

Annual performance report for Castle Cement Ltd, Ribblesdale works.

Permit number EPR/BL7272IB, variation number EPR/BL7272IB/V005

Calendar year 2009

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	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 Environment 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°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, and meat and bone meal. A variation has been issued by the Environment Agency to allow for the trial burning of wood and wood waste in the calciner.

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 °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, and Cemfuel. 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, 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 despatched in bulk road tankers or in palletised paper 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 2009 is summarised in the table below.

Waste type	EWC code	Tonnes used
Cemfuel	19 02 08	14917
Chipped tyres	16 01 03	7702
Meat and bone meal (MBM)	02 02 03	20384
Wood	03 01 05	445

c) Operational hours.

The total hours of operation of the kiln and the total tonnage of cement clinker produced in 2009 is summarised in the table below.

Equipment	Annual production	Operational hours
Kiln 7	452760 tonnes	4715 hours

The annual shutdown of the kiln took place in January and lasted 4 weeks. During this time major maintenance to the plant took place. The plant was also stopped for all of April and June, plus additional off time in August and November. This downtime was due to the reduced demand for cement and some further maintenance was undertaken during these periods.

d) Residues.

The following residues were produced during the year.

Residue	EWC code	Annual production
Cement kiln dust (CKD)	10-13-04	2909 tonnes

The material is recycled off site by Future Industries and Bi Product Recovery.

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, benzene, 1,3-butadiene, 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		✓
Benzene		✓
1,3-butadiene		✓
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	99.9
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 monthly 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	1 st half 2009	2 nd half 2009
Hydrogen fluoride	mg/m ³	<0.039	<0.029
Mercury and its compounds	mg/m ³	0.0013	0.0013 ⁽¹⁾
Cadmium and thallium and their compounds	mg/m ³	0.022	0.011 ⁽¹⁾
Group III metals and their compounds	mg/m ³	0.23	0.26 ⁽¹⁾
Benzene	mg/m ³	3.2	3.7
1,3-butadiene	mg/m ³	<0.0029	<0.0037
Dioxins and furans (I-TEQ)	ng/m ³	<0.0020	0.010 ⁽¹⁾
Dioxin like PCBs (WHO-TEQ)	ng/m ³	0.00055	0.0012 ⁽¹⁾
Polycyclic aromatic hydrocarbons (total)	mg/m ³	<1.1343	0.94

Note: Due to reduced running of the kiln and the poor weather during December it was not possible to complete the periodic monitoring for the 2nd half of the year before the kiln was stopped for its major overhaul. Following discussion with the Environment Agency it was agreed that the periodic monitoring would be completed in the first quarter of 2010. The results marked (1) were obtained in the 1st quarter of 2010 and reported as the 2nd half of 2009.

5. Summary of plant compliance

The plant met its sulfur dioxide, hydrogen chloride, total organic carbon, carbon monoxide, and nitrogen oxides emission limits 100% of the time. The plant met its particulate emission limit 97.9% of the time.

There was a breach of the particulate emission limit on 13th February 2009 when the daily average emission was 35 mg/m³. This was reported to the Environment Agency as a part A notification and followed up with a part B notification. The breach occurred due to an increase in the dust content of the cooler waste gases used to reheat the gases exiting the wet gas scrubber. Changes to the cooler control loops were carried out to prevent a reoccurrence.

There was a breach of the particulate emission limit on 1st March 2009 when the daily average emission was 31 mg/m³. This was reported to the Environment Agency as a part A notification and followed up with a part B notification. The breach occurred due to a worn sluice on the dust collection system. The sluice was replaced.

There was a breach of the particulate emission limit on 10th September 2009 when the daily average emission was 32 mg/m³. This was reported to the Environment Agency as a part A notification and followed up with a part B notification. The breach occurred due to insufficient cooling of the kiln exhaust gases caused by a faulty water control valve. An electronics card that controls the opening of the valve was changed.

There was a breach of the particulate emission limit on 1st March 2009 when the daily average emission was 44 mg/m³. This was reported to the Environment Agency as a part A notification and followed up with a part B notification. The breach occurred as a result of the scrubber bypass damper not being fully closed allowing some gases to pass directly up the stack instead of first passing through the wet gas scrubber. The damper was closed manually and extensive repairs carried out to the damper and drive mechanism during the January 2010 kiln overhaul.

