NACAA
national association of clean air agencies

February 21, 2012

Docket Nos. EPA-HQ-OAR-2006-0790,
EPA-HQ-OAR-2002-0058 and
EPA-HQ-OAR-2003-0119
U.S. Environmental Protection Agency
EPA Docket Center
Mailcode: 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Sir/Madam:

Pursuant to the solicitation for public comment published in the *Federal Register* by the U.S. Environmental Protection Agency (EPA) on December 23, 2011, the National Association of Clean Air Agencies ("NACAA") is pleased to provide the following comments on EPA's proposals for reconsideration of regulations limiting emissions of hazardous air pollutants ("HAPs") from Industrial, Commercial and Institutional ("ICI") Boilers under section 112 of the Clean Air Act ("CAA") and for regulation of toxic and criteria air pollutants from Commercial Industrial Solid Waste Incineration ("CISWI") units under section 129 of the CAA. NACAA is a national, non-partisan, non-profit association of air pollution control agencies in 45 states, the District of Columbia, four territories and over 165 metropolitan areas. The air quality professionals in our member agencies have vast experience dedicated to improving air quality in the U.S. The comments we offer are based upon that experience. The views expressed in these comments do not represent the positions of every state and local air pollution control agency in the country. Attached to this letter is a document containing our detailed comments on these proposals.

NACAA strongly supports adoption of timely HAP emission limitations for ICI boilers and CISWI units. The final regulations should meet both the letter and the intent of the statute and strike the appropriate balance in protecting public health, while avoiding the imposition of unnecessary costs on the regulated community. These combustion units are, after coal-fired power plants, among the largest emitters of toxic and criteria pollutants in the country. Accordingly, the benefits to public health and welfare that will result from a well-considered rule are substantial. Efforts to develop such a rule have been underway for almost 15 years and NACAA remains hopeful that EPA will shortly promulgate regulations that provide these essential benefits.

NACAA believes this proposal, if adopted, will lead to significant reductions in HAP emissions in a number of subcategories covered by these rules, most notably in reductions of mercury (Hg) from the solid-fuel fired subcategory. These emission reductions are especially important from this sector, which has remained largely unregulated under the CAA until now. For this reason, NACAA generally supports promulgation of rules for this sector. However, flaws in the EPA calculation procedure, which we describe below, have created several subcategories that are, for all practical purposes, exempt from control requirements. NACAA believes that these "exemptions" are neither intended by the CAA, nor wise as a matter of public policy.

EPA has proposed to use an array of calculations, adjustments and defaults to determine the new and existing MACT floors. Our review of EPA's calculations of the average performance of the top-performing units concludes that they are generally correct to within a few percent. The issue lies in the determination of the "variability" of the top performing units. EPA's proposed procedure generally overstates this variability and for some categories produces grossly inaccurate results.

The magnitude of these errors is demonstrated by two key facts. First, EPA's methodology results in a situation where, in a majority of EPA's proposed subcategories, the calculated new source MACT floor (based on the best performing unit) is higher (less stringent) than that for existing sources (based on the average of the top 12 percent of units in the subcategory). Common sense and basic arithmetic provide that the rate of emissions of the "best" unit (i.e., the lowest emitter in the group) must be less than the average of that unit and the emission rates of a group whose emissions are higher. At a minimum, the procedure adopted by EPA must achieve this result.

Second, EPA's methodology leads to emission limitations that are currently being met by almost all units subject to the regulation in many source categories. This is inconsistent with the statutory requirement that the existing source MACT floor be set at the performance that reflects the 94th percentile (average of the top 12 percent) of the best performing units. Such limits simply create testing and paperwork burdens without providing any public health benefit and are likely to lead to additional litigation that delays reduction in HAP emissions from the entire sector.

EPA did not design its test program with the subcategories it now proposes and therefore did not require testing of a sufficient number of sources within each of the subcategories included in this proposal. Thus, not only does EPA not have sufficient data to determine the variability in the performance of each of the individual units in the group, in many instances it does not have sufficient data to reasonably apply statistics to the subgroup as a whole. We offer several suggestions for potential methods of developing reasonable estimates of the average variability of performance that one might anticipate from better performing units, rather than attempting to calculate the variability of performance of each individual unit where the data are not available to do so. We also offer several suggestions to correct the larger sources of error in EPA's approach.

EPA has proposed to retain its "work practice" standards for carbon monoxide ("CO") emissions for certain subcategories and for emissions of dioxins and furans ("D/F") for all subcategories on the basis that measuring emissions of these pollutants is impracticable. However, EPA has not identified the specific work practices that the regulated community must employ. Given the complex nature of D/F formation, the development, implementation and enforcement of a meaningful D/F work practice requirement is itself impracticable. The fact that many sources have shown a "below the detection limit" ("BDL") test result does not make such testing impracticable nor will such results be a violation. EPA should address the issue of an unnecessary testing burden for "clean units" head on and not suggest that an unspecified work practice obligation will achieve the necessary emission reductions. Where EPA believes that emissions from some sources are truly insignificant, it should say so and use the authorities available to it for *de minimis* emissions.

EPA should be guided by two broad principles in determining MACT floors. MACT floors should require some level of emission reduction from a substantial percentage of each subcategory and clearly require significant emission reductions from gross emitters. While the Courts have determined that MACT standards do not have to be achievable by all sources, MACT standards should be set at a level that is achievable by a significant portion of the regulated community. The overall policy of the Clean Air Act is:

> to protect and enhance the quality of the Nation's air resources so as to promote the public health and the productive capacity of its population. [42 U.S.C. 7401(b)(1)].

Accordingly, EPA should also demonstrate that the standards it adopts are achievable by the vast majority of sources through the use of cleaner fuels and/or emission controls. In order to do this, EPA should identify the reasons why emission rates at better performing units are so much lower (better) than the worst emitters in the group. EPA should also demonstrate how its decisions concerning development of MACT standards serve to promote public health. At the very least EPA should calculate and provide to the public the estimated impact of its decisions on data management and determination of the MACT floors on HAP emission rates and, to the best it can, public health.

In conclusion, we believe that if EPA adopts our recommendations it can develop sensible limits for all subcategories and do so within the next three months. NACAA appreciates the effort of EPA, its employees and its contractors over the past 15 years that these rules have been under development. NACAA's members have been engaged with EPA in this effort since the 1998 Industrial Combustion Coordinated Rulemaking and are committed to continue to work with EPA and other interested parties to develop rules that work.

Thank you for this opportunity to comment on these important proposals. Please contact us if we can provide additional information.

Sincerely,

S. William Becker

NACAA Comments on EPA Proposals for Reconsideration of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial and Institutional (ICI) Boilers under Section 112 of the Clean Air Act (CAA) and Regulations Limiting Emissions of Toxic and Criteria Air Pollutants from Commercial Industrial Solid Waste Incineration (CISWI) Units under Section 129 of the CAA

Docket Nos. EPA-HQ-OAR-2006-0790; EPA-HQ-OAR-2002-0058; EPA-HQ-OAR-2003-0119

February 21, 2012

INTRODUCTION

Pursuant to the solicitation for public comment published in the *Federal Register* by the U.S. Environmental Protection Agency (EPA) on December 23, 2011, the National Association of Clean Air Agencies (NACAA) is pleased to provide the following comments on EPA's proposals for reconsideration of regulations limiting emissions of hazardous air pollutants ("HAPs") from ICI Boilers under section 112 of the CAA and for regulation of toxic and criteria air pollutants from CISWI units under section 129 of the CAA. NACAA is a national, non-partisan, non-profit association of air pollution control agencies in 45 states, the District of Columbia, four territories and over 165 metropolitan areas. The air quality professionals in our member agencies have vast experience dedicated to improving air quality in the U.S. The comments we offer are based upon that experience. The views expressed in these comments do not represent the positions of every state and local air pollution control agency in the country.

NACAA strongly supports adoption of timely HAP emission limitations for these sectors. The final regulations should meet both the letter and the intent of the statute and strike the appropriate balance in protecting public health, while avoiding the imposition of unnecessary costs on the regulated community. These combustion units are, after coal-fired power plants, among the largest emitters of toxic and criteria pollutants in the country. Accordingly, the benefits to public health and welfare that will result from a well-considered rule are substantial. Efforts to develop such a rule have been underway for almost 15 years and NACAA remains hopeful that EPA will shortly promulgate regulations that provide these essential benefits.

If EPA fails again to adopt and implement a standard in a timely fashion, or if it fails to adhere to the statute and the rule is overturned once again, the public health benefits will be delayed. In addition, a significant burden will fall to state and local agencies that will be obliged to issue several thousand permits on a case-by-case basis. In the current economic climate these agencies can ill afford to engage in such an undertaking while maintaining current activities to protect public health and welfare.

SUMMARY

Under sections 112(d)(2) and 129(a)(2) of the CAA emission limits for existing sources must reflect the maximum degree of reduction in emissions that the EPA Administrator determines is feasible (Maximum Achievable Control Technology or "MACT") **and** shall not be less stringent than the average emission limitation achieved by the best performing 12 percent of sources (for which the Administrator has emissions information) (the "MACT floor"). EPA concludes that recent court decisions require that (a) floors for existing sources must reflect the average emission limitation achieved by the best-performing 12 percent of existing sources; (b) a MACT floor cannot be "no control"; (c) EPA cannot ignore non-technology factors that reduce HAP emissions and (d) the levels of HAPs in fuels consumed by sources must be reflected in the MACT floor determination.[1]

EPA has proposed to use an array of calculations, adjustments and defaults to determine the new and existing MACT floors and has provided most of the calculations underlying its proposed floors. Our review of the detailed calculation process leads us to conclude that EPA's approach is flawed in several significant respects and in almost every instance overstates the variability in emissions performance that is shown in EPA's data set and other readily available information. These inflated calculations have resulted in the establishment of excessively lenient MACT floors. Ironically, for a few subcategories, EPA inexplicably failed to provide any allowance for variability or arbitrarily assigned a variability that is far too low to account for expected operational differences in performance over time.

In light of the significant errors related to variability, NACAA strongly recommends that EPA revisit each of its MACT floor calculations, especially where the proposed floor is so lenient that a large majority of existing sources already meet the limit. We believe EPA has sufficient information available to EPA to correct the errors in its current proposal and issue a final rule on reconsideration in the next few months.

Below we expound upon these conclusions.

Where EPA has data from testing at levels of precision sufficient to determine the actual variation in performance of a reasonably significant number of units, and where the agency's approach to identifying the "best performing units" does not skew the results too significantly, the resulting calculations lead to proposed limits that would lead to significant emission reductions from some of the highly polluting subcategories. However, where these factors are not present, EPA's procedures and assumptions lead to gross overestimates of the variability in performance of the best performing units and proposed emission limits that are higher than current emissions. Such limits simply create testing and paperwork burdens without providing any public health benefit. Moreover, these limits clearly do not meet the requirements of section 112 and are likely to lead to additional litigation that delays reduction in HAP emissions from the entire sector.

[1] A source that is a low emitter because of low levels of HAP in its fuel can still be a "best performer" whose emission levels are part of the "average of the best performing 12 percent."

No single factor is responsible for the EPA overestimates. In its comments on the 2010 proposal for this sector, NACAA identified several errors in the proposed EPA calculation methodology, including:

- use of inconsistent definitions of "best performing unit";
- use of the Upper Probability Limit ("UPL") statistical approach for units that are not expected under section 112 to currently meet a MACT floor, especially in data sets with small numbers of test results;
- treatment of "Below Detection Limit ("BDL") emission test results; and
- creation of large numbers of subcategories with limited numbers of emission test results.

In the final rule EPA declined to correct the errors identified by NACAA and provided no explanation for its decision to persist in those errors. EPA did, however, revise its calculation procedure, in response to comments from industry, and "pooled" the statistical variation shown by individual units. The public was not provided an opportunity to comment on this change, even though it led to a significant upward revision of a number of proposed limits. On reconsideration of the final rule, EPA now proposes to retain the procedure used in the final rule and create additional subcategories for particulate matter ("PM") emissions, which would cause very large increases in PM limits for a number of subcategories of sources.

The magnitude of these errors is demonstrated by two key facts. First, EPA's methodology results in a situation where, in a majority of EPA's proposed subcategories, the calculated new source MACT floor (based on the best performing unit) is higher (less stringent) than that for existing sources (based on the average of the top 12 percent of units in the subcategory). Common sense and basic arithmetic provide that the rate of emissions of the "best" unit (i.e., the lowest emitter in the group) must be less than the average of that unit and the emission rates of a group whose emissions are higher. At a minimum, the procedure adopted by EPA must achieve this result.

Second, EPA's methodology leads to emission limitations that are currently being met by almost all units subject to the regulation. This is inconsistent with the statutory requirement that the existing source MACT floor be set at the performance that reflects the 94^{th} percentile (average of the top 12 percent) of the best performing units. A determination of the variability of each of the sources in the top 12 percent is a worthwhile goal. However, the cost of conducting sufficient testing to do so reliably for each of the sources in the top 12 percent of each of the large number of subcategories that EPA proposes is too high for the benefit that would be achieved and would further delay issuance of final rules for several years.

EPA did not design its test program with the subcategories it now proposes in mind and therefore did not require testing of a sufficient number of sources within each of the subcategories it is proposing. Thus, not only does EPA not have sufficient data to determine the variability in the performance of each of the individual units in the group, in many instances it does not have sufficient data to reasonably apply statistics to the subgroup as a whole. In the most extreme instance EPA acknowledges that it does not have any data for mercury for one of its proposed subcategories. EPA also acknowledges that it does not have meaningful data for two of the regulated metals that should be included in its alternate total selected metals ("TSM") limit in any of its proposed subcategories. We offer several suggestions below for potential methods of developing reasonable estimates of the average variability of performance that one might anticipate from better performing units, rather than attempting to calculate the variability of performance of each individual unit where the data are not available to do so. We also offer several suggestions to correct the larger sources of error in EPA's approach.

EPA has proposed to retain its "work practice" standards for carbon monoxide ("CO") emissions for certain subcategories and for emissions of dioxins and furans ("D/F") for all subcategories on the basis that measuring emissions of these pollutants is impracticable. However, EPA has not identified the specific work practices that the regulated community must employ. Given the complex nature of D/F formation, the development, implementation and enforcement of a meaningful D/F work practice requirement is itself impracticable. The fact that many sources have shown a "below the detection limit" ("BDL") test result does not make such testing impracticable nor will such results be a violation. EPA should address the issue **of** an unnecessary testing burden for "clean units" head on and not suggest that an unspecified work practice obligation will achieve the emission reductions. Where EPA believes that emissions from some sources are truly insignificant, it should say so and use the authorities available to it for *de minimis* emissions.

EPA has also proposed a number of corrections, clarifications and modifications that make sense. The more significant of these proposals are addressed in "OTHER ISSUES" below.

BACKGROUND

The history of EPA regulation of toxic air pollutants over the past 40 years demonstrates that this area has proven to be challenging to the agency. EPA has had the authority and obligation to regulate emissions of HAPs since 1970,[2] but over the next 20 years it managed to set emission limitations for only seven of these pollutants.[3] Even where it set limits,[4] those limits applied to only a subset of the emitters of those HAPs.

Frustrated with the slow pace of reductions in HAP emissions, in the 1990 CAA Amendments Congress severely cabined EPA's discretion and established an extremely prescriptive approach to be employed. Instead of allowing or requiring EPA to determine which pollutants were hazardous, Congress enacted a list of 189 HAPs. Rather than allowing EPA to decide the degree of risk that was acceptable, Congress established a technology-based approach (MACT standards for emitters of the regulated HAPs) and "residual risk" requirements to address any significant risk that might remain after adoption and implementation of the MACT standards. Congress further narrowed EPA's discretion in determining the "maximum achievable control technology" by promulgating a simple mathematical formula to establish minimum emission limitations for MACT standards. Under the statute, the emission limitation adopted by EPA for a covered unit may be no less stringent than the average of the best

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[2] In 1977 Congress adopted amendments to enhance EPA's authority and require additional progress in regulating HAPs.

[3] EPA set emission standards for certain emitters of asbestos, beryllium, mercury, radionuclides, inorganic arsenic, benzene and vinyl chloride

[4] Several of the limits set were the result of lawsuits (e.g., Sierra Club v. Gorsuch,, New York v. Gorsuch).

performing 12 percent of similar units.[5] To ensure that further delays in regulating toxic air pollutants would not occur, Congress established tight deadlines for promulgation of EPA rules and created a regulatory disincentive – a hammer – that would occur if EPA missed a deadline for regulating a particular industrial sector. The MACT "hammer" under section 112(j) of the CAA provides that if EPA fails to promulgate a MACT standard for a particular sector by the statutory deadline, state and local permitting authorities must issue permits within 18 months establishing such limits on a case-by-case basis.

When the court vacated the earlier ICI Boiler MACT rule it fell to state and local permitting authorities to commence the process of developing case-by-case MACT permits for these units. Those efforts have been suspended since EPA promulgated MACT standards for this sector on March 21, 2011. On that same day, EPA also published a notice announcing its intent to reconsider certain provisions of the final rule. This reconsideration notice identified the following issues:

- revisions to the proposed subcategories,
- establishing a fuel specification through which gas-fired boilers that use a fuel other than natural gas or refinery gas may be considered Gas 1 units,
- establishing a work practice standard for limited-use units, and
- providing an affirmative defense for malfunction events.

This notice also identified several issues of central relevance to the rulemaking where reconsideration was appropriate under CAA section 307(d), including:

- revisions to the proposed monitoring requirements for carbon monoxide for major source boilers,
- revisions to the proposed dioxin emission limit and testing requirement for major source boilers, and
- establishing a full-load stack test requirement for carbon monoxide coupled with continuous oxygen (oxygen trim) monitoring.

Subsequent to the publication of the final rule EPA received a number of petitions for reconsideration of the final rule. EPA has proposed additional revisions to the final rule in response to those petitions.

SUMMARY OF PROPOSED REVISIONS TO EXISTING SOURCE MACT

EPA has proposed to revise almost all of the MACT limits established in the final rule that would include 38 separate subcategories. The agency has also proposed over 100 other revisions that, in the pre-publication version of the proposal, require 64 pages to describe. NACAA does not have sufficient resources to address each of these issues in the time provided, but has attempted to identify and respond the most significant issues.

[5] The standard is to be based on application of Maximum Achievable Control Technologies (MACT), but may not be less stringent than the level achieved by the average of the best performing 12 percent of units in the subcategory for which the Administrator has information.

In response to comments on the 2010 rule, EPA adopted a different approach for calculating the Upper Probability Limit ("UPL") to provide for calculation of the "pooled" variability of units in a subcategory, rather than the simple variability of those units. On the basis of this change and without additional notice to interested parties, EPA then adopted MACT floors that were significantly different from those in the 2010 proposal. On reconsideration, EPA proposes to use the same procedure as in the final rule. EPA's misapplication of this new technique leads it to calculate mercury ("Hg") MACT floors for existing oil-fired units that are seven times higher (less stringent) than would have occurred under the 2010 approach and far more lenient than the underlying data would suggest. EPA states that it is seeking public comment only on the issues specifically identified in its 64-page list of proposed changes and that it will not respond to any comments addressing other aspects of the final rule or any other related rulemakings. However, EPA also argues that the changes it is proposing are so comprehensive that it should provide a new three-year compliance period for all sources. While we agree that certain issues, such as "risk-based exemptions," need not be revisited, interested parties have not had an opportunity to comment on EPA's change in procedure. We think it is unwise for EPA to suggest that it will not consider any and all comments related to the substance of the rulemaking.

EPA'S PROCEDURE FOR CALCULATING VARIABLITY

EPA has studied its approved reference testing methods for years and has amassed significant information about the performance of those methods. Based on this body of knowledge, EPA reports that, where the result of a test is near the detection level applied, most of its test procedures are accurate to within +/- 50 percent; at other times EPA asserts that these tests are accurate to within +/- 15 percent. Monitoring devices, such as CO monitors, must meet stringent requirements for drift and must be calibrated to within 2 percent of the full scale value of the expected emission level of the unit. The paired testing data and other data in the record of this case show that, especially at the better performing sources, the variability in Hg and other specific pollutants is quite low. Similarly, years of testing of pollution control devices found in this sector, such as PM controls (fabric filters and electrostatic precipitators ("ESP"), show highly consistent performance. Thus far, EPA has not factored any of these facts into its determination of the performance of the best performing units.

In order to evaluate whether EPA's procedure for calculating variability is appropriate, one first has to examine what "variability" EPA is calculating and whether it is relevant under sections 112 or 129. EPA's procedure involved determining the 99th percentile UPL of the difference in performance between all test runs for all units in the top 12 percent. This calculation improperly combines two factors: (1) the inter-unit difference between the "best performers" and "the best of the best performers" and (2) the expected variability in performance for each of the best-performing units. EPA does not have the resources to evaluate each of these situations in detail to determine whether the difference represented inherent variability in performance of the unit or is a consequence of factors (such as fuel composition or specific hardware design) that are within the control of the source, and so it simply, and incorrectly, assumes that each of the units within the top 12 percent is identical and that all of the difference in performance is a "variability" in performance that is essentially random and therefore susceptible to statistical analysis. This can be addressed by normalizing the data so that one only examines the variability in performance.

Replicate compliance method testing of the best performing units over a period of years and varying operating conditions would likely be the best method for determining which units are among the best performing units and for assessing the variability of the performance of such units. However, EPA does not have such information and development of this information is infeasible at this time. Moreover, EPA does not have sufficient data of any sort to make an accurate assessment of the variability of either individual units or subcategories with relatively limited data. As discussed earlier, the problem is readily apparent for new sources, where EPA's attempts to determine the variability in the performance of the "best" unit based on a single reference test clearly produce an incorrect result. This problem also exists in a large number of existing source subcategories where EPA has insufficient test data to apply its method. EPA has acknowledged this problem and attempted to partially respond to it by using its "beyond the floor" MACT authority to raise the new source MACT limit to the level of the existing source MACT floor in 24 subcategories. While directionally correct, we believe it is unlikely that this will be found to be sufficient, since common sense and basic arithmetic demonstrate that the result is still wrong – the performance of the "best" individual unit cannot be the same as the average of the larger group. Moreover, EPA does not make a similar adjustment to existing source MACT floors that are also based on limited data. NACAA recommends that EPA examine a number of additional options for assigning a variability factor, including a return to the philosophy underlying its 2004 determination of variability of performance. We provide more detailed recommendations later in this section.

EPA compounds the error associated with attempting to employ its statistical procedures to extremely limited data sets by applying a series of multipliers and alternate tests of variability. In most, but not all instances, EPA selects the test that leads to the least stringent MACT floor determination. Moreover, the basis for several key decisions respecting data management (discussed below) is not well supported. The lack of a consistent, reasoned basis for EPA's choices creates a risk that the rule will be overturned and in some instances, the resulting floor calculation will be substantially different if other, equally reasonable, factors are used in developing the final determination. We discuss a number of these issues in detail below, but the impact of EPA's new statistical approach in categories with relatively small numbers of tests is clearly illustrated by the Hg limit EPA calculated for liquid-fired boilers. While these factors affect all of EPA's MACT floor calculations, they are most apparent in the calculations for new sources, which, under EPA's methodology, always involve single units with limited testing.

The following discussion sets out our best understanding of the relative impacts of several EPA choices on the overall effectiveness of the resulting MACT floor for other subcategories. We have included herein and attached as Appendix 1 a series of charts setting out EPA's test data as provided as appendices to its MACT floor memo for each unit, along with EPA's proposed limit for the applicable subcategory. These charts provide a basis for the assessment of the effectiveness of the proposed limit. EPA's appendices included only the "lowest test result" for a given unit rather than all test results. In most instances, the difference in effectiveness is minimal, as most sources were only tested once, so the "lowest test result" is also the highest test result. Where a significant number of units were subjected to more than one test, we have also produced a chart including all test results for the top 12 percent to assist in gauging the effectiveness of the proposed limit. We encourage EPA to produce similar charts, including all test results, for all units for the rules it ultimately adopts.

Definition of "Best Performing Unit"

More than any other factor, EPA's definition of "Best Performing Unit" leads to overestimates of performance of the best performing units. It creates a situation where units with high UPLs are designated as "best performing units" and displace better performing units in the "top 12 percent" category. EPA is obliged to base the existing source MACT floor on the performance of the "best performing units" and has offered no plausible explanation for its decision.

EPA has used two (or three) different methods for establishing the "performance" of the average of the best-performing 12 percent. In selecting the units to be included in the top 12 percent, EPA assumed that the performance of those units was demonstrated by the best test result. Thereafter, in calculating the average of the selected units, EPA assumes that the performance of a selected unit is defined by all test results[6] available for that unit. EPA then multiplies these results by a fuel variability factor to establish the final number that it uses to calculate the floor. This fuel variability factor is also different for different units, and so, again, the unit with the lowest single test result is not necessarily the "best performer" as used in EPA's calculations.

NACAA believes that EPA should use either the best test result for both purposes or use the best average of all test results for both purposes. This use of inconsistent definitions of performance has resulted in at least one MACT floor that is higher than it should be, as units with better average performance over all tests were excluded in favor of other units with a lower individual test result but higher overall emissions. We also believe that use of the average of all test results for an individual unit is an appropriate measure of the performance of that unit, provided that the subsequent analysis of variability does not then treat that average as a single test result. One way to address this issue may be to use the average of all test results to identify the best performing units in the calculation of the average of the top 12 percent, but then include all test results of the "best performers" in the determination of the potential variability of that average.[7] The identification of the "best performers" should take place after all of the variability adjustments have been made to the universe of "candidate best performers." In this way the MACT floor would not be artificially increased by the use of data from sources that are ultimately not the best performers within a subcategory.

The Upper Probability Limit ("UPL")

In the development of the 2004 rule for this sector, EPA determined the base performance level of the median unit in the top 12 percent and then applied a variability factor that was

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[6] EPA includes all test results of "best performers" in its calculation of the MACT floor for each subcategory. This effectively over weights the contribution of sources that have been tested multiple times compared to those that may have been tested only once.

[7] This is not the same as using the 99th percentile UPL of the individual runs as a factor to multiply the average.

calculated on the average of the variance in performance for all units with similar pollution technologies. The U.S. Court of Appeals determined that EPA's method for identifying the base performance level was inappropriate, but did not opine on the method for determining the variability factor.[8] In developing the 2010 final rule, EPA attempted to calculate the anticipated variation in performance of each of the units in its "best performing" group on an individual unit or subcategory basis. Rather than simply determining the variance in performance, EPA chose to calculate the UPL of the best performing units, that is, the emission level that each unit in the top 12 percent could be expected to meet at a 99th percentile confidence level. EPA's procedure also errs by attempting to determine the emission level that the bottom half of the top 12 percent will meet 99 percent of the time. However, EPA should not expect these units to meet the MACT floor limit since nominally half of the top 12 percent do not meet the average and therefore are not complying units.[9] The development of a compliance margin should be limited to an evaluation of the variability of the top 6 percent performing units under the compliance conditions imposed by the regulation.

Failure to Require Sufficiently Precise Testing and Subsequent Treatment of BDL Test Results

The first step in any scientifically sound measurement process is to ensure that the procedures employed are sufficiently precise to determine meaningful differences. In response to questions from industry as to whether they should extend sampling periods to ensure more precise results, EPA advised them that they did not need to and that the agency would address it the final rulemaking. EPA defines the method detection limit as, "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte." Where the "adjusted" average emissions of the top 12 percent is "near" the method detection level, EPA now proposes[10] to increase the calculated average so that the floor is not less than 300 percent of the detection level. To justify this increase EPA observes that when measurements are near the detection level the measurement uncertainty can be as high as (+/-) 40 percent, while such uncertainty is reduced to (+/-) 15 percent if the measured value is three times (300 percent) the detection level. However, since such measurement uncertainties are necessarily part of the overall variability determined in step one of EPA's procedure, there is no need or basis to substitute this arbitrary figure for the actual emission data that the statute requires be used. Additionally, it also makes no technical sense to introduce a known error of 300 percent in the MACT floor in order to avoid a possible error of 25 percent[11] in any individual measurement. This step constitutes yet one more bias in favor of allowing higher levels of HAP emissions. In this rulemaking EPA proposes to compound this error by "adjusting" the detection level reported by the laboratory in accordance with established protocols, even where EPA has no information that the detection levels reported by the laboratory are incorrect.

[8] It did agree that EPA could apply a variability factor to take into account expected variation in performance of such units.
[9] Those units in the top 12 percent, but with emission levels greater than the average of the top 12 percent (i.e., the 6th through 12th percent best performers), do not "comply."
[10] EPA employed this technique in the cement kiln New Source Performance Standard rule.
[11] This is the difference between the potential error at the detection level and that at three times the detection level.

Pooling Variability

Pooled variance is a method for estimating variance given several different samples taken in different circumstances where the mean may vary between samples but the true variance (or precision) is assumed to remain the same. Under EPA's revised UPL procedure, fuel analyses results are disaggregated from emission test results and further disaggregated by the number of unique sources. As a result, the method is highly sensitive to the number of tests and the number of units that are tested. However, in some subcategories the majority of the test and fuel analysis results were BDL and the detection limits for the emission test results are several times lower than those for the fuel analyses. EPA's pooled variance process generates high levels of variability, based largely on differences in the degree of precision of the measuring process and EPA's treatment of BDL data (where the results are known to be less than the BDL). This leads to unreasonable results where the sample size is relatively small. In addition to generating unrealistic results for a broad array of new source subcategories, EPA's proposed new statistical approach also appears to lead to results for PM and CO that are not consistent with the in-use performance of units in a number of other subcategories with limited data.

Unjustified Fuel and Boiler Type Subcategories

NACAA supports the development of subcategories in MACT rule development, where such subcategories are based on meaningful differences in anticipated fuels and unit designs. EPA has received a significant number of comments from sources making general assertions and theoretical arguments in support of additional subcategories; accordingly, the agency has proposed to greatly expand the number of subcategories for several pollutants. NACAA agrees that EPA's proposal to establish four broad categories based on fuel type – coal, biomass, liquid and gas – is reasonable.

