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The Coalition for Responsible Waste Incineration (CRWI) appreciates the opportunity to submit comments on *Mandatory Reporting of Greenhouse Gases: Proposed Rule* (74 Fed. Reg. 16448, April 10, 2009). CRWI is a trade association comprised of 27 members with interests in waste combustion. CRWI members operate incinerators, liquid fuel-fired boilers, solid fuel-fired boilers, and hydrochloric acid production furnaces that burn hazardous waste (hazardous waste combustors) and are regulated under a number of MACT standards. CRWI members also provide technical expertise and services to facilities that own and operate various types of combustion devices. We appreciate the effort EPA has put into this proposed rule. We look forward to working with the Agency to develop regulations that are consistent with the requirements of the Clean Air Act and good engineering practices.

CRWI members are concerned that about a number of issues in this proposed rule. Our comments and suggested modifications are as follows.

#### 1. Reporting of Carbon Dioxide Emissions

It is likely that a number of hazardous waste combustors will be required to report greenhouse gas emissions based on § 98.2(a)(3). The emissions reporting requirements for these units are in Subpart C. All Subpart C units must report emissions of carbon dioxide, methane, and nitrous oxide (§ 98.32). Facilities covered under Subpart C are given four options (tiers) on which to calculate their carbon dioxide emissions. Tiers 1 and 2 allow facilities to use default high heat



values of their fuel and a fuel-specific default carbon dioxide emission factor (Table C-1 or C-2) to estimate emissions. Tier 3 uses the carbon content of the fuel and Tier 4 involves the use of a carbon dioxide continuous emissions monitoring. Hazardous waste combustors will not be able to use either Tier 1 or Tier 2 because there are no default values for their "fuel" in Tables C-1 and C-2. Thus, it appears that these units will be forced to use either Tier 3 or 4 to calculate their carbon dioxide emissions. Very few of these units have carbon dioxide continuous emission monitors<sup>1</sup> so most will be forced to use Tier 3. While this may be appropriate for certain conditions, it will not be appropriate in others. Some hazardous waste combustion facilities will burn thousands of different waste streams in a year. Some are burned daily; others are burned once or twice a year. Trying to put a system in place to use Tier 3 would quickly become an unmanageable problem. Thus, certain hazardous waste combustors have no good choices on how to estimate their carbon dioxide emissions.

To address this problem, CRWI has three suggestions. The first one is to require reporting only from those facilities that have a default emissions factor in either Tables C-1 or C-2. This would cover the major combustion sources while not subjecting the minor sources to extensive testing requirements. The rest of the sources contribute relatively small amounts to the total inventory. EPA has already recognized the relatively small contribution by exempting hazardous waste from the calculations and reporting in the landfill subpart of this proposed rule.

The second suggestion is to add a Tier 5 to Subpart C so those facilities, if they choose to do so, can develop site-specific emissions factors. This is already allowed (or required) on some level for the cement kiln (§ 98.83) and nitric acid production (§ 98.223) categories. Hazardous waste combustors conduct performance tests every 5 years as required under Part 63, Subpart EEE. During these periodic tests, the facility could measure and analyze for the parameters necessary to develop a site-specific emissions factor. Other sources may be able to use historical data to develop a relationship between carbon dioxide emitted and mass of waste burned. Adding the ability to develop a site-specific emission factor gives these facilities another tool to accurately estimate carbon dioxide emissions without the unnecessary burden of frequent sampling or continuous monitoring.

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<sup>1</sup> If every facility that does not have a carbon dioxide monitor tried to purchase and install one in the fourth quarter of 2009, it is highly unlikely there would be enough monitors available to fill the need.



The third suggestion is to allow facilities to use Dulong's approximation<sup>2</sup> to estimate the carbon content of the materials combusted. Normally, this approximation is used to estimate the Btu's per pound of a material based on carbon, hydrogen, oxygen, and sulfur content of the material to be burned. Some hazardous waste combustors will have a good estimate of the sulfur content and the Btu/lb but will not have a good estimate of the carbon content. By rearranging this equation, assuming the oxygen content of the waste is small, and that there are two hydrogens for every carbon, the equation can be used to estimate the carbon content for materials burned.

Finally, CRWI suggests that EPA develop a mechanism by which additional emission factors can be added to Tables C-1 and C-2. As facilities get more experience in developing and using site-specific emissions factors, there may be a need to expand these tables.

## 2. Reporting of Methane and Nitrous Oxide Emissions.

Subpart C sources are also required to report methane, and nitrous oxide emissions. Emission factors for these two gases are shown in Table C-3 for common fuels and certain wastes. If the materials burned in a facility are not included in this Table, it is not clear how to report these emissions. EPA stated in the Technical Support Document for this proposed rule that methane and nitrous oxide accounts for less than one percent of the carbon dioxide equivalents<sup>3</sup>. Since greater than 99% of the greenhouse gas emissions for this sector are covered by reporting carbon dioxide, little additional accuracy would be gained by reporting methane and nitrous oxide emissions. CRWI suggests that only facilities that have default emissions factors in Table C-3 be required to report methane and nitrous oxide emissions.