None of the breaches were due to the burning of waste materials.

6. Summary of plant improvements.

There were no improvement conditions relating to the burning of waste materials due in 2009.

7. Summary of information made available.

Monthly emission 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

Environmental Services
Ribble Valley Borough Council
Council Offices
Church Walk
Clitheroe
BB7 2RA

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 matters of

concern with the company. Representatives of the Environment Agency also attend this meeting.

Hanson Cement publishes a community newsletter titled 'Open Door' and this is delivered to every household within a five mile radius of Ribblesdale works.

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: cement.customer.services@hanson.biz

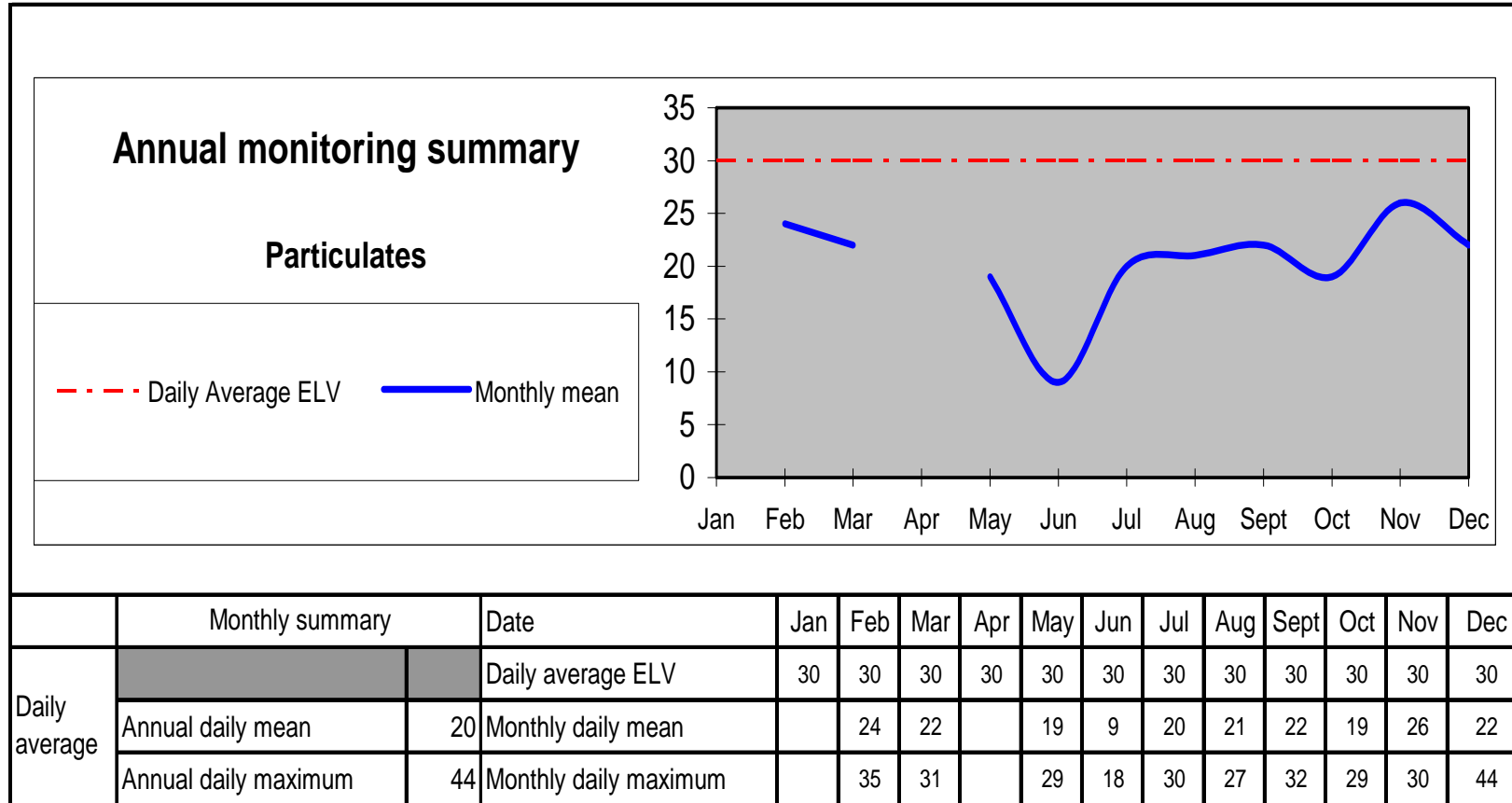
By 'phone: 01200 422401.

