Castle Cement Ltd, Ribblesdale works

Annual performance report as required by

Condition 4.2.2

Permit EPR/BL7272IB/V008

for calendar year 2014

Annual performance report for Castle Cement Ltd, Ribblesdale works

1 Introduction

Condition 4.2.2 of EPR permit BL7272IB requires an annual performance report.

4.2.2 A report or reports on the performance of the activities of the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretative review of that data;

(b) the performance parameters set out in schedule 4 table S4.2 using the forms specified in table S4.3 of that schedule ;

(c) the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Chapter IV of the Industrial Emissions Directive (IED)) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED

2 Condition 4.2.2 (a)

2.1 Emissions to air

The main emissions to air from the installation are from the kiln via the main stack (emission point A2). These are covered in detail in the response to condition 4.2.3.

The cement mills and associated equipment and the coal mills (emission points A4, A5, A7, A8, A10, A11) are the remaining major sources of emissions to air. The permit includes emission limits and specific monitoring standards for these emission points.

Table 2.1.1 below provides a summary of performance of these emission points based upon the monitoring data collected in 2014.

Emission point	Description	Daily average limit (mg/m^3)	Annual mean emission (mg/m^3)	Standard deviation (mg/m^3)
A4	Cement mills nos. 9, 10, 11 (No2 Redecam)	40	3	4.3
A5	Cement mills nos. 9, 10, 11 (No1 Redecam)	40	1	1.4
A7	Cement mill no. 7	75	10	8.1
A8	Cement mill no.8	75	21	12.0
A10	Coal mill no.4	40	1	1.5
A11	Coal mill no.5	40	1	2.1

Table 2.1.1 Summary of emissions to air for monitoring points other than A2.

There were no breaches of the emission limits from any of the cement or coal mills in 2014.

There were a total of 2 notifications of unauthorized releases from the site. These are summarized below in Table 2.1.2

Type	Short description	Date of notification
Breach of a daily ELV	Breach of particulate limit from kiln 7 main stack, 31 mg/Nm^3 against a limit of 30 mg/Nm^3	2nd Sept 2014
Breach of a daily ELV	Breach of hydrogen chloride limit from kiln 7 main stack, 11 mg/Nm^3 against a limit of 10 mg/Nm^3	9th Oct 2014

Table 2.1.2 Summary of Part A notifications for releases to air 2014.

The breach of the particulate limit from kiln 7 resulted from an incorrect reading for the gas temperature leaving the gas conditioning tower. This incorrect reading caused insufficient water to be sprayed into the conditioning tower and this led to the performance of the electrostatic precipitator being adversely affected. The thermocouple measuring the temperature was found to have a worn outer sheath allowing cold air to be drawn over the instrument and indicating a lower than actual temperature of the gas leaving the tower. The faulty thermocouple was replaced and there has been no further re occurrence of this type of fault.

The breach of the hydrogen chloride limit from kiln 7 stack occurred as a result of stopping the raw mill for routine maintenance whilst the wet gas scrubber was unavailable for operation. Hydrogen chloride (HCl) is an acidic gas that is efficiently removed in the kiln and preheater tower due to the fine, alkaline particles present in the gas stream. Any HCl not removed in the kiln and preheater passes to the raw mill where it is scrubbed out by the dust storm in the mill produced by the crushing of limestone. Finally any HCl that is still present will be removed in the wet gas scrubber, HCl being very soluble in water. However, because both the mill and the scrubber were not operational this did not happen. The emission would not have happened if the mill had not been stopped for maintenance whilst the scrubber was off line. To prevent a re-occurrence a procedure has been introduced that will prevent the mill being stopped for routine maintenance whilst the wet gas scrubber is un available and vice versa.

2.2 Emissions to water

Discharges to water from the installation are via emission points W1 and W2. Monitoring of these emission points is carried out by monthly spot monitoring. The permit includes emission limits for these emission points.

Table 2.2.1 below provides a summary of performance of these emission points based upon the monitoring data collected in 2014.

