Annual performance report for Hanson Cement Ltd, Ketton works.

Permit number BM0486IT / LP3532SL

Calendar year 2018

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 2018.

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^{o}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 is 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, 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 2018 is summarised in the table below.

Waste type	EWC code	Tonnes used	
		Kiln 7	Kiln 8
Cemfuel	19 02 08	0	18245
Tyres	16 01 03	0	-
Profuel+SRF	19 02 10	0	67257
Meat and bone meal (MBM)	02 02 02	0	973

c) Operational hours

The total hours of operation of the kiln and the total tonnage of cement clinker produced in 2018 is summarised in the table below.

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

During the year two shutdowns occurred on the kiln system.

- January the first planned scheduled maintenance shutdown took place.
- August the second planned schedule maintenance shut down 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	3823 t

The material produced for EWC code 10-13-12 can be 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, total organic carbon and ammonia. In addition to this periodic spot sampling is carried out for metals, dioxin and furans, dioxin like PCBs, hydrogen fluoride, Benzene and 1,3-Butadiene. The table below summarises the emissions measured and frequency.

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

* 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 operating normally	
	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	Kiln 7		Kiln 8	
		1st half	2nd half	1st half	2nd half
Hydrogen fluoride	mg/m^3	Kiln off	Kiln off	<0.0050	<0.038
Mercury and its compounds	mg/m^3	Kiln off	Kiln off	0.0036	0.00083
Cadmium and thallium and their compounds	mg/m^3	Kiln off	Kiln off	0.00034	<0.00035
Group lll metals and their compounds	mg/m^3	Kiln off	Kiln off	0.0094	0.0072
Benzene	mg/m^3	Kiln off	Kiln off	3.3	<0.76
1,3-butadiene	mg/m^3	Kiln off	Kiln off	1.63	<0.76
Dioxins and furans (I-TEQ)	ng/m^3	Kiln off	Kiln off	0.010	0.00060
Dioxin like PCBs (WHO-TEQ)	ng/m^3	Kiln off	Kiln off	0.0195	0.0026

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 there were three limit breaches related to NOx. Two of these were related to the cessation of Ammonia injection prior to a schedule kiln stop, where work is taking place internally on the calcining tower. This is for the safety of personnel working in the tower and has been pre-agreed with the Environment Agency. One breach of NOx was experienced upon the start-up of the plant with the new bag filter installed in January and February and was related to the commission in the new plant and the Ammonia injection rate required not being optimised.

5. Summary of plant improvements.

Particulate – The bag filter was commissioned in February and the emission limit value was lowered to 10mg/Nm3 from a previous value of 30mg/Nm3.

Summary of information made available

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

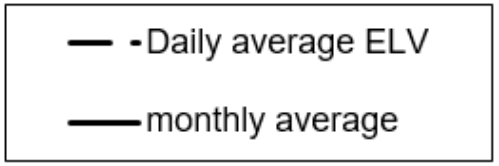
Hanson Cement plans to publish a community newsletters titled 'Open Door' in 2019 and this will be delivered to every household in the villages around Ketton works.