EPA proposes, however, to subdivide these broad categories into 38 subcategories for existing and new units. In support of the explosion in the number of subcategories, EPA explains the differences in design between, for example, a coal-fired stoker boiler and a coal-fired pulverized coal ("PC") boiler. However, large boilers do not come off an assembly line[12] and can last for up to 50 years. Almost every large boiler will have differences in design from every other large boiler. Even smaller boilers will have differences in design from small boilers produced by other manufacturers. As a result, it is insufficient to simply identify design differences. Where EPA seeks to establish additional subcategories it must explain why those differences matter and point to information in the record that supports its conclusion.

For example, within the Boiler MACT "coal-fired" category, EPA proposes separate subcategories for stoker, fluidized bed and pulverized coal designs. However, we know of no reason why well-controlled units of these designs should differ significantly in levels of HAP emissions. Similarly, EPA proposes to establish seven subcategories of wood-fired boilers[13] – wet stoker, dry stoker, fluidized bed, suspension, dutch oven, fuel cell and hybrid suspension –

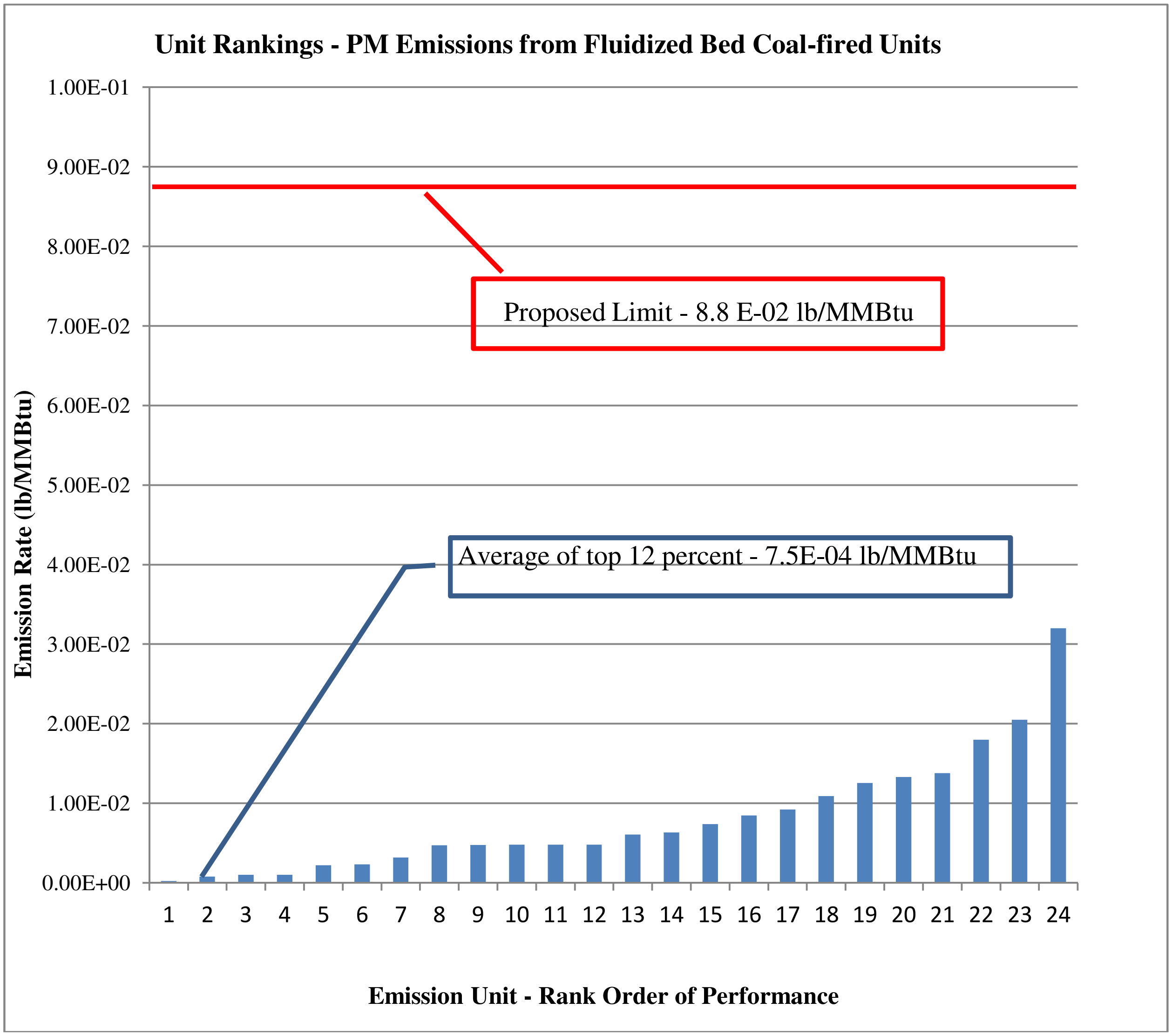
[12] Even mass-produced automobiles will exhibit design differences within and between models and manufacturers.
[13] NACAA has raised a concern that differences in the combustion properties of "wet" wood and "dry" wood might warrant development of a separate subcategory.

based on differences in the design of the combustion chamber of these units**.** However, most boilers and. in particular, the best-performing units, are equipped with PM control devices ranging in effectiveness from cyclones and multi-cyclones to electrostatic precipitators and fabric filters. The performance of the installed PM control device governs the level of PM and TSM emissions to a far greater extent than differences in design of the combustion unit itself. Indeed, in the stoker/sloped/other dry biomass subcategory we note that each of the units in the subcategory is only served by cyclone or multiclone particulate matter control devices, while in other subcategories most of the units are equipped with more effective fabric filer or electrostatic precipitator control devices. We do not believe that EPA is authorized to create a class of "poorly controlled units" and recommend that no separate subcategories be authorized for PM or TSM.[14]

Under EPA's current and proposed procedures, creating larger numbers of subcategories usually leads to higher MACT floors in two ways. First, if a small number of the best performers (e.g., fuel cells) can be culled from a larger group into its own subcategory, the MACT floor for the larger group (the wood-fired boilers) will rise. Second, because the small group will have a small number of tests, the statistical variability of the small group will also increase, leading to MACT floor increases for both the larger group and the smaller group. EPA's decision to create separate subcategories for PM emissions based on the design of the combustion chamber creates a situation where a unit with highly variable emissions is classified as a top performer, based on EPA's inappropriate definition of best performing unit. Since that unit has many more test results than others in the group, EPA's pooled UPL process causes that unit to dominate and results in a limit that is technically invalid. The resulting proposed limits are often substantially higher than the highest emitting unit. See Chart 1.

[14] These devices, along with sulfur dioxide and nitrogen oxide controls may also affect emission levels of hydrogen chloride and mercury.

Chart 1. PM Emissions (Lowest Test Result) for Fluidized Bed Coal-fired Units



EPA has the means to objectively evaluate requests for subcategories and should do so for all subcategories incorporated in its rule. It should determine through the use of statistical techniques, such as a T-test of significance, that the emissions performance of each proposed subcategory is in fact significantly different from the broader category or subcategory of which it is a member. If a significant difference is shown, EPA should determine whether the difference is a function of the design of the combustion unit itself or is related to the prevalence of post-combustion controls that can be employed throughout the category. Where EPA determines that the emissions performance of the proposed subcategory is, in fact, significantly different from the broader category and is associated with the design of the combustion chamber itself, rather than post-combustion controls, EPA should compute the arithmetic average of the best performing unit(s). However, unless the proposed subcategory has sufficient data (nominally 50 data points) upon which to determine the variability of performance, EPA should apply the variability factor from the broader category to the arithmetic average of the best source(s) in the new subcategory. Where EPA did not collect emissions data from a representative sample of all units within a proposed subcategory, EPA has no basis to assume that any particular unit is in the top 12 percent of that subcategory. It is therefore insufficient to establish a subcategory on the basis that a particular unit's emissions are greater than the top 12 percent of the broader category.

Choice of the 99th percentile

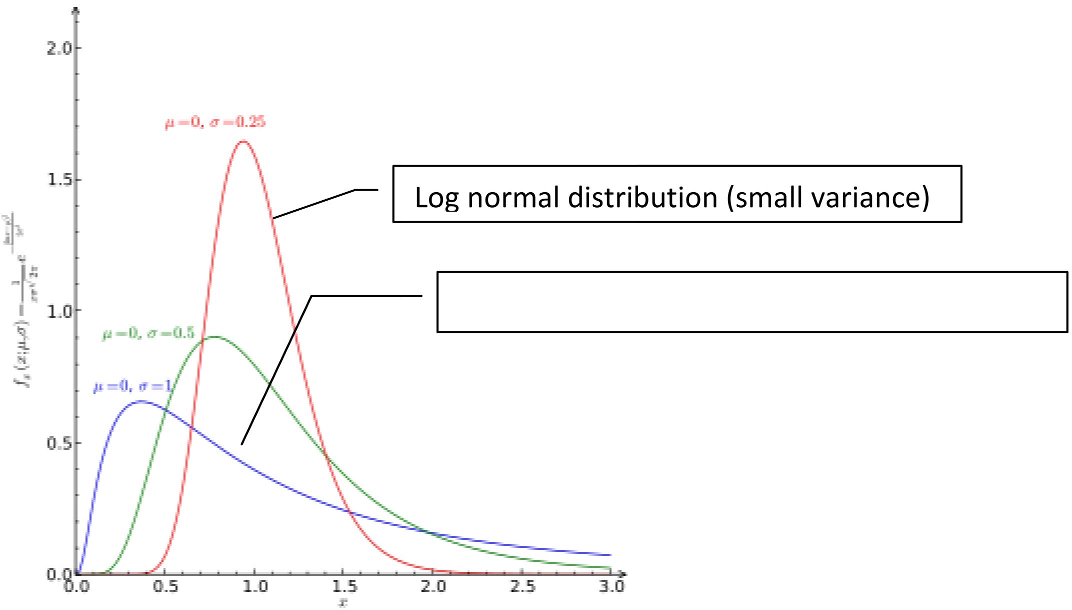
EPA has recommended the use of the 99th percentile UPL of pre-regulation testing and argued that its use is justified because the agency adopted the same approach in the medical waste incinerator MACT rule. This rationale does not explain why EPA believes the 99th percentile UPL is appropriate and not the 50th,[15] 90th or, for that matter the 99.99th percentile.[16]

The decision matters because with each increase in the "guaranteed" compliance margin, the standard increases, and there comes a point where the compliance margin is so great that sources can merely accept the risk of a failed compliance test rather than reduce emissions. If a source fails a compliance test it will ordinarily be afforded the opportunity for a retest and only if a source has a confirmed deficiency in its control equipment will a modification be ordered. We are unaware of any situation where a source that is willing to make such modifications as are necessary to meet an applicable limit has ever been ordered to permanently cease operation on the basis of a single failed stack test. In contrast, where an excessive compliance margin is provided emission standards can be ineffective. ,

The degree to which emission tests results can vary are not truly random, but are constrained by the laws of physics and chemistry and, in many instances, the performance of pollution control devices. EPA's statistical analyses of the data show that, if the data were randomly distributed, there would be a substantial number of instances where emission rates are less than zero. We know that this is not possible and so the data are "skewed" to the right. One method used by statisticians to adjust for this form of distribution is to assume what is known as a log-normal distribution. See Figure 1. With the assumption of a log-normal distribution, one then evaluates the distribution of the logarithm of the number rather than the number itself. EPA has employed this method in a number of instances.

[15] Civil enforcement of environmental standards is based on a "preponderance of the evidence," which merely requires that a violation be more likely than not (51st percentile).
[16] Some in industry have argued that the levels should be set so that there is no significant probability that a facility would fail a compliance test at any point in its useful life.

Figure 1. Log-normal Distributions



One feature of log-normal distributions is that they have "tails" that become very long as the variance increases. That is, the difference between the mean and the value that represents the 90th percentile probability is much greater where one assumes a log-normal distribution than otherwise. However, we know that the emission rate of specific pollutants, such as mercury ("Hg"), can never be larger than the amount of Hg in the fuel and that emission rates are also influenced by the operational characteristics of installed pollution control devices. Yet, EPA's calculations routinely predict results that are inconsistent with these facts. .They also lead to results, cited above, where the performance of the best performing unit is calculated to be worse than the average of the top 12 percent and where the calculated performance of the best units approximates the demonstrated performance of the worst units. These examples illustrate the point that in order to properly determine whether a particular statistical method is appropriate for a data set, one must determine whether the results of the method employed make sense. We submit that EPA's decision to use the 99th percentile leads to unrealistically large calculated variations in performance of the best performing units, especially where the distribution is assumed to be log-normal and especially where the sample size is small so that relatively large variances are computed.

Fortunately, there are additional facts to help guide EPA's determination of a standard compliance margin to be applied to all subcategories – the compliance obligations and testing conditions that are imposed by the standard. An equitable balance is struck when the same conditions used to establish the compliance margin are thereafter used to set the compliance obligation (and vice versa). If a source is required to be regularly tested under conditions that represent the 99th percentile "worst-case" conditions, then a 99th percentile compliance margin might well be appropriate. Additionally, a larger compliance margin is ordinarily appropriate for standards with short averaging periods and continuous emission monitors ("CEMs") than for standards that have long averaging periods or where compliance is determined by scheduled stack tests conducted by the source.[17] We also agree with EPA that a larger compliance margin is warranted where the emission limit is at or near the detection limit of the reference method.

EPA observes that standards are to be complied with "at all times," but this is a truism that is not particularly helpful.[18] What are helpful are the provisions in the rules that set out the conditions under which compliance will be determined. In years past, facilities were to be tested under "reasonable worst case conditions." Today, that standard has been reduced to "representative" conditions – a phrase that suggests that a compliance margin based on a 99th percentile projection[19] of possible emissions may be too large and that industry projections of severe test conditions may be overstated. Moreover, the structure of the compliance obligations itself suggests that the 99th percentile may be too stringent. The following factors, among others set out in the proposed rules, bear on a determination of the appropriate compliance margin:

1. For sources that intend to comply with mercury and hydrogen chloride ("HCl") fuel sampling, the rules require that a source conduct a stack test and demonstrate compliance using 90th percentile worst-case fuel (employing Student's t-test to determine that percentile);
2. For other purposes (e.g., PM and CO compliance), the source may select a "representative" operating condition (suggesting that neither a 90th percentile nor a 99th percentile worst-case test is required for these pollutants);
3. A source whose emissions during a test are less than 75 percent of the applicable limit is entitled to a reduced frequency of stack testing (suggesting that EPA does not really believe that replicate testing of sources will vary by more than 33 percent);
4. Parametric operating limits may not generally be less effective than demonstrated during the stack test (a useful provision, but also one that suggests that EPA believes that in-use emissions variability is zero);
5. Many of the applicable standards and other requirements contain exclusions from full compliance at all times (e.g., six-minute exclusion under opacity requirements, 5-percent exclusion for bag leak detection systems);
6. Power (voltage or amperage) to electrostatic precipitators ("ESPs") may not fall to less than 90 percent of that employed during a stack test[20] (for which we can think of no justification); and
7. Parametric limits are allowed to be based on the lowest (least effective) hourly parameters of the three runs of the compliance test. On its face this will not lead to compliance since it will be less than the average flow rate during the test. Moreover, such parametric limits do not provide any allowance for the variations employed in setting the standard. EPA should provide that the operating parameters be set at the

[17] We do not intend to suggest that there is widespread cheating during compliance testing. Our point is that the source has substantial prior notice of such tests and is in control of the operating conditions during the test.

[18] EPA also asserts that the failure of a compliance test is not a violation of a standard until and unless some governmental authority agrees. We understand the reference in the context of the annual certification of compliance (where EPA does not intend sources to have to "confess" to a violation of law), but not otherwise.

[19] We understand that a 99th percentile UPL is not precisely the same as a 99th percentile worst-case condition, but the differences are extremely subtle.

[20] If power to the ESP falls below that employed during the test, PM control efficiency would be reduced. The amount of this reduction is presumably unit-specific and so we can think of no justification for this provision.

levels employed during the test run that yielded the lowest emission rate, plus some additional margin to account for in-use variability.

While EPA may have used the 99th percentile UPL in one recent New Source Performance Standard ("NSPS"), in other NSPS rulemakings, such as the mercury limits under the utility NSPS 40 CFR Part 60, Subpart Da,[21] it has employed a 90th percentile statistical test (t-test) coupled with the same test for the fuel-sampling compliance demonstration.

EPA has proposed that owners and operators use parametric monitoring (i.e., pH, pressure drop, scrubbant flow rate, etc.) based on stack testing to demonstrate continuous compliance with applicable emission limits. The averaging period used for the parametric monitoring in the original Boiler MACT finalized in March 2011 was a 12-hour average. In the currently proposed amendments, EPA is requiring proposing that owners and operators instead use a 30-day rolling average. This creates an averaging period for parametric monitoring that is grossly inconsistent with the emission standard set through initial performance test (stack testing). The averaging period for a stack test for an emission standard, such as particulate, is typically determined from the average of three stack test runs, which would be only one- to two-hour long runs. Where the emission standard is based on the average of three, one-hour stack tests, parametric monitoring with a 30-day rolling average (or even a 12-hour average) will not ensure compliance as the affected unit could be operated outside of the range (and presumably above its three-hour emission limit) for half the month. We do not object to the use of long-term averages *per se*, as such averages can be a solution to the variability issue. However, there is then no technical justification for the very large variability factors adopted by EPA (based on one-hour test runs) in a system that permits 30-day averages to be used for compliance.

FUEL VARIABLITY

EPA takes the result of its 99th percentile UPL calculation and applies a second variability factor, what it styles as a "fuel variability factor," to determine the overall variability to apply to a "best performing unit." This constitutes double counting and should not be permitted. This double counting occurs because fuel variability is part of, and in many instances the major part of, the test-to-test variability that forms the basis of the 99th percentile UPL calculation. In the case of the liquid-fired Hg limit, EPA applied a "Fuel Variability Factor" to the 99th percentile UPL to further increase its proposed MACT floor to 2.6 x 10^{-5} lb/MMBtu. EPA applies this factor, not because the data respecting the Hg fuel variability of the best units showed that the variability was too large, but because it was, in EPA's view, too small. EPA acknowledged that, for solid-fuel units, the variability in the amount of a pollutant in the fuel would be reflected in the emissions performance of the units but decided that "[f]or existing and new liquid fuel units, the fuels making up the best performing units demonstrated less variability in their composition and type, and there were a smaller pool of available test runs. EPA determined that an additional fuel variability factor was necessary in these cases." EPA's added

[21] See, Memorandum from Robert Wayland, OAQPS, to William Maxwell, OAQPS, "Revised new source performance standard (NSPS) statistical analysis for mercury emissions" (sic), May 31, 2006.

emission factor makes only a slight (5 percent) difference in that case, but, if applied to solid fuel-fired units, would increase the standard by an order of magnitude.[22]

HG LIMITS FOR LIQUID FIRED BOILERS

EPA's proposed limits for Hg emissions from liquid-fired boilers reveal the magnitude of EPA's decisions respecting (1) the level of precision to be employed in conducting emission testing and fuel analysis, (2) determining variability of "best" sources with insufficient data, (3) "pooling" variance among different sources where there is no reason to believe that each of those sources has the same amount of variability, and (4) determining the UPL based on emission data where the source is not "in compliance."

Distillate oil (#2 oil) is commonly understood to contain far less Hg than coal or biomass; while residual oil (#6 oil) contains somewhat less Hg than solid fuels. EPA's existing source MACT floor is based on a series of test results from ten sources combusting four different types of oil.[23] Six sources submitted the results of a single compliance test and four sources submitted 41 fuel analyses. The arithmetic average of these results is 3.70 x 10^{-7} lb/MMBtu and the standard deviation is 3.07 x 10^{-7} lb/TBtu, suggesting that a reasonable MACT floor would be in the range of 1.0 - 1.5 x 10^{-6} lb/MMBtu (a variability factor of 300 to 500 percent).[24] EPA's earlier UPL calculation led to the final rule MACT standard of 3.4 x 10^{-6} lb/MMBtu – a variability factor of over 900 percent. EPA's newly proposed statistical procedure results in a proposed UPL of 2.49 x 10^{-5}, using the same data. This number is more than 100 times the arithmetic average of the data and more than 100 times the standard deviation of the data set[25]. As a consequence, of the 71 sources for which EPA has data, only four sources will have to reduce emissions.

As Table 1 demonstrates, many of the characteristics of the data for the liquid fuel-fired subcategory are similar to those in the solid fuel-fired subcategory and yet EPA's proposed MACT floor for liquid fuel-fired boilers is nearly ten times higher than the proposed limit for solid fuel-fired units. Charts 2 and 3 demonstrate the impact of EPA's determination of variability on the effectiveness of the rule. The average of the top 12 percent (lowest test value) in each case is well below 1.0 x 10^{-6} lb/MMBtu. If EPA had set the limit for coal-fired units at that level, approximately 25 percent of the subcategory would meet the limit and the balance would be required to take some steps to reduce emissions. At the proposed level of 3.1 x 10^{-6} lb/MMBtu, while the gross emitters would have to take steps to comply, approximately two-thirds of the units in the subcategory would not need to reduce emissions. For the oil-fired subcategory, only four of 71 units would have to reduce emissions at all; the proposed limit is

[22] Memorandum, Eastern Research Group to Shrager, B, USEPA, *Revised MACT Floor Analysis (November 2011) for the Industrial, Commercial, and Institutional Boilers and Process Heaters National Emission Standards for Hazardous Air Pollutants – Major Source,* November, 2011 ("MACT Floor Memo") Appendix C-4-(a)(i). p. 7.

[23] MACT Floor Memo, Appendix C-4-(a)(i).

[24] A somewhat higher limit may be appropriate as many of the reported results were below detection limits, thereby constraining the variability that would have been demonstrated by more precise analyses. This effect is offset by the fact that the arithmetic average would be lower with more precise analyses, but the degree to which these factors offset is not known.

[25] Sources routinely maintain, and EPA agrees, that fuel variability is so small that sources only have to conduct new fuel analyses when they change suppliers.

five times higher than the emission rate of the fifth highest emitting unit in the subcategory. These results do not appear to be consistent with EPA's obligation to set MACT floors at levels that represent the average of the performance of the top 12 percent.

Table 1. Comparison of Hg Data for Oil-fired and Coal-fired Units

Emission data units : x 10^{-6} lb/MMBtu	**Solid fuel-fired**	**Liquid-fired**
Number of units	39	6
Number of fuel analyses (FA) employed	0	24
Number of emission tests (ET)	61 tests/183 runs	6 tests/ 18 runs
Combined ET + Fuel Analyses (FA) average	0.391	0.370
Combined ET + FA STD DEV	0.291	0.307
AVG + 3(STD DEV)	0.973	1.291
EPA Calculated floor	3.1	26
EPA "multiplier" (Floor/AVG)	7.93	70

Chart 2. Hg Emissions from Liquid Fuel-fired Units

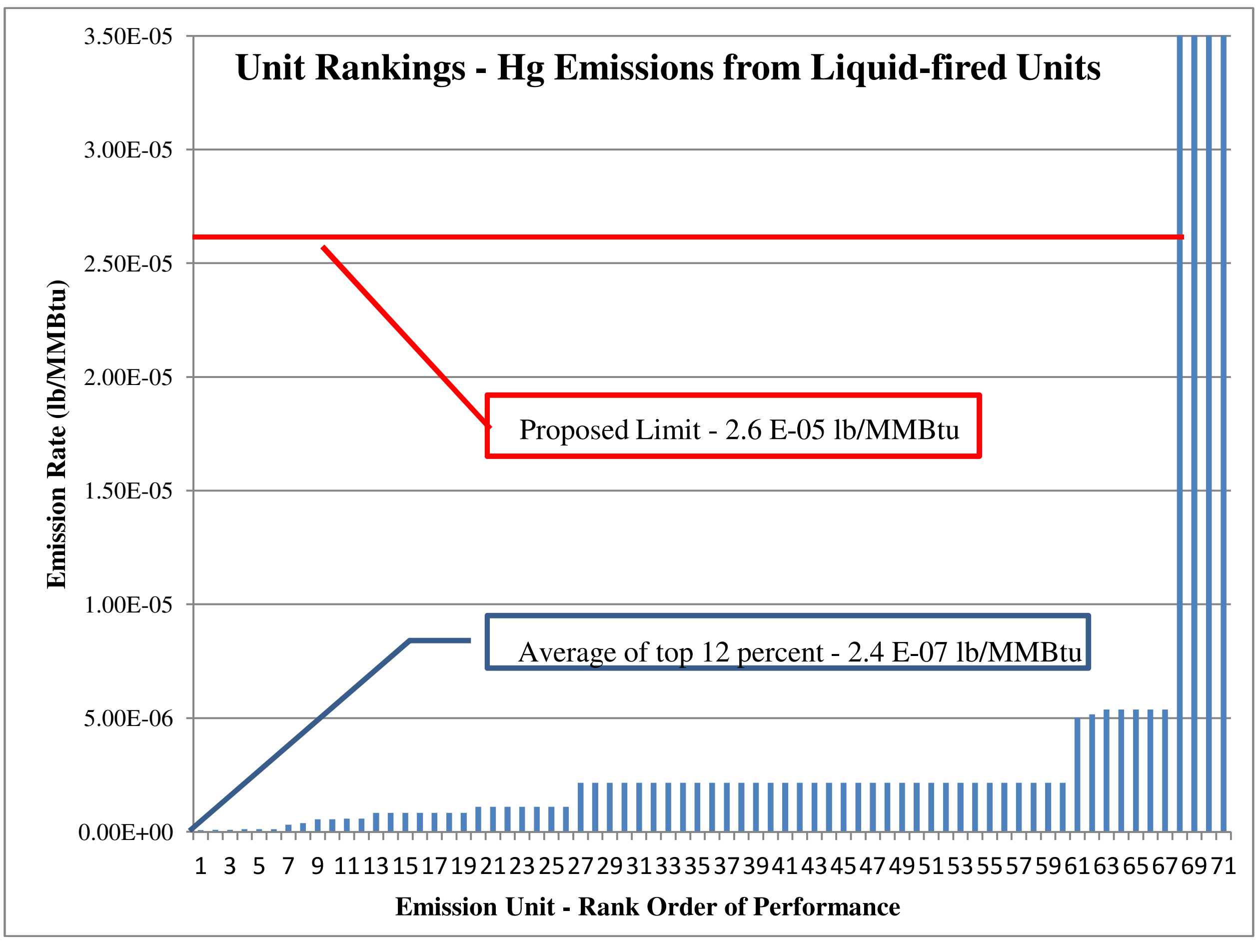
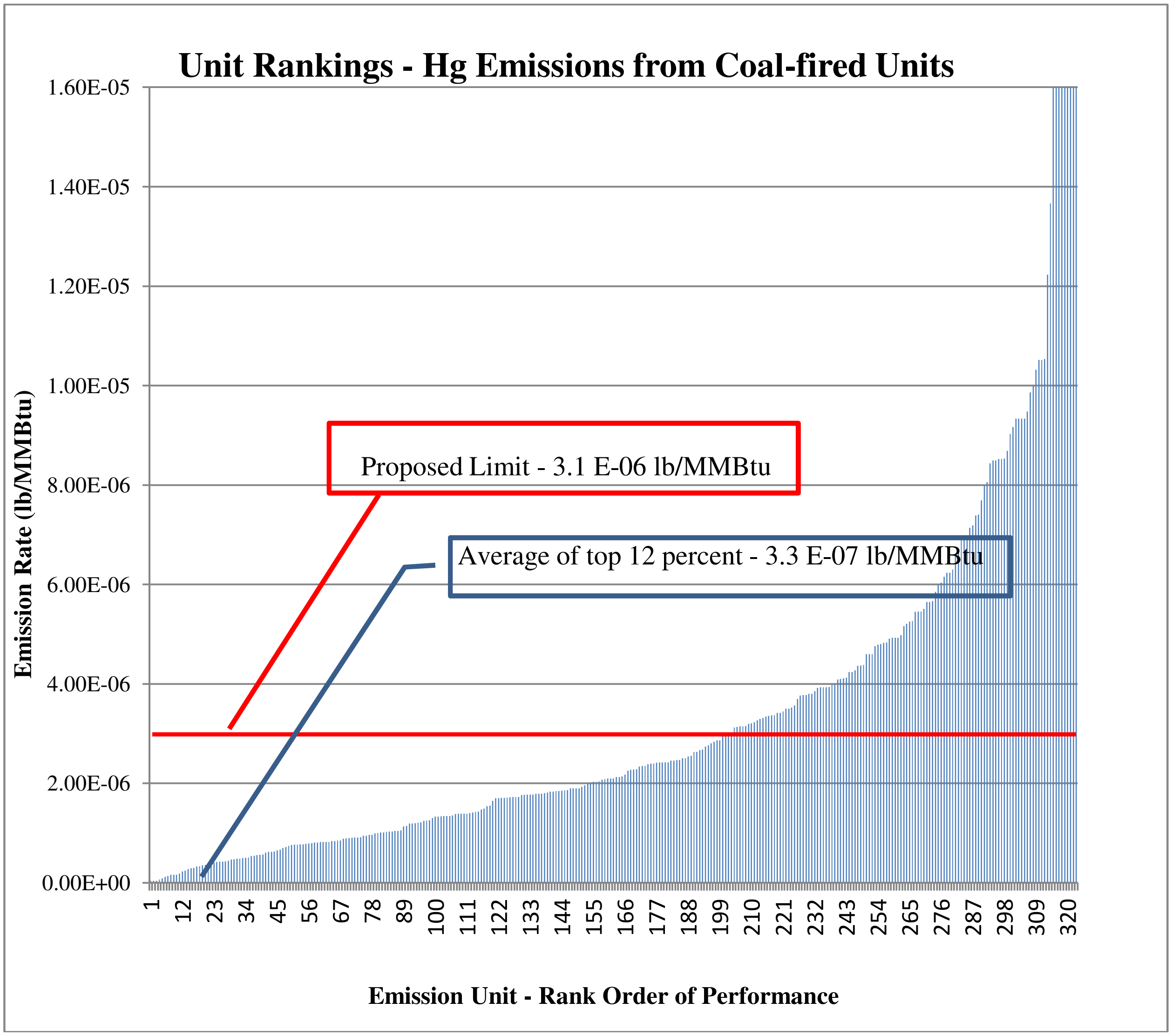


Chart 3. Hg Emissions Data for Coal-fired Units



NACAA attempted to discern why EPA's procedure generated such different results when the overall distribution of the Hg emissions data for coal and oil-fired units was so similar. The largest single reason for this vast difference appears to be a simple error in importing the data – EPA incorporates the emissions data for HCl instead of Hg into its UPL calculation.[26] With the correct data, EPA's 99th percentile UPL calculation yields a MACT floor of 4.58×10^{-7} lb/MMBtu.

