



State of Ohio Environmental Protection Agency

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Mailcode: 2822T
1200 Pennsylvania Ave., NW
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Docket ID No. EPA-HQ-OAR-2002-0058

Subject: National Emission Standards for Hazardous Air Pollutants for Major Sources:
Industrial, Commercial, and Institutional Boilers and Process Heaters

On behalf of the Ohio EPA, we appreciate the opportunity to comment on the proposed National Emission Standards for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial, Commercial, and Institutional (ICI) Boilers and Process Heaters (Boiler MACT), which was published in the *Federal Register* on June 4, 2010 (75 *Federal Register* 32005).

The Ohio EPA believes implementing the NESHAP rules for ICI boilers is an important step in improving Ohio's air quality to protect public health and the environment. However, the Ohio EPA finds the proposed rule to contain fundamental flaws, and as written, will cause unnecessary economic hardships to Ohio's industrial sector. We also believe the proposed rule creates a significant impediment to the development of clean and renewal fuels as alternatives for non-renewable fossil fuels.

The major deficiencies of the proposed rule are:

- A reliance on insufficient data to support many of the proposed MACT emission standards, especially those related to biofuels;
- An inconsistent and, in some cases, overly-simplistic approach that relies on a few broad source categories to establish emission rates that does not recognize the variability of emissions among sources types; and
- The potential to increase emissions of certain criteria pollutants, such as NO_x, as a result of the pollution control approaches required for other pollutants in the rule.

In order to remedy these deficiencies, the Ohio EPA recommends that EPA:

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director



- Set reasonable and achievable new source MACT standards.
- Consider the variability of top performing boilers in use across the many segments of the economy, including differences in design, function, load, fuel mix, and pollution control efficiencies when setting emissions standards.
- Use the best available data to set emission standards that is unbiased and reviewed for quality.
- Carefully examine approaches that reduce costs without affecting public health.
- Consider alternative regulatory approaches for biomass boilers to foster the expanded use of these renewable fuels.
- Consider defining "solid waste" so as to allow a diverse set of secondary materials fuels to be considered for use to power industrial, commercial and institutional boilers, and process heaters across the country.
- Work closely with States during the implementation of the Boiler MACT standards given the thousands of combustion units that will be affected and ultimately permitted under Title V.

In order to accomplish this recommended approach, US EPA should undertake considerable additional analysis, revise its proposed rule and provide for an additional round of public comment. In the case of biofuels, it may be necessary to delay adoption of standards for biomass boilers altogether until more information has been collected and evaluated.

While the Ohio EPA appreciates the complexity involved in establishing NESHAP standards over the varied range of source types and sizes addressed by the proposed rules, we believe it is important for the proposed rule to develop the standards consistent with the Clean Air Act determination methodology. In this regard, the most representative method may be to identify more source categories rather than the few broad source categories currently proposed by US EPA. Such an approach more definitively demonstrates applicable control levels and address the varied concerns between source types and fuels.

The attached appendix highlights issues related to the methodology apparently used in developing the proposed rule which we request EPA conduct further review.

Finally, for a rule of this complexity and wide scope, it is essential that US EPA provide guidance for implementation when the final rule is issued or at a minimum set a date of issuance of guidance. Affected facilities and state, local, or tribal agencies will necessarily rely on EPA's guidance for the successful implementation of the NESHAP standards.

The Ohio EPA appreciates the opportunity to comment on this very important rule. Please feel free to contact Robert Hodanbosi, Chief, Division of Air Pollution Control with questions on these comments at 614-644-2270.

Sincerely,

A handwritten signature in black ink, appearing to read "C. Korleski". The signature is fluid and cursive, with a large initial "C" and a stylized "K".

Chris Korleski
Director

Methodology for Determining MACT Control Performance

The single emission rate across the board for source categories as proposed may be warranted for some pollutants. However, the Ohio EPA encourages the US EPA to further evaluate source categories for differences in configuration and fuels to ensure that the proposed emission rates reflect control levels that are achievable.