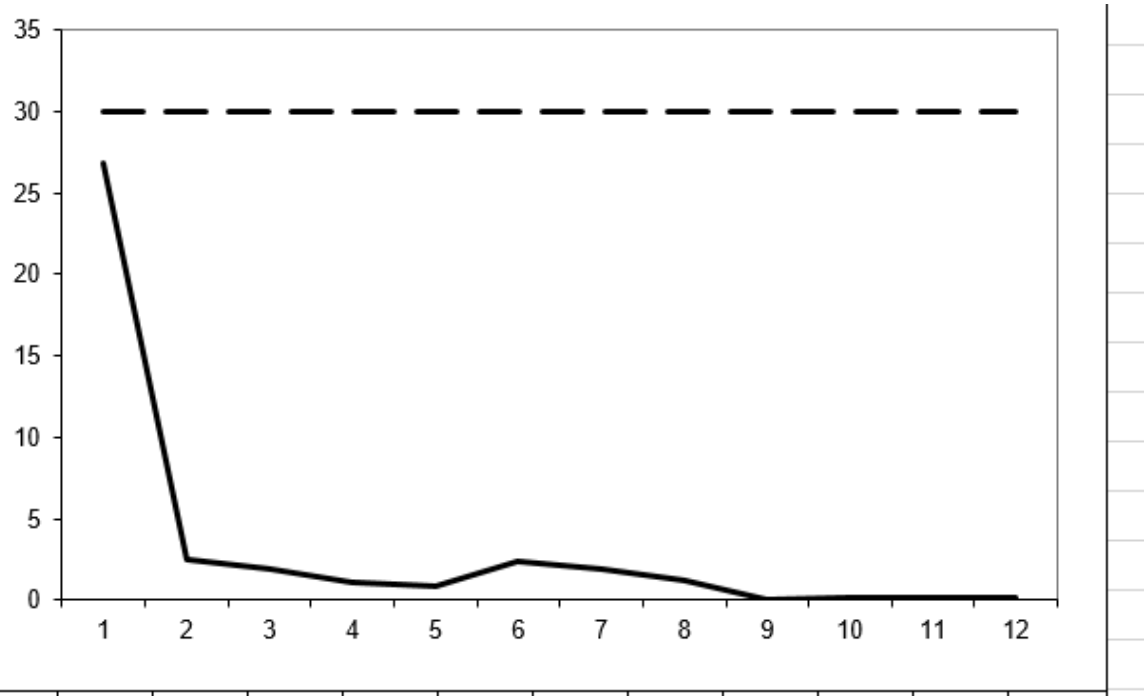
Appendix 1

Kiln 8

Annual monitoring summary

Particulates



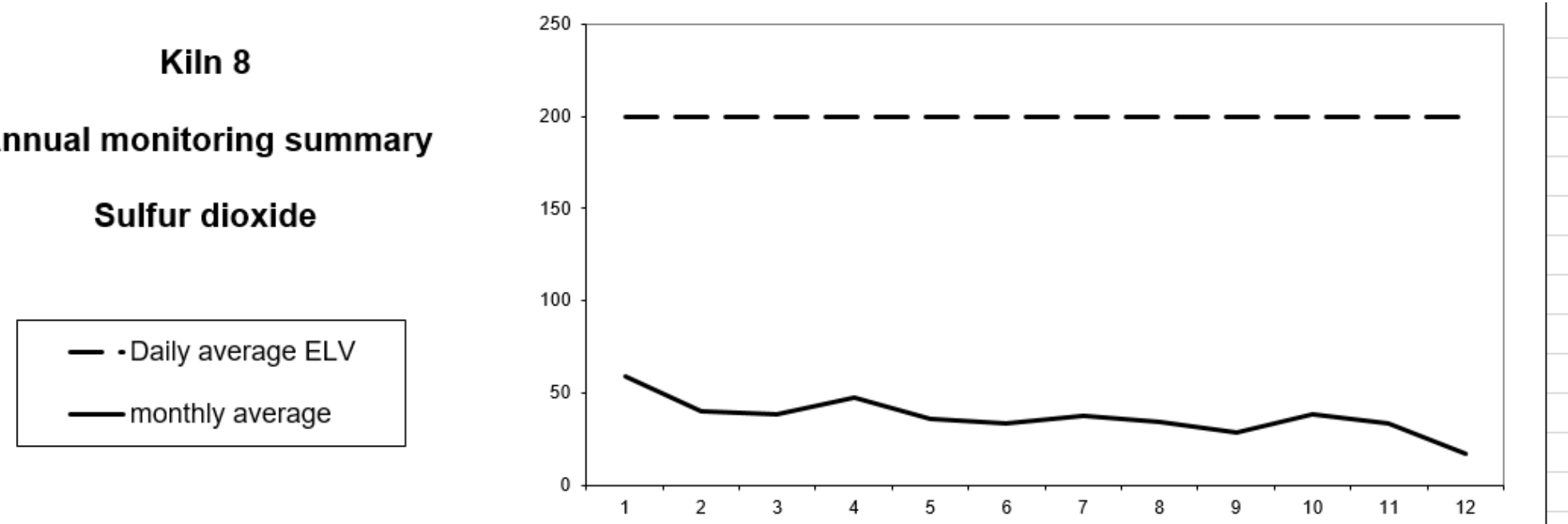


	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	30	30	30	30	30	30	30	30	30	30	30	30
	Annual average	30	monthly average	27	3	2	1	1	2	2	1	0	0	0	0
	Annual maximum	28	Monthly maximum	28	4	2	3	2	3	3	3	0	0	0	0

