Abatement operation (including details of abnormal operation and times)* |
| *Clinker cooler temperatures* | *Kiln inlet carbon monoxide and oxygen concentrates* |
| *Kiln exit temperatures* | *Bypass dust discharge rate* |

# Schedule 3 Forms to be used

Unless otherwise agreed in writing between Agency and the Operator, the following Agency forms are to be used for reports submitted to Agency.

| Table S3.1:Reporting Forms | | |
|---|---|---|
| **Media/parameter** | **Form Number** | **Date of Form** |
| Air Continuous Monitor | M/A1, M/A2, M/A5, M/A7 | Permit Date |
| Air Sampling Tests | M/A3, M/A4, M/A6 | Permit Date |
| Water (controlled waters) | M/W1 | Permit Date |
| Waste | M/WA/1 | Permit Date |

**END OF PERMIT**

# SCHEDULE 3

## EMISSIONS TO AIR: REPORT OF CONTINUOUS MONITORING RESULTS. A1

### Release Summary for month .....20.....

**Permit Number BL1096**

**Castle Cement Ltd, Padeswood Works**

| Form M/A1 – Air Continuous Monitoring | | | | | |
|---|---|---|---|---|---|
| **Substance** | **Average concentration during month, mg/m³** | **Maximum daily mean concentration recorded during month, mg/m³** | **Maximum [1]half hourly mean concentration recorded during month, mg/m³** | **Number of [1] half hours / days in the month in which limit in column 2 of Tables 6.1.2s or 6.1.2b exceeded*** | **Kiln operating time during month that monitor and recording equipment available (hrs)** |
| Particulates | | | | | |
| Oxides of Nitrogen as $NO_2$ | | | | | |
| $SO_2$ | | | | | |

1 As appropriate
* This excludes periods during instrument calibration

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/A1**

## SCHEDULE 3

## EMISSIONS TO AIR: REPORT OF CONTINUOUS MONITORING RESULTS. A2

### Release Summary for month .....20.....

### Permit Number BL1096

### Castle Cement Ltd, Padeswood Works

| Form M/A1 – Air Continuous Monitoring | | | | | |
|---|---|---|---|---|---|
| **Substance** | **Average concentration during month, mg/m³** | **Maximum daily mean concentration recorded during month, mg/m³** | **Maximum [1]half hourly mean concentration recorded during month, mg/m³** | **Number of [1] half hours / days in the month in which limit in column 2 of Tables 6.1.2s or 6.1.2b exceeded*** | **Kiln operating time during month that monitor and recording equipment available (hrs)** |
| Particulates | | | | | |
| Oxides of Nitrogen as $NO_2$ | | | | | |
| $SO_2$ | | | | | |

1 As appropriate
* This excludes periods during instrument calibration

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/A2**

## SCHEDULE 3

## EMISSIONS TO AIR: REPORT OF SAMPLING TESTS. A1.

## Release Summary for 6 months ending .....20.....

**Permit Number BL1096**

**Castle Cement Ltd, Padeswood Works**

| Form M/A3 – Air Sampling Tests | | | | |
|---|---|---|---|---|
| **Substance** | **Measured concentration ($mg/m^3$) or ($ng/m^3$) where relevant** | **Concentration indicated by continuous monitor during period of test** | **Date Tested** | |
| Particulates | | | | |
| Oxides of Nitrogen as $NO_2$ | | | | |
| $SO_2$ | | | | |
| Volatile Organic Compounds as Total Organic Carbon | | | | |
| Hydrogen Chloride | | | | |
| Hydrogen Fluoride | | | | |
| Cadmium & thallium & their compounds (total) | | | | |
| Mercury and its compounds | | | | |
| Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) | | | | |
| Dioxins and furans as I-TEQ and WHO-TEQ and dioxin-like PCBs as WHO-TEQ | | | | |
| PAH | | | | |
| Benzene | | | | |
| 1,3 Butadiene | | | | |

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/A3**

## SCHEDULE 3

## EMISSIONS TO AIR: REPORT OF SAMPLING TESTS. A2.

## Release Summary for 6 months ending .....20.....

## Permit Number BL1096

## Castle Cement Ltd, Padeswood Works

| Form M/A4 – Air Sampling Tests | | | | |
|---|---|---|---|---|
| **Substance** | **Measured concentration ($mg/m^3$) or ($ng/m^3$) where relevant** | **Concentration indicated by continuous monitor during period of test** | **Date Tested** | |
| Particulates | | | | |
| Oxides of Nitrogen as $NO_2$ | | | | |
| $SO_2$ | | | | |
| Volatile Organic Compounds as Total Organic Carbon | | | | |
| Hydrogen Chloride | | | | |
| Hydrogen Fluoride | | | | |
| Cadmium & thallium & their compounds (total) | | | | |
| Mercury and its compounds | | | | |
| Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) | | | | |
| Dioxins and furans as I-TEQ and WHO-TEQ and dioxin-like PCBs as WHO-TEQ | | | | |
| PAH | | | | |
| Benzene | | | | |
| 1,3 Butadiene | | | | |