Number of Sources Evaluated:

The analysis of NESHAP standards for major sources appears to be based on a limited number of sources in each of the proposed source categories. This approach does not appear to represent a MACT floor analysis. The Ohio EPA's understanding is that the analysis should be based on performance data for most sources within a source category with the possible exclusion of a few outliers or inappropriate data. If data for a substantial number of sources within the source category is not available then data for these sources must be obtained through testing or engineering analysis. The best performing source (new source standards) and the top performing 12% of sources (existing source standards) would then be identified from this full pool of emissions and control data. Rather, the analysis seems to only utilize emissions performance data from a limited number of sources and in some cases as few as one or two sources¹. At a minimum, a NESHAP standard needs to be based on the performance of 5 sources or all sources if fewer than 5 are in the category. If the US EPA varies from this methodology, it should clearly demonstrate that fewer sources are representative of all sources within the category, or that the analysis is in the context of a "beyond the MACT floor" evaluation of control technologies.

Using performance data from a limited number of sources is unlikely to yield the same result as evaluating the performance of all affected sources. A standard based on a limited data pool can clearly be exceptionally stringent as we are concerned is the case here. Ohio EPA encourages US EPA to utilize all available sources of data in determining emission performance across the broadest number of sources possible, even if means conducting additional tests on the variety of source categories.

Evaluating Fuel Variability:

The evaluation of fuel variability and impact on HAP emissions appears to be based on the same limited set of sources that were evaluated for control performance. For setting a standard, the fuel variability, at a minimum, should be evaluated across all sources in the source energy. However, the US EPA should be cautious in using only this approach as it does not address potential changes in fuel market conditions and availability. We do not believe it was the intent of Congress for U. S. EPA to promulgate standards that would, for practical purposes, eliminate the use of certain coal types in

¹ Singleton, April 2010, MACT Floor Analysis (2010) for the Industrial, Commercial, and Institutional Boilers and Process Heaters National Emissions Standards for Hazardous Air Pollutants – Major Source, Appendix C-1 Summary of Number of Sources with Test Data and Top 12 Percent MACT Floor by Fuel Type, Memo from Amanda Singleton, ERG, to Jim Eddinger, USEPA.

industrial boilers applications. An alternative approach is to develop the standard in the form of a control efficiency requirement instead of the proposed emission rate expressed in pounds per mmBTU. The control efficiency approach allows for variability in fuel conditions while requiring the control performance levels targeted for the source category through the MACT analysis. A combination of the two approaches is to set emission rate standards for more specific fuel classes based on the delineated control efficiencies.

10 mmBTU/hr capacity threshold:

The proposed rule defines a single emission limit applicable by boiler type over a very broad capacity range of either greater or less than 10 mmBTU/hr. It has been our experience that there are distinct combustion characteristics for the same type of boiler at additional capacity thresholds that may affect the emissions of organic HAP emissions (refer to discussion on carbon monoxide emission limit). For example, liquid fuel-fired boilers in the range of 100 to 150 mmBTU/hr or larger are multiple burner systems, whereas smaller boilers are typically single burner systems. In similar fashion, differences in combustion configuration are expected for process heaters through different size ranges and by types of application. Another example is coal-fired stoker boilers which in range in size from 50 mmBTU/hr to over 500 mmBTU/hr. This difference in stoker boiler size greatly affects the characteristics of combustion, the rate of heat absorption, boiler residence time, etc., all of which affect combustion characteristics of the sources. Clear distinctions in combustion characteristics for different types of boilers are identified in EPA's documents of Achievable Control Technology for NOx controls. The same concept should apply to the MACT standards.