Appendix 1

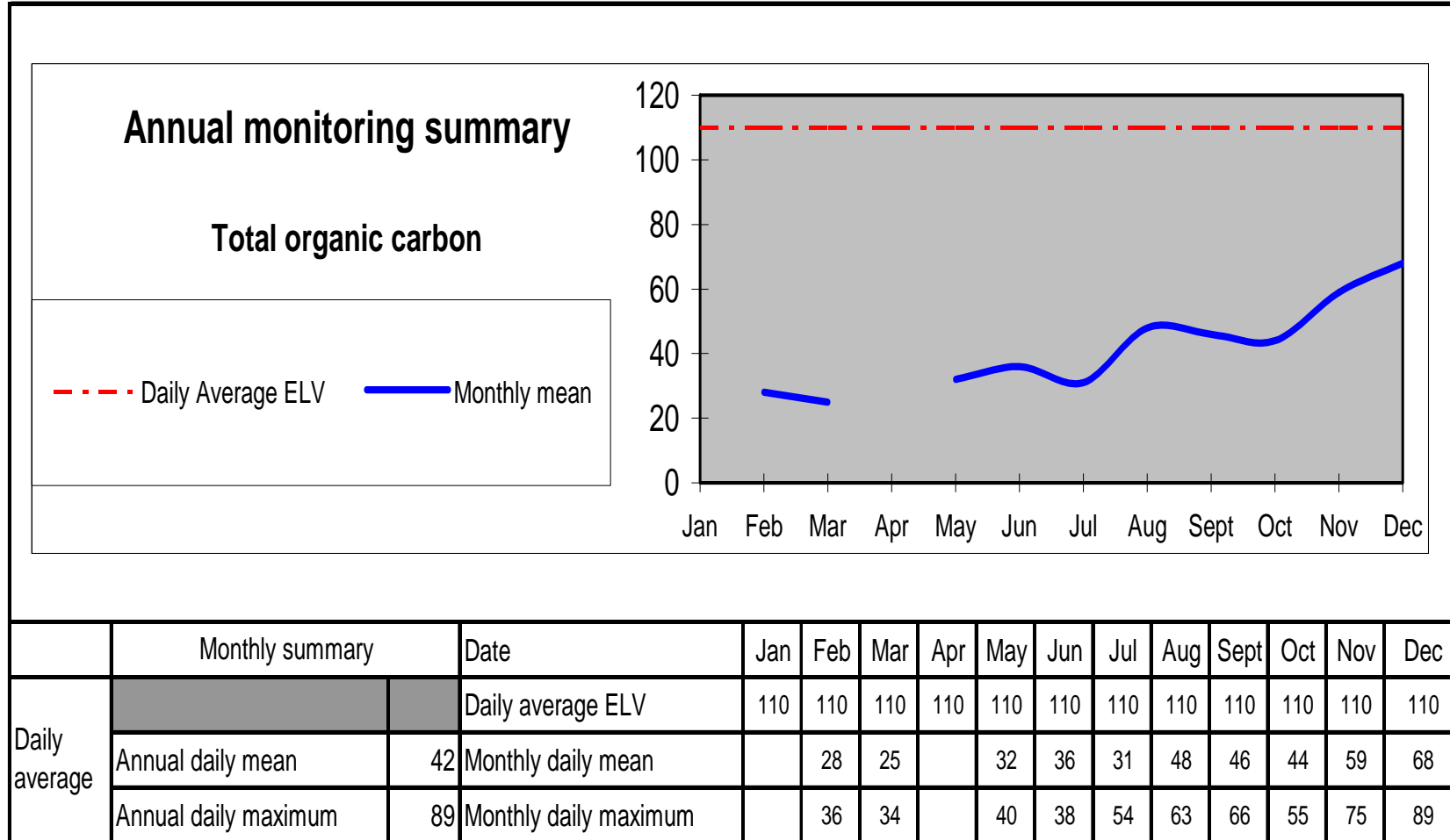
The following graphs show the annual emission to air of the following continuously monitored pollutants:

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

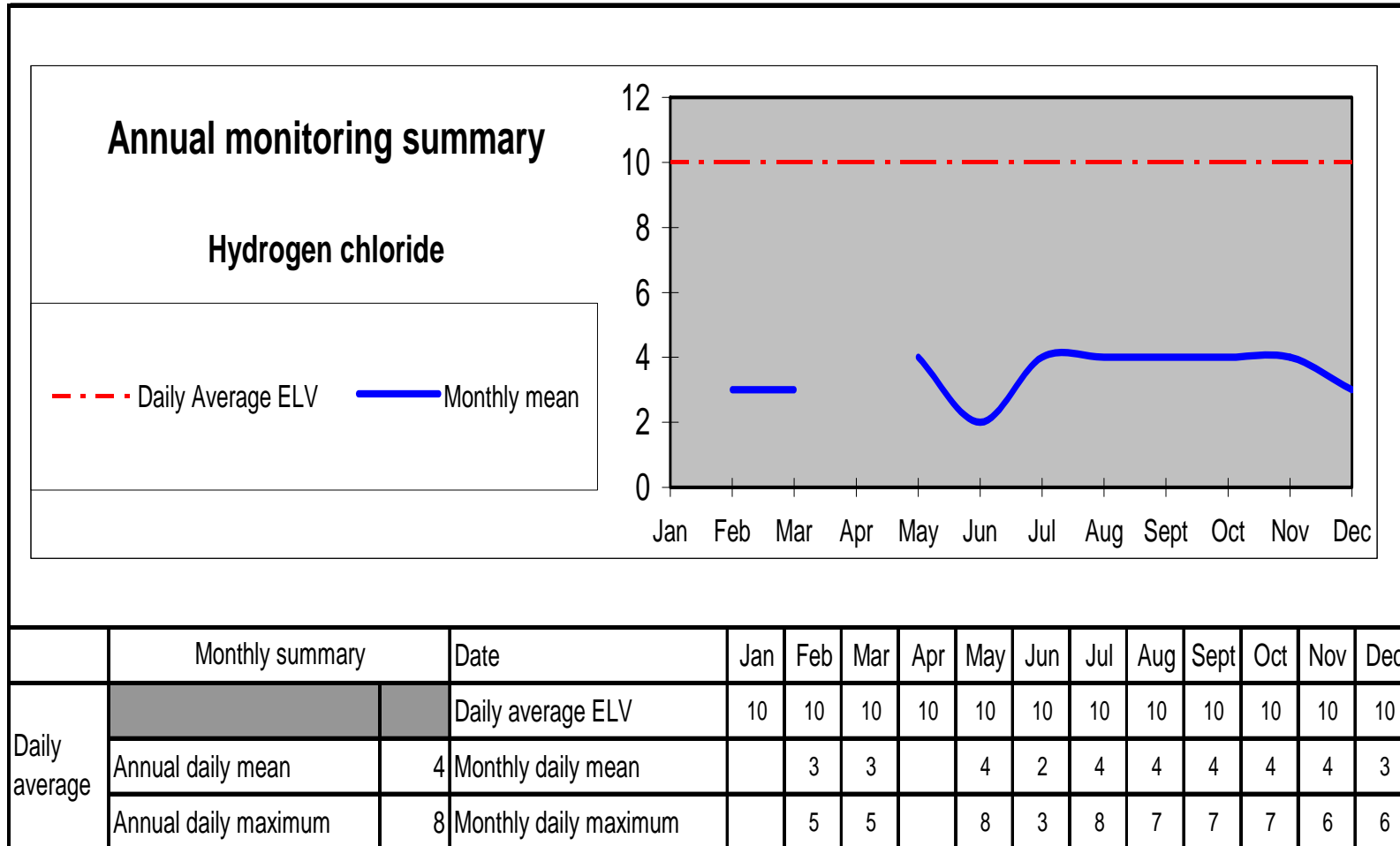
1. Annual monitoring summary for particulates