[26] The error can be found in MACT Floor Memo, Appendix C, Worksheet "C-4(a)(iv)&C-4b(iv)" which is then carried over into Worksheet "C-4(a)(ii)."

RECOMMENDATIONS CONCERNING CALCULATION OF THE MACT FLOOR

In the absence of sufficient data to make determinations of the variability of individual units and subcategories with limited data, EPA should develop a reasonable compliance margin to apply to the best-complying sources. The underlying issues are sufficiently complex that, in the absence of truly comprehensive data, no single analysis will likely prove to be dispositive. For this reason we recommend that EPA perform a series of analyses and examine the central tendency of the results of those analyses. From these results EPA can establish one or more default variability factors to apply where the limited number of test results affects the calculation of variability in a given subcategory. One such group of analyses, but by no means the only approach that could prove useful, is to start with the most comprehensive data set to determine a broad "default" variability factor and examine more specific data sets to determine whether a more limited variability factor can be assigned based on the data available.[27] Such an approach could proceed as follows:

- Commence the process by identifying all units that may reasonably be found to be in the top 12 percent. This might include the top 25 – 33 percent of units based on their mean test result and all units whose mean test emissions are within an order of magnitude of the best performing unit.
- Calculate the nominal "performance" of each unit; by summing the mean and one standard deviation[28] of the unit specific data.
- Average the performance of the top performing 12 percent, understanding that this is likely an overestimate, based on the low number of test runs for most units.

Since this approach is likely to overestimate the variability to some degree, the results of the first assessment should be considered an upper bound of potential MACT floors, EPA should then look to see if the variability of the broad group is less than that calculated above.

- Using the pool of "best performers" identified above, normalize the emission test results for all sources for which EPA has data, including those not in the top 12 percent and determine the average variability in the performance for the broad group. EPA could accomplish this by dividing the variance for each unit by the mean of the data for that unit and average the results, not the UPL. It has been argued that sources in the top 12 percent have less variability than the population at large and so this variance should be considered to represent an upper bound of a permissible variance.
- Repeat the above-described analyses for the three basic subgroups – solid, liquid and gas. This then would form a second set of possible default variability factors for the subgroups for which sufficient data are available. Since there are more tests available for the entire liquid-fired set of units, it may prove possible to develop a separate variability factor for liquid-fired units, which, while likely larger than that for the best performing units, is more accurate than that based on limited data for the best performing units.
- Repeat the above-described analyses using data for the top best-performing, 50 percent, 25 percent, 12 percent and 6 percent of the basic subgroups. Employ these results if the

[27] We have not conducted these sorts of analyses and have no way of anticipating their results.
[28] It may be more appropriate to use Student's t-test at a similar level of confidence.

average variance is less than that for the larger group or if it can be established that the calculated increase in variance is due to differences in performance and not the consequence of the reduced sample size. Iteration in this fashion should identify a point where the reduction in sample size outweighs the improvements normally expected from better performing units.

- For purposes of determining the arithmetic average, results reported at a detection limit should be employed as recorded, however, for purposes of determining variance such results should be excluded as they artificially reduce the variance.
- For purposes of determining the arithmetic average of the best performing top 12 percent, all test results should be employed to identify the best performers, not the best single result. This will increase the arithmetic average, but is a more reasonable estimate of the performance of units with multiple tests than the lowest single result currently employed by EPA.
- Once the variance of the data has been determined, it should be applied to the arithmetic average of the top 12 percent, not to any unit in the data set. Consistent with most of the enforcement expectations, we recommend that it be applied at the 90^{th} percentile level.
- For those subcategories where the data are sufficiently robust, a variability factor specific to the subcategory may be applied; for all others the applicable MACT floor would be the arithmetic average of the data for the subcategory, as adjusted by the applicable default variability factor.
- Where a source or group of sources wishes to maintain that a different variability factor should apply, those parties should be responsible for providing sufficient data to develop a factor that is not dominated by the paucity of data.
- Additionally, EPA could determine the "normalized" variance for each unit where more than a certain number of tests (perhaps 10) are available and average those values.

EPA should examine the performance of similar units in the electric generating unit sector and other sectors and review relevant BACT and LAER determinations. EPA should also examine the overall distribution of the data set at issue to determine a reasonable variability factor. Where there are a large number of units with similar emission levels, a large variability adjustment should not be applied.

Where EPA determines that a source category's emissions are highly variable over a short period (e.g., CO), EPA should consider longer averaging periods, such as 30-day rolling averages, that reflect and accommodate this form of variability, while still preserving the environmental benefits the CAA contemplates. However, under no circumstances should 30-day CEM-based limits be higher than the corresponding reference method (three- hour) limit.

WORK PRACTICE STANDARDS

In 2004, EPA candidly admitted that it could not develop CO work practice standards for ICI Boilers:

> Consequently, any uniform requirements or set of work practices that would meaningfully reflect the use of good combustion practices or that could be

meaningfully implemented across any subcategory of boilers and process heaters could not be identified.[29]

EPA has nonetheless asserted that measuring CO levels is impracticable[30] and has set out what it describes as a work-practice standard. What EPA has adopted and continues to propose is not a set of good combustion practices that could be meaningfully implemented across a subcategory, but a requirement to follow the manufacturer's recommendation for good combustion practices. This assumes that manufacturers can do what EPA could not – identify a set of good combustion practices applicable to boilers designed and built over the past 50 years. It also assumes that the manufacturers of these units are still in business and will invest the resources needed to do so voluntarily. These assumptions are patently incorrect. There is no obligation on the part of manufacturers to develop any meaningful set of broadly applicable good combustion practices or to determine the set of work practices employed by the best performers in the sector or to determine whether any particular set of work practices approximates the emission performance of the best performers in a subcategory. Conceivably, an organization like The National Board of Boiler & Pressure Vessel Inspectors might be able to provide a certification/best practices review of any legacy boiler, even if the original manufacturer is no longer in business and individual sources can retain consulting firms to study the operation of individual boilers and recommend a set of best practices for that boiler. We submit that such a program, that imposes obligations on relatively clean boilers as well as high emitters, if conducted in a technically sound manner, may prove to be more costly overall and provide far less environmental benefit than a defined numerical limit that requires significant emission reductions from gross emitters. CO CEMs are available, relatively inexpensive and used by industry for process control. These devices should be required for all combustion units covered by the major source and CISWI rules. Further, EPA's assertion that CO monitoring is infeasible is inconsistent with its proposed reliance on CO optimization for D/F control.

EPA now proposes to adopt a similar "work practice" standard for dioxin and furan emissions, again asserting that enforcing a numerical limit is impracticable, notwithstanding the hundreds of D/F emission tests in the rulemaking record. EPA argues that this is demonstrated by the large number of results that are "non-detect" ("ND"), detection level limited ("DLL") or BDL. First, we note that this problem is of EPA's creation. EPA knew, before testing was to be conducted, that many results would be at or below detection limits if it only required sample periods of one hour per run. Indeed, industry sources specifically raised this issue and inquired whether they should extend sample periods to ensure more precise results. EPA's response was that sources need not do so and that EPA would "address" the issue in its rulemaking. Testing for D/F and other pollutants often included detection and quantification limits that are quite high – one source reported a detection limit for mercury that equates to 6.57 lb of mercury emissions per year,[31]while several sources reported D/F detection limits several orders of magnitude larger

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[29] Memorandum, Eddinger, J., USEPA to Docket No. OAR-2002-0058, February, 2004,*"Revised MACT Floor Analysis for the Industrial, Commercial, and Institutional Boilers and Process Heaters National Emission Standards for Hazardous Air Pollutants Based on Public Comments"* p.18.

[30] NACAA has commented that this representation is incorrect. CO emissions' testing has been conducted for several decades on thousands of different sources.

[31] This is roughly equivalent to a quantification limit of more than 60 lb/yr. EPA refers to the quantification limit as the level at which emissions can be measured accurately.

than the levels of regulatory interest. Further, if the standard is set at the most common detection limit, plus an appropriate variability factor, no harm is done, since a subsequent emission test that is BDL would not constitute a violation. Retaining such a limit would not require any change in performance for relatively clean units, but would at least require gross emitters to reduce emissions.

Developing a meaningful work-practice standard for controlling D/F emissions is far more difficult and resource intensive than merely reducing CO levels. According to the Industrial Combustion Coordinated Rulemaking ("ICCR") study[32], control of CO levels is not sufficient; one must also examine the interaction of several factors in a complex combustion environment. The ICCR study concludes that CO monitoring can help confirm that current operating conditions are the same as during a D/F emissions test, but are not a direct indicator of low D/F emissions; equivalent dioxin levels can be found at 1 ppm as are found at 4,000 ppm CO levels. Other factors were found to be more important and, based on the ICCR workgroup results, meaningful work-practice standards would have to include good combustion practices (including total hydrocarbon and CO concentrations, soot formation and particle entrainment), quench rate, air pollution control device temperature and fuel and waste parameters.[33] Large ICI boilers will have far higher flow rates than medical waste incinerators and so may actually emit a substantial amount of dioxin on an hourly (or certainly annual) basis. . As discussed above, such a task would require significant resources. Indeed, such an effort would likely be more expensive than testing. There is no reason to suspect that manufacturers would voluntarily do so (even if it could be done) and no authority to require that they invest in such an effort.[34] Some manufacturers may, as a courtesy to their clients, publish "nominal" good combustion practices. However, there is no way for federal, state or local enforcement authorities to require that such practices have any practical impact. The end result would be additional paperwork demands on sources and permitting authorities and no environmental benefit.

EPA's real argument appears to be that setting D/F limits for these sources is "not worth it" because emission levels are "small." If this is the case, EPA should make this argument clearly and support it with objective facts. It should, at least, compare daily/annual D/F emissions from medical waste incinerators (and other source categories) with D/F limits with anticipated D/F emissions from high emitters to see if those emissions are *de minimis.* Additionally, EPA should explore options to reduce testing burdens for the sector. Potential areas for reduced testing costs are pooled testing for units of similar designs and reduced testing frequencies for sources whose emissions are below a certain threshold. Additionally EPA could attempt to review operating conditions for better performing units to determine whether there are readily discernible operating conditions (such as maximum boiler temperature, oxygen levels or chlorine content of fuel and designed residence time) where parametric monitoring can be employed in lieu of reference testing. EPA might also consider a threshold where, if sources demonstrate very low D/F emission rates, a one-time test, combined with parametric monitoring might suffice.

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[32] See, Gullet, B,, USEPA, and Seeker, Randy, EER Corp *"Chlorinated Dioxin and Furan Formation, Control and Monitoring"* 1997.

[33] Id, slide 79.

[34] It is also likely that the manufacturers of a large number of boilers are no longer in business.

EPA'S PROPOSED RULES DO NOT PROPERLY ADDRESS UNITS BURNING MIXTURES OF FUELS

When a source combusts only one type of fuel at all times, determining which emission limit to apply is straightforward. However, many sources combust different types of fuels at different times and a substantial number of sources combust different mixtures of these fuels at different times. In developing its Model Permit Guidance,[35] NACAA attempted to address this issue by examining test results where only one type of fuel is employed to set the recommended range of suggested limits. It was anticipated that state and local permitting authorities would then determine the appropriate procedure for establishing permit limits on a case-by-case basis, either by applying the limit that was the most stringent at all times, by determining the weighted average of relevant limits or by requiring a compliance demonstration based on full utilization of one fuel.

EPA has taken a different approach. It has adopted a "designed to combust" test and a hierarchical scheme for determining the fuel category of a source.

1. If a source generates more than 10 percent of its heat from biomass, it is in the biomass category.
2. If it uses less than 10 percent biomass and more than 10 percent coal it is in the coal category.
3. If it burns oil, but less than 10 percent coal and less than 10 percent biomass it is in the liquid-fired category.
4. If it burns any amount of gas other than natural gas (Gas 1) it is in the Gas 2 category.

EPA has not explained the rationale for this approach, which places many sources in fuel categories other than those that dominate emissions. This approach also appears to invite "category shopping" and does not seem to address all possible combinations. For example, if a fluidized bed boiler burns 91 percent coal and 9 percent biomass, the proposed CO limits are 56 ppm. If that same boiler combusts 90 percent coal and 10 percent biomass, the proposed CO limits are 370 ppm. This change is far larger than what one would expect based on such a small difference in the fuel combusted.

In its most recent proposals EPA has employed a different approach to the determination of the emission limit to be applied. Whereas, in the 2011 rulemaking any test result where the source was combusting more than 10 percent coal was used in determining the MACT floor for the coal subcategories, in its most recent calculation of MACT floors EPA only used data from tests where the source was burning 90 percent or more coal during the test for existing sources and 100 percent coal for new sources. We believe that a 90-percent threshold is appropriate for the definition of this subcategory and appropriate for establishing a limit for "coal-fired" units, but see no reason to have a higher threshold for new units. Having done so, however, EPA needs to revise its definition of the subcategory to be consistent with its approach in setting standards. EPA may not exclude results from testing of clean sources within the subcategory. We recommend that fuel-based subcategory limits and subcategory definitions each be based on a

[35] See http://www.4cleanair.org/Documents/RHAP.pdf.

minimum (e.g., 85-95 percent) usage of the fuel type and that EPA devise an approach for establishing emission limits for units that burn mixed fuels in lesser amounts.

OTHER DATA MANAGEMENT ISSUES

EPA's approach to "rounding" introduces an additional inappropriate bias to the calculation of MACT floors and should be revised to reflect technically correct rounding procedures and the requirements of the statute. In the calculation of the MACT floor, such as the application of calculated UPLs, EPA "rounded" the interim values and in each such instance rounded the values up. In most engineering calculations, rounding protocols provide for rounding down as well as up. Rounding ordinarily includes truncating the number of significant digits that are employed in a calculation and occurs at the end of the calculation process. EPA justifies its decision to only round up by asserting that to do otherwise would deprive sources of the "variability" cushion they were otherwise entitled to. Again, this argument ignores the public interest in reducing emissions of hazardous air pollutants, as well as normal engineering protocols. It would also seem to be contrary to written EPA policy concerning rounding for NSPS compliance purposes.[36] This policy, which has not been revised to our knowledge, adopts ASTM standard rounding protocols – carry at least five significant digits throughout all intermediate calculations and employ ASTM Procedure E 380 (round down if less than 5; round up if greater than 5) for the final calculation. Where a MACT floor would otherwise be calculated at 2.27, it would seem that "rounding" a final standard to 3.00 would be technically unjustifiable and would not comply with the requirement of section 112 that the MACT standard **be not less stringent** than the average of the top 12 percent.

In the proposed calculations of MACT floors for CO for biomass sources EPA significantly alters the reported data to account for what it styles as "measurement span errors." This appears to be double counting of variability, since any random errors in the measurement system will be reflected in the variability of the resulting data. Moreover, the method relies on the highest reported values of computed errors rather than an average of those errors.

EPA has provided no rationale for selecting the maximum emission factor in a group of tests in developing its fuel variability factors. Other examples of an upward bias can be found in EPA's calculation process[37] including: (1) exclusion of test results where the result provided is "zero" or "non-detect," but the detection limit is not provided, and (2) failure to include homogeneous waste material combusted by some biomass boilers in the fuel variability analysis (EPA argued that such data should be excluded because it is not a representative material for other boilers in the biomass subcategory).

EPA's proposed standards are also highly sensitive to the decisions to exclude clean sources without sufficient basis and to retain highly variable results that are more properly

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[36] See, "Memorandum: Performance Test Calculation Guidelines", William Laxton, OAQPS, and John Seitz, OAQPS.

[37] The rounding process employed by EPA can increase MACT floor results significantly. The other biases we mention are unlikely to have a large impact on the MACT floor. The use of log-normal statistical procedures may or may not result in lower MACT limits than would otherwise be the case, but is technically justified where non-normal distributions are observed.

treated as outliers. This is especially true in EPA's new source MACT floor calculations. By way of example, for one new source subcategory[38], the source had been tested twice, for a total of six runs. Results from five of the six runs were low and consistent; but the results of the sixth run were 100 times greater than any of the other five runs. Since this result is outside the 99th percent confidence level of the rest of the data set, under EPA's methodology it should have been excluded. EPA retained this value and the result is an extremely high new source MACT floor calculation.

OUTPUT-BASED STANDARDS

NACAA has long supported the general notion of output-based standards as a way to encourage energy efficiency and mitigate emissions of air pollutants. However, unlike the EGU sector, determining energy efficiency improvements from a variety of industrial processes is a complex task that EPA has not yet addressed. Moreover, EPA has not developed the MACT floors using net output-based data and is not proposing to promulgate mandatory output-based MACT limits. Rather, it has converted the results of MACT data for sources selected as best-performing units on an input-basis and proposes to offer sources the option of complying with either the input-based limits or the converted limits. In addition, the uncertainties associated with past and future determinations of the unit's net heat rate are larger than potential efficiency gains that may result from adoption of output-based standards for existing units using common factors. NACAA believes that the most significant effect of offering existing sources the option of output-based standards based on a pre-determined conversion factor will be a reduction in the effectiveness of the rule, rather than any measureable improvement in efficiency of existing or new sources.

For existing units, the principal effect of an "optional" output-based standard would be to establish a class of "winners" that qualify for lower emission rates based on their currently existing condition, rather than providing an incentive to reduce emissions. Since facilities with low efficiencies (high heat rates) may elect to comply with the input-based limit, the only "losers" in this process are the members of the public who are subjected to higher emissions of HAPs than would otherwise be the case. For this reason EPA should not allow an output-based standard as an option for existing sources to employ, but should set standards based on net output emissions data. This could be accomplished at the next review of the standard, as required by the CAA every eight years and discussed below.

Opportunities for improvement in the heat rate of existing sources are relatively small. In addition, many efficiency improvement options, such as soot removal, are not permanent and require ongoing maintenance to sustain improved performance. Before proceeding in this area EPA should develop a record that would enable accurate measurement and determination of sustainable efficiency improvements. The record in this rulemaking is not sufficient to establish such procedures.

[38] Biomass Dutch Oven Filterable PM.

MACT LIMITS FOR SIMILAR UNITS SHOULD BE CONSISTENT

New and modified sources subject to section 165 of the CAA must install "the best available control technology" (BACT) for a number of criteria pollutants regulated under the CAA, including, as relevant here, CO, sulfur dioxide ("SO_2,"), nitrogen oxide ("NO_x") and mercury. In the proposed rules EPA is setting limits for certain pollutants based on the application of "the maximum achievable control technology." There is nothing in the plain text of the CAA or its legislative history that suggests that Congress intended MACT, which applies to emissions of highly toxic and carcinogenic pollutants, to be less stringent than BACT, which applies to criteria pollutants. Indeed, for new sources it is clear that Congress intended MACT[39] to be at least as stringent as the lowest achievable emission rate (LAER), which is generally recognized as being more stringent than BACT.

Regulatory authorities are to consider costs when establishing both BACT and MACT limitations that are more stringent than the MACT floor. There is nothing in the CAA that speaks to how EPA and permitting authorities must weigh costs against other considerations in establishing BACT. However, there has been a substantial body of precedent that speaks to this issue. In contrast, in establishing a requirement for a MACT floor, Congress effectively set a floor on what should be considered reasonable costs for MACT control technologies. Since MACT may be no less stringent than the performance level of the best-performing 12 percent, the costs to those sources of achieving that level of performance (including the worst-performing unit within a subcategory) must be within what was considered to be appropriate for MACT sources in that subcategory. This is of particular relevance to the set of rules under consideration, where the cost of control for similarly situated units is essentially the same but the calculated MACT floors are substantially different.

In its MACT determinations EPA needs to explain how an emission limit imposed for a unit subject to section 129 (and therefore presumably meeting the reasonable cost test for MACT) is not reasonable for an identical unit subject to section 112.

If the PM and mercury limits remain roughly as proposed for existing sources,[40] few sources will desire to be regulated under section 129. Most sources will argue that they get a "meaningful" contribution to the overall combustion process from what they burn. This will increase the level of disagreement over whether a material is a waste and may result in fewer sources burning waste materials. Some sources (with low CO levels) might find it in their interests to assert that they are incinerators rather than energy recovery units. Thus, the definitions of "solid waste" and "incinerator" may matter to a number of sources.

EPA should also consider its proposed MACT rules in light of BACT determinations for similarly situated units and explain why emission limitations deemed "available" as BACT are orders of magnitude more stringent than the ("maximum achievable") MACT standards. A

[39] The MACT floor definition is essentially the same as the definition of LAER, which applies to new and modified sources in nonattainment areas.

[40] NO_x and SO_2 limitations under section 129 may also discourage combustion of solid waste. This issue can be addressed by EPA when it adopts emission limitations for large industrial units under Phase II of its Transport Rules.

review of EPA's RACT/BACT/LAER clearinghouse reveals a number of BACT decisions for cement kilns that are far more stringent than EPA's proposed limits.[41] In addition, EPA's control technologies guidelines for cement kilns,[42] published under section 108 of the CAA, document the existence of cost-effective retrofit technologies available for control of SO_2 and NO_x in cement kilns. EPA seems to assume either that there are no cost-effective controls for these pollutants at cement kilns or that the CAA does not require MACT limits to be based on these controls. EPA should explain its rationale in greater detail and set forth a basis for any final decision it makes. EPA should review each of its proposed MACT limits to ensure that they reflect the application of maximum achievable technology, not merely the MACT floor. In addition, it would seem that MACT should be more stringent than either GACT or BACT. Accordingly, MACT limits for cement kilns for SO_2 and NO_x should be at least as stringent as BACT limits for such units.

Moreover, the performance demonstrated by the best performing units suggests that existing sources, if equipped with MACT level technology, would be capable of far better performance than suggested by EPA's rules. Similarly, we note the very significant differences in the MACT limit that EPA applies to smaller units at area sources compared to similar units at major sources. Since the MACT limits for those units are presumed to meet the statutory effectiveness tests for MACT controls, unless the cost per ton for similar units at area sources is substantially different it would seem that the test is met at those sources as well.

COMPLIANCE DATE

EPA has proposed to extend the compliance date for all sources and all limits. We agree that such an extension is appropriate where more stringent limits are imposed following reconsideration, since sources should not have to comply with standards that ratchet in stringency after only one year. We note that EPA's stay pending reconsideration has been rejected by the Court and caution that an effort to provide an extended compliance deadline for sources whose emission limits are not made more stringent may invite litigation that affects an extension for sources facing more stringent limits. We further note that the CAA provides the option of an additional year for compliance where a source demonstrates a need for more time.

EPA has also requested public comment on whether the compliance date for boiler tune-ups for area sources should be extended to March 2013, as EPA is currently proposing, or if the compliance date should be extended to March 2014. To be consistent with the initial compliance date for boiler tune-ups at major sources, EPA should extended the compliance date for area sources to March 2014. Although the tune-up requirements do not appear overly burdensome, affected sources will still need sufficient time to determine what needs to be included in the tune-up protocol, when to schedule the initial tune-up, and to develop the reporting protocol that needs to be submitted to EPA or to the delegated state or local agency. Further, there appears to be no reason why the smaller area sources should not have the full three years to comply that is

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[41] Many of these decisions are for new units, but are based on technologies suitable for retrofit (albeit at somewhat greater cost).

[42] See, http://www.epa.gov/ttn/catc/dir1/cement_updt_1107.pdf See also additional studies by Northeast States for Coordinated Air Use Management (NESCAUM) http://www.nescaum.org/documents/ici-boilers-20081118-final.pdf/; http://www.nescaum.org/documents/hg-control-and-measurement-techs-at-us-pps_201007.pdf/.

currently afforded to major sources. Extending the compliance date for tune-ups would also allow extra time for states to identify and provide outreach and compliance assistance to area source facilities. This assistance is very important, because many of these sources have had little prior experience in understanding and complying with complex air regulations. EPA is not providing states additional funding to implement these new standards. Having sufficient time before the compliance deadline to assistance affected area sources will help ease the implementation burden for states and will almost certainly minimize violations after the compliance date.

OTHER ISSUES

EPA has solicited comment on a number of additional issues. We offer our comments on these issues in no particular order.

- NACAA agrees that a definition limiting the period of "startup" is appropriate. We recommend that such a definition be based on a percentage of the normal operating load of the unit as some sources may operate for extended periods of time at far less than the full rated capacity of the unit.
- NACAA recommends that the frequency of mandated tune ups be based on objective data concerning decay of performance after a tune up.
- NACAA agrees with the industry suggestion and EPA proposal that sources be allowed 30 days to make the adjustments in order to allow for multiple adjustments to optimize CO emissions.
- NACAA agrees with the suggestion that, where burner inspection is impossible without destroying the unit, it should not occur. In such instances, however, the source should conduct CO monitoring to determine whether the burner has deteriorated to the point that it should be replaced. We do not believe that burner inspections should be waived where they are merely "difficult" as this term is unenforceable. We suggest that such sources be allowed to determine CO baseline emissions after a tune up and thereafter substitute CO testing in lieu of inspection if they prefer.
- NACAA notes that EPA's rationale for the establishment of a non-continental liquid subcategory (without emission data for each pollutant) is undercut by the use of continental liquid data for missing pollutant data.
- EPA has proposed reduced testing frequency for sources whose emission tests are at or below 75 percent of the emission limit. This suggestion is inconsistent with EPA's determination that emissions from well-controlled sources routinely vary by more than an order of magnitude
- NACAA agrees that sources may employ automated fuel-sampling equipment, but notes that the 90th percentile compliance obligation is inconsistent with EPA's determination that MACT floors must be set at a 99th percentile level.
- EPA has solicited comment on an industry proposal to allow units that switch to natural gas as a compliance option to average emissions with similar units that do not switch to natural gas. NACAA does not see how this concept could be authorized under the Act.
- EPA has requested comment on a stakeholder proposal that EPA consider creating a subcategory for units that are installed and used in place of flares that are currently used to combust process gases. The stakeholders also suggested that it would be appropriate

to assume that the emissions from process gases diverted from flares to boilers have ‘‘zero emissions’’ for the purposes of classifying the boiler in which they are combusted. Since the process gases must be combusted in either event, they requested that the EPA develop an approach where it uses a concept similar to the emissions averaging provisions, for example, to simply assume that combustion of such process gases in a boiler rather than a flare should not be counted as emissions from the boiler because there is no net increase in emissions. NACAA supports the use of well-controlled closed combustion devices in lieu of open. However, it appears that such devices would be governed by Gas 2 limits. EPA provides an exemption for combustion devices used as pollution control devices where 50 percent of the heat value of the device is provided by the exhaust stream that is being controlled. The stakeholder proposal would effectively remove the 50-percent limit. NACAA believes this is excessive and would substantially eliminate HAP emission reductions in the Gas 2 category.

- NACAA believes that EPA’s proposal to establish emission limits to two significant digits is a step in the right direction, but recommends that those limits be set to three significant digits. No reason has been advanced by EPA for not doing so.
- EPA has proposed to delete the requirement that compliance monitors for PM limits conduct annual RATA testing to demonstrate the accuracy of the results. NACAA opposes this proposal as it will diminish the protectiveness of the standards and potentially render the standard unenforceable.
- EPA has solicited comment on the use of continuous Hg monitors rather than fuel testing. NACAA supports this proposal; as discussed herein fuel sampling is insufficiently precise to monitor compliance at appropriate emission levels.
- NACAA is supportive of EPA efforts to afford maximum flexibility to affected sources in demonstrating compliance, in order to allow lowest cost emission reductions and the best use of limited state and local resources. We agree that properly functioning SO_2 controls will also reduce HCl emissions and so chlorine levels can be correlated with HCl emissions in such units and in such instances. Sources with existing SO_2 monitors should not have to install separate HCl monitors. However, low sulfur concentration in fuels does not guarantee low chlorine levels in those fuels, especially in biomass fuels. NACAA does not support the use of continuous SO_2 monitors as a surrogate for HCl monitoring in units that do not have active SO_2 controls.
- EPA has proposed MACT floors for CO emissions from three subcategories that are either at, or very close to, the sole test result for the subcategory, effectively providing no allowance for in-use variation in performance. No reason is offered for EPA’s decision and we assume that some correction will be made.
- EPA has not proposed a TSM alternative “because of the limited emission test data for TSM and the large variability in the TSM data for these subcategories. Using the EPA’s maximum achievable control technology (MACT) floor methodology, the alternative TSM limits resulted in MACT floor values which do not appear to represent the actual performance of the best performing units.” NACAA agrees with EPA’s recommendation and the rationale for not proposing such limits. While EPA has sent follow-on inquiries to some sources for additional data, there is insufficient opportunity to meaningfully review and comment on any data that may be provided at this time.
- NACAA has reviewed EPA’s Response to Comments submitted in the 2011 rulemaking. We recognize that responding in detail to the many thousands of comments received in

that rulemaking would be an enormous undertaking. As a consequence, however, EPA has not provided a meaningful response to most of the comments submitted by NACAA. This makes it difficult to advance the issues that carry forward from that rulemaking to the present activity.

CONCLUSION

NACAA believes the proposed rules, if adopted, will lead to significant reductions in HAP emissions in a number of subcategories, most notably in reductions of Hg from the solid fuel-fired subcategory. These emission reductions are needed to address HAP emissions from this sector, which have remained largely unregulated under the CAA until now. For this reason, NACAA generally supports promulgation of rules for this sector. However, flaws in the EPA calculation procedure have created several subcategories that are, for all practical purposes, exempt. NACAA believes that these "exemptions" are neither intended by the CAA, nor wise as a matter of public policy.

EPA should be guided by two broad principles in determining MACT floors. MACT floors should require some level of emission reduction from a substantial percentage of each subcategory and clearly require significant emission reductions from gross emitters. While the Courts have determined that MACT standards do not have to be achievable by all sources, MACT standards should not be set at a level that is unachievable by a significant portion of the regulated community. The overall policy of the Clean Air Act is:

> to protect and enhance the quality of the Nation's air resources so as to promote the public health and the productive capacity of its population. 42 U.S.C. 7401(b)(1).

