

Annual performance report for Hanson Cement Ltd, Ketton works.

Permit number BM0486IT / LP3532SL

Calendar year 2015

This report is required under the Waste Incineration Directive (WID) Article 12(2): requirements on access to information and public participation. This requires the operator of an incineration or co-incineration plant to produce an annual report to the Regulator on the functioning and monitoring of the plant and to make this available to the public. To satisfy the requirements of the Directive the following information should be provided clearly in the report:

1. Introduction

Name of company	Hanson Cement
Name of plant	Ketton works
Permit number	BM0486IT
Address	Ketton
	Stamford
	Lincs
	PE9 3SX
Telephone	01780 720501
Contact name	T Fox
Position	Quality & Environment Manager

2. Plant description

The principle purpose of the activities at the installation is to manufacture cement.

Limestone and clay are extracted from an adjacent quarry. This material is then crushed in a dedicated crushing plant together with a number of minor additives to produce a raw material that is no larger than 100 mm. The crushed stone and clay is, after homogenisation in a blending store fed to a vertical roller mill to produce raw meal, a fine powder that is the feedstock for both of the cement kilns.

The site operates two kilns that for historic reasons are known as kiln 7 and Kiln 8.

Kiln 7

Remained mothballed throughout 2015.

Kiln 8

This is a "pre-calciner" kiln and was commissioned in 1986. The ground raw meal is heated in a series of cyclones by the exhaust gases from the kiln. An additional combustion chamber is located between the base of the lowest cyclone and the kiln inlet. This raises the meal temperature to 880°C while providing sufficient residence time at this temperature to achieve partial calcination or decomposition of the meal (to oxides). This is achieved using a combination of coal, Profuel[®] and MBM. The partially reacted material then enters the kiln, a refractory lined steel tube 4.2 metres in diameter and 68 metres long. The kiln inclined downwards from the feed end (a few degrees only) and rotates up to 4 revolutions per minute meaning that the material gradually moves towards the discharge end of the kiln undergoing complex chemical reactions to produce clinker.

The heat required for the reactions is provided by two 63 MW burners, one in the kiln burning coal, Cemfuel[®], Profuel[®] and MBM and the second, in the pre-calciner burning coal, Profuel[®] and MBM. The clinker leaves the kiln via a series of moving grate coolers to a purpose built store.

The clinker is ground in one of 6 cement mills. gypsum, waste plaster board, limestone, Tin chloride and Ferrous sulfate may also be added in the milling process to control the properties of the finished cement. The cement is transported pneumatically to storage silos before being despatched in bulk road or rail tankers or in palletised paper or plastic sacks.

3. Summary of plant operation

a) Plant details

Two cement kiln burning waste materials operates on site, for historic reasons these are known as kiln 7 and Kiln 8.

b) Annual waste throughputs

The amount of waste burned in 2015 is summarised in the table below.

Waste type	EWC code	Tonne	s used
		Kiln 7	Kiln 8
Cemfuel	19 02 08	0	20820
Tyres	16 01 03	0	-
Profuel	19 02 10	0	72513
Meat and bone meal (MBM)	02 02 02	0	8257

c) Operational hours

The total hours of operation of the kiln and the total tonnage of cement clinker produced in 2015 is summarised in the table below.

Equipment	Annual production	Operational hours
Kiln 7	0	0
Kiln 8	Confidential	Confidential

The first of three shutdowns on kiln 8 took place in January over 21 days, with the second taking place in June over 14 days and the third taking place in November over 5 days. During these times major maintenance to the plant took place.

d) Residues

The following residues were produced during the year.

Residue	EWC code	Annual production
Cement kiln dust (CKD)	10-13-12	0 t
Cement Kiln dust (CKD)	19-02-04	3707t

The material produced for EWC code 10-13-12 is disposed of in the landfill at Grange Top Quarry (Permit Number BV14531R). The material produced for EWC code 19-02-04 is stored on site prior to being used offsite for soil conditioning.

4. Summary of plant monitoring.

a) Pollutants measured.

Emissions from kiln 7 & 8 stacks are monitored continuously for particulate matter, carbon monoxide, sulfur dioxide, hydrogen chloride, oxides of nitrogen, and total organic carbon. In addition to this periodic spot sampling is carried out for metals, dioxin and furans, dioxin like PCBs, hydrogen fluoride, Benzene, 1,3-Butadiene, and polycyclic aromatic hydrocarbons. The table below summarises the emissions measured and frequency.

Emission	Continuously	Periodically
Particulates	\checkmark	
Carbon monoxide	\checkmark	
Sulfur dioxide	\checkmark	
Oxides of nitrogen	\checkmark	
Hydrogen chloride	\checkmark	
Total organic carbon	\checkmark	
Hydrogen fluoride		\checkmark
Mercury and its		\checkmark
compounds		
Cadmium and thallium		\checkmark
and their compounds		
Group III metals* and		\checkmark
their compounds		
Benzene		\checkmark
1,3-butadiene		\checkmark
Dioxins and furans		\checkmark
Dioxin-like PCBs		
Polycyclic aromatic		✓
hydrocarbons		

* Group III metals are antimony, arsenic, chromium, cobalt, copper, lead, manganese, nickel, and vanadium.

b) Availability of continuous emissions monitors

The percentage of time during the year when the kiln was in operation that the continuous emission monitors were operating normally is summarised in the table below.

Emission monitor	% time c norr	perating nally
	Kiln 7	Kiln 8
Particulates	-	100
Carbon monoxide	-	100
Sulfur dioxide	-	100
Oxides of nitrogen	-	100
Hydrogen chloride	-	100
Total organic carbon	-	100

c) Summary of continuous emissions monitor data.