Emission point	Description	Suspended solids (mg/)		pH		Oil/grease	
		Limit	Annual Mean	Limit	Annual Mean	Limit	Mean
W1	Surface water run off, quarry drainage and cooling water	45	3.4	5 - 9	7.8	None visible	nil
W2	Surface water run off and cooling water via settling pond	45	5.2	5 - 9	7.8	None visible	nil

Table 2.2.1 Summary of emissions to water for monitoring points W1 and W2.

There were no unauthorized releases to water during 2014.

3 Condition 4.2.2 (b)

The quantity of cement kiln dust removed from site is reported quarterly by use of the Environment Agency Waste Return. In 2014 the following quantities of CKD were recycled off site as a soil conditioner.

Period	Quantity (tonnes)
1 Jan – 31 Mar	245.89
1 Apr – 30 Jun	74.51
1 Jul – 30 Sept	58.53
1 Oct – 31 Dec	nil

Table 3.1 Summary of CKD removed from site

4 Condition 4.2.2 (c)

This report is produced using the agreed EA report template and is included in the following pages.

Annual performance report for Castle Cement Ltd, Ribblesdale works.

Permit number EPR/BL7272IB, variation number EPR/BL7272IB/V008

Calendar year 2014

This report is required by Chapter IV of the Industrial Emissions Directive (IED) Article 55(2): - Reporting and public information on waste incineration plants and waste co-incineration plants. 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 give account of the running of the process and the level of emissions into air and water in comparison to the emission limit values. Article 55(2) also requires that this information is made available to the public.

1. Introduction

Name of company	Castle Cement Limited, trading as Hanson Cement
Name of plant	Ribblesdale works
Permit number	EPR/BL7272IB
Address	West Bradford Road, Clitheroe, Lancashire, BB7 4QF.
Telephone	01200 422401
Contact name	N Sharpe
Position	Quality and Cement Manager
Further information	

2. Plant description

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

Limestone interleaved with shale is extracted from 2 local quarries. This material is then crushed in a dedicated crushing plant together with a number of additives to produce a raw material that is no larger than 75 mm. The crushed stone is, after homogenisation in a blending store, dried and crushed in a vertical roller mill to produce raw meal, a fine powder that is the feedstock for the cement kiln.

The raw meal is conveyed pneumatically to the top of the pre heater tower. The meal is heated by the exhaust gases from the kiln as it passes down the tower until it reaches the calciner. This is a combustion chamber located between the kiln inlet and the bottom stage cyclone in which approximately 60% of the thermal energy required for the kiln is input. In the calciner the material temperature reaches 880^{o}C which results in most of the carbon dioxide in the limestone being driven off, a process called calcination. Fuels permitted to be burned in the calciner are coal, petroleum coke, chipped tyres, meat and bone meal, and solid recovered fuel (SRF) a fuel made from paper, plastics, and fibrous wastes.

The calcined material enters the kiln, which is a slightly inclined tube rotating at approximately 3 r.p.m. As the kiln rotates the material moves to the discharge end undergoing a series of complex chemical reactions to produce cement clinker. To complete the required chemical reactions the material must reach a temperature in the region of 1450 ^{o}C. The thermal energy required at this point is supplied via the kiln burner, a co-axial pipe that is permitted to use coal, petroleum coke, Cemfuel, meat and bone meal, and solid recovered fuel. The heated material leaves the kiln and is cooled to freeze the chemical reactions; the heat recovered is used as combustion air in the kiln and calciner. The cooled clinker is then directed to a purpose built store for later use or led directly to the cement mills for grinding.

The clinker is ground in one of 4 cement mills. Gypsum, desulfurisation gypsum, plaster moulds, reclaimed plasterboard, limestone, 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 dispatched in bulk road and rail tankers or in palletised paper or plastic sacks.

3. Summary of plant operation

a) Plant details.

One cement kiln burning waste materials operates on site, for historic reasons this is known as kiln 7.

b) Annual waste throughputs.

The amount of waste burned in 2014 is summarised in the table below.

Waste type	EWC code	Tonnes used
Cemfuel	19 02 08	15017
Chipped tyres	16 01 03	8457
Meat and bone meal (MBM)	02 02 03	8385
Solid recovered fuel (SRF)	19 02 10, 19 12 10	34024

c) Operational hours.