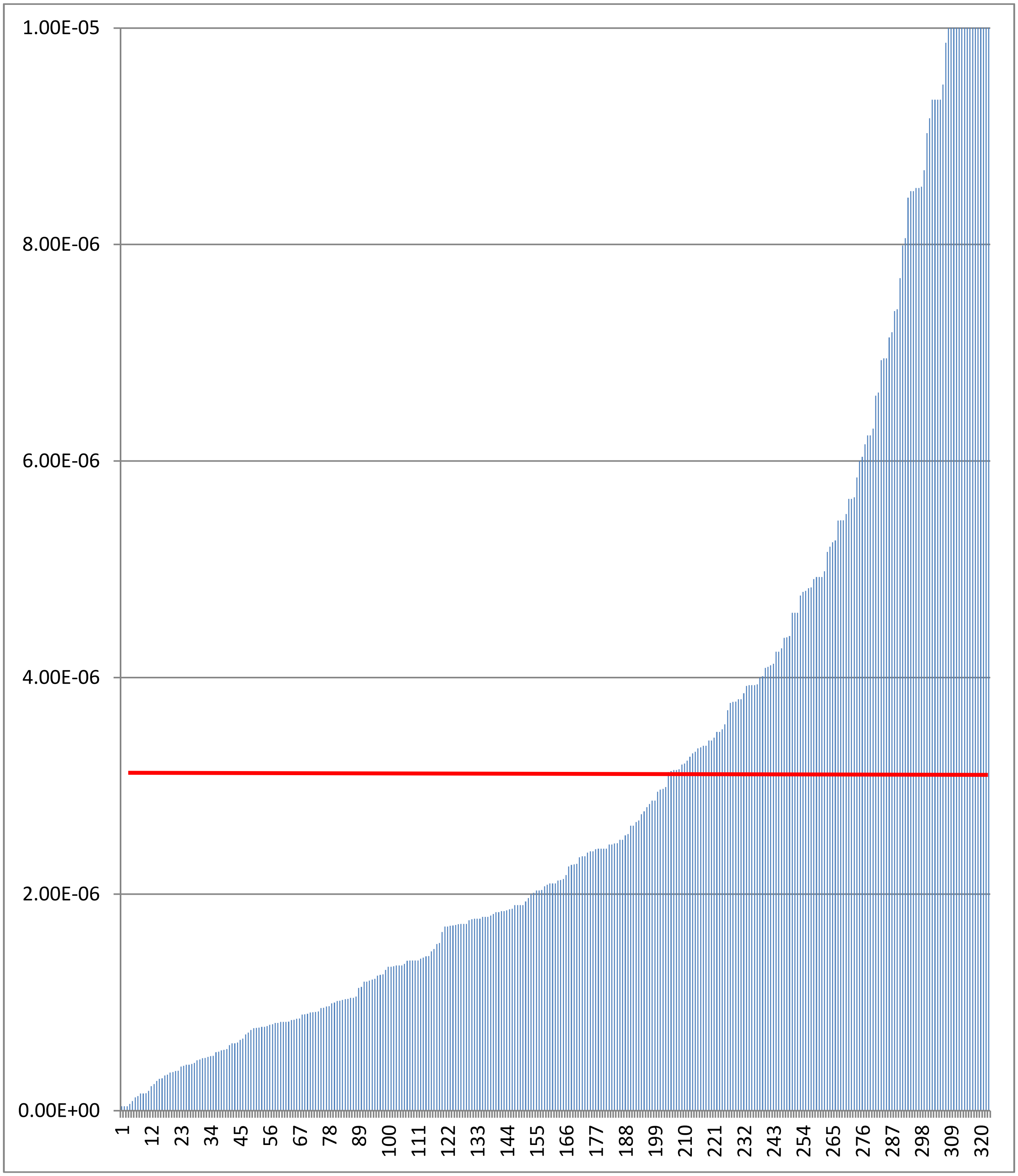
Accordingly, EPA should also demonstrate that the standards it adopts are achievable by the vast majority of sources through the use of cleaner fuels and/or emission controls. In order to do this, EPA should identify the reasons why emission rates at better performing units are so much lower (i.e., tighter) than the worst emitters in the group. EPA should also demonstrate how its decisions concerning development of MACT standards serve to promote the public health. At the very least EPA should calculate and provide to the public the estimated impact of its decisions on data management and determination of the MACT floors on HAP emission rates and, to the best it can, public health.

The EPA calculations of the average performance of the top-performing units are generally correct to within a few percent. The issue lies in the determination of the variability of the top-performing units. EPA's proposed procedure generally overstates this variability and for some categories produces grossly inaccurate results. Fortunately, the reasons for the unrealistic assessment of variability in performance of a number of subcategories are readily apparent on review of the underlying data. We do not believe that reassessing the variability of best-performing units in the manner we describe will greatly increase the cost of the rule, as EPA's procedure does require substantially reduced emissions in HAPs in some of the most important subcategories. It will require a reasonable level of emission reductions in all subcategories. EPA's reanalysis of the variability of emissions from the best-performing units should include evaluation of alternate approaches to determining variability and specifically identify the impact on emissions of each of the potential alternatives. Similarly, where EPA believes adopting and enforcing numerical limitations requires the use of work-practice standards, EPA should show that the standards it adopts reflect the work practices of the best performing units and achieve emission reductions that are not less stringent than would be achieved by application of MACT floors. Where EPA declines to set limits at the levels achieved by commonly employed pollution control technologies, such as fabric filters, acid gas scrubbers and sorbent injection, EPA should set forth its reasons. Finally, EPA should acknowledge the limitations in the data set used to develop the current rules and recognize that any future rulemaking in this sector should consider any improvements in the data that may be available at that time.

We recognize that this comment is long and raises a large number of issues. This, we believe, is to be expected given the very large number of issues associated with developing sensible, affordable and protective emission limitations in such a diverse sector. We have attempted to avoid repeating comments we made concerning the proposal that led to the final rules that are now being reconsidered. However, many of those same issues are relevant to EPA's reconsideration decisions. Therefore, NACAA has attached those comments and incorporates them herein. EPA's proposed emission limits will generate significant emission reductions for a number of subcategories in the sector. We believe that if EPA adopts our recommendations it can develop sensible limits for all subcategories and do so within the next three months. NACAA appreciates the effort of EPA, its employees and its contractors over the past 15 years that these rules have been under development. NACAA's members have been engaged with EPA in this effort since the 1998 ICCR and are committed to continue to work with EPA and other interested parties to develop rules that work.

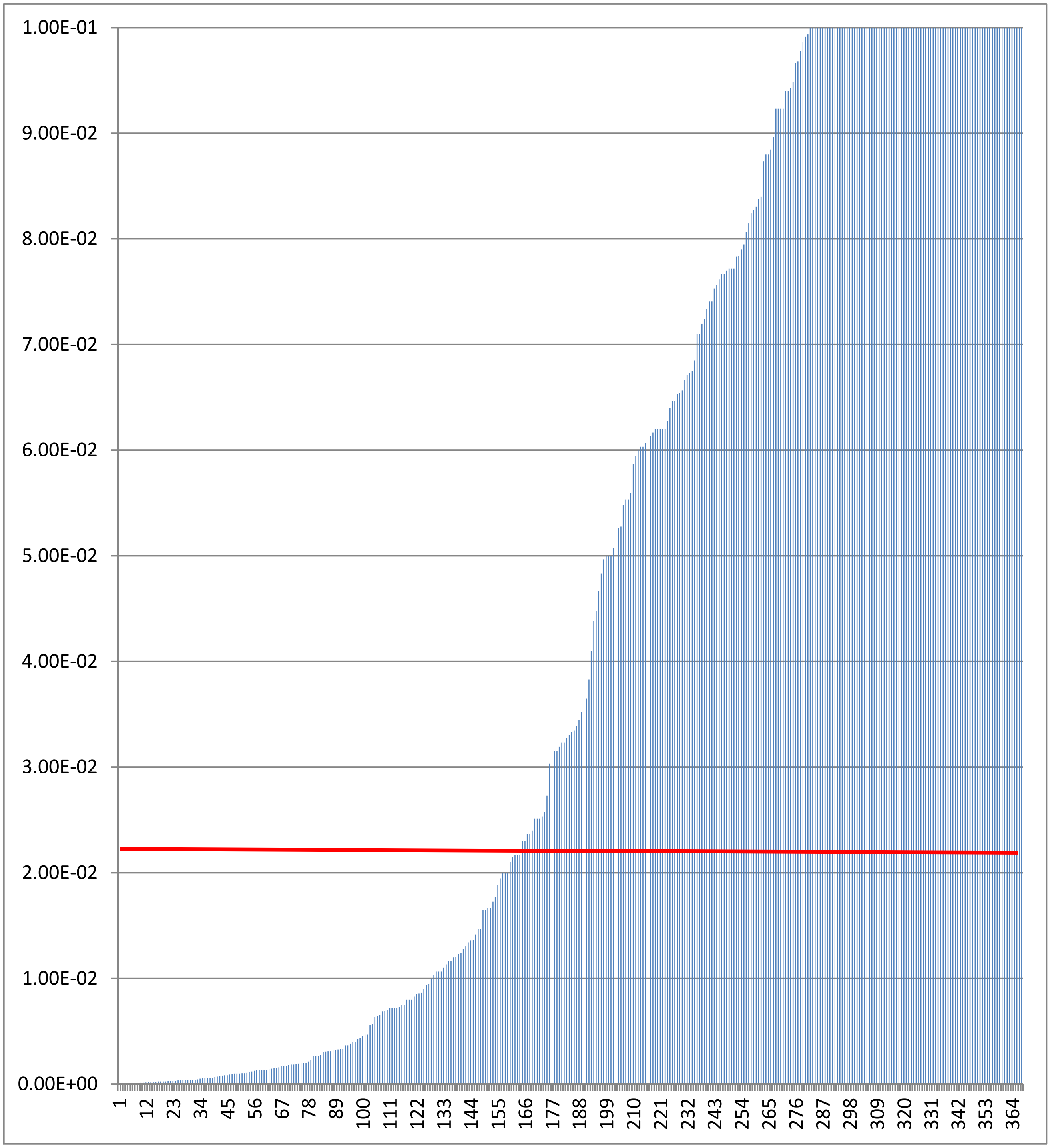
Appendix 1

Chart 2a: Unit Rankings for Hg from Solid Fuel Units (10^{-6} lb/MMBtu) (proposed limit 3.1 x 10^{-6} lb/MMBtu)[43]



[43] Headings refer to EPA's Worksheets numbers.

Chart 2b: Unit Rankings for HCl Emissions from Solid Fuel Units (proposed limit 0.022 lb/MMBtu)

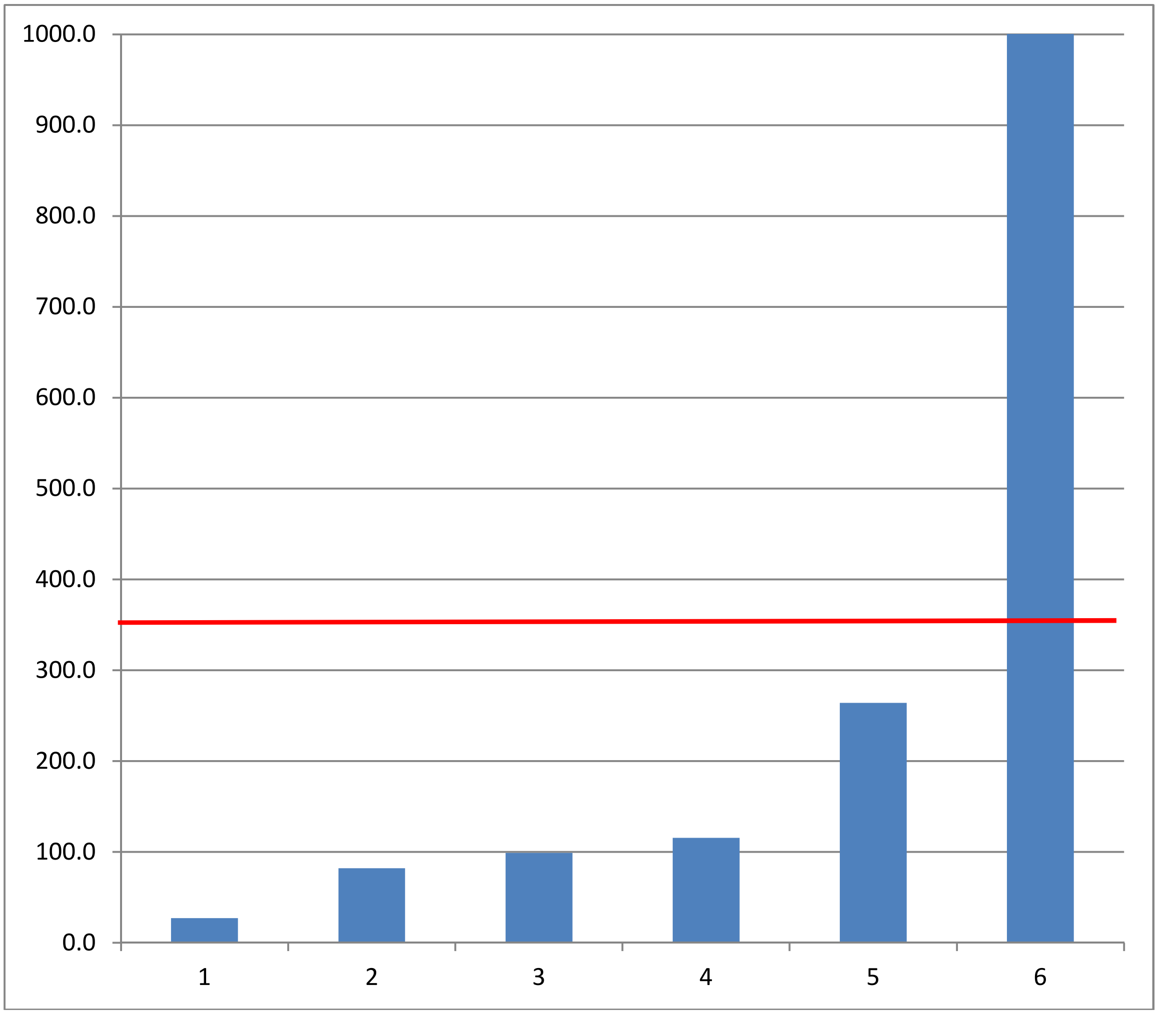


Appendix B-3a: Unit Rankings for CO from Fluidized Bed Biomass Units (Recommended Option)

FacilityID	Minimum Test Average	Number of Tests
WIGPGreenBay2818	27.0	1
TNDomtar2384	81.7	1
GATempleInlandRome	98.8	1
TNBowaterNewsprint	115.4	1
ALIPCourtland	263.8	1
NDCargillWestFargo[44]	3551.7	1

[44] Not in top 5 units; result did not affect MACT floor

Chart 3a: Unit Rankings for CO from Fluidized Bed Biomass Units (proposed limit 370 ppm)

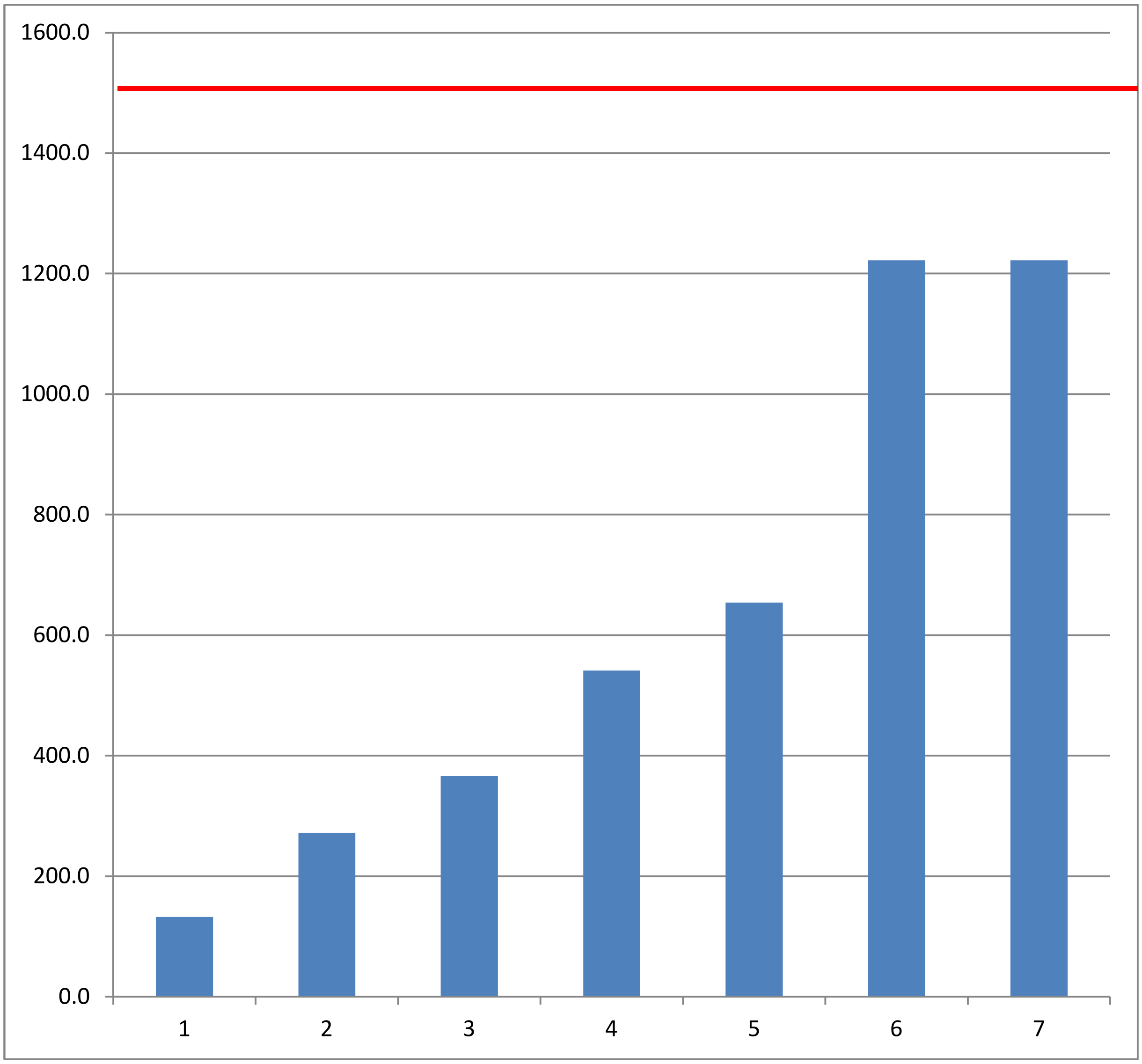


Appendix B-3b: Unit Rankings for CO from Fuel Cell Biomass Units (Recommended Option)

Facility ID	Test Average	Number of Tests
MNWeyerhaeuserIronton	132.3	1
IDPotlatch	272.1	2
GAADMLocation551	366.4	1
ARAnthonyForestProducts	541.3	1
ARAnthonyForestProducts	654.3	1
TXNorbordTexasNacogdoches[45]	1222.1	1
TXNorbordTexasNacogdoches	1222.1	1

[45] Not in top 5 units; results did not affect MACT floor

Table 3b: Unit Rankings for CO from Fuel Cell Biomass Units (Proposed Limit 1500 ppm)



Appendix B-3c: Unit Rankings for CO from Dutch Oven/Pile Burners Biomass Units (Recommended Option)

Facility ID	Test Average	Number of Tests
ARWeyerhaeuserDierksMill	62.6	4
WVGPMtHopeOSB	126.9	1
KYWeyerhaeuserEKY	180.0	3
KYWeyerhaeuserEKY	180.0	3
MSWeyerhaeuserBruce	240.0	6
ORStimsonLumberForestGrove[46]	240.0	4
ORStimsonLumberForestGrove	240.0	4
ORStimsonLumberForestGrove	240.0	4
WAWeyerhaeuser_Raymond	240.0	3
VAGeorgiaPacificBrooknealGladys	240.0	1
ARPotlatchForestWarren	286.0	4
WAGraysHarborPaper	513.6	1
ORRosboroSpringfield	523.5	1

[46] Not in top 5 units, results did not affect MACT floor

Chart 3c: Unit Rankings for CO from Dutch Oven/Pile Burners (Proposed Limit 810 ppm)

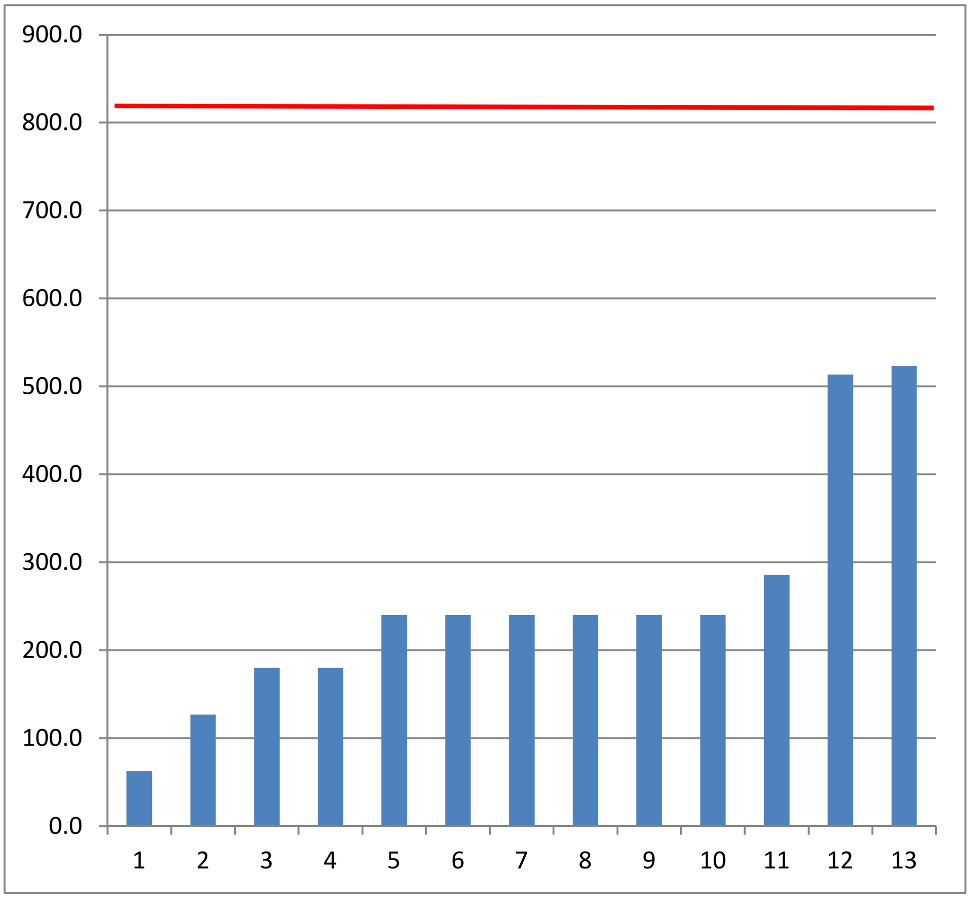
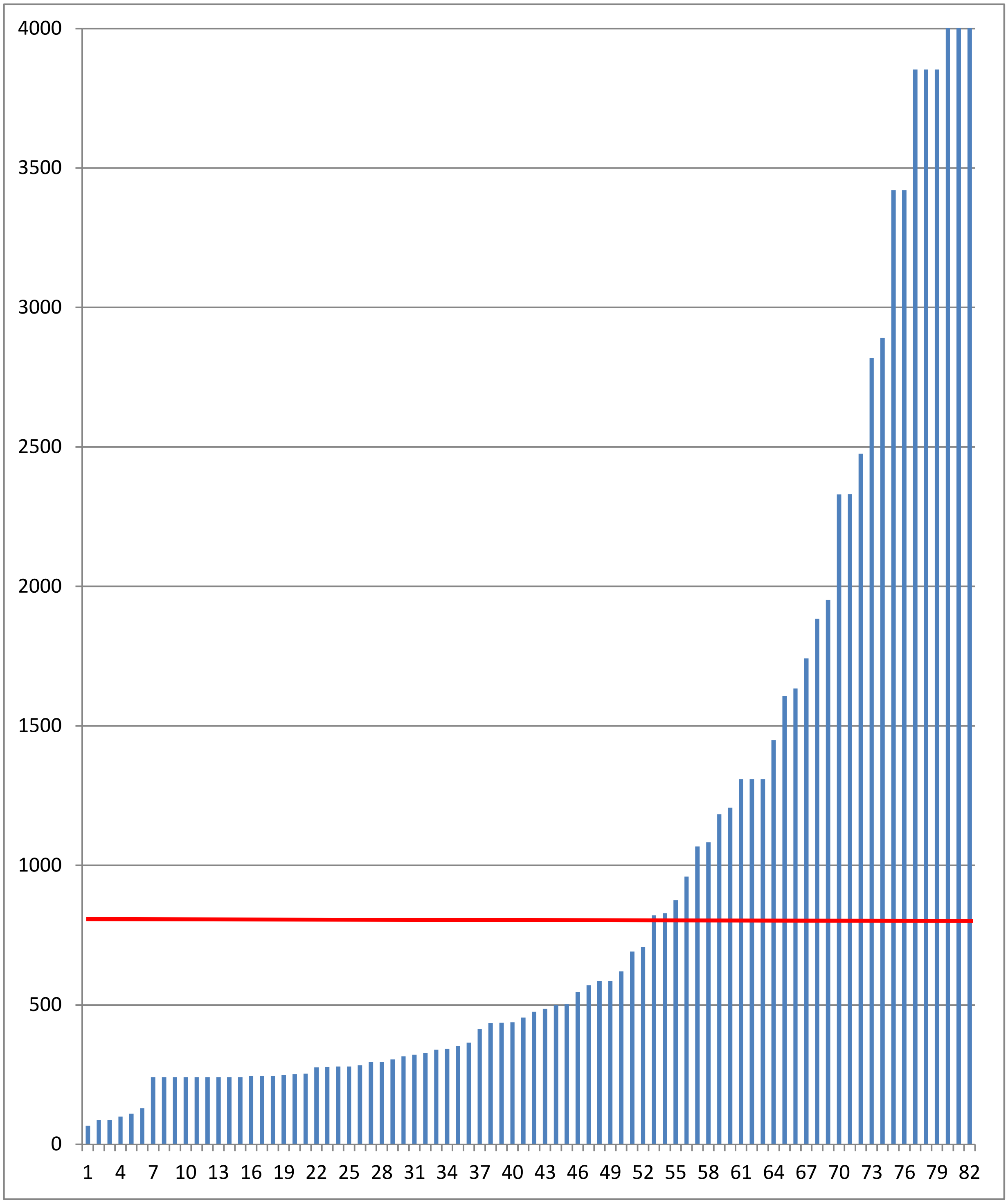


Chart 3d: Unit Rankings for CO from Stokers/Sloped Grate/Other Wet Biomass Units (Proposed Limit 790 ppm)

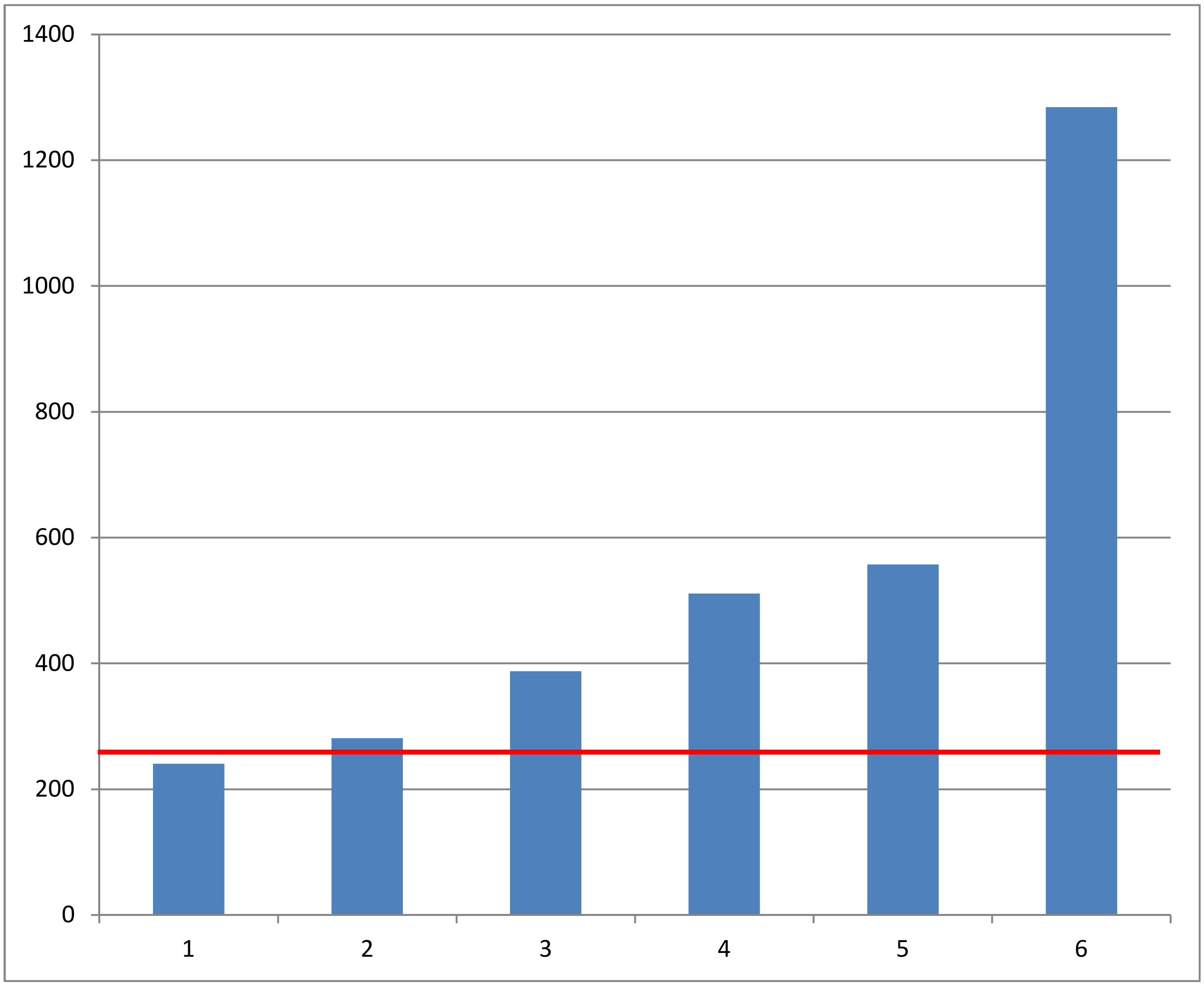


Appendix B-3e: Unit Rankings for CO from Stokers/Sloped Grate/Other Dry Biomass Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
WIAlgoma[47]	B03	240.3834	1
WVAmericanWoodmark	B1	281.3497	1
FLSmurfit-Stone	5PB	387.5904	1
WIAshland	B20	511.1034	1
OKPanPacificProducts	EU 100	557.0262	1
WVAmericanWoodmark	B2	1284.254	2