Kiln 8

Annual monitoring summary

Sulfur dioxide

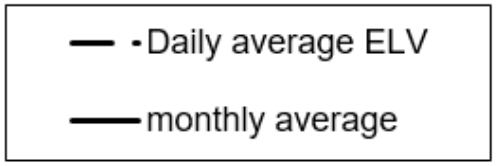


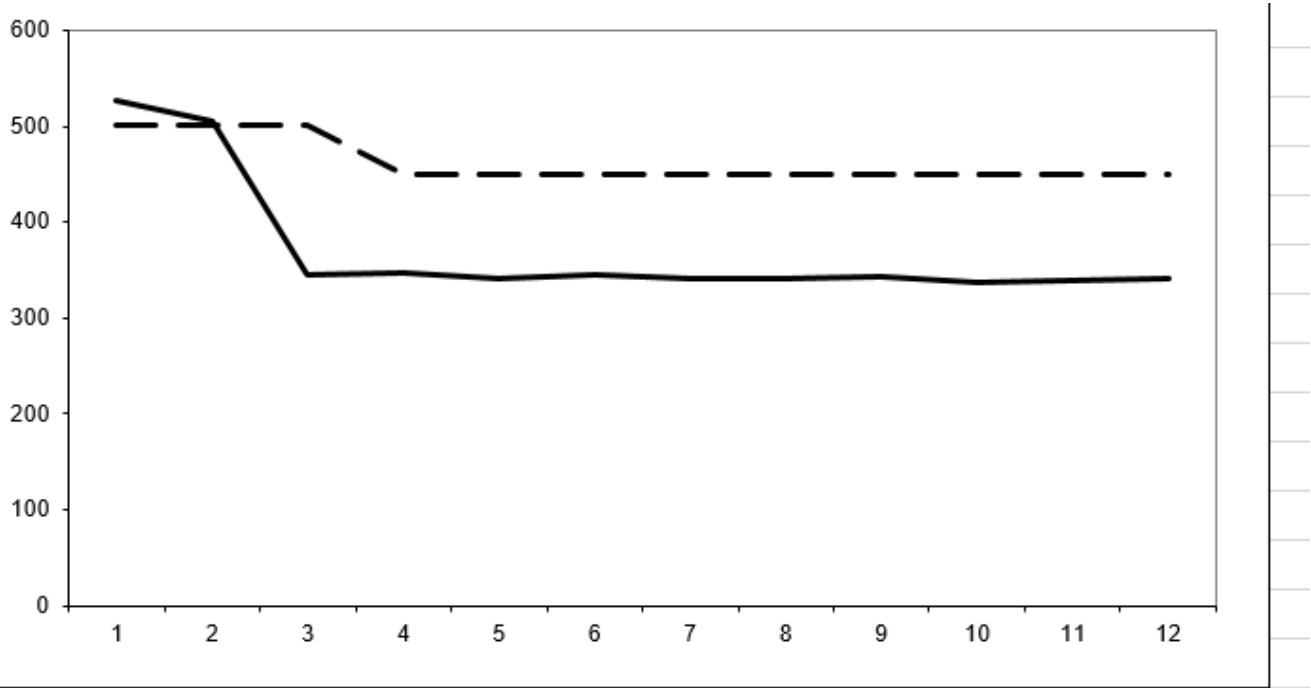
	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	200	200	200	200	200	200	200	200	200	200	200	200
	Annual average	200	monthly average	59	41	39	48	36	33	38	34	29	39	33	17
	Annual maximum	111	Monthly maximum	102	63	100	100	111	91	105	102	87	101	103	69