The total hours of operation of the kiln and the total tonnage of cement clinker produced in 2014 is summarised in the table below.

Equipment	Annual production	Operational hours
Kiln 7	Commercially confidential	Commercially confidential

The plant was shut down for maintenance in January and most of February.

d) Residues.

The following residues were produced during the year.

Residue	EWC code	Annual production
Cement kiln dust (CKD)	10 13 12	Commercially confidential

4. Summary of plant monitoring.

a) Pollutants measured.

Emissions from kiln 7 stack 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, and polycyclic aromatic hydrocarbons. 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		✓
Dioxins and furans		✓
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 operating normally
Particulates	99.7
Carbon monoxide	99.7
Sulfur dioxide	99.7
Oxides of nitrogen	99.7
Hydrogen chloride	99.7
Total organic carbon	99.7

c) Summary of continuous emissions monitor data.

Monthly continuous emission monitor 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 below.

	Unit	Emission limit value	1st half 2014	2nd half 2014
Hydrogen fluoride	mg/Nm^3	1	0.13	0.12
Mercury and its compounds	mg/Nm^3	0.05	0.0018	0.0043
Cadmium and thallium and their compounds	mg/Nm^3	0.05	0.0050	0.0079
Group III metals and their compounds	mg/Nm^3	0.5	0.18	0.21

Dioxins and furans (I-TEQ)	ng/Nm^3	0.1	0.013	0.0036
Dioxin like PCBs (WHO-TEQ)	ng/Nm^3	No limit applies	0.0013	0.0012
Polycyclic aromatic hydrocarbons (total)	mg/Nm^3	No limit applies	<0.0218	<0.0215

5. Summary of plant compliance

The plant met its nitrous oxides, carbon monoxide, sulfur dioxide, and total organic carbon emission limits 100% of the time of operation. The plant met its particulates and hydrogen chloride emission limits 99.7% of the time of operation. Details of the breaches of the particulates and hydrogen chloride limits are given in Table 2.1.2 of the response to condition 4.2.2 (a) above.

6. Summary of plant improvements.

A report on the Technical Evaluation for the burning of SRF at the calciner and MBM at the main burner was submitted to the Environment Agency during the year.

During the first half of the year a new selective non catalytic reduction (SNCR) system was commissioned. This system was installed to meet the new, lower nitrous oxides (NOx) emission limit value that became applicable from July.

7. Summary of information made available.

Routine monitoring data reported to the Environment Agency is published in the public register. The register is held at the following addresses:

The Environment Agency
430 Birchwood Boulevard
Birchwood
Warrington
WA3 7WD

A copy of this report is also available online at www.hanson.com/uk.

A Hanson Cement/Ribble Valley Borough Council Liaison Committee meets at least twice a year. This meeting provides a forum for elected representatives of local parish and District councils to discuss any matters of concern with the company. Representatives of the Environment Agency also attend this meeting.

Hanson Cement operates an ‘open door’ policy enabling members of the public to 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, Ribblesdale Works, Clitheroe, Lancs, BB7 4QF