[47] Only the WIAlgoma Unit B03 test result is included in the MACT floor as it represents the top 12 percent

Chart 3e: Unit Rankings for CO from Stokers/Sloped Grate/Other Dry Biomass Units (Proposed Limit 250 ppm)

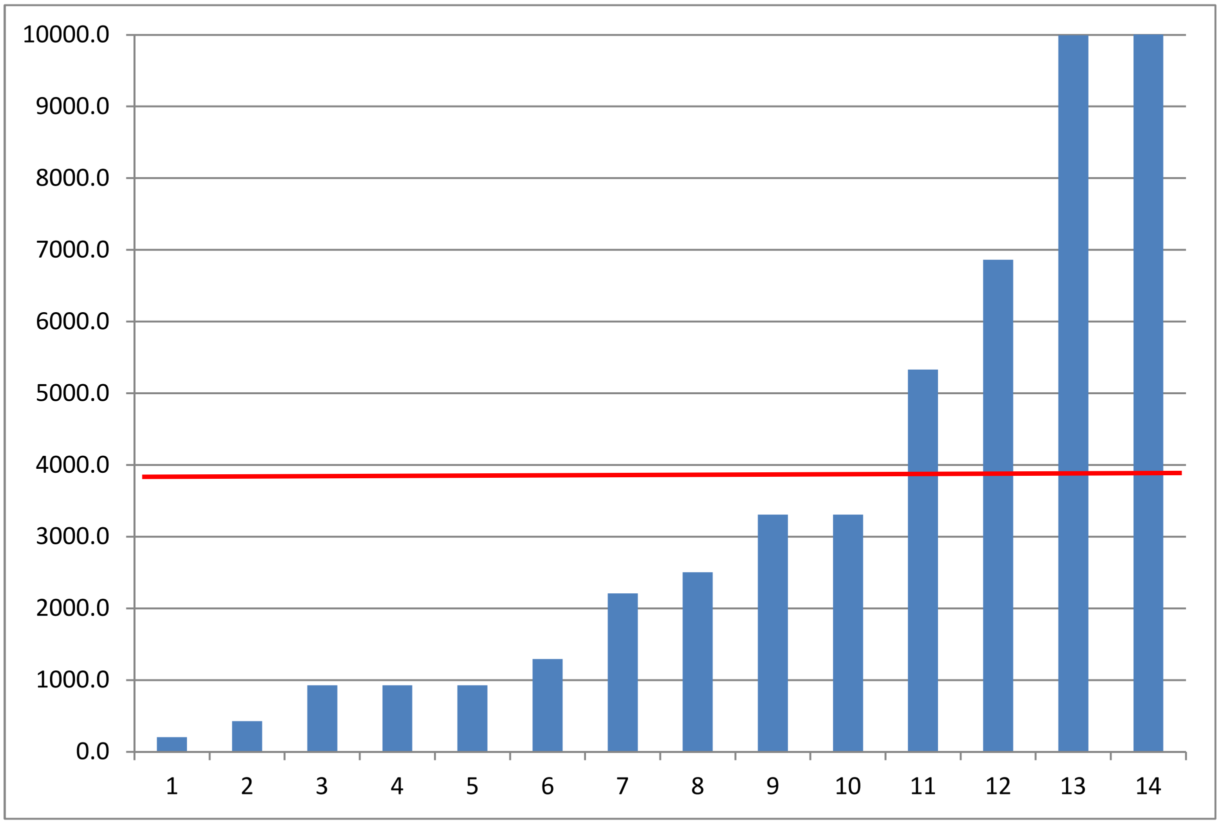


Appendix B-3f: Unit Rankings for CO from Hybrid Suspension Grate Boiler Biomass Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests[48]
FLUSSugarCorp	Boiler No. 7	204.1	13
FLUSSugarCorp	Boiler No. 8	426.6	6
FLSugarCaneGrowersCoop	Boiler No. 8	930.0	13
FLSugarCaneGrowersCoop	Boiler No. 3	930.0	1
TXRGVSG	Boiler No. 6	930.0	1
FLUSSugarCorp	Boiler No. 4	1293.3	11
HIPuuneneSugarMill	Boiler 3	2210.7	3
FLSugarCaneGrowersCoop	Boiler No. 1	2503.3	1
HIPuuneneSugarMill	Boiler 1	3306.4	2
HIPuuneneSugarMill	Boiler 2	3306.4	2
FLOsceolaFarms	Boiler No. 3	5331.9	1
FLUSSugarCorp	Boiler No. 1	6861.9	1
FLOsceolaFarms	Boiler No. 6	9992.6	1
FLUSSugarCorp	Boiler No. 2	19810.1	2

[48] The large number of tests for several units will affect the overall compliance picture as several units will show higher results in other tests.

Chart 3f : Unit Rankings for CO from Hybrid Suspension Grate Boiler Biomass Units (Proposed Limit 3900 ppm)

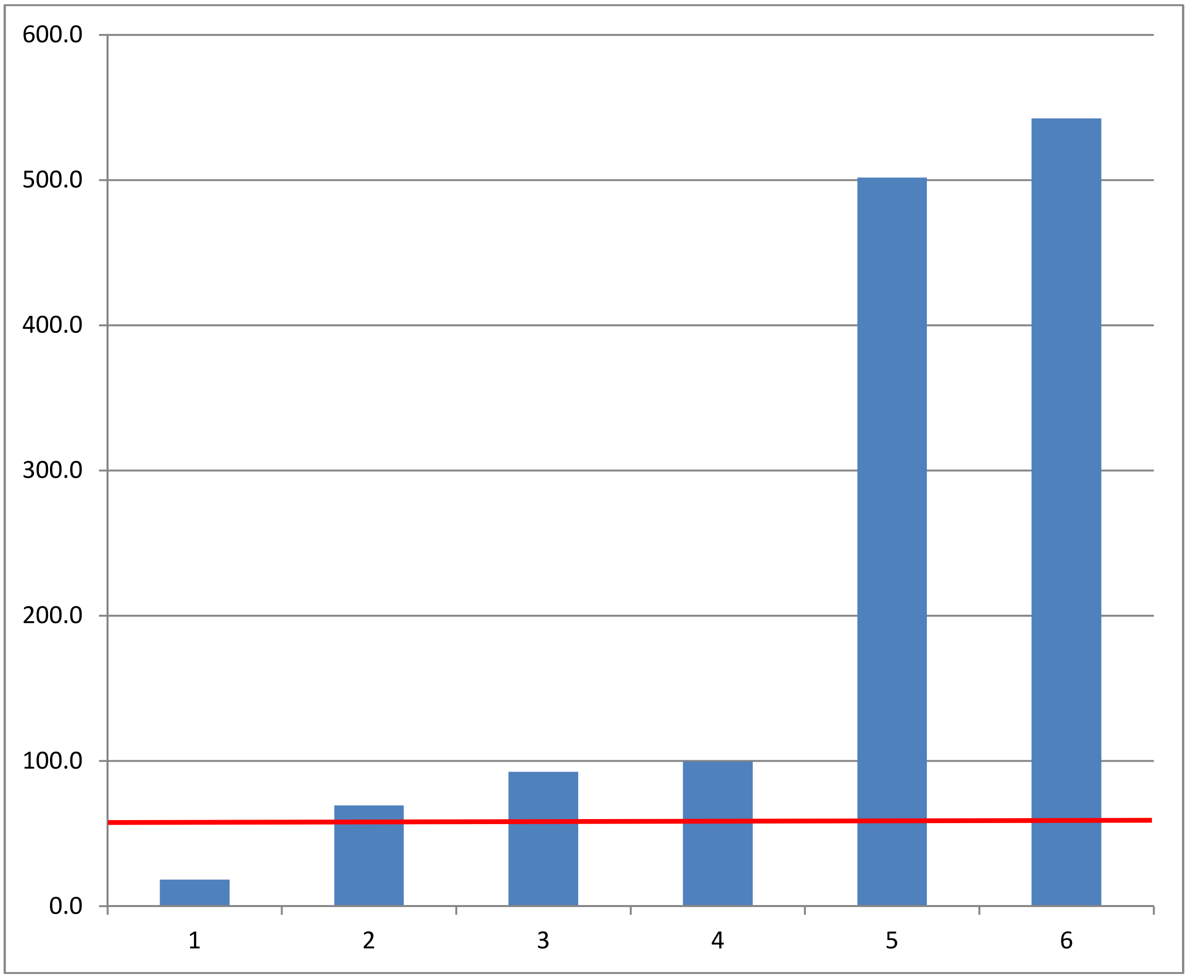


Appendix B-3g: Unit Rankings for CO from Suspension Burner Biomass Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
GATempleInlandThomson[49]	BW-B001	18.3	2
TXDibollTemple-Inland	PB-44	69.3	1
MNAndersonCorpBayport	Boiler 11 EU620	92.5	2
MNAndersonCorpBayport	Boiler 12 EU621	99.6	2
OHSauderWoodArchbold	B009	501.8	1
OHSauderWoodArchbold	B008	542.5	1

[49] Only the result for the GATempleInlandThomson unit was used to compute the MACT floor as it represents the top 12 percent.

Chart 3-g: Unit Rankings for CO from Suspension Burner Biomass Units (Proposed Limit 58 ppm)



Appendix B-4a: Unit Rankings for CO from Fluidized Bed Coal/Solid Fossil Fuel Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
IAADMCornProcessingCR	EU-530	12.73478	1
ILCornProductsInt[50]	B10	32.90599	1
ILPolyOne	B1	38.58314	1
NCUNCCogen	ES-001	41.05215	1
IAADMCornProcessingCR	EU-501B	51	3
IAADMCornProcessingCR	EU-501A	51	1
IAADMCornProcessingCR	EU-502A	51	1
NEADMLincoln	EU26 Coal Boiler	51	1
INPurdueUniverisity	Boiler 5	54	2
ILBungeDanville	CFB Boiler	54	1
IAArchersDanielsMidlandDesMoines	Asea Boiler #1	55.2046	2
WIGPGreenBay2818	B29 - Fluidized Bed Boiler #9	110	2
IAADMCornProcessingCR	EU-502B	110	1
IAUofIowa	EP7 Boiler 11	110	1
PAKimberlyClarkChester	Boiler #10 (ID 035)	110	1
PAPHGlatfelter	PB5	110	1

[50] Only the first two units were used for the MACT floor calculation as they comprised the top 12 percent.

Chart 4a - Unit Rankings for CO from Fluidized Bed Coal/Solid Fossil Fuel Units (Proposed Limit 56 ppm)

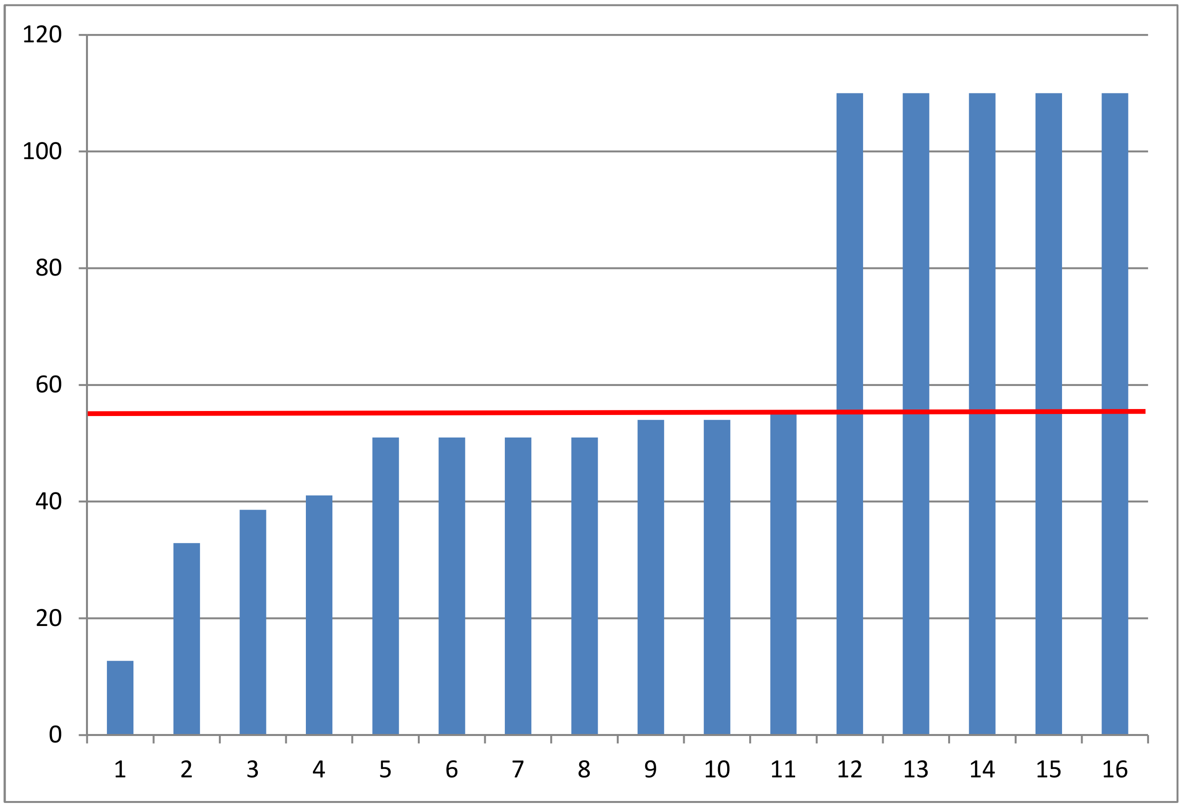
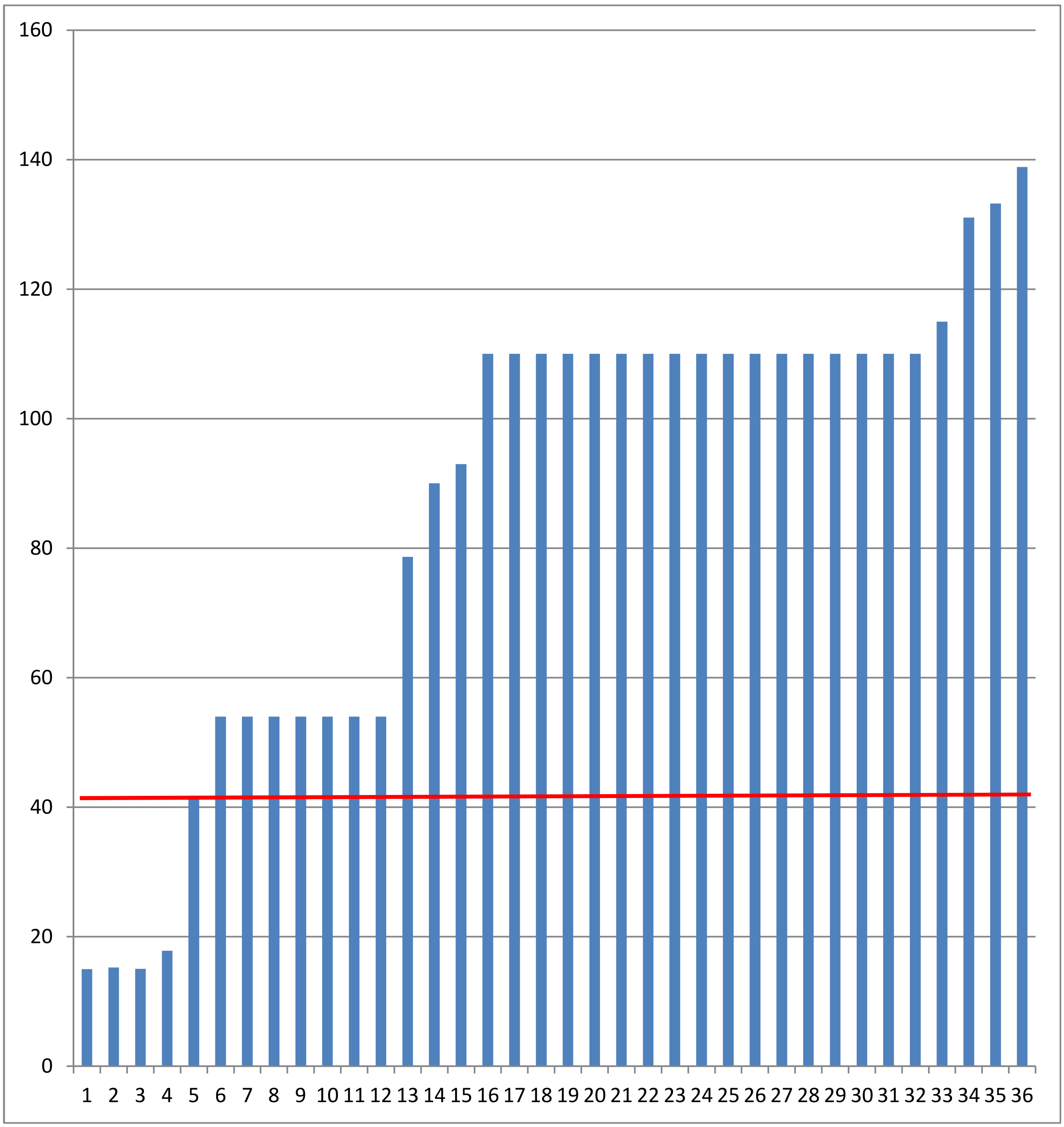


Chart 4b: Unit Rankings for CO from Pulverized Coal/Solid Fossil Fuel Units (Proposed limit 41 ppm)

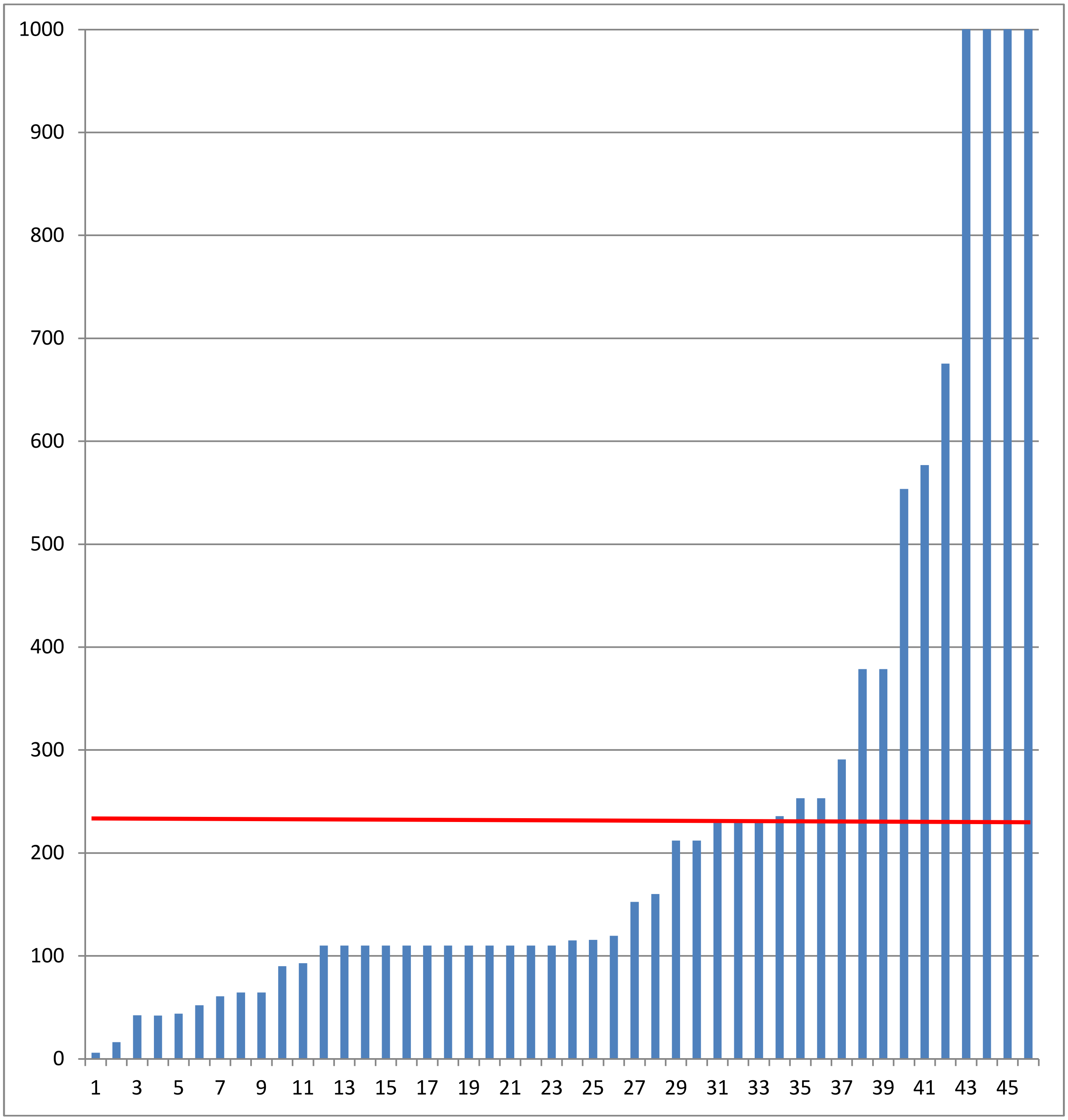


Appendix B-4c: Unit Rankings for CO from Stoker Coal/Solid Fossil Fuel Units (Recommended Option)

FacilityID	Minimum Test	Number of Tests
INNotreDame	6	1
WVDuPontWashingtonWorks	16.31036	1
IAMuscatinePowerandWater	42.41023	3
OHMortonSaltRittman	42	1
VAUniversityofVirginia	43.97924	2
KYISPChemicals	52.07334	2
ILAbbottAbbottPark	60.66338	1
WIThilmanyLLC	64.45627	1
WIThilmanyLLC	64.45627	1
WVATKRocketCenter	89.92871	2
OHAppletonIdeas	93	1
IAMonsantoMuscatine	110	1
IAUofIowa	110	1
MOColumbiaPowerPlant	110	1
MOColumbiaPowerPlant	110	1
NCEPCORRoxboro	110	1
NCEPCORRoxboro	110	1
NCEPCORRoxboro	110	1
NCNC_DukeUniversity_Durham	110	1
OHAkronThermalEnergy	110	1
OHAppletonIdeas	110	1
SCInternationalPaperEastover	110	1
VAUniversityofVirginia	110	1
WIFlambeauRiverPaper	114.9405	1
SCClemson	115.5321	1
OHBataviaTransmissions	119.6666	1
VAUniversityofVirginia	152.5902	1
WYFMCGranger	160.0386	1

WIThilmanyPapersNicoletMill	212.115	1
WIThilmanyPapersNicoletMill	212.115	1
NCEPCORSouthport	232.6775	1
NCEPCORSouthport	232.6775	1
NCEPCORSouthport	232.6775	1
WYFMCGranger	235.6569	1
MNADMCornDivision	253.2463	1
MNADMCornDivision	253.2463	1
MDNewPage-Luke	290.9382	1
OHCampbellsSoupCo	378.6471	1
OHCampbellsSoupCo	378.6471	1
TNCargillMemphis	553.7431	1
IDTASCOPaul	576.9392	1
NDMinnDakFarmers	675.4882	1
MIMortonSaltManistee	1285.947	1
IACargillEddyville	4373.055	1
IACargillEddyville	4373.055	1
IACargillEddyville	4373.055	1

Chart 4c: Unit Rankings for CO from Stoker Coal/Solid Fossil Fuel Units (Proposed Limit 220 ppm)

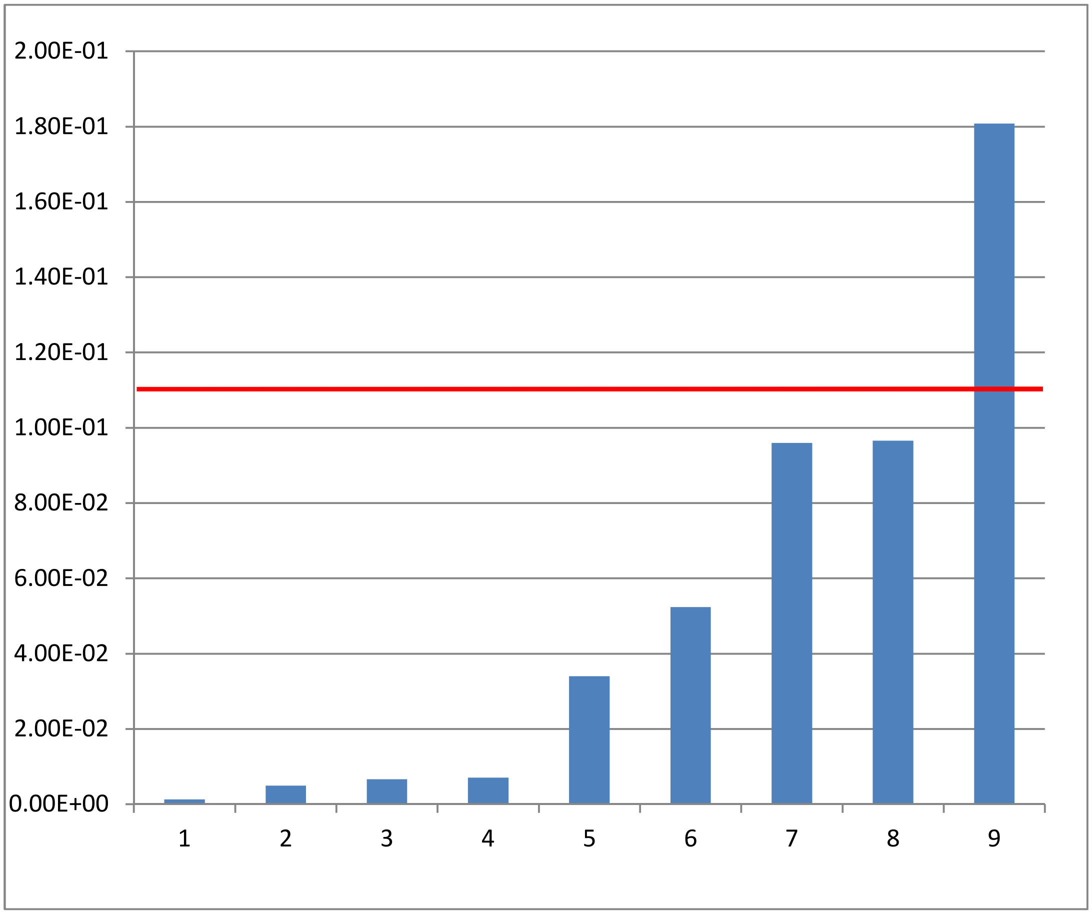


Appendix B-5a: Unit Rankings for Filterable PM from Fluidized Bed Biomass Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
WIGPGreenBay2818	B10 - Wastepaper Sludge-Fired Boiler 10	1.34E-03	2
ALIPCourtland	No. 3 Combination Boier / 11Cu301	4.92E-03	1
GATempleInlandRome	WF	6.65E-03	1
ORGeorgiaPacificWaunaMill	EU35 - Fluidized Bed Boiler	7.10E-03	1
TNBowaterNewsprint	Bubbling Fluidized Bed Boiler	3.40E-02	3
NCSeaboardLumber[51]	ES-3	5.24E-02	1
TNDomtar2384	HFB1-1	9.60E-02	1
FLRayonierPerformance	PB06	9.66E-02	1
NDCargillWestFargo	Foster Wheeler Boiler (EU43)	1.81E-01	1

[51] Test results from the top 5 units were used to compute the MACT floor.