Kiln 8

Annual monitoring summary

Nitrogen oxides



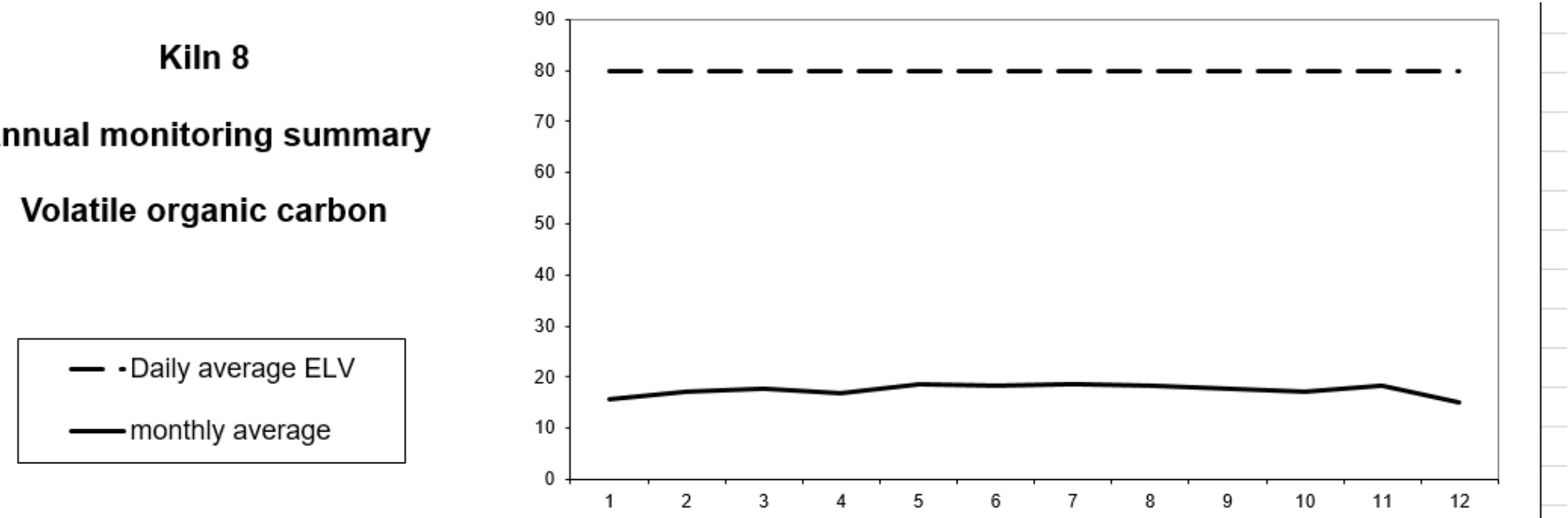


	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	500	500	500	450	450	450	450	450	450	450	450	450
	Annual average	450	monthly average	527	506	344	346	341	344	341	341	343	337	339	341
	Annual maximum	658	Monthly maximum	658	643	425	401	379	372	375	451	375	357	363	354