**Signed on behalf of the Operator .....**

**Dated .....**
**Form M/A4**

# SCHEDULE 3

## EMISSIONS TO AIR: REPORT OF CONTINUOUS MONITORING RESULTS. A8

### Release Summary for month .....20.....

**Permit Number BL1096**

**Castle Cement Ltd, Padeswood Works**

| Form M/A5 – Air Continuous Monitoring | | | | | |
|---|---|---|---|---|---|
| **Substance** | **Average concentration during month, mg/m³** | **Maximum [1]hourly mean concentration recorded during month, mg/m³** | **Maximum [1]half hourly mean concentration recorded during month, mg/m³** | **Number of [1]hours / days in the month in which limit in column 2 of Tables 6.1.2s or 6.1.2b exceeded*** | **Kiln operating time during month that monitor and recording equipment available (hrs)** |
| Particulates | | | | | |
| Oxides of Nitrogen as $NO_2$ | | | | | |
| $SO_2$ | | | | | |
| Volatile Organic Compounds as Total Organic Carbon | | | | | |
| Carbon Monoxide | | | | | |
| Hydrogen Chloride | | | | | |

1 As appropriate
* This excludes periods during instrument calibration

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/A5**

## SCHEDULE 3
## EMISSIONS TO AIR: REPORT OF SAMPLING TESTS. A8.

**Release Summary for 6 months ending .....20.....**

**Permit Number BL1096**
**Castle Cement Ltd, Padeswood Works**

| Form M/A6 – Air Sampling Tests | | | | |
|---|---|---|---|---|
| **Substance** | **Measured concentration ($mg/m^3$) or ($ng/m^3$) where relevant** | **Concentration indicated by continuous monitor during period of test** | **Date Tested** | |
| Particulates | | | | |
| Oxides of Nitrogen as $NO_2$ | | | | |
| $SO_2$ | | | | |
| Volatile Organic Compounds as Total Organic Carbon | | | | |
| Carbon Monoxide | | | | |
| Hydrogen Chloride | | | | |
| Hydrogen Fluoride | | | | |
| Cadmium & thallium & their compounds (total) | | | | |
| Mercury and its compounds | | | | |
| Zinc and its compounds | | | | |
| Sb, Sn, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) | | | | |
| Dioxins and furans as I-TEQ and WHO-TEQ and dioxin-like PCBs as WHO-TEQ | | | | |
| Polycyclic aromatic hydrocarbons | | | | |
| Benzene | | | | |
| 1, 3 Butadiene | | | | |

**Signed on behalf of the Operator .....**

**Dated .....**

**M/A6**

## SCHEDULE 3

## EMISSIONS TO AIR: REPORT OF CONTINUOUS MONITORING RESULTS. A3 to A7 and A9

### Release Summary for year 20.....

**Permit Number BL1096**

**Castle Cement Ltd, Padeswood Works**

| Form M/A7 – Air Continuous Monitoring | | |
|---|---|---|
| **Parameters: Particulate matter mg/m³** | **Monitoring Points** | **Date** |
| | A3 | |
| | A4 | |
| | A5 | |
| | A6 | |
| | A7 | |
| | A9 | |

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/A7**

## SCHEDULE 3

## RELEASES INTO WATER. W1.

**Quarterly Release Summary for Period .....to.....**

**Permit Number BL1096**

**Castle Cement Ltd, Padeswood Works**

| Form M/W2 Releases to Water | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date | Release point(s) | pH Maximum | pH Minimum | Temperature | Volumetric Flow | Suspended Solids | BOD |
| | W1 | | | | | | |

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/W1**

SCHEDULE 3

## ANALYSIS OF WASTE. EMISSION POINT: CRUMBLEISER.

**Release Summary for Period .....to.....**

**Permit Number BL1096**

**Castle Cement Ltd, Padeswood Works**

| Form M/WA/1 | | | | | |
|---|---|---|---|---|---|
| Date | Waste | Calcium | Chloride | Sulphur | Alkali Content |
| | Bypass Dust | | | | |

**Signed on behalf of the Operator .....**

**Dated .....**

**Form M/WA/1**