Chart 5a: Unit Rankings for Filterable PM from Fluidized Bed Biomass Units (Proposed Limit 1.1 E-01 lb/MMBtu)

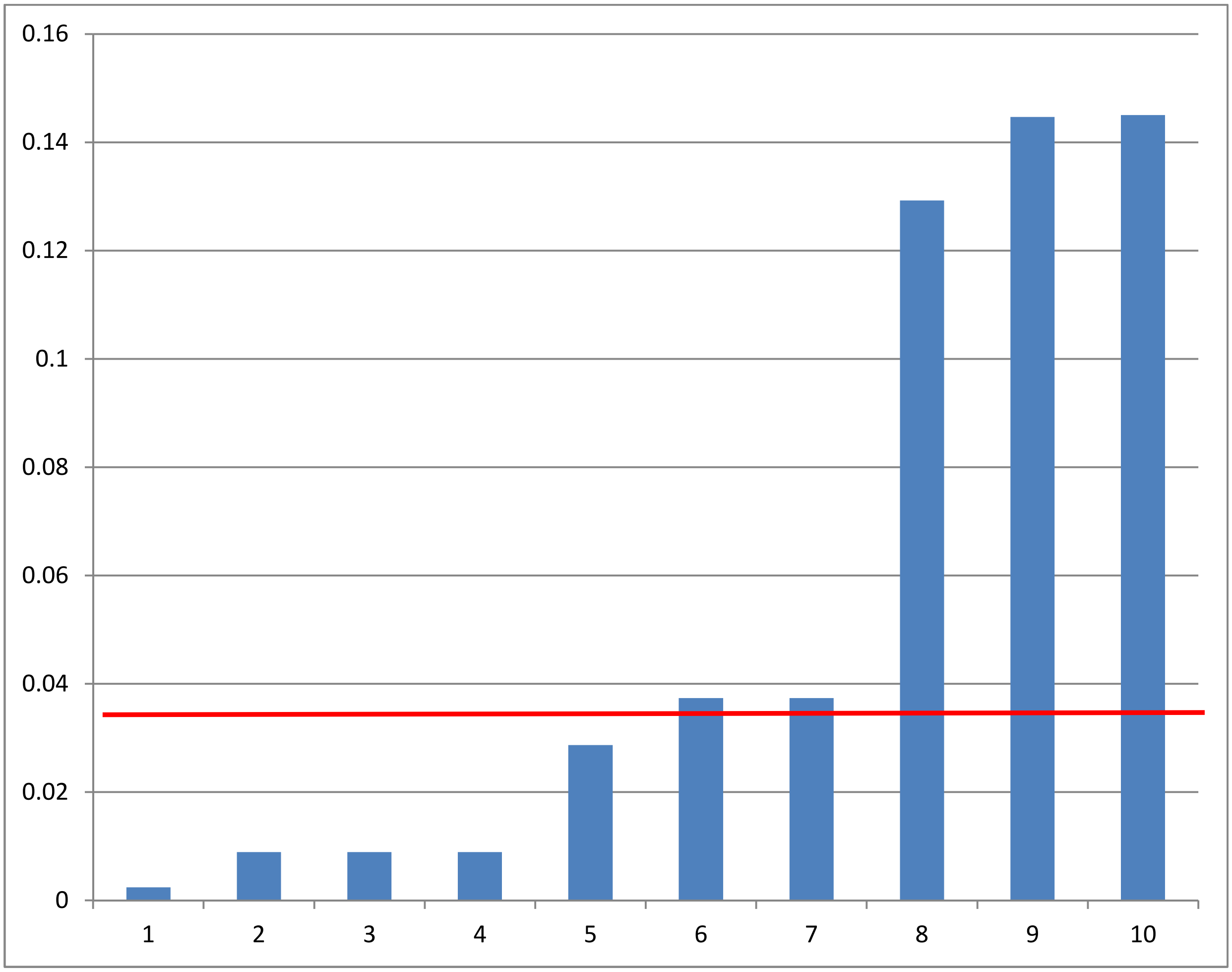


Appendix B-5c: Unit Rankings for Filterable PM from Fuel Cell Biomass Units (Recommended Option)

Facility ID	Combustor ID	Test Average	Number of Tests
IDPotlatch	PB-1 CE	0.0024	2
MSNorbordMS	Wellons No. 1	0.008944	1
MSNorbordMS	Wellons No. 2	0.008944	1
MSNorbordMS	Wellons No. 3	0.008944	1
MNWeyerhaeuserIronton[52]	EU 001 - 4 Cell Furnace	0.028662	1
TXNorbordTexasNacogdoches	Konus No. 1	0.037333	1
TXNorbordTexasNacogdoches	Konus No. 2	0.037333	1
ARAnthonyForestProducts	SN-12	0.129252	1
FLOsceolaFarms	Boiler No. 5	0.144667	11
FLOsceolaFarms	Boiler No. 4	0.145	11

[52] Results from the top 5 units were used to compute the MACT floor.

Chart 5c: Unit Rankings for Filterable PM from Fuel Cell Biomass Units (Proposed Limit 0.033 lb/MMBtu)



Appendix B-5e: Unit Rankings for Filterable PM from Dutch Ovens/Pile Burners Biomass Units (Recommended Option)

Facility ID	Combustor ID	Test Average	Number of Tests
ARPotlatchForestWarren	Wellons Boiler	0.0008	2
WAWeyerhaeuser_Raymond	Hog Fuel Boiler EU1	0.0008088	3
ARWeyerhaeuserDierksMill	SN-45	0.00142	3
MSWeyerhaeuserBruce	AA-002 No. 2 Boiler	0.0033333	7
WVGPMtHopeOSB[53]	5600 - Wellons Energy System	0.0443333	1
KYWeyerhaeuserEKY	MP 01-01	0.052	1
KYWeyerhaeuserEKY	MP 01-02	0.052	1
KYWeyerhaeuserEKY	MP 01-03	0.052	1
ORRosboroSpringfield	DV 01.1	0.12	1
WAGraysHarborPaper	No. 6 Boiler (EU2)	0.2360333	2
VAGeorgiaPacificBrooknealGladys	5600	2.4433333	1

[53] The large number of tests for several units will affect the overall compliance picture as several units will show higher results in other tests. See Chart 5e(1). Results from the top 5 units were used to compute the MACT floor.

Chart 5e: **Unit Rankings for Filterable PM from Dutch Ovens/Pile Burners Biomass Units (Proposed Limit 3.6 x10^{-2} lb/MMBtu)**

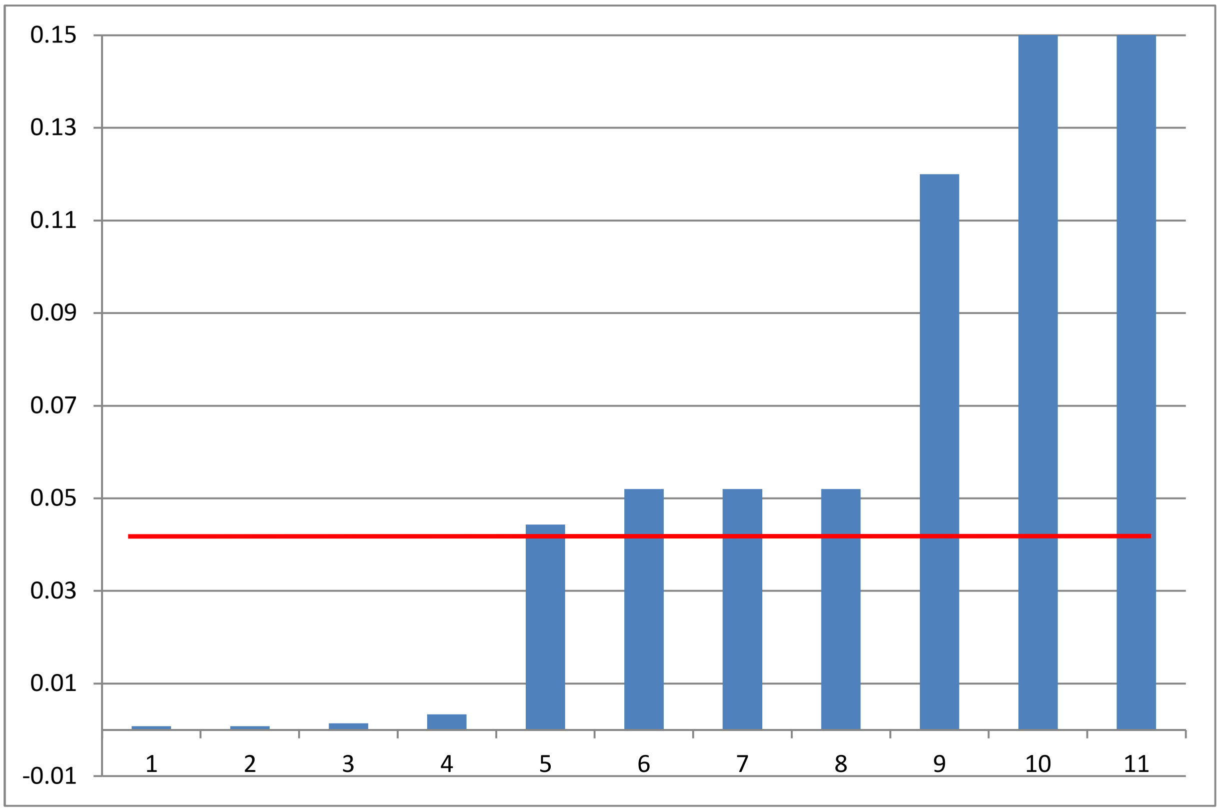
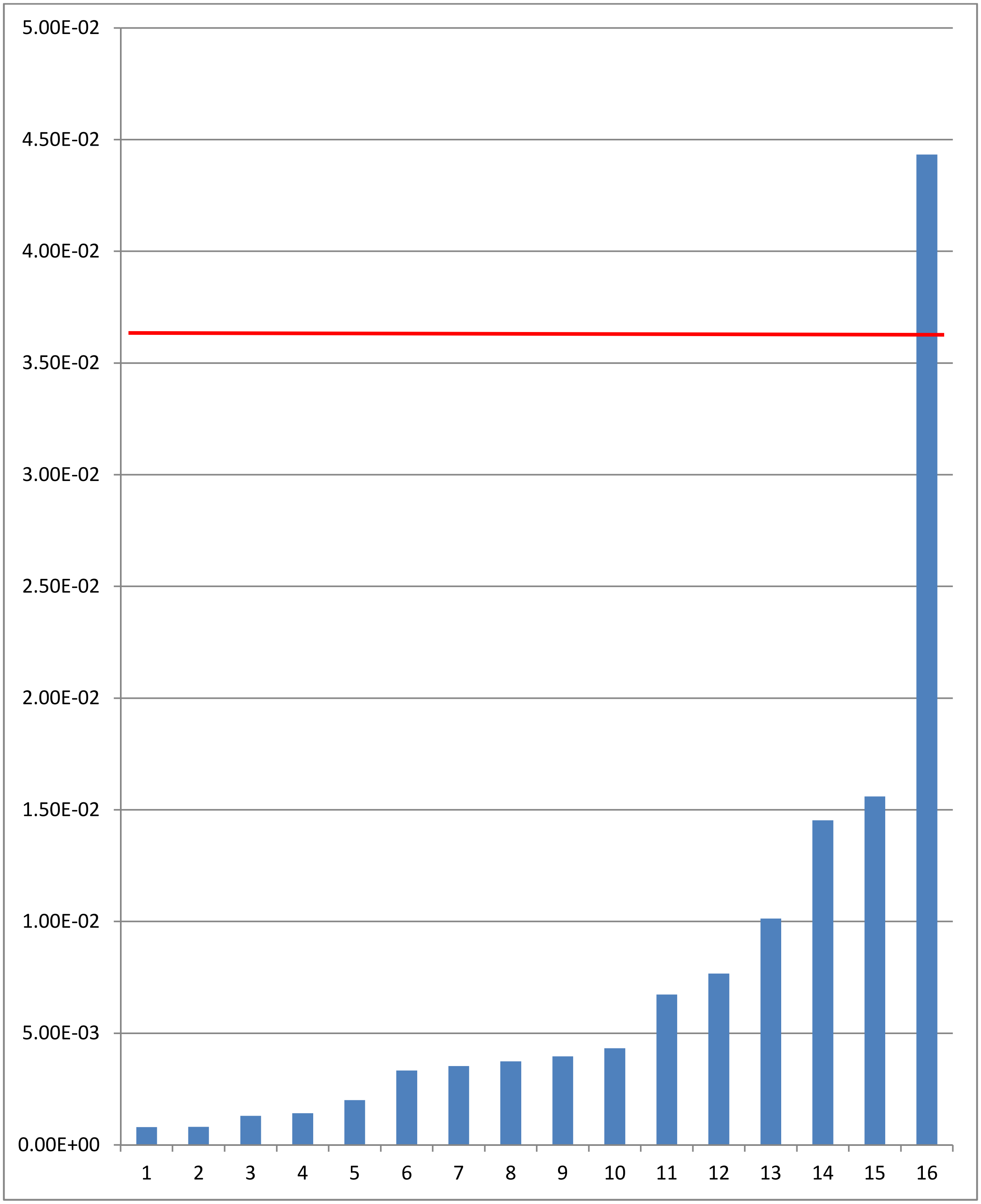
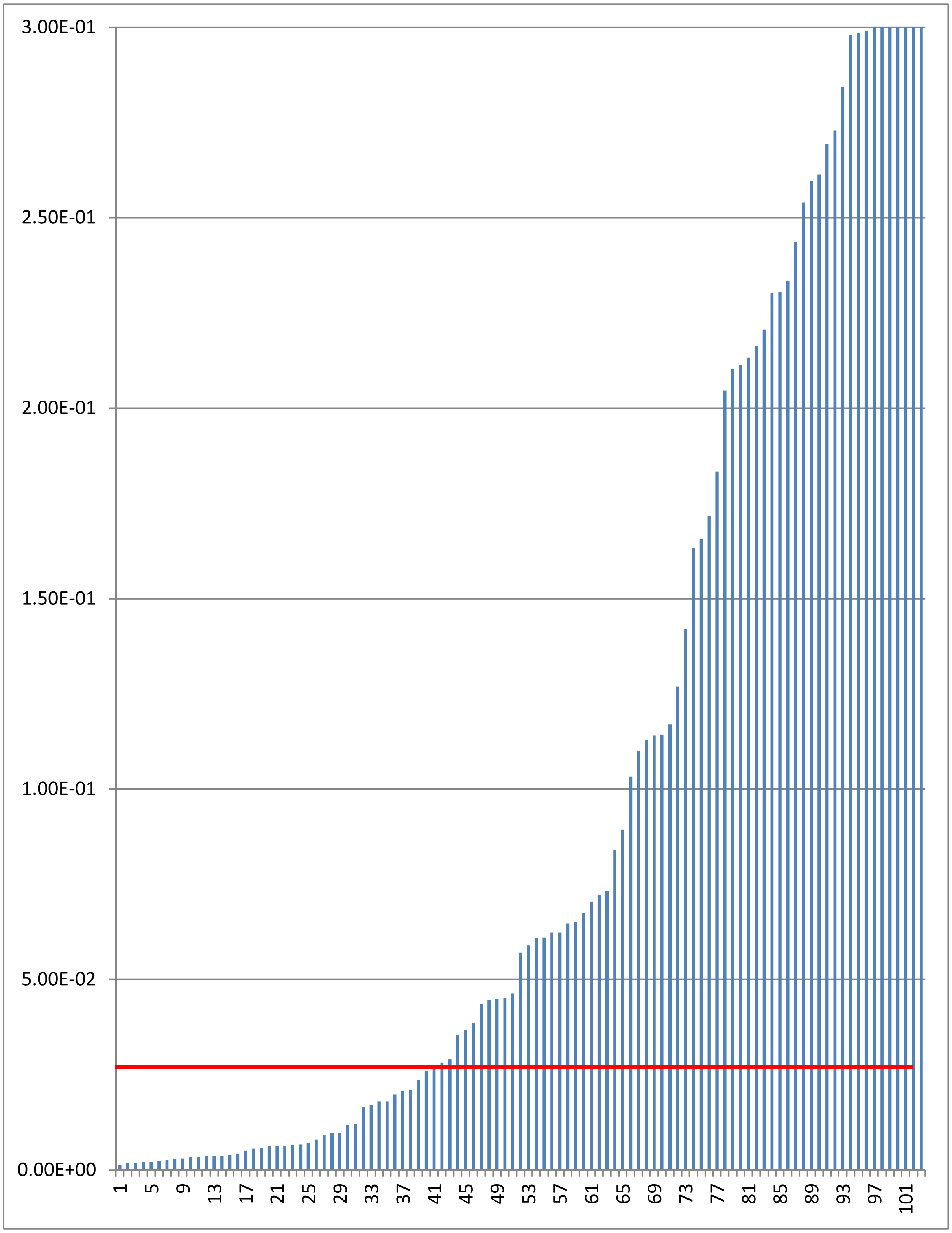


Chart 5e(1): Unit Rankings for Filterable PM from Dutch Ovens/Pile Burners Biomass Units (Proposed Limit 3.6 x10^{-2} lb/MMBtu)[54]



[54] All test results for units in the top 12 percent, not just the minimum test result.

Chart 5g: Unit Rankings for Filterable PM from Stokers/Sloped Grate/Other Wet Biomass (Proposed Limit 0.029 lb/MMBtu)

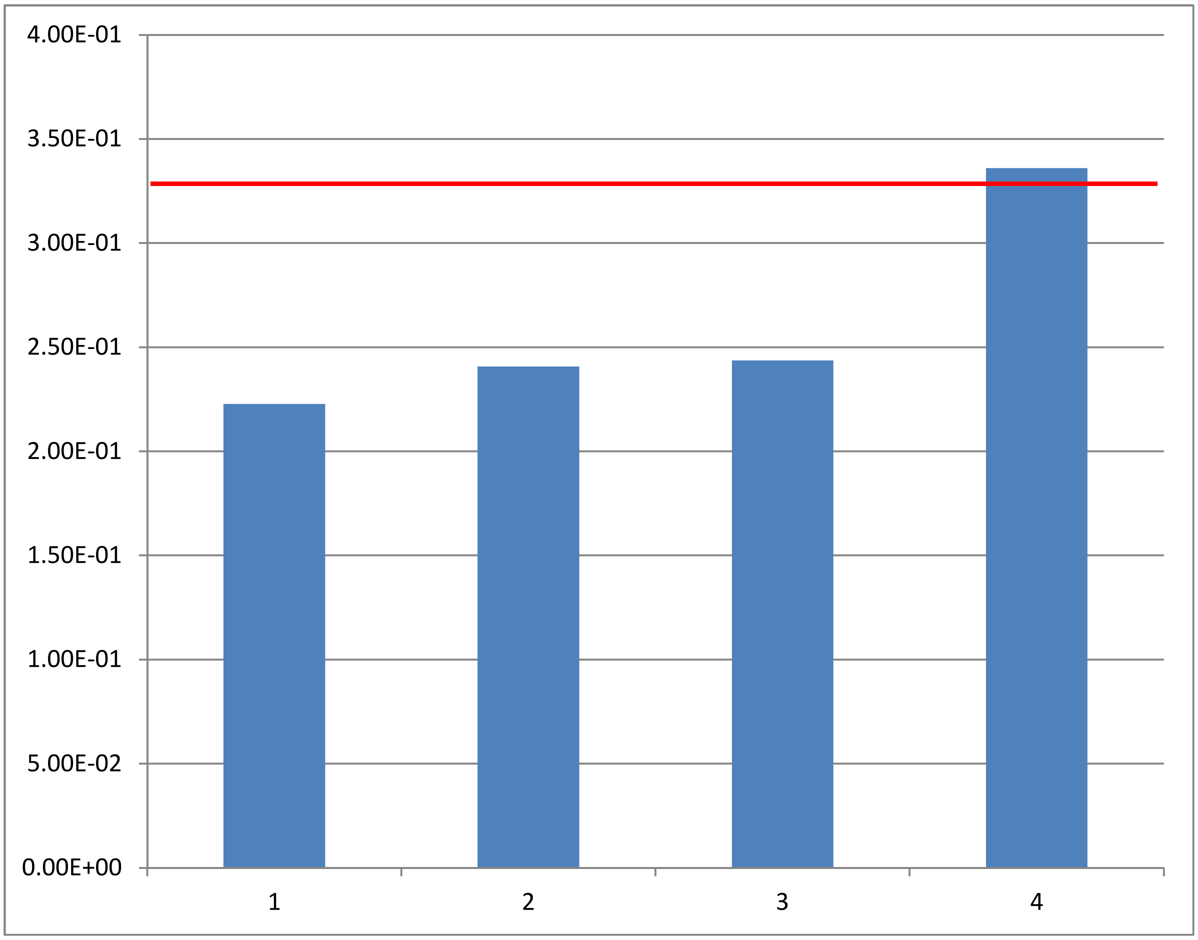


Appendix B-5i: Unit Rankings for Filterable PM from Stokers/Sloped Grate/Other Dry Biomass Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests	Total Control
WVAmericanWoodmark[55]	B2	2.23E-01	1	Cyclone or Multiclone
NCStanleyFurniture	FB-3	2.41E-01	2	Cyclone or Multiclone
WVAmericanWoodmark	B1	2.44E-01	1	Cyclone or Multiclone
NCHickoryChairCompany	WFB-1	3.36E-01	1	Cyclone or Multiclone

[55] MACT floor based on the best performing unit (top 12 percent).

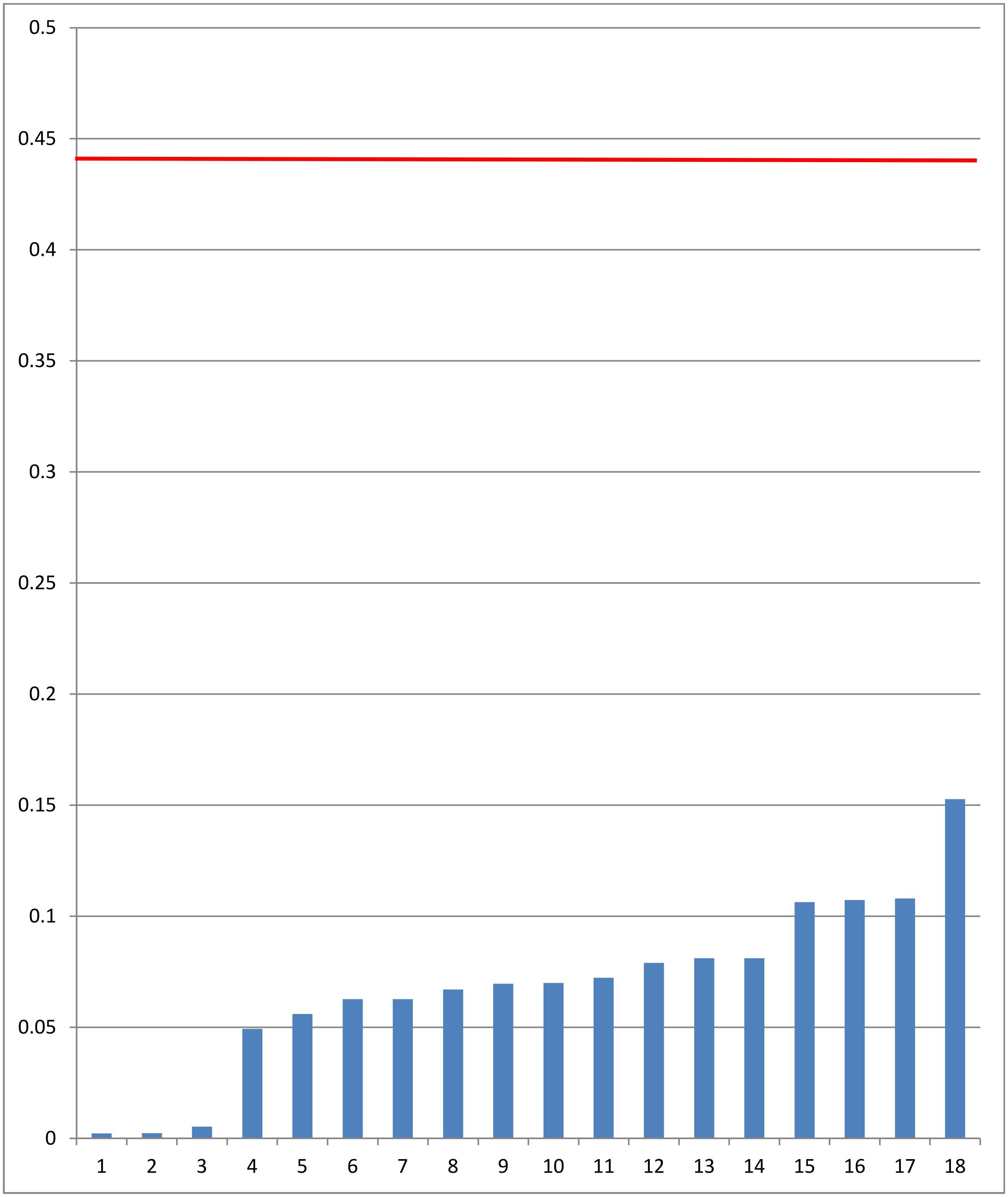
Chart 5i: Unit Rankings for Filterable PM from Stokers/Sloped Grate/Other Dry Biomass Units (Proposed Limit 0.32 lb/MMBtu)



Appendix B-5k: Unit Rankings for Filterable PM from Hybrid Suspension Grate Boiler Biomass Units (Recommended Option)

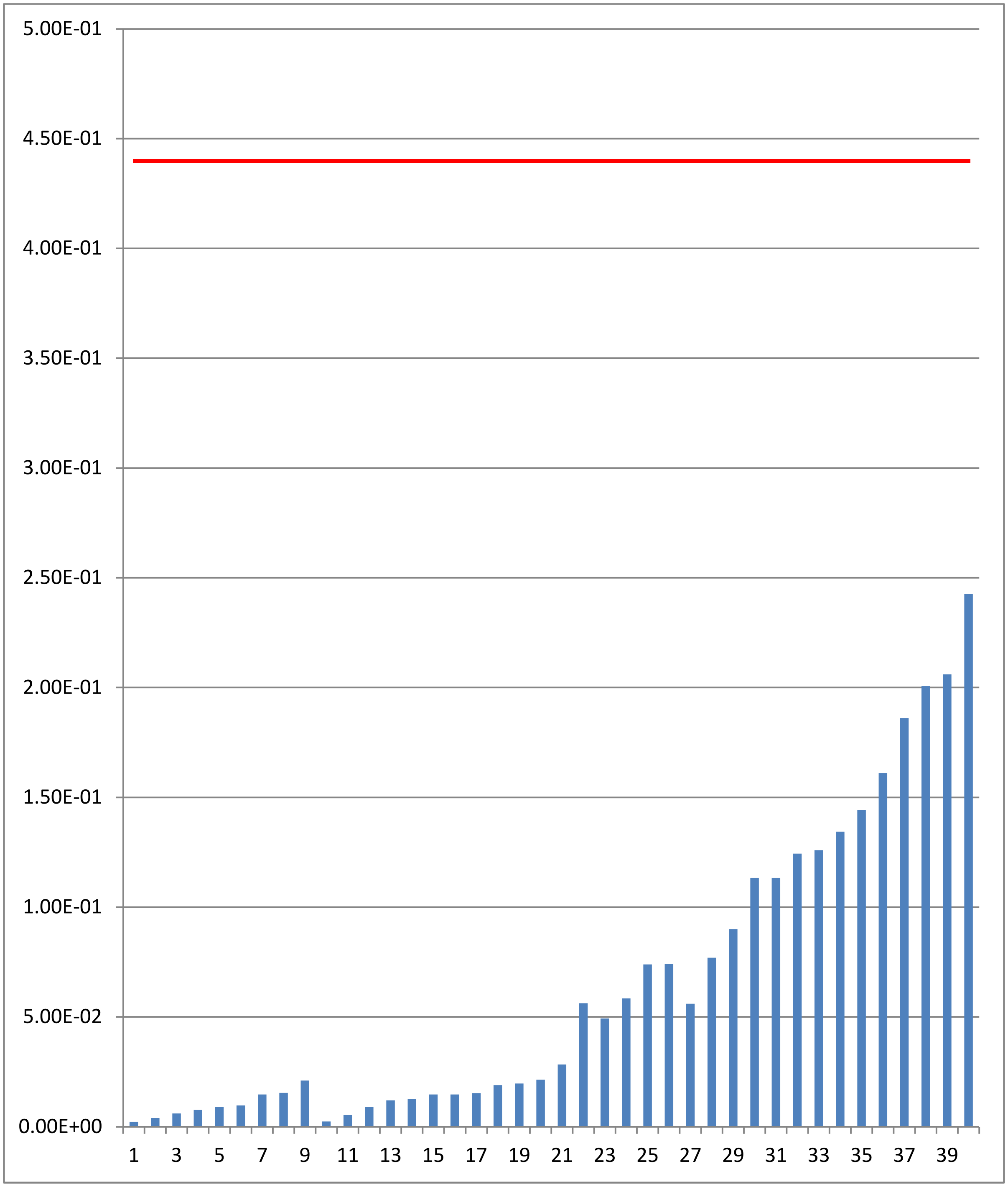
FacilityID	UnitID	Minimum Test Average	Number of Tests
FLUSSugarCorp	Boiler No. 8	0.002233	9
TXRGVSG	Boiler No. 6	0.002333	1
FLUSSugarCorp	Boiler No. 7	0.005333	12
HIPuuneneSugarMill	Boiler 3	0.049333	4
FLSugarCaneGrowersCoop	Boiler No. 3	0.056	14
FLSugarCaneGrowersCoop	Boiler No. 5	0.062667	16
FLSugarCaneGrowersCoop	Boiler No. 8	0.062667	15
FLSugarCaneGrowersCoop	Boiler No. 1	0.067	2
FLUSSugarCorp	Boiler No. 4	0.069667	13
FLSugarCaneGrowersCoop	Boiler No. 2	0.07	14
FLSugarCaneGrowersCoop	Boiler No. 4	0.072333	13
FLOsceolaFarms	Boiler No. 6	0.079	12
HIPuuneneSugarMill	Boiler 1	0.081133	3
HIPuuneneSugarMill	Boiler 2	0.081133	3
FLOsceolaFarms	Boiler No. 3	0.106333	12
FLUSSugarCorp	Boiler No. 1	0.107267	14
FLUSSugarCorp	Boiler No. 2	0.108	17
FLOsceolaFarms	Boiler No. 2	0.152667	12

Chart 5k: Unit Rankings for Filterable PM from Hybrid Suspension Grate Boiler Biomass Units (Proposed Limit 0.44 lb/MMBtu)[56]



[56] The large number of tests for several units will affect the overall compliance picture as several units will show higher results in other tests. See Chart 5k(a). Results from the top 5 units were used to compute the MACT floor.