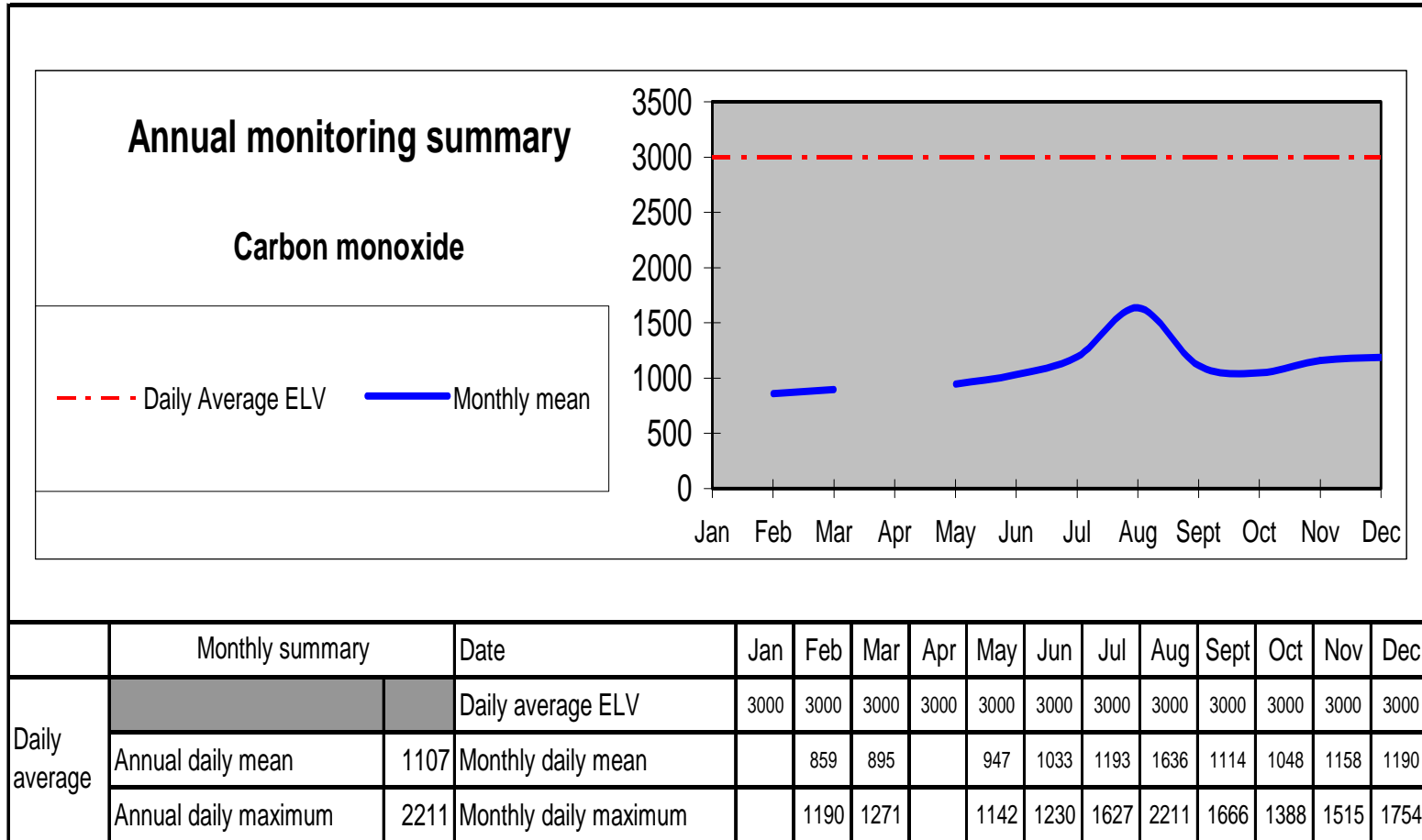
2. Annual monitoring summary for total organic carbon.