By e mail: enquiries@hanson.biz

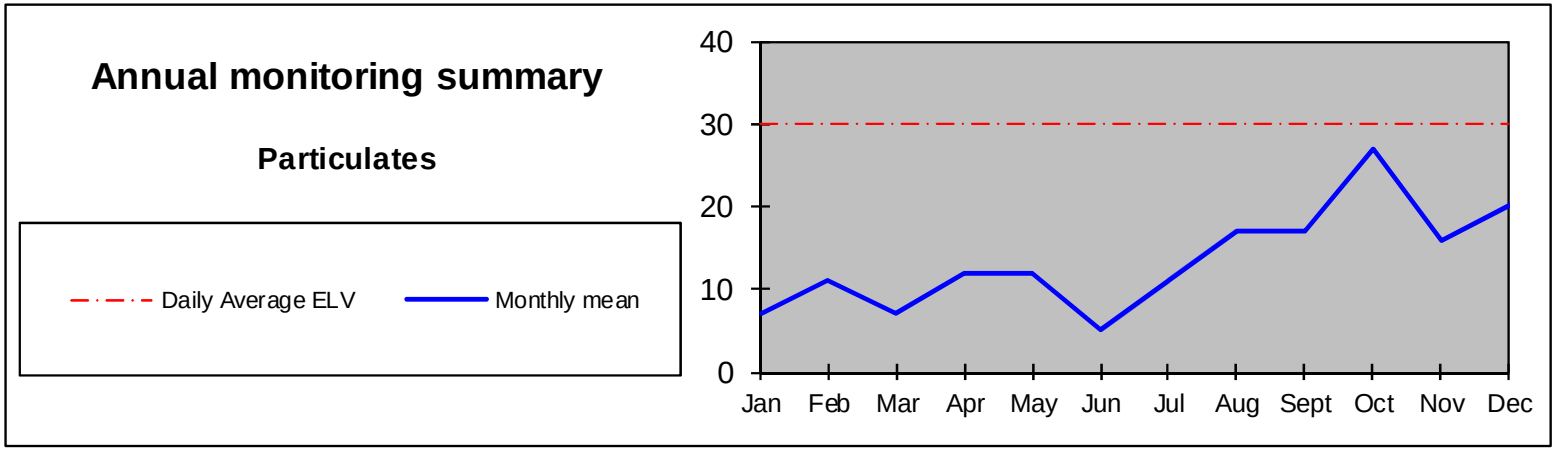
By ‘phone: 01200 422401.

Appendix 1

The following graphs show the annual emission to air of the following continuously monitored pollutants:

1. Particulates.
2. Total organic carbon.
3. Hydrogen chloride.
4. Carbon monoxide.
5. Sulfur dioxide.
6. Nitrogen oxides.

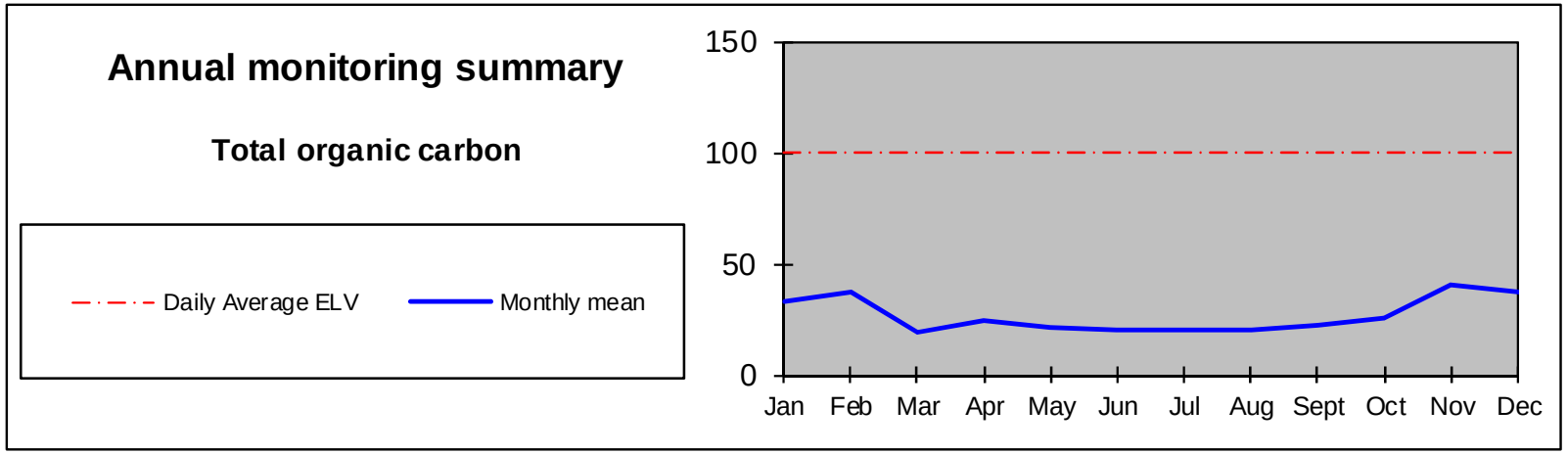
1. Annual monitoring summary for particulates