Methane. All incinerators, boilers, and process heater that burn hazardous waste are required to destroy 99.99% of the organic material fed. Some of these materials are very difficult to destroy. Since methane is very easy to destroy, it is highly unlikely that any methane will be emitted from these facilities. This is not a compound that many hazardous waste combustors routinely measure. The one CRWI member that measured methane emissions found that the concentration was less than 1 ppmv in the stack. Given this information, CRWI sees no reason why these facilities should be required to report methane emissions. Most, if not all will simply report zero emissions of methane.

<sup>2</sup> C. R. Brunner, 1993. Hazardous Waste Incineration, Second Edition, McGraw-Hill, Inc., p. 326.

<sup>3</sup> Technical Support Document for Stationary Fuel Combustion Emissions: Proposed Rule for Mandatory Reporting of Greenhouse Gases Office of Air and Radiation (U.S. Environmental Protection Agency, January 30, 2009), section 1.1



Nitrous oxide. There is very little, if any, information on nitrous oxide emissions for hazardous waste combustors. As far as we know, this has never been measured during testing. However, there is information in the literature that indicates the nitrous oxide emissions from high temperature combustion are very small.

The Department of Energy stated on their web site that “Until a few years ago, fuel combustion was thought to be a major source of nitrous oxide emissions. However, the discovery of a sampling error, which resulted in erroneously high emissions factors, revealed that combustion is actually a minor anthropogenic source.”<sup>4</sup> This is echoed in the technical support document<sup>3</sup> for this proposed rule where EPA states

The stationary combustion of carbon-based fuels produces three significant greenhouse gases: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). The amount of CO<sub>2</sub> emitted is directly related to the carbon content of the fuel. Typically, nearly 100 percent of the fuel carbon is oxidized to CO<sub>2</sub>. The CH<sub>4</sub> and N<sub>2</sub>O emissions from stationary combustion are much smaller and are indirectly related to the carbon and nitrogen contents of the fuel. In the U.S., CO<sub>2</sub> emissions represent over 99 percent of the total CO<sub>2</sub>-equivalent<sup>1</sup> (CO<sub>2</sub>e) GHG emissions from all commercial, industrial, and electricity generation stationary combustion sources. CH<sub>4</sub> and N<sub>2</sub>O emissions together represent less than one percent of the total CO<sub>2</sub>e emissions from the same sources (U.S. EPA, 2008 - Inventory of U.S. Greenhouse Gases and Sinks). (footnote omitted)

In addition, the 2009 inventory of greenhouse gas emissions in the United States<sup>5</sup>, EPA estimated that the 2007 nitrous oxide emissions from waste combustion were 0.4 Tg CO<sub>2</sub> equivalents. The total U.S. greenhouse gas emissions for 2007 were 7,150.1 Tg CO<sub>2</sub> equivalents. Nitrous oxide emissions from this source category represent less than 0.006 percent of the total greenhouse gas emissions.

Research on nitrous oxide formation or destruction during the combustion processes gives the same picture. In a 1989 paper, Miller and Bowman<sup>6</sup> stated that “N<sub>2</sub>O is a very short-lived species in hot combustion gases...” (page 324). In

<sup>4</sup> <http://www.eia.doe.gov/oiaf/1605/archive/87-92rpt/chap4.html> – accessed 4/20/09

<sup>5</sup> U.S. EPA. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007, April 15, 2009, EPA 430-R-09-004

<sup>6</sup> Miller, J.A., and C.T. Bowman. 1989. Mechanism and Modeling of Nitrogen Chemistry in Combustion. Prog. Energy Combust. Sci., Vol. 15: 287-338.



a subsequent article, Miller and Bowman<sup>7</sup> state that "At low temperatures, the  $N_2O$  is relatively stable and appears as a major product in the gas stream; however, at temperatures above 1150 K, the calculations show that  $N_2O$  decays rapidly in the gas stream and is still decomposing at the exit of the reactor..." The temperature mentioned in the quote corresponds to approximately 1600° F, lower than the temperatures in hazardous waste combustors. In addition, the authors state that nitrous oxide decays rapidly in gas-phase temperatures above 1150 K (page 310). Finally, in his book, Kuo<sup>8</sup> states that  $N_2O$  formed during combustion reacts rapidly with hydrogen ions to form  $N_2$  (p. 268).

Given this, it seems logical to require only the hazardous waste combustors that have emission factors in Table C-3 to report their emissions for methane and nitrous oxide. This would not create a large error in reporting since all of the sources in this category are less than one percent of the CO<sub>2</sub>e. Not reporting emissions for those sources without emission factors would be much less than one percent. This is a similar conclusion to what EPA came to in the preamble (74 Fed. Reg. at 16485) when discussing whether to require the development of site-specific emission factors for methane and nitrous oxide. Here, EPA decided that this would be "too costly for the small improvement in data quality it might achieve." Based on the science of nitrous oxide formation and destruction, CRWI suggests that EPA require reporting of nitrous oxide emissions only for those facilities that can use the emission factors found in Table C-3. Since this is such a small portion of the CO<sub>2</sub>e, the gain in accuracy would not be worth the cost.