Existing Pollution Control Equipment:

The configuration of existing pollution control equipment on a boiler is also expected to result in different maximum capabilities in controlling pollutants. Specifically, fabric filter based systems are expected to achieve higher control efficiencies for both mercury and chlorine than electrostatic precipitators. It appears that EPA's proposed rule applies fabric filter based control efficiencies when for sources controlled by electrostatic precipitators. Further, larger existing coal or coke fired boiler may have sulfur scrubbing devices in place which would be very effective for acid gas HAPs. This control measure should not be discounted for large sources, but at the same time may not be applicable to smaller coal boilers. In this case, as previously discussed, capacity thresholds may be appropriate for identifying combustion and equipment characteristics for boilers.

Many boilers in ozone non-attainment areas have also been modified to achieve reductions in NOx emissions. The first basic step in controlling NOx emissions, especially industrial sized boilers, is to apply combustion modifications which can result in higher carbon monoxide emissions. It is not clear that the evaluation EPA performed in proposed its MACT rule addresses the necessity to meet NOx requirements or the physical changes that have been made to boilers in order to meet these limits stemming from other EPA rules. In some cases, staging the combustion and increasing residence

time in the combustion zone could theoretically result in more complete combustion of organic HAPs. Or in other types of modifications, less complete combustion may be achievable while meeting the NOx requirement. At a minimum, US EPA needs to recognize that NOx requirements are in place for boilers which may impact the ability to meet the proposed carbon monoxide emission limits (refer to discussion on CO emission limits). It may be necessary to address combustion equipment configurations through separate source categories. Ohio EPA recommends evaluating sources with and without NOx combustion modifications in order to delineate the potential interaction with NOx emission requirements.

Control Performance and Standards:

The emission limits proposed in the rule seem to be set based on the lowest demonstrated emission rates within a source category (based on a limited number of sources) and does not directly evaluate control efficiency of equipment. Using the emission rate approach may not identify the sources demonstrating the highest control efficiencies, but rather may simply reflect low fuel content of the pollutants. In this case, resulting emission limits can be more stringent than achievable for sources utilizing certain fuels. An example of this affect is the variability in chlorine content for biomass fuels.

An alternative approach that should be considered is to identify best performing sources based on control efficiency. This approach identifies the best operating control systems and provides the basis for sources to make a showing of similar control efficiency for the different source categories.

Specific Comments to Emission Limitations

Missed Source Categories:

The proposed NESHAP rule does not appear to address or set standard for several specific cases:

- Cyclone boilers
- Petroleum coke fuel fired boilers
- Natural gas fired boilers fired by landfill gas
- Propane fired boilers
- Gasification process fired boilers
- Process heating where the heated materials contribute to the pollutants

Organic HAP/Carbon Monoxide Emission Limits:

Ohio EPA understands that lower carbon monoxide emitted from boilers or process heaters theoretically represents more complete combustion and therefore lower organic HAP emissions. However, the proposed CO standards for both coal and gas fired emission sources may be beyond levels representing good combustion. An illustration

of this point is that one expects pulverized coal fired boilers to be operating more consistently for efficient combustion while maintaining lower CO levels. Yet, a higher CO emission limit of 90 ppm is proposed for existing pulverized coal fired boilers as compared to the proposed 50 ppm for stoker boilers. Does this higher CO level for pulverized coal boilers indicate that some of the stoker boilers with low CO are merely operating under excessive combustion air levels or with substantial air infiltration? Would these stoker boilers have higher NOx emissions?

In assessing the data for boiler CO emissions, the US EPA should consider this type of balance point. Simply assessing the 12% lowest data points for CO or HAPs may include units that are running with excessive combustion air and at lower overall efficiency thereby increasing emissions of greenhouse gases also. This type of affect probably occurs most often for stoker boilers but is applicable, at a minimum, to all solid fuel fired boilers and likely to the gaseous and liquid fired source categories as well. Therefore, evaluating the emissions database for organic HAP control and the use of CO as a surrogate standard may not be a straight-forward process and may need to consider the quality of operation in defining units representing the top 12% or best operating source.

