

Dioxin emissions higher than expected

Dioxin emissions from some waste incinerators and cement kilns may be up to eight times higher than previously thought, according to trials of continuous sampling methods commissioned by the Environment Agency.[1] The regulator describes the findings as "inconclusive", but has no plans for further research.

Consultants Netcen carried out trials over three months at Waste Recycling Group's Eastcroft municipal waste incinerator in Nottingham and Lafarge Cement's Caudon site in Staffordshire during 2003 and 2004.

The aim was to compare two continuous dioxin monitoring systems, AMESA and DMS, with the established certified manual method BS EN 1948. The continuous systems typically monitor over a 14- to 28-day period, while the standard method covers only six hours.

Netcen found dioxin levels were consistently higher when monitored by continuous sampling.

At Eastcroft, AMESA produced results five times higher than manual sampling, while the results from DMS were three times higher. At Caudon, some of the AMESA test results were up to eight times higher, while DMS produced results five times greater than manual sampling.

The report reviews other studies of continuous sampling, notably from Flanders, Belgium, where it is a regulatory requirement at municipal waste and sewage sludge incinerators. One study suggests manual sampling underestimated dioxin emissions by a factor of 30 to 50. But the Agency raises questions over the robustness and accuracy of these findings.

Both trial sites are regulated under the waste incineration Directive, which sets a limit on dioxin emissions of 0.1ng/m³ expressed as a toxic equivalent. The report says most results were within the limit, although DMS found "slightly elevated" levels at the incinerator during plant start-up, when the Directive's limit does not apply.

The report says AMESA and DMS do not meet standard BS EN 1948 because they only take samples from a fixed point within the emissions duct. Manual sampling traverses the duct to ensure a representative sample.

Tricia Henton, Agency environmental protection director, described the findings as "inconclusive" and said more research was needed.

However, although the Agency is to investigate the higher results at the incinerator, it has no plans to do further work on continuous sampling.

It is also surprising that the Agency did not test continuous sampling in the ferrous metals sector, which is the largest emitter of dioxins (ENDS Report 365, pp 43-44).

Ms Henton emphasised the considerable uncertainty of monitoring at such low levels: "The levels of dioxins emitted by incinerators and cement kilns are so small they are very difficult to test for. We are talking about levels that are less than one tenth of a thousandth of a millionth of a gram. As a result, the smallest change to the conditions of the test can have a huge impact on the findings."

The Agency points out that regulated industrial sources of dioxins are of small and decreasing significance. For instance, in 2004, incinerators released 2 grams of dioxins, less than 2% of total emissions in England and Wales.

Dr Martin Bigg, head of industry regulation, agreed the results were consistently higher, but had considerable doubts over whether they were more accurate. Dr Bigg said he had "total confidence" in certified manual sampling, which is required by the Directive.

Although the trials were carried out more than two years ago and the report has been finished for some months, the Agency has only just published it. Despite requests to publish the report sooner, Dr Bigg said the Agency had refused because it did not want to publish an incomplete document.

Alan Watson, a consultant specialising in advising community groups, said he was "disappointed" the Agency had ruled out requiring continuous sampling alongside manual methods. The requirement "would be an important step in reassuring the public about levels of dioxins and would provide a lot of valuable data for little extra cost".

Mr Watson said continuous sampling would remove the temptation for operators to improve results by increasing activated carbon injection to abate dioxins when manual sampling was taking place.

A WRG spokesman said that as a responsible operator the company would not manipulate sampling data. Eastcroft was asked to participate because it was suitable for the installation of continuous sampling equipment. WRG has no plans to fit continuous sampling at its incinerators unless required to do so, but would continue to cooperate with the Agency's research.

In a statement, Lafarge said it was pleased to take part in the trial, which confirmed dioxin emissions from Caudon were well within the stringent limits of the waste incineration Directive.

Further information

1 Use of continuous isokinetic samplers for the measurement of dioxins and furans in emissions to atmosphere (<http://publications.environment-agency.gov.uk/pdf/SCHO0306BKNJ-e-e.pdf?lang=e>)