### 3. Reporting Thresholds

CRWI is concerned with the 25,000 metric tons reporting threshold. EPA justifies this based on the idea that a number of industry expressing "support for a 25,000 metric ton of CO<sub>2</sub>e threshold because it sufficiently captures the majority of GHG emissions in the U.S., while excluding smaller facilities and sources." (see 74 Fed. Reg. at 16467). However, this is not a universal position for industry. The American Chemistry Council specifically suggested using 100,000 metric tons because it would capture greater than 90 percent of the carbon dioxide equivalents from the chemical industry. CRWI also suggests that the initial reporting threshold should be set at 100,000 metric tons carbon dioxide equivalents primarily because this would be consistent with the requirements of the European Union Emissions Trading Scheme for general industrial sources

<sup>7</sup> Miller, J. A, and C.T. Bowman. 1991. Kinetic Modeling of the Reduction of Nitric Oxide in Combustion Products by Isocyanic Acid. International Journal of Chemical Kinetics, Vol. 23: 289-313

<sup>8</sup> Kuo, K.K. 2005. Principles of Combustion. John Wiley & Sons, Inc.



and Canada's mandatory reporting rules. At a later date, EPA could lower the reporting threshold and evaluate how much additional information is obtained. Starting with 100,000 metric ton threshold would allow EPA to include most of the major sources of greenhouse gas emissions while learning how to gather and process the data. EPA could continue lowering the threshold, add smaller sources at a controlled pace, until becoming convinced additional data is not needed.

#### 4. Schedule for Reporting

In Section 98.3(b) of the proposal, EPA suggests that facilities and suppliers begin collecting data on January 1, 2010, and that the first emission report would be due on March 31, 2011. We understand and support EPA's effort to move without delay to develop an inventory of greenhouse gases. However, we are concerned that neither EPA nor industry will be ready to begin reporting on January 1, 2010. EPA is unlikely to publish the final rule until late in 2009. In order to comply with the final rule, facilities will need a few months to review the rule and develop an implementation plan; which will (for most of our operations) include arranging staff to manage the program, reconfigure current monitoring equipment (or if inadequate, require additional monitoring equipment), and development and training on the new reporting program (including data collection and use of EPA's reporting system). Facilities will need more than a couple of months to complete the activities and begin monitoring in accordance with EPA's requirements. As such, we suggest that facilities begin collecting data on January 1, 2011, for reporting on March 31, 2012.

As a further modification of EPA proposed schedule, we suggest EPA use 2010 as a voluntary reporting period. That is, during 2010, EPA could make its staff available to review voluntary submittals ahead of start of the official data collection period. This would allow those sites that are ready to report (e.g., those facilities that are already reporting under other programs such as California's AB32, etc.) to submit reports early. This could lessen EPA's workload for those sites during the first official reporting year. The voluntary reporting period could also be helpful to "new GHG reporters" if it allowed facilities to submit draft or partial inventories for EPA review prior to the mandatory reporting deadline. The results of the review could be used to adjust/confirm data collection and reporting prior to the start of the mandatory inventory program. This proposal primarily differs from EPA's proposed "abbreviated report" in § 98.3(d) in that while the proposed abbreviated reports mandate the reporting of total aggregated facility emissions in March 2011 (which provides very little relief for facilities during the initial reporting year) and the 1-year voluntary program would not subject facilities to mandatory reporting or to



the enforcement provisions of § 98.8 for data collecting or reporting errors during this voluntary reporting period.

#### 5. Compliance Certification Requirements

CRWI is concerned that EPA has developed a new certifying official title called "designated representative." This type of position has been created in at least two other regulations and we see no reason to create a third. For reporting under Title V, EPA has already defined a "responsible official" in § 63.2. This person is required to certify the accuracy of the reporting requirements under § 63.10. For reporting under the Toxics Release Inventory, EPA simply requires the signature of a senior management official (§ 372.85(b)(2)). CRWI suggest that EPA make the final rule reporting requirements match one of these reporting requirements. We see no reason for a third.

#### 6. Reporting of Indirect Emissions

The CRWI agrees with EPA's proposal to not collect data on electricity purchases (for use in estimating "indirect" emissions). Collecting this data for our member facilities would be cumbersome and would result in the potential for double-counting of emissions. We believe the scope of the rule, with the comments noted above, is adequate to address the policy development requirements of the underlying legislation. However, we do not oppose others wanting the ability to use this to get a complete picture of their greenhouse gas emissions as long as it is on a voluntary basis.

Thank you for the opportunity to comment on this proposed rule. If you have any questions on our comments, please contact me (202-452-1241 or [mel@crwi.org](mailto:mel@crwi.org)).

Sincerely yours,

A handwritten signature in black ink, appearing to read "Melvin E. Keener".

Melvin E. Keener, Ph.D.  
Executive Director

cc: CRWI members  
Carole Cook, EPA