For gaseous and liquid fired boilers and several of the new solid fuel fired boiler types, the CO emission limit appears to be based on the use of CO oxidation catalyst. If control equipment is not the basis for the CO emission limitations, especially for smaller and existing sources, then this determination should be reviewed further

In addressing whether a CO standard is representative of overall low organic HAP emissions for all sources in a source category, the US EPA may want to consider allowing compliance directly with an organic HAP standard. Performance testing could then be used in the case of any specific source to establish CO emission levels consisted with meeting the applicable organic HAP standard.

Mercury Emission Limits:

Because mercury emissions are dependent on the content of mercury in the fuel, the US EPA should consider if a control efficiency standard is warranted. Currently, as described elsewhere, the mercury standard may be inappropriately set if it is set based on lowest emission rates seen at the tested facilities without considering the variability of mercury in fuel. Also, the control efficiency approach may allow for variability in fuels without compromising the MACT level of control.

Biomass Fuels Emissions Limits:

Further evaluation of fuel variability is needed for biomass fired units. All of the sources evaluated by US EPA appear to be fired by some form of wood which is lower in chlorine content than other solid biomass fuels. Comparatively the chlorine content of woody fuels is in the range of 0.02 to 0.06%, dry fuel basis, whereas agricultural based fuels can range upward to 0.73%, dry fuel basis. In fact, the chlorine content of some

biomass fuels can be higher in plant materials than for various coals². The US EPA's analysis cannot preclude types of biomass that will likely be used in increasing amounts into the future. Significant variability in chlorine and mercury content is evident for different biomass fuels. For this reason, the US EPA needs to clearly evaluate and specify the intent of emissions limits for such sources and different biomass fuels. Currently, the proposed limits for chlorine and mercury, for some biomass based fuels can require significant control requirements where they were not anticipated and may severely restrict the nation's efforts to find alternative renewable fuel source to replace non-renewable fossil fuels.

The US EPA should also consider separately or clearly define the treatment of gaseous fuels derived from biomass. Such fuels generated by bio-digester systems, wastewater treatment plants, and landfills are currently fired in boilers and likely to grow in future use. Depending on the source, the fuel is likely to contain chlorine or mercury and likely to have constituents that can lead to the formation of dioxins and furans.

The CO emission limit for both existing and new biomass fired boilers appears problematic. The CO emission level supposed to correspond to complete combustion of organic HAPs included dioxins and furans. However, the emission limit of dioxin and furan for fluidized bed and fuel cell boilers is a magnitude higher than for stoker boilers, while the CO limit is lower. Conversely, the CO limit is much higher for suspension burners than stokers, but still have dioxin and furan limits similar to the fluidized bed. This affect could very well be the result of variability or quality of fuels being combusted at the tested sources rather than characteristics of specific boiler types. Once again this points to US EPA better delineating biomass fuels or providing an alternative compliance format for organic HAPs other than the fixed CO emission concentration. As previously suggested, one alternative may be for direct testing of organic HAPs. Another alternative may be to consider setting standards consistent with lower moisture content allowing for better combustion.

Compliance Demonstration Issues

Ohio EPA requests US EPA confirm that any limit listed is not below the detection limits of the applicable test methods for the specific pollutant. US EPA and many states differ in policy regarding values below this level. Many US EPA methods used in stack testing do not even address the detection limit. Ohio EPA feels it would be remiss in assuming zero would apply for all values under the detection limit and does not understand the usefulness of confirming values consistently below the detection limit. Consequently, setting a MACT floor based on this data may not be accurate.

² Duong, et al, *Chlorine Issues with Biomass Cofiring in Pulverized Coal Boilers: Sources, Reactions, and Consequences A Literature Review*.

Incompatibility with Federal Biomass Crop Assistance Program (BCAP)

EPA's MACT rule appears to be at odds with SDA's Biomass Crop Assistance Program and other federal initiatives designed to rapidly expand a competitive, sustainable and reliable biomass energy market. The MACT rule, as currently drafted, has the potential to stop progress made under these programs instead of promoting renewable fuels.