	Monthly summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Daily average			Daily average ELV	30	30	30	30	30	30	30	30	30	30	30	30
	Annual daily mean	14	Monthly daily mean	7	11	7	12	12	5	11	17	17	27	16	20
	Annual daily maximum	92	Monthly daily maximum	12	28	25	29	30	16	26	29	31	92*	28	29

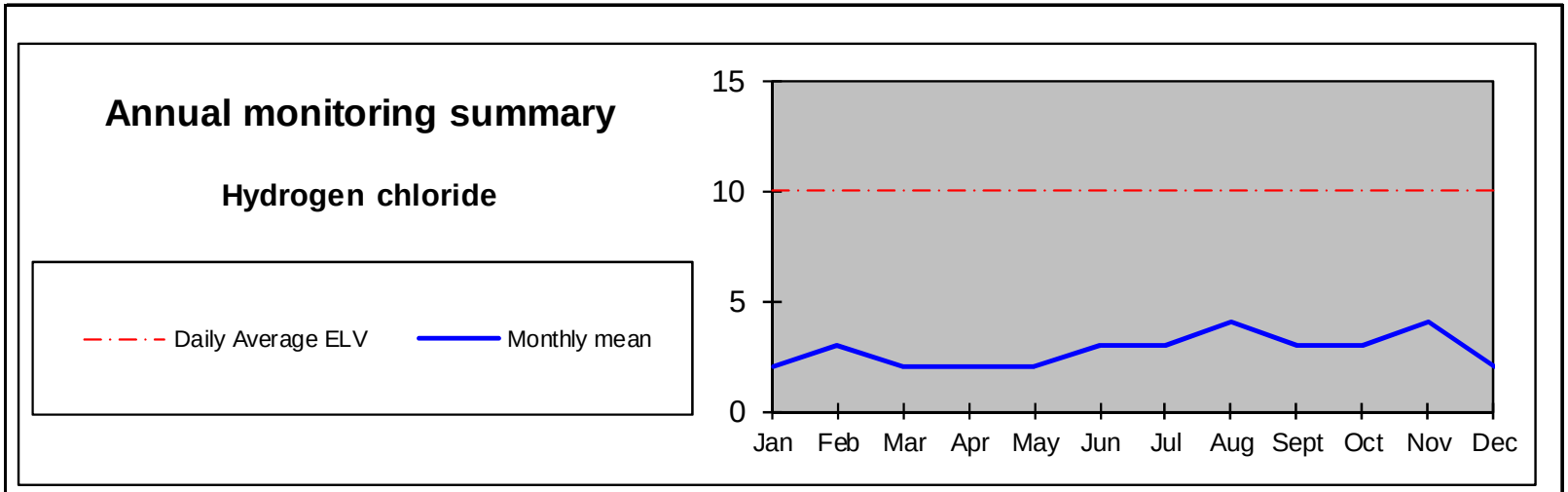
* The annual daily maximum occurred during a day without the wet gas scrubber running