Chart 5k(a): Unit Rankings for Filterable PM from Hybrid Suspension Grate Boiler Biomass Units (Proposed Limit 0.44 lb/MMBtu)[57]



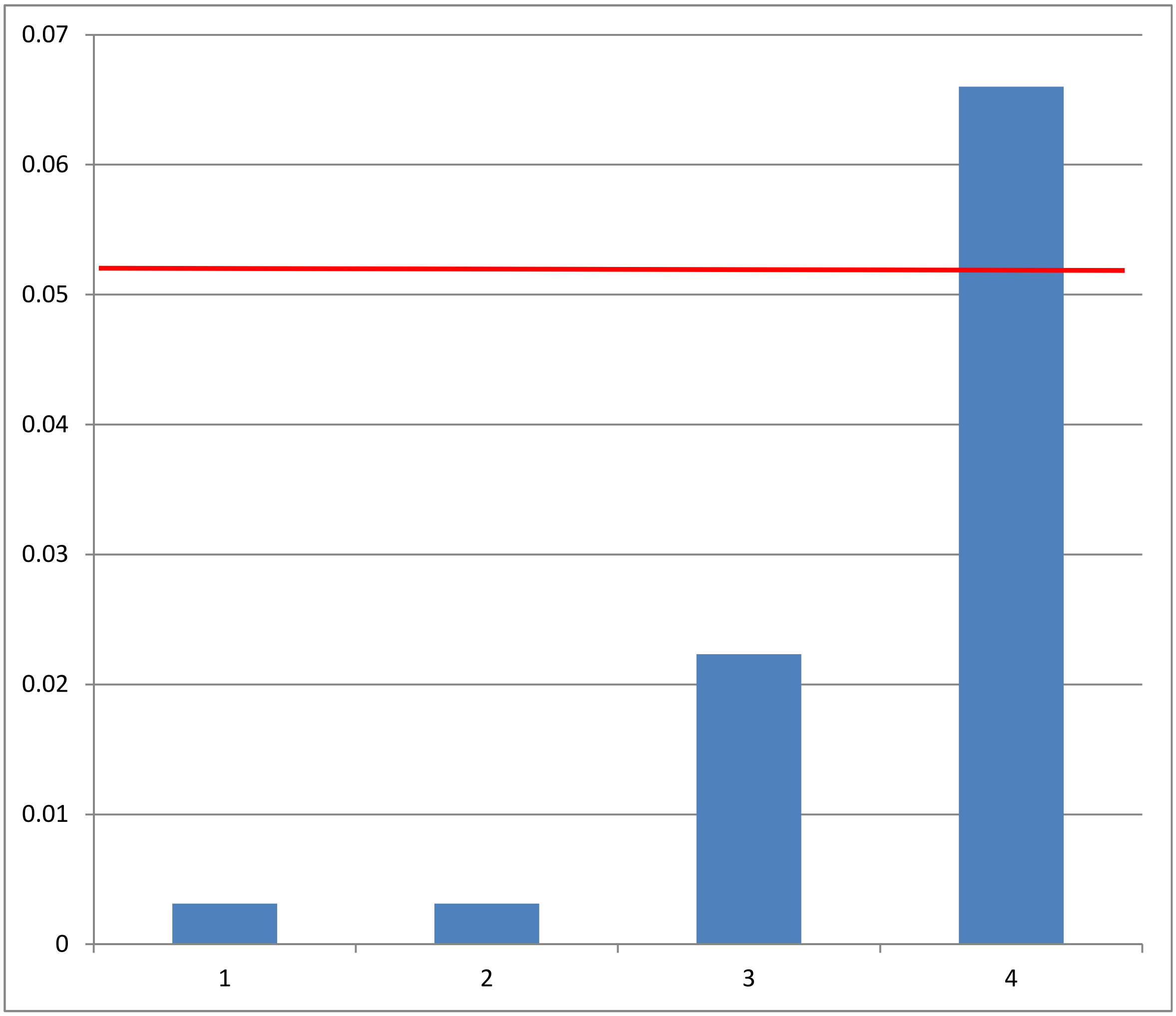
[57] Includes all test results for units in the top 12 percent.

Appendix B-5m: Unit Rankings for Filterable PM from Suspension Burner Biomass Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
MNAndersonCorpBayport	Boiler 11 EU620	0.003133	3
MNAndersonCorpBayport	Boiler 12 EU621	0.003133	3
OHSauderWoodArchbold[58]	B009	0.022333	1
OHSauderWoodArchbold	B008	0.066	1

[58] EPA based the MACT floor on the third best performing unit (as the top 12 percent) because the top two units were co-firing an unspecified amount of natural gas during the test.

Chart 5m: **Unit Rankings for Filterable PM from Suspension Burner Biomass Units (Proposed Limit 0.051 lb/MMBtu)**



Appendix B-6a: Unit Rankings for Filterable PM from Fluidized Bed Coal/Solid Fossil Fuel Units (Recommended Option)[59]

FacilityID	UnitID	Minimum Test Average	Number of Tests
IAArchersDanielsMidlandDesMoines	Asea Boiler #1	2.1000E-04	2
WIGPGreenBay2818	B29 - Fluidized Bed Boiler #9	7.9000E-04	10
IAIAStateUnivPowerPlant	B1	1.0000E-03	1
IAIAStateUnivPowerPlant	B2	1.0000E-03	1
IAADMCornProcessingCR	EU-502B	2.2000E-03	1
INPurdueUniverisity	Boiler 5	2.3333E-03	2
ILPolyOne	B1	3.2000E-03	2
IARoquetteAmerica	Circulating Fluidized Bed	4.7378E-03	1
ILCornProductsInt	B10	4.7400E-03	2
NYBlackRiverGen	E00001	4.8000E-03	2
NYBlackRiverGen	E00002	4.8000E-03	2
NYBlackRiverGen	E00003	4.8000E-03	2
IAADMCornProcessingCR	EU-530	6.0833E-03	1
IAUofIowa	EP7 Boiler 11	6.3333E-03	1
SCSonocoHartsville	Boiler Number 9	7.3667E-03	2
NCUNCCogen	ES-001	8.4520E-03	1
IAADMCornProcessingCR	EU-501B	9.2333E-03	2
GAGPSRMRiincon	EU BO02	1.0900E-02	1
ILBungeDanville	CFB Boiler	1.2567E-02	1
IAADMCornProcessingCR	EU-502A	1.3300E-02	2
PAKimberlyClarkChester	Boiler #10 (ID 035)	1.3803E-02	2
IAADMCornProcessingCR	EU-501A	1.8000E-02	2
NEADMLincoln	EU26 Coal Boiler	2.0483E-02	1

[59] MACT floor based on the best 4 (top 12 percent).

MNADMMankato	ASEA Boiler #5	3.2000E-02	1

Chart 6a: **Unit Rankings for Filterable PM from Fluidized Bed Coal/Solid Fossil Fuel Units (Proposed Limit 0.088 lb/MMBtu)**

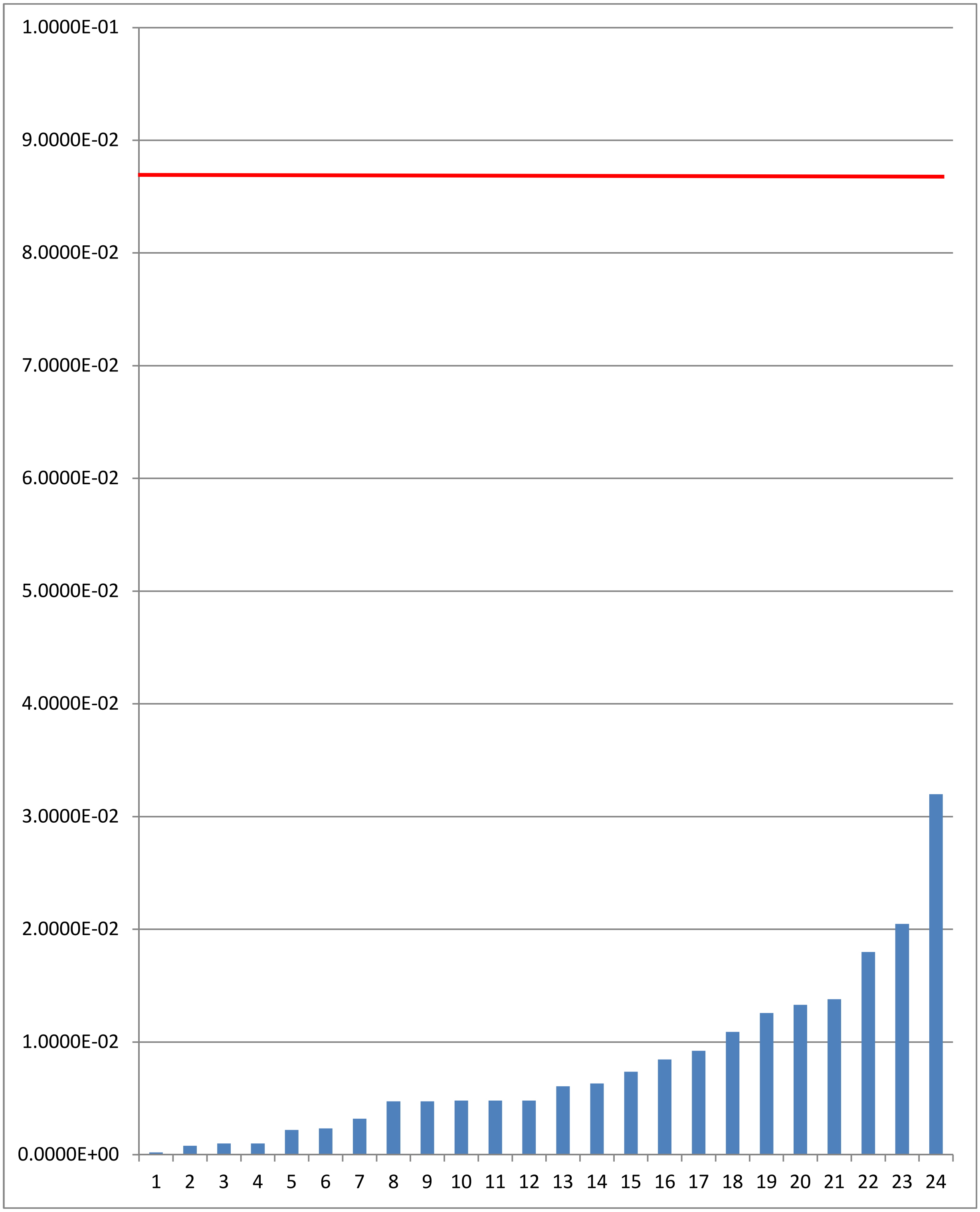
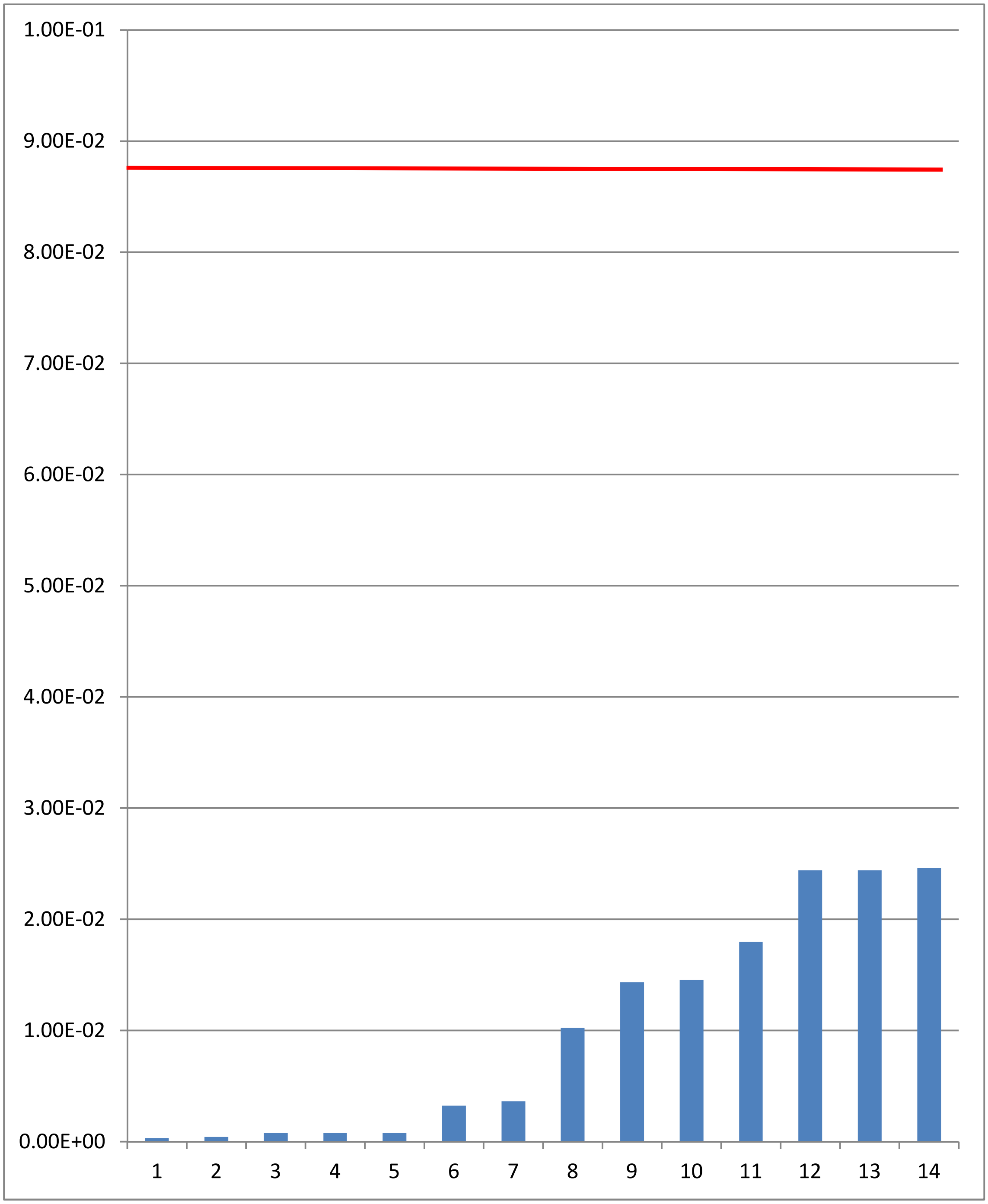


Chart 6a(1) : Unit Rankings for Filterable PM from Fluidized Bed Coal/Solid Fossil Fuel Units (Proposed Limit 0.088 lb/MMBtu)[60]



[60] All test results for units in the top 12 percent (not just minimum test result).

Chart 6c: Unit Rankings for Filterable PM from Pulverized Coal/Solid Fossil Fuel Units (Proposed Limit 0.044 lb/MMBtu)

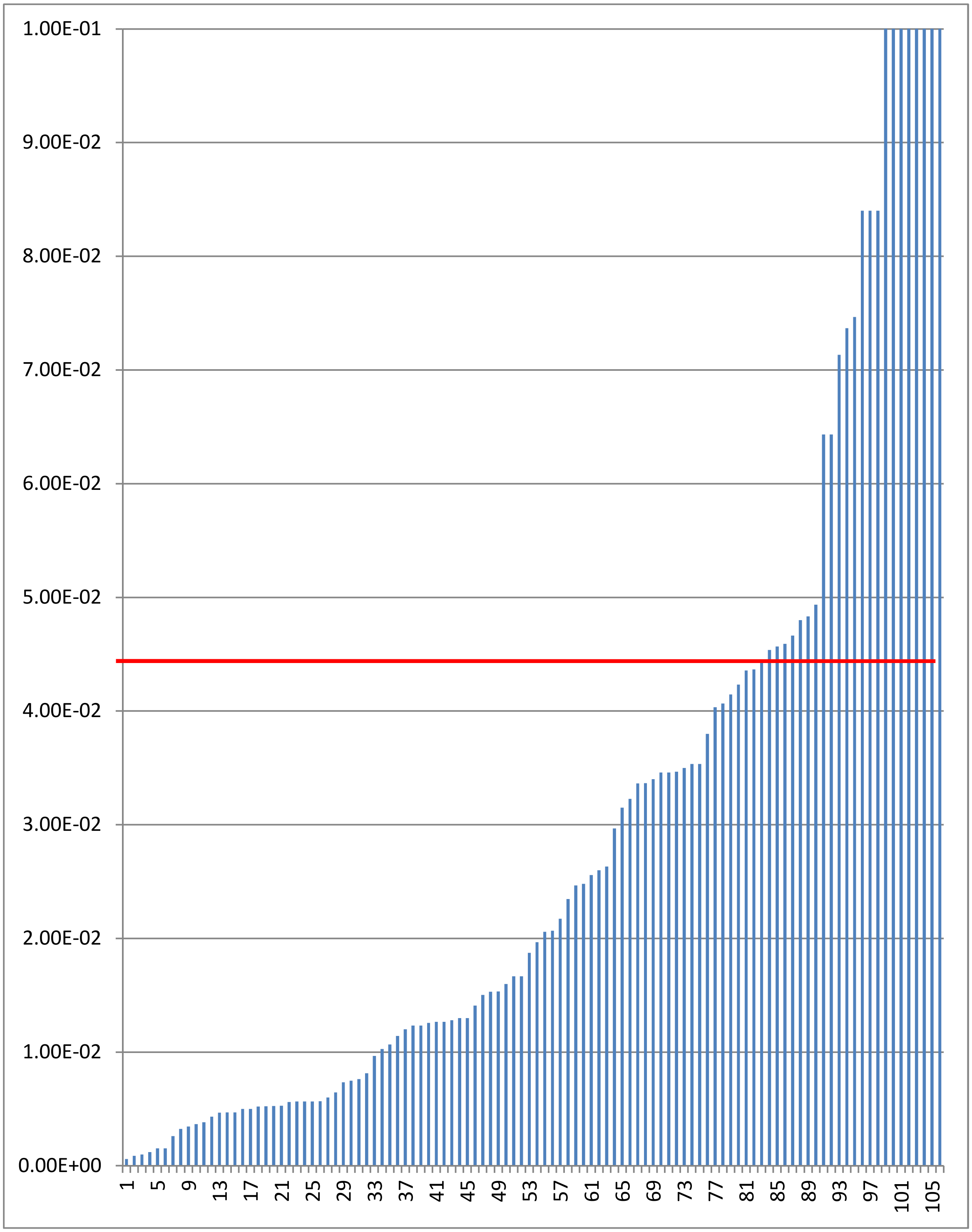


Chart 6e: Unit Rankings for Filterable PM from Stoker Coal/Solid Fossil Fuel Units (Proposed Limit 0.028 lb/MMBtu)

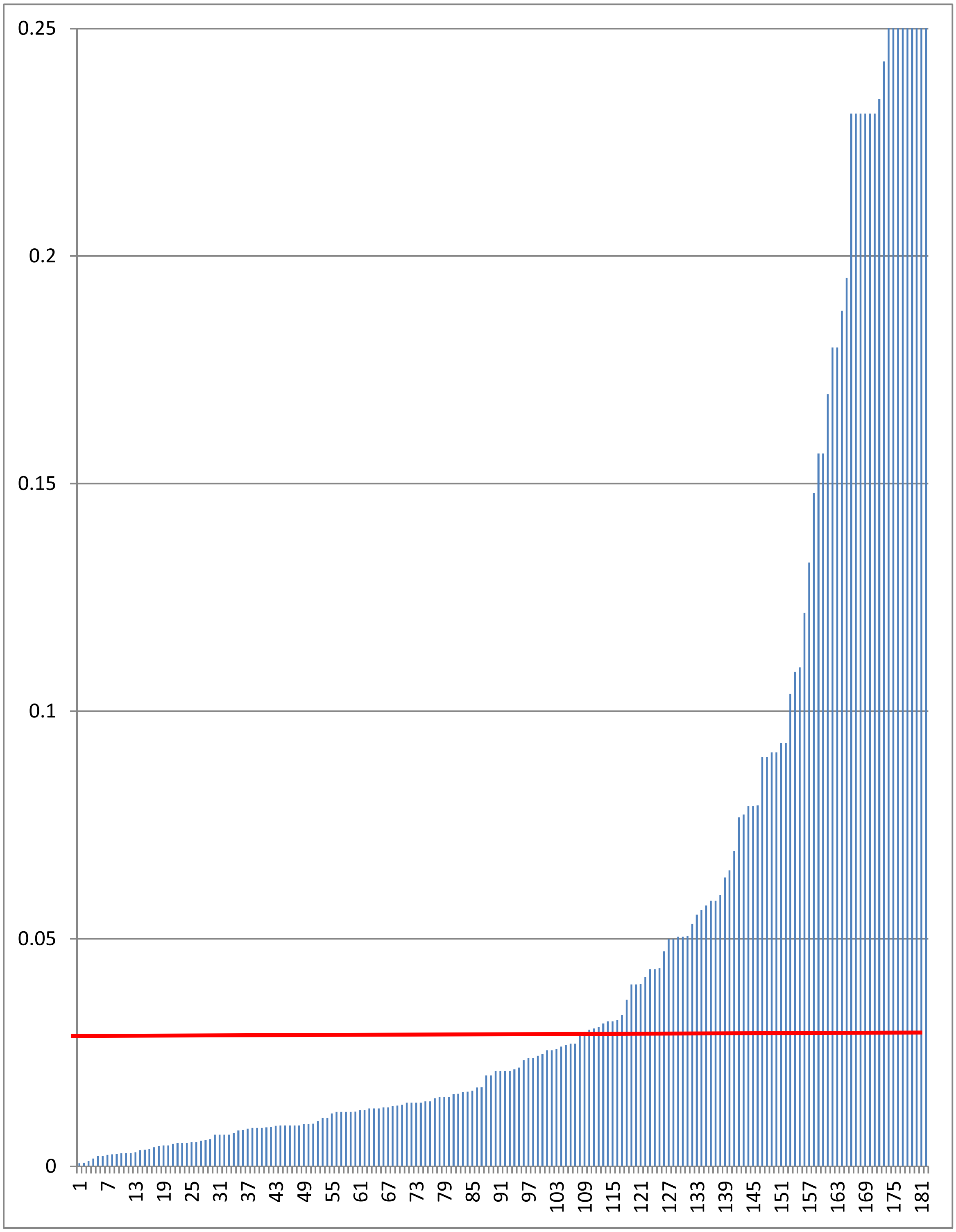
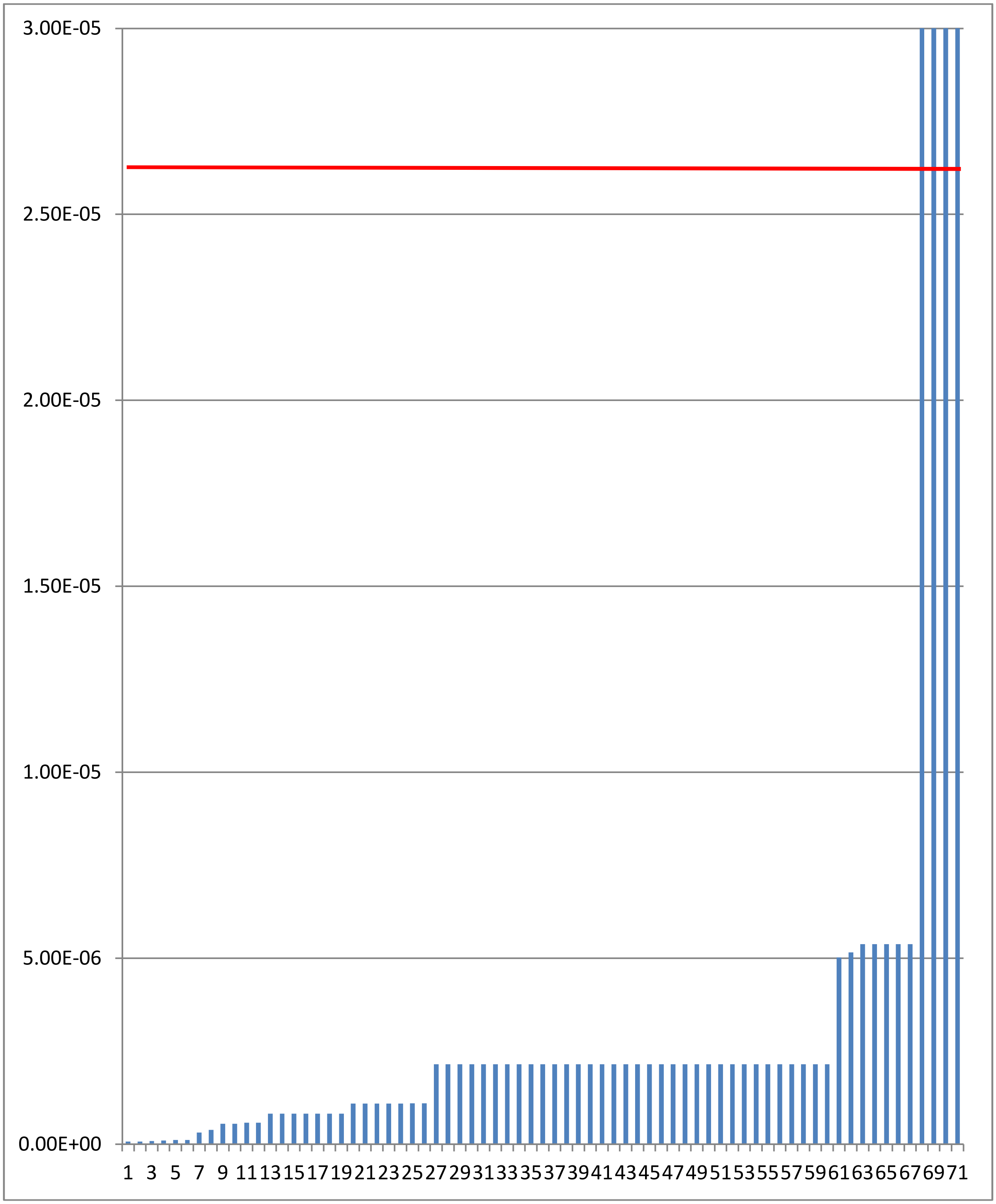
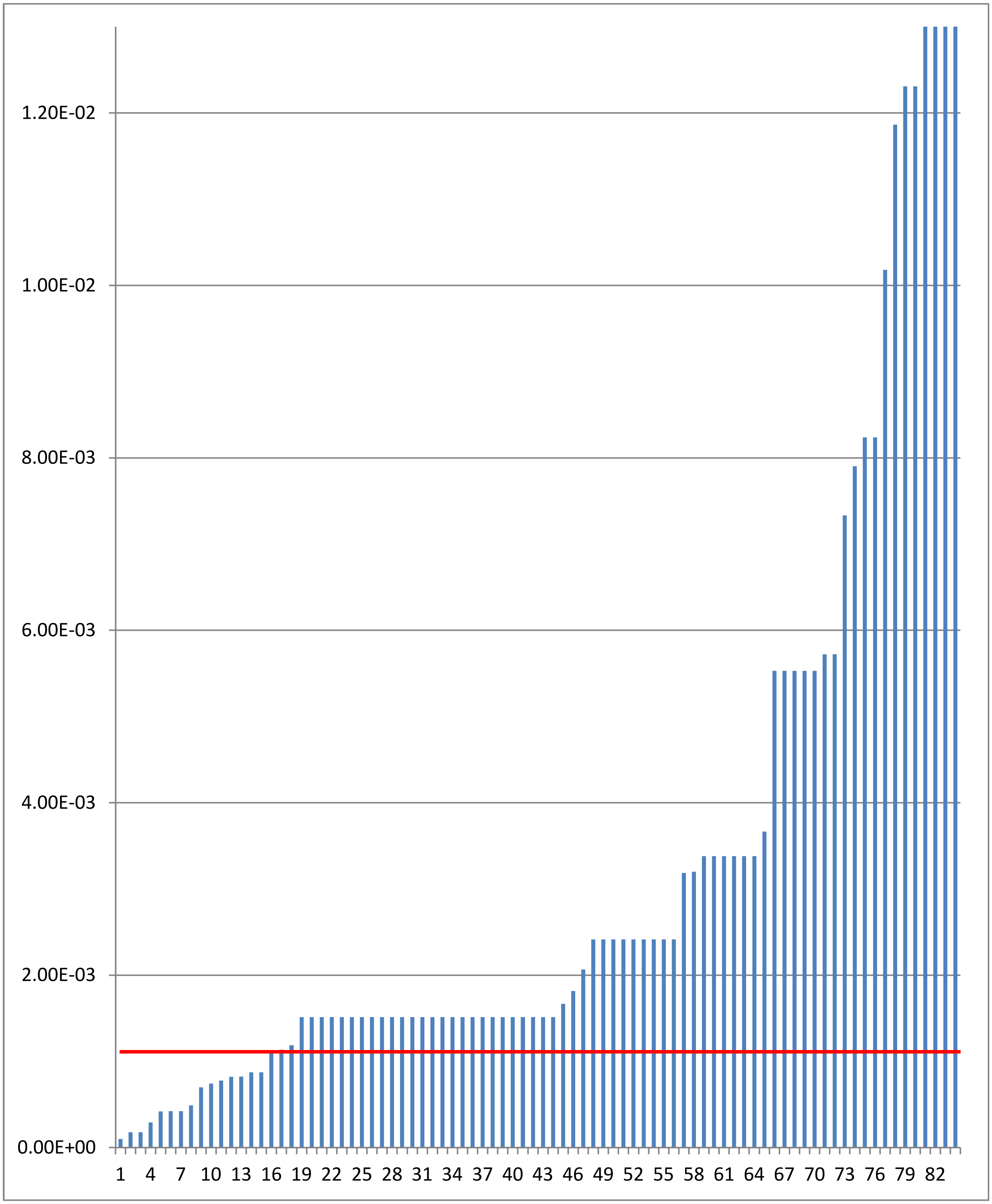


Chart 7a: Unit Rankings for Hg from Liquid Units (Proposed Limit 2.6 x 10^{-5} lb/MMBtu)[61]



[61] All test results are included (not just minimum test results).