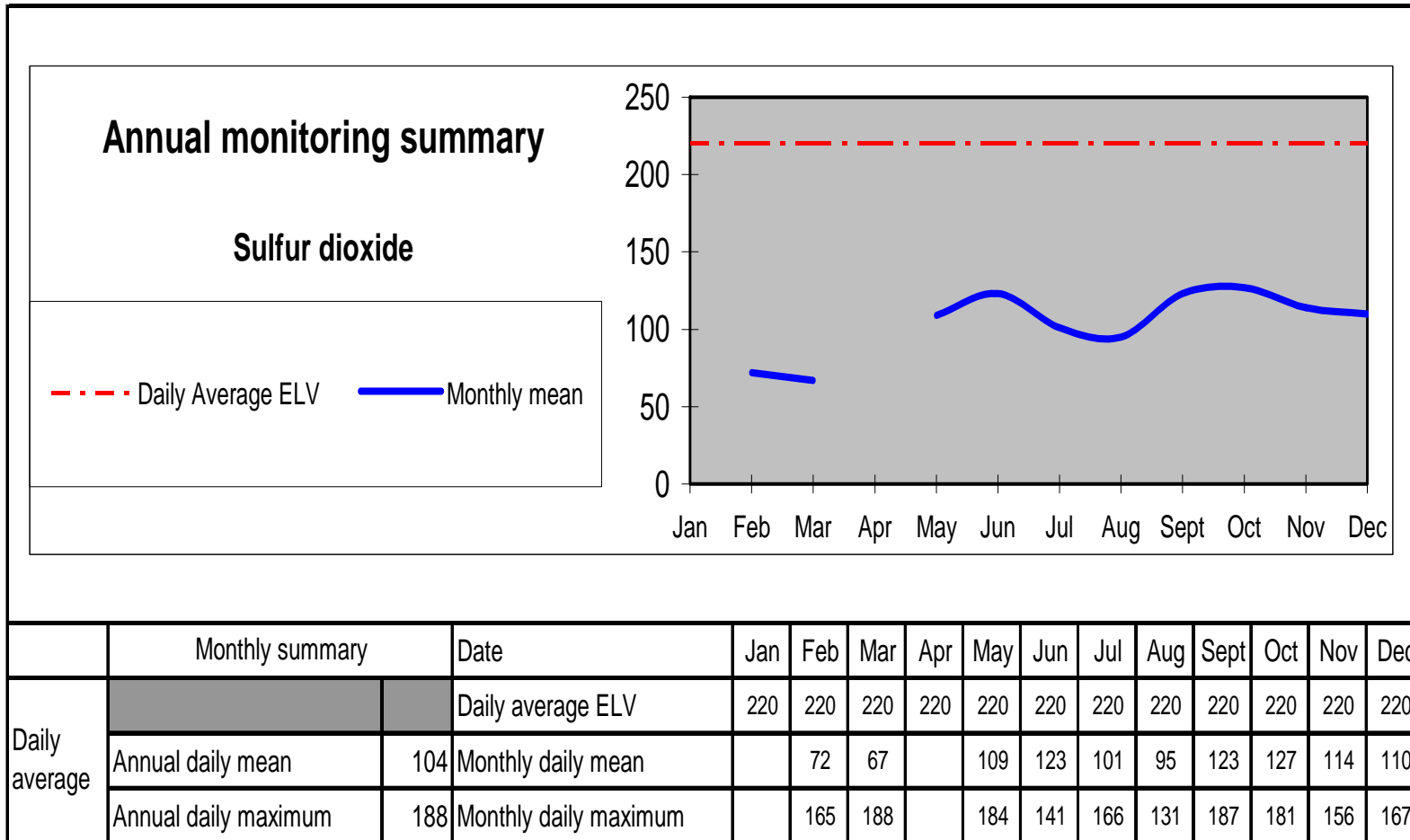
3. Annual monitoring summary for hydrogen chloride.



4. Annual monitoring summary for carbon monoxide.



5. Annual monitoring summary for sulfur dioxide.



6. Annual monitoring summary for nitrogen oxides.