2. Annual monitoring summary for total organic carbon.



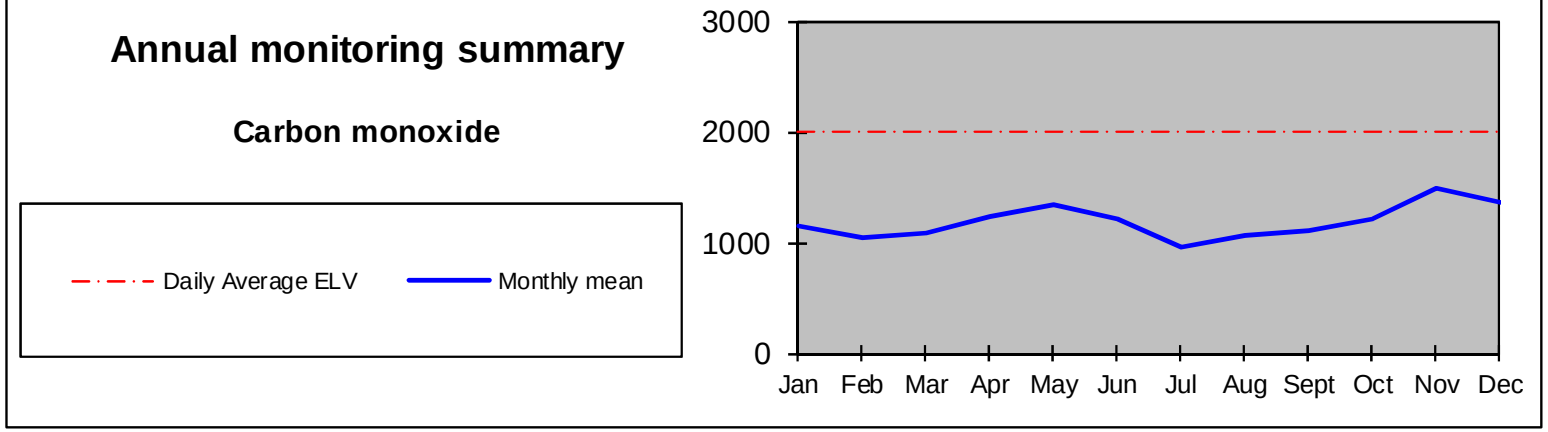
	Monthly summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Daily average			Daily average ELV	100	100	100	100	100	100	100	100	100	100	100	100
	Annual daily mean	27	Monthly daily mean	33	37	19	24	21	20	20	20	22	25	40	37
	Annual daily maximum	57	Monthly daily maximum	36	57	24	46	24	22	24	26	24	37	54	50

3. Annual monitoring summary for hydrogen chloride.



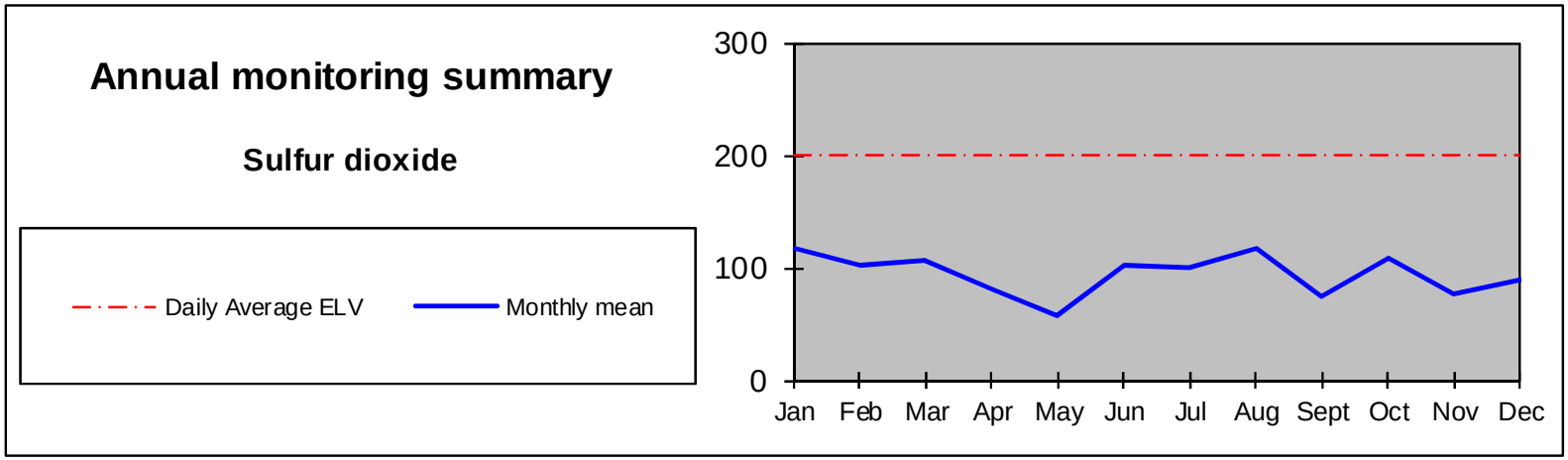
	Monthly summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Daily average			Daily average ELV	10	10	10	10	10	10	10	10	10	10	10	10
	Annual daily mean	3	Monthly daily mean	2	3	2	2	2	3	3	4	3	3	4	2
	Annual daily maximum	11	Monthly daily maximum	2	9	5	5	5	9	5	7	8	11	10	6