Kiln 8

Annual monitoring summary

Volatile organic carbon

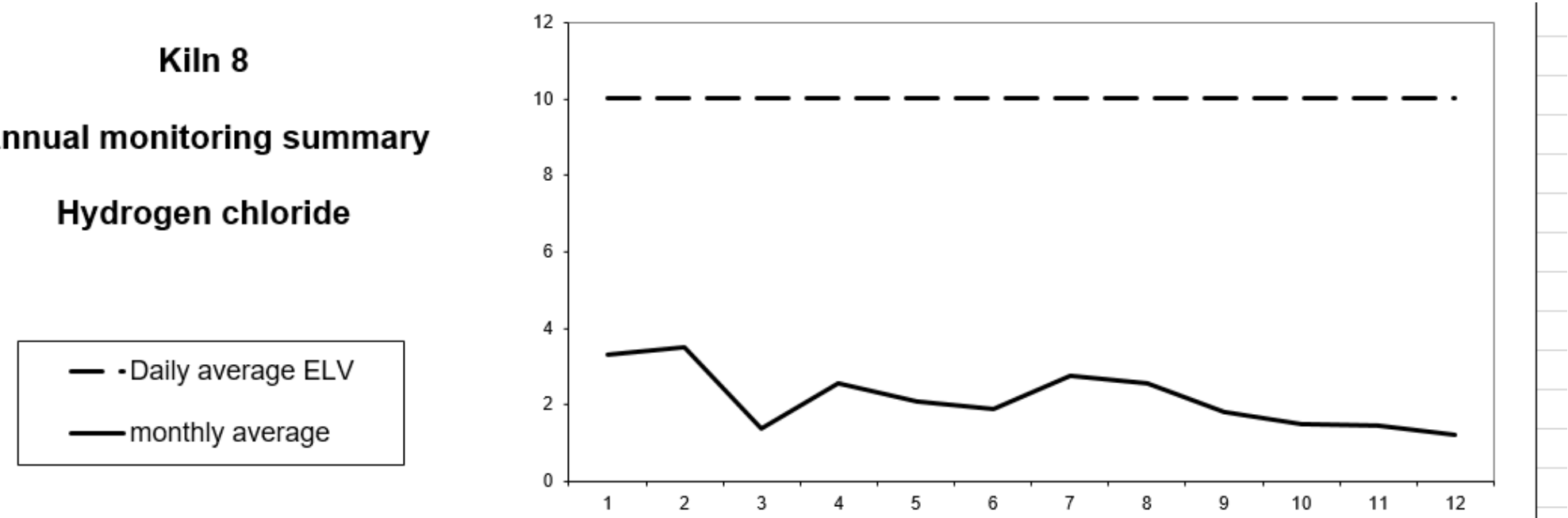


	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	80	80	80	80	80	80	80	80	80	80	80	80
	Annual average	80	monthly average	16	17	18	17	19	18	18	18	18	17	18	15
	Annual maximum	22	Monthly maximum	17	19	21	19	22	22	22	21	22	20	22	20

Kiln 8

Annual monitoring summary

Hydrogen chloride

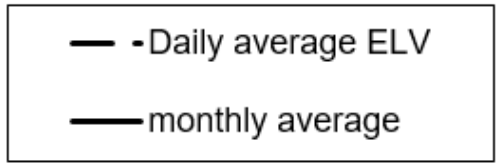


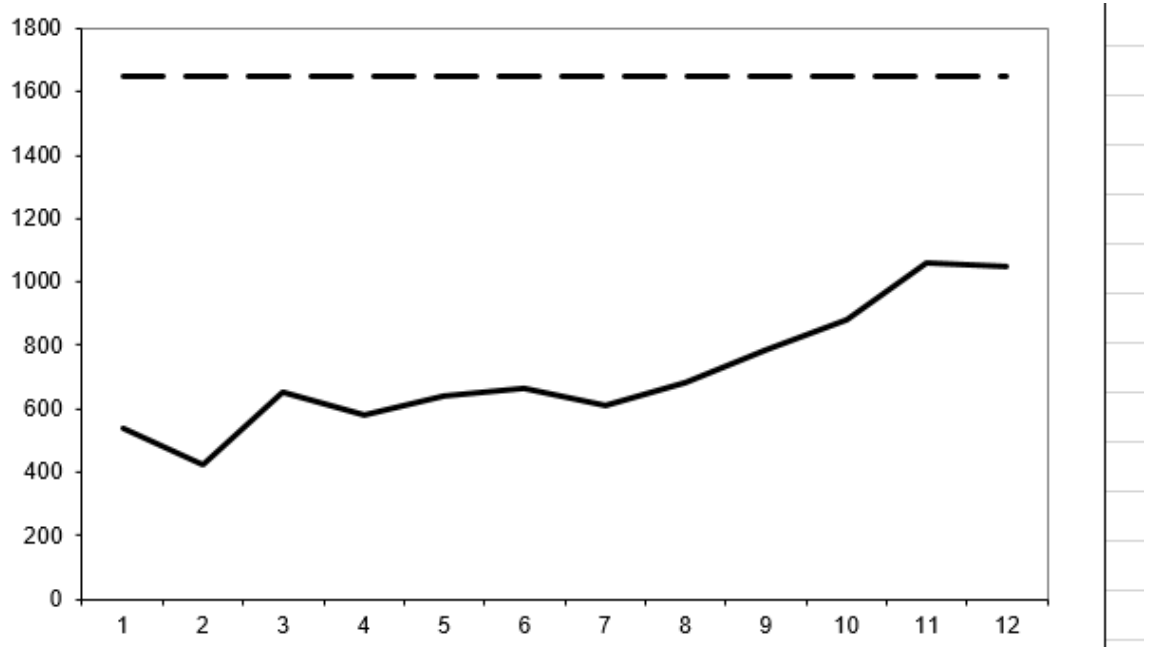
	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	10	10	10	10	10	10	10	10	10	10	10	10
	Annual average	10	monthly average	3	4	1	3	2	2	3	3	2	2	1	1
	Annual maximum	7	Monthly maximum	5	5	5	7	6	5	6	6	6	4	5	6