Continuous emission data is submitted quarterly to the Environment Agency. This information is required by the permit and shows the average daily emission result for each day of the month.

A summary of emission data is shown graphically in Appendix 1.

d) Results of periodic monitoring.

Results of periodic monitoring of emissions are shown in the table below. The permit requires that periodic monitoring is carried out in the first and second half of each year for the species listed in the table.

	Unit	Kilı	n 7	Kilı	n 8
		1 st half	2 nd half	1 st half	2 nd half
Hydrogen fluoride	mg/m ³	Kiln off	Kiln off	0.38	0.081
Mercury and its compounds	mg/m ³	Kiln off	Kiln off	0.0019	0.00021
Cadmium and thallium and their compounds	mg/m ³	Kiln off	Kiln off	0.00044	0.0012
Group III metals and their compounds	mg/m ³	Kiln off	Kiln off	0.033	0.032
Benzene	mg/m ³	Kiln off	Kiln off	3.0	3.5
1,3-butadiene	mg/m ³	Kiln off	Kiln off	4.1	1.9
Dioxins and furans (I-TEQ)	ng/m ³	Kiln off	Kiln off	0.0086	0.0023
Dioxin like PCBs (WHO-TEQ)	ng/m³	Kiln off	Kiln off	0.0013	0.00026
Polycyclic aromatic hydrocarbons (total)	mg/m ³	Kiln off	Kiln off	0.12	0.099

Summary of plant compliance

Kiln 7

Kiln off.

Kiln 8

Continuous Emission Monitoring – Breaches of the emission limits are reported to the Environment Agency within 24 hours. Routinely prior to formally reporting the breach, the site contacts the Environment Agency and discusses the cause and potential corrective actions with the relevant inspector.

During the year the limit breaches related to HCl, SO2, NOx & Particulates.

The NOx level is routinely controlled by the SNCR system; this injects Ammonia under controlled conditions, where it combines with the NOx to form water and Nitrogen. The unavailability of the SNCR plant caused the breaches; corrective measures have been implemented to prevent recurrence.

HCI and SO2 are routinely controlled when required, by the injection of a specialised Lime product into the gas stream. The control parameters for the Lime injection system have been revised so that the system is activated at an earlier stage. Further process investigation will continue if these emissions remain an issue in 2016.

Reducing the level of particulate emission has continued to be a major focus. Work completed and ongoing is detailed in section 5) Summary of plant improvements.

Periodic Emission Monitoring – All periodic monitoring results fell within the emission limits.

5. Summary of plant improvements.

The focus of plant improvement in 2015 has continued to be on controlling and lowering the level of particulate emissions. This program of work has continued into 2016 and is scheduled during the major plant shutdown in January and into the year. The program of work includes:-

- i) Rebuilding the conditioning tower,
- ii) Completion of plating the external of the electrostatic precipitator,
- iii) Install new high voltage transformer sets.
- iv) Replacing worn or damaged electrodes and collector plates inside the electrostatic precipitator,
- v) Overhauling the water treatment plant supplying the gas conditioning tower,

- vi) A dedicated crew identifying and repairing areas where false air can ingress during the shutdown.
- vii) Replacing the back-up particulate continuous emission analyser

A project is underway to replace the electrostatic precipitator with a bag filter. This will significantly reduce the level of particulate emission and is currently scheduled for completing in 2017.

Summary of information made available

Emission data reported to the Environment Agency is published in the public register and can be obtained form the Environment Agency.

Hanson Cement hosts a Liaison Committee that meets three times a year. This meeting provides a forum for elected representatives of local parish and District councils to discuss matters of concern with the company. Representatives of the Environment Agency also attend this meeting.

Hanson Cement operates an 'open door' policy where members of the public can contact the company to arrange a visit to the site or obtain information. The company can be contacted by the following methods:

By post: Hanson Cement Ltd, Ketton, Stamford, Lincs, PE9 3SX

By e mail: enquiries@hanson.com

By 'phone: 01780 720501

Hanson Cement plans to published a community newsletters titled 'Open Door' in 2016 and this will be delivered to every household in the villages around Ketton works.

Appendix 1



Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Daily average ELV	30	30	30	30	30	30	30	30	30	30	30	30
Annual average	15	monthly average	30	19	17	15	20	18	20	25	25	17	25	27
Annual maximum	106	Monthly maximum	40	27	26	21	28	26	28	36	37	34	45	106



Annual summary		Date	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Daily average ELV	200	200	200	200	200	200	200	200	200	200	200	200
Annual average	67	monthly average	32	31	36	42	72	100	83	126	93	108	77	39
Annual maximum	343	Monthly maximum	52	139	126	60	257	343	165	221	191	240	241	124



Annual summary		Date	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Daily average ELV	500	500	500	500	500	500	500	500	500	500	500	500
Annual average	446	monthly average	484	489	470	467	480	481	477	498	478	474	470	478
Annual maximum	722	Monthly maximum	505	722	485	494	513	514	565	545	550	486	490	506



Annual summary		Date	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Daily average ELV	80	80	80	80	80	80	80	80	80	80	80	80
Annual average	8	monthly average	8	8	8	8	8	10	9	8	9	10	9	9
Annual maximum	28	Monthly maximum	9	11	12	12	10	28	12	11	12	17	14	11



Annual summary		Date	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Daily average ELV	10	10	10	10	10	10	10	10	10	10	10	10
Annual average	4	monthly average	3	3	3	4	4	4	4	5	5	4	4	3
Annual maximum	10	Monthly maximum	5	7	6	6	7	8	7	7	10	9	6	5



	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
	Annual average	509	monthly average	687	487	434	587	525	516	484	509	611	581	581	645
	Annual maximum	967	Monthly maximum	873	663	570	890	967	757	740	647	815	879	737	853