4. Annual monitoring summary for carbon monoxide.



	Monthly summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Daily average			Daily average ELV	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	Annual daily mean	1191	Monthly daily mean	1152	1053	1077	1233	1339	1223	965	1054	1110	1222	1491	1371
	Annual daily maximum	1962	Monthly daily maximum	1293	1536	1555	1770	1787	1831	1603	1697	1690	1545	1962	1837

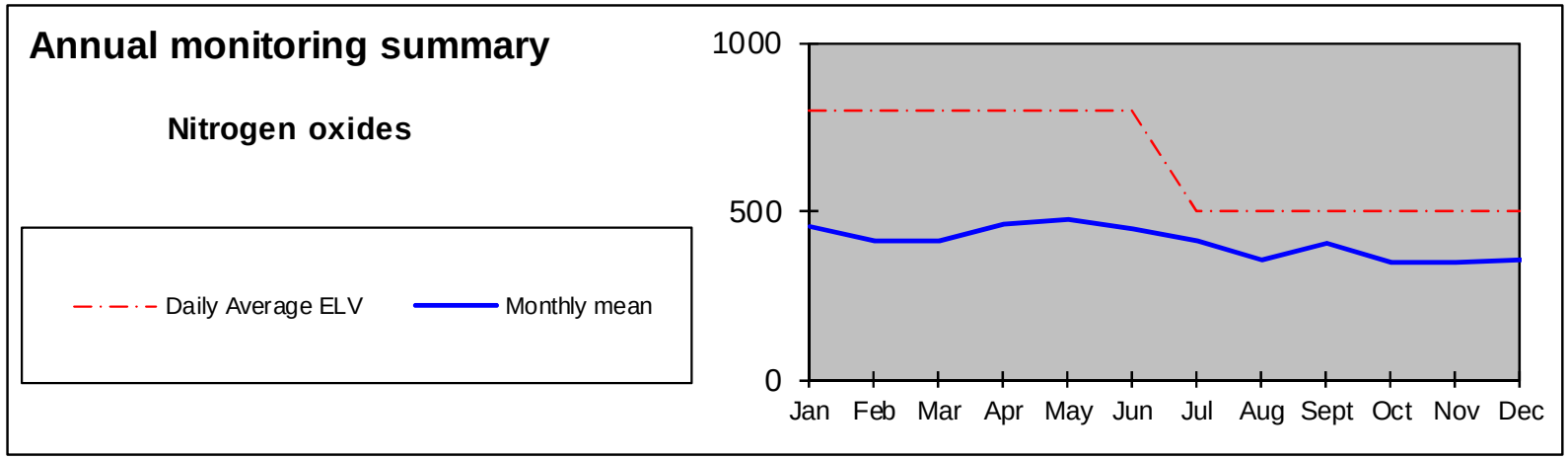
5. Annual monitoring summary for sulfur dioxide.



	Monthly summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Daily average			Daily average ELV	200	200	200	200	200	200	200	200	200	200	200	200
	Annual daily mean	94	Monthly daily mean	117	102	106	81	58	103	99	117	75	108	76	89
	Annual daily maximum	418	Monthly daily maximum	133	159	168	154	118	161	158	174	170	418*	145	127

* The annual daily maximum occurred during a day without the wet gas scrubber running

6. Annual monitoring summary for nitrogen oxides.



	Monthly summary		Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Daily average			Daily average ELV	800	800	800	800	800	800	500	500	500	500	500	500
	Annual daily mean	407	Monthly daily mean	451	410	414	463	477	448	412	357	404	347	347	353
	Annual daily maximum	659	Monthly daily maximum	540	528	479	548	659	558	460	491	474	435	433	454