Kiln 8

Annual monitoring summary

Carbon monoxide



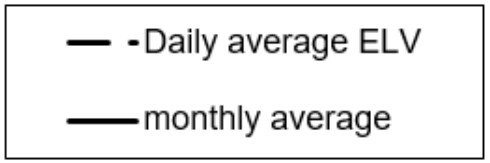


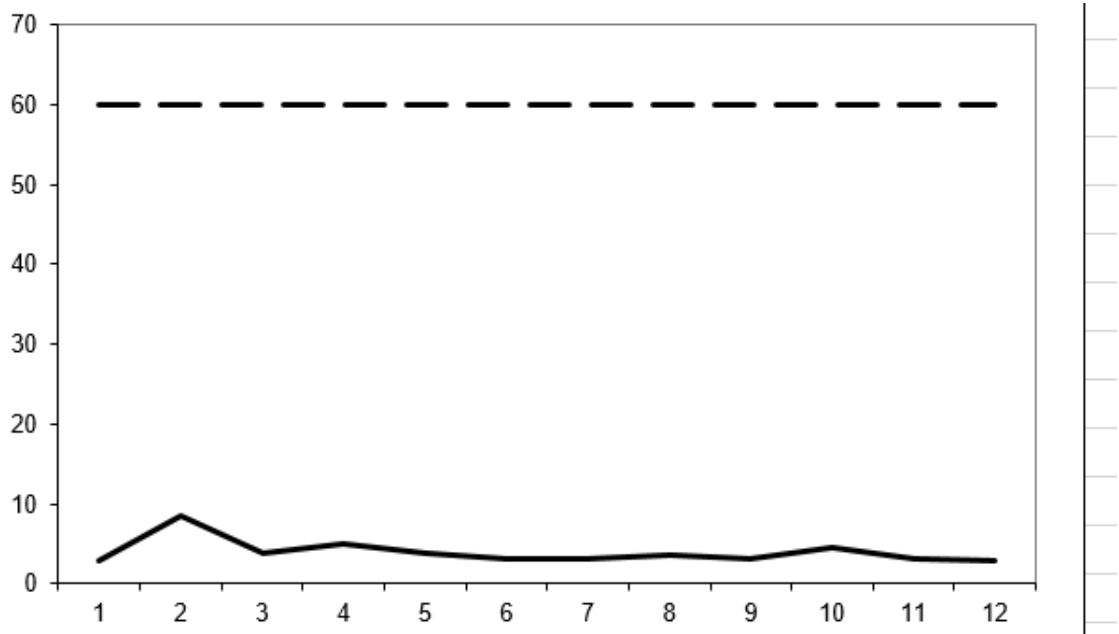
	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
	Annual average	1650	monthly average	539	425	653	582	640	664	613	681	786	878	1060	1048
	Annual maximum	1147	Monthly maximum	703	472	799	810	877	822	848	817	1053	1139	1146	1147

Kiln 8

Annual monitoring summary

Ammonia





	Annual summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Daily average ELV	60	60	60	60	60	60	60	60	60	60	60	60
	Annual average	60	monthly average	3	9	4	5	4	3	3	4	3	4	3	3
	Annual maximum	29	Monthly maximum	4	11	15	17	15	12	12	14	13	29	11	13