Chart 7b: Unit Rankings for HCl from Liquid Units (Proposed Limit 1.2 x 10^{-3} lb/MMBtu)

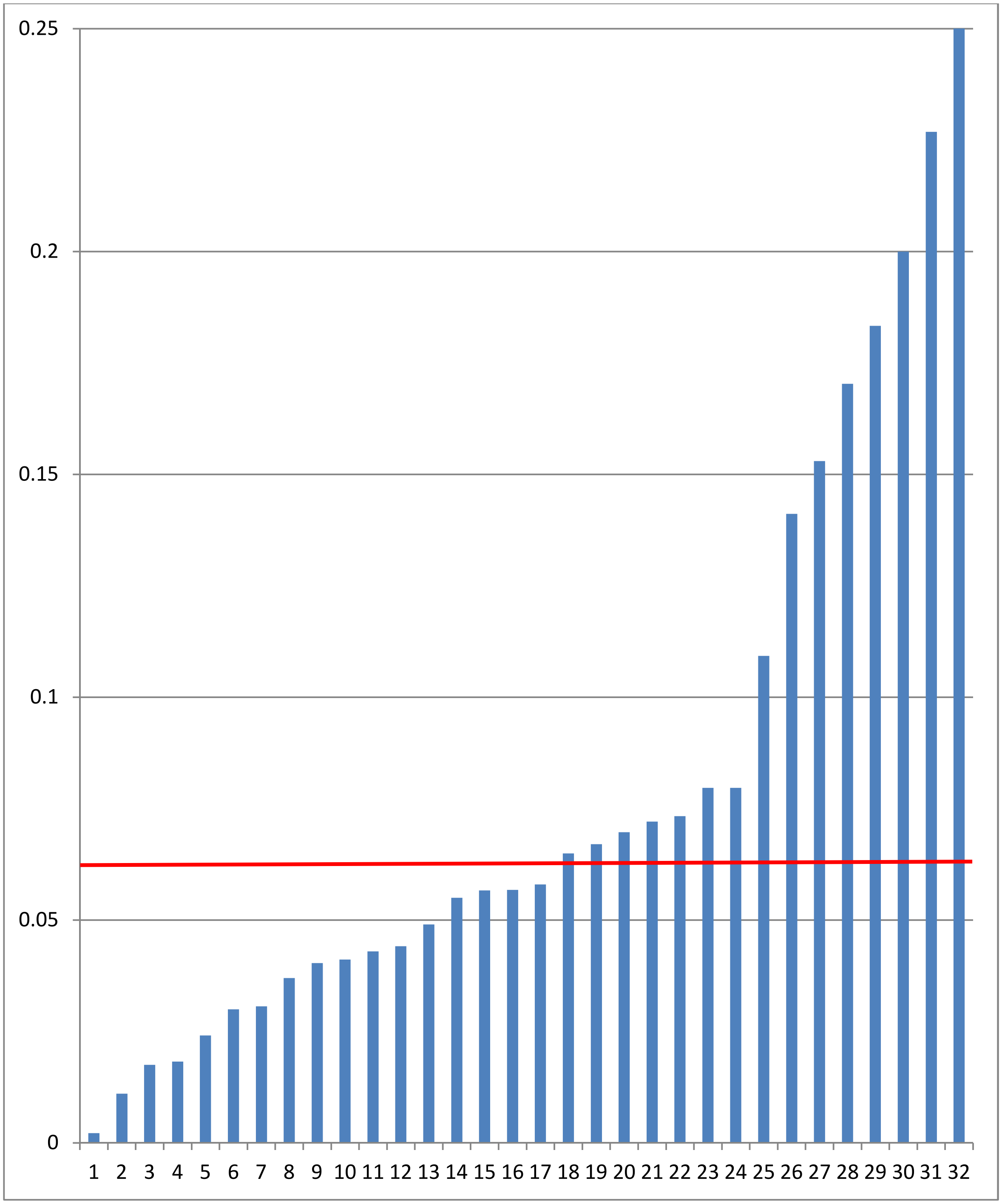


Appendix B-7c: Unit Rankings for Filterable PM from Heavy Liquid Units (Recommended Option)

FacilityID	UnitID	Total Control	Minimum Test Average	Number of Tests
SCMilliken-Dewey	D30	No HAP APCD Control	0.002167	1
MNGPDuluth	EU33 Boiler #3	Electrostatic Precipitator	0.011017	1
NYConEd59thStStationNewYork	Boiler 118	No HAP APCD Control	0.017508	1
PABoeingRidleyPark	033	No HAP APCD Control	0.018259	1
NJVinelandMuniElectric-HowardDown	Unit 9	Cyclone or Multiclone	0.024105	1
MENewPage-Rumford	PB#5	Venturi Scrubber	0.03	1
WANipponPaper	#10 Package Boiler	No HAP APCD Control	0.030633	1
NCWeyerhaeuser-Vanceboro	ES 161-001	Dry Scrubber	0.037	1
ORCascadePacificPulp	PB1EU	No HAP APCD Control	0.040333	1
WANipponPaper	#9 Package Boiler	No HAP APCD Control	0.041136	1
OHCampbellsSoupCo	B003	No HAP APCD Control	0.043	1
ORGeorgiaPacificWaunaMill	EU33 - Power Boiler	No HAP APCD Control	0.044102	1
OHCampbellsSoupCo	B004	No HAP APCD Control	0.049	1
MAGEAviationLynn	99-2	No HAP APCD Control	0.055	1
MAGEAviationLynn	99-1	No HAP APCD Control	0.056667	1
SCDAKAmericas	P8F	No HAP APCD Control	0.056739	1
MAGEAviationLynn	99-5	No HAP APCD Control	0.058	1
ORWahChang	6633-78 (SEP-AS-502B, Boiler #2)	No HAP APCD Control	0.064943	1
MAGEAviationLynn	99-3	No HAP APCD Control	0.067	1
MEFPLEnergyWyman	Unit #5	No HAP APCD Control	0.069689	2
VASmurfitStoneWestpt	PB08	Electrostatic Precipitator	0.072119	1
MEPioneerPlastics	Boiler #6	No HAP APCD Control	0.073333	3

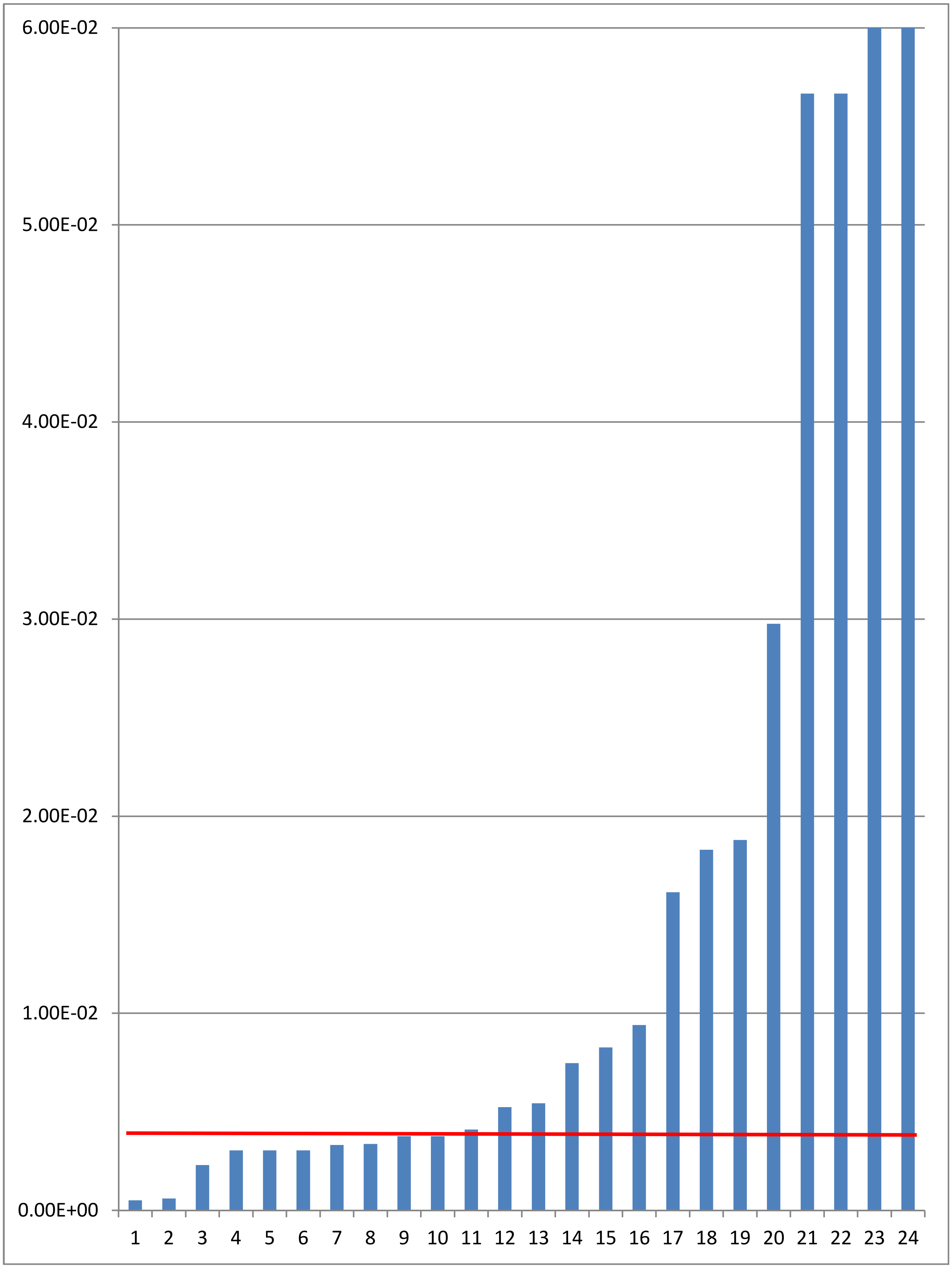
MEVersoPaperAndroscoggin	Power Boiler No. 1	No HAP APCD Control	0.079667	1
MEVersoPaperAndroscoggin	Power Boiler No. 2	No HAP APCD Control	0.079667	1
ORGPToledo	EU13 - Power Boiler #1	No HAP APCD Control	0.10925	1
NCWeyerhaeuser-Vanceboro	ES 150-001	No HAP APCD Control	0.1411	1
TNKimberlyClark2397	WB	Electrostatic Precipitator	0.152997	1
NCKapStone	PKG2	No HAP APCD Control	0.170333	1
SCBowaterCoatedPaper	Power Boiler	No HAP APCD Control	0.183333	1
MEPioneerPlastics	Boiler #4	No HAP APCD Control	0.2	1
NCInvistaHwy421	B7600	No HAP APCD Control	0.226807	1
VANewportNewsShipbuildingDryDock	78-E1	No HAP APCD Control	0.45	1

Chart 7c: Unit Rankings for Filterable PM from Heavy Liquid Units (Proposed Limit 0.062)[62]



[62] All results represent single emission tests at individual units. The minimum test result is also the maximum test result.

Chart 7e: Unit Rankings for Filterable PM from Light Liquid Units (Proposed Limit 3.4 x 10^{-3} lb/MMBtu)



Appendix B-7g: Unit Rankings for CO from Heavy Liquid Units [63](Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
ORGeorgiaPacificWaunaMill	EU33 - Power Boiler	9	1
PABoeingRidleyPark	033	9	1
VANewportNewsShipbuildingDryDock	78-E1	9.218887	1
NJVinelandMuniElectric-HowardDown	Unit 9	10.62865	1
MEFPLEnergyWyman	Unit #5	51	1
NYConEd59thStStationNewYork	Boiler 118	51	1
SCDAKAmericas	P8F	51	1
MNGPDuluth	EU33 Boiler #3	77.82179	1
KSGMFairfax	Boiler No.1	93	2
MEPioneerPlastics	Boiler #4	93	1
MEVersoPaperAndroscoggin	Power Boiler No. 1	93	1
MEVersoPaperAndroscoggin	Power Boiler No. 2	93	1
PAAppletonPapers	#033	93	1
WIWRREnvironmental	B#4	93	1
NCInvistaHwy421	B7600	98.86139	1
ORIPSpringfield	Power Boiler	551.8526	1
SCMilliken-Dewey	D30	720.2335	1

[63] MACT floor based on top 12 percent (3 units)

Chart 7g: Unit Rankings for CO from Heavy Liquid Units (Proposed Limit 10 ppm)

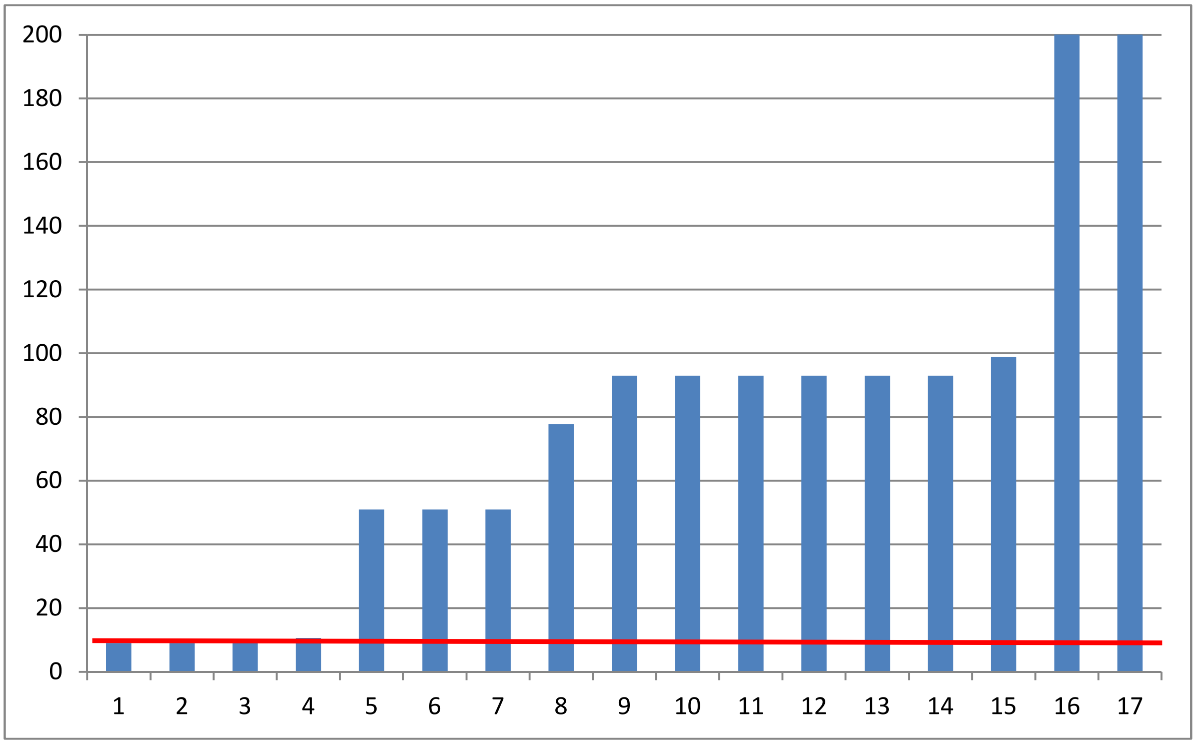
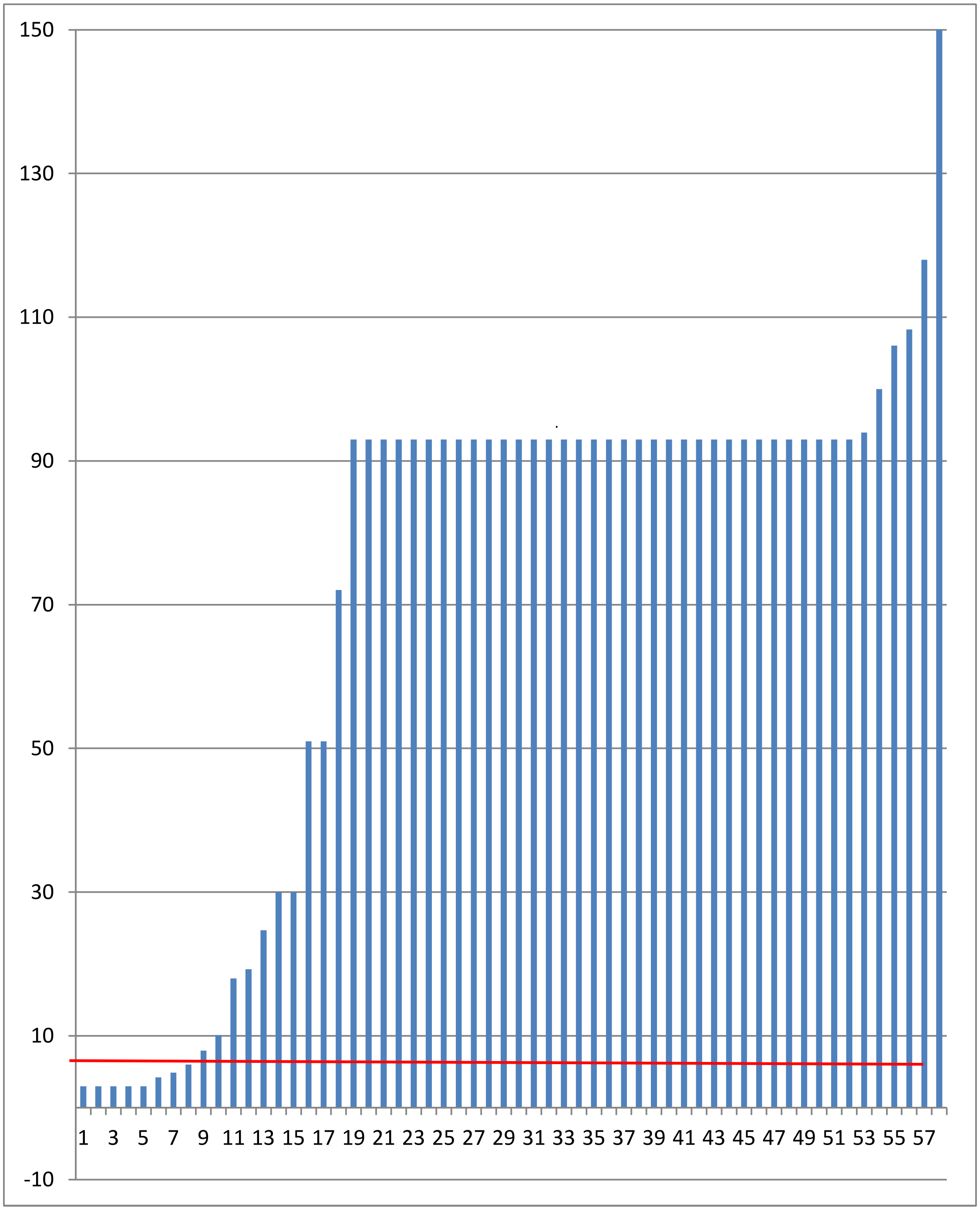


Chart 7h: Unit Rankings for CO from Light Liquid Units (Proposed Limit 7 ppm)[64]



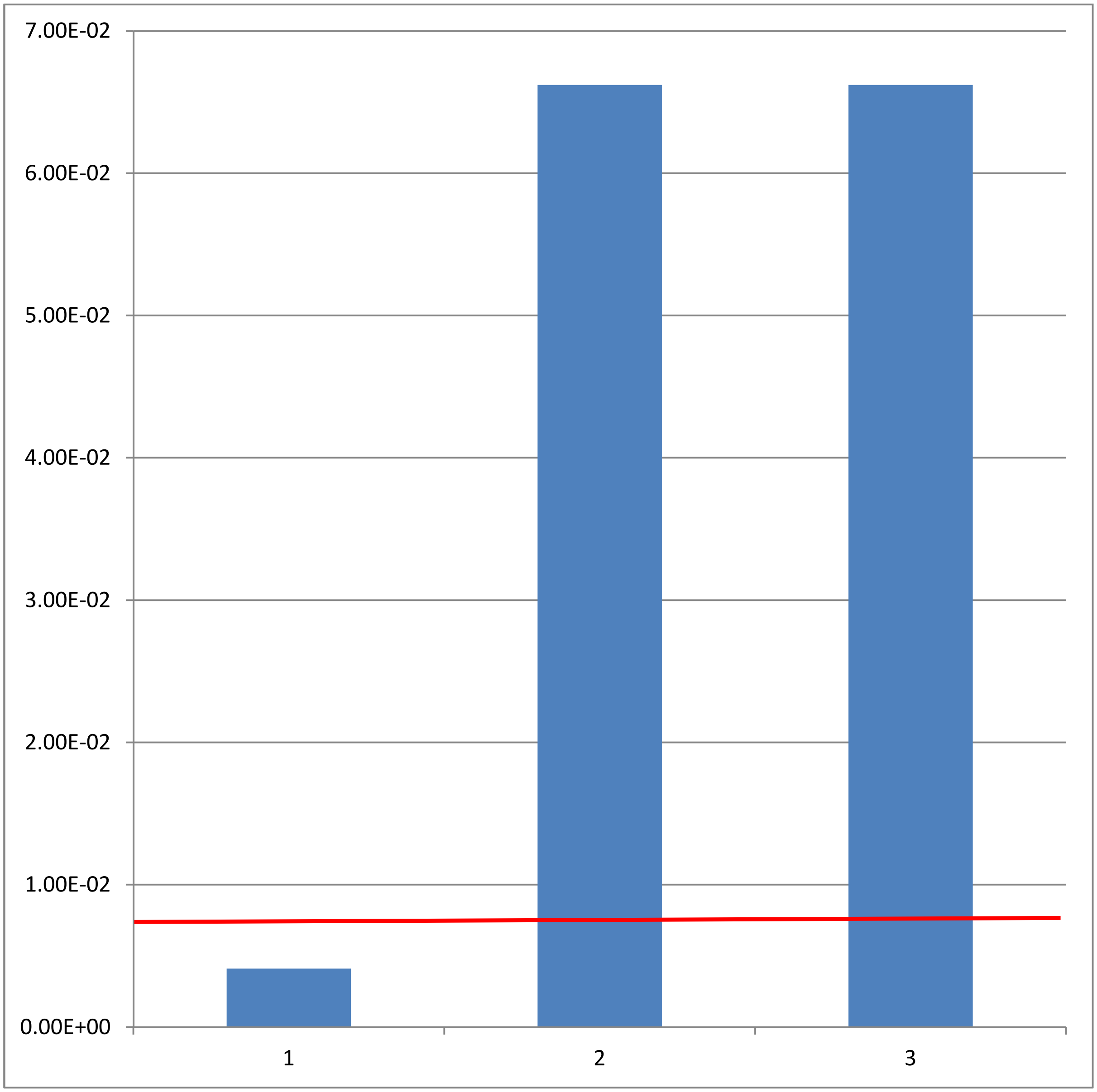
[64] The number of identical readings suggests a problem with this data set.

Appendix B-8a: Unit Rankings for Filterable PM from Non-Continental Liquid Units (Recommended Option)[65]

FacilityID	UnitID	Minimum Test Average	Number of Tests
HITesoro	SG1102	0.0041	2
HIChevronKapolei	F-5103	0.066195	1
HIChevronKapolei	F-5153	0.066195	1

[65] MACT limit based on the single best performing unit.

Chart 8a: Unit Rankings for Filterable PM from Non-Continental Liquid Units (Proposed Limit 8 x 10^{-3} lb/MMBtu)

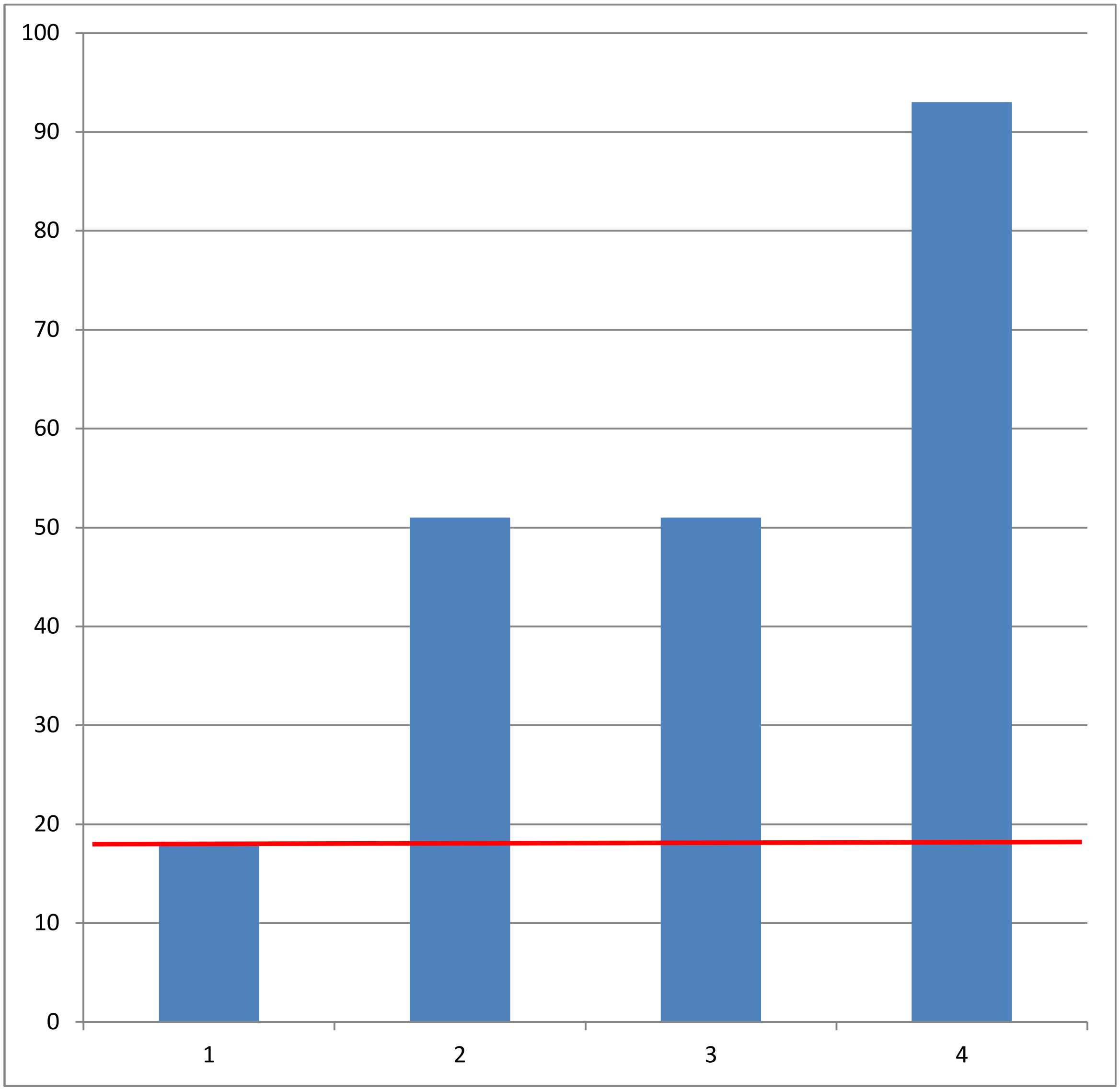


Appendix B-8c: Unit Rankings for CO from Non-Continental Liquid Units (Recommended Option)[66]

FacilityID	UnitID	Minimum Test Average	Number of Tests
HITesoro	SG1102	18	1
HITesoro	SG1103	51	4
HIChevronKapolei	F-5103	51	1
HITesoro	H503	93	6

[66] MACT floor based on best performing unit (top 12 percent)

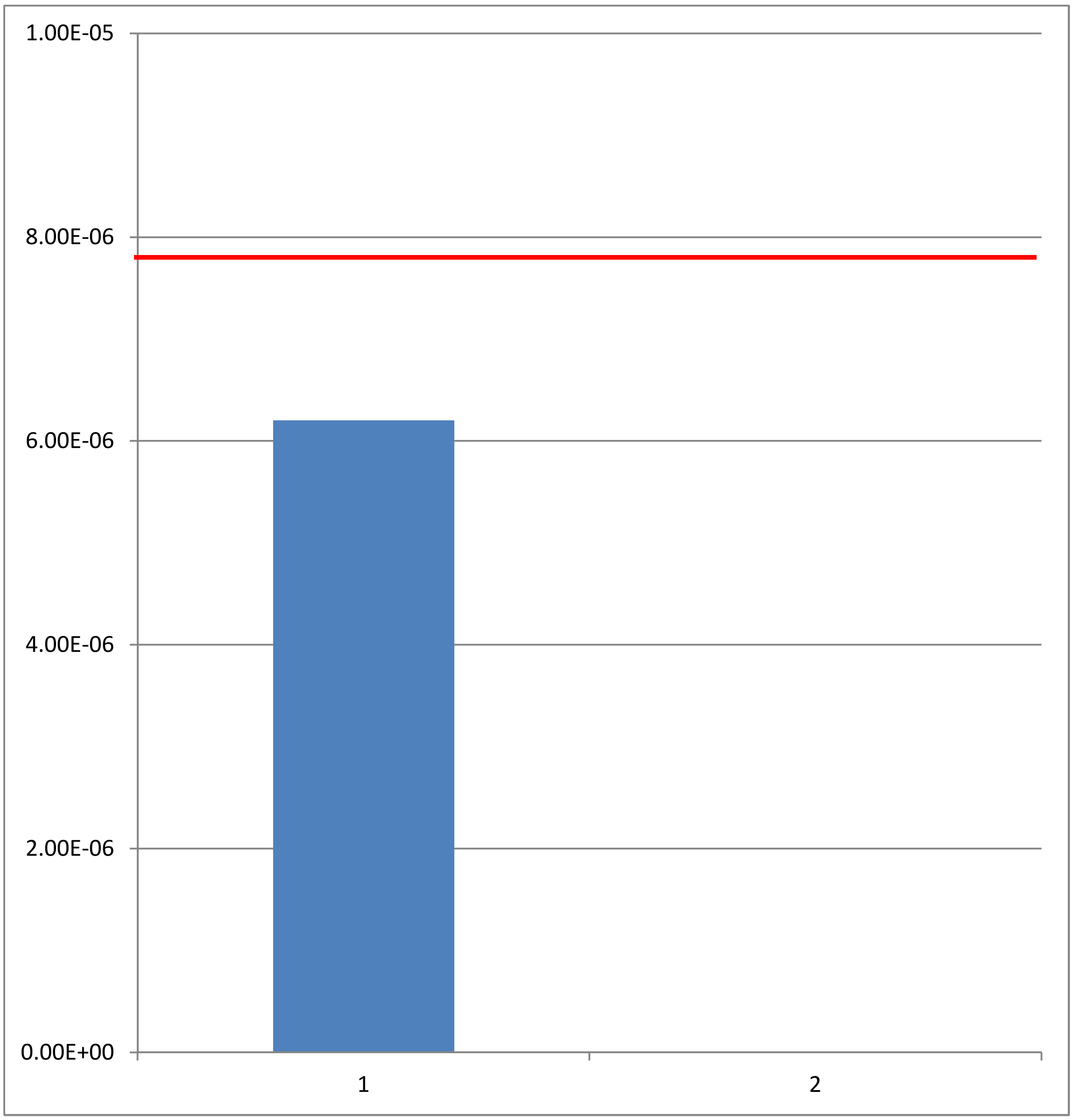
Chart 8c: **Unit Rankings for CO from Non-Continental Liquid Units (Proposed Limit 18 ppm)**



Appendix B-9a: Unit Rankings for Hg from Process Gas Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
WVMountainStateCarbonFollansbee	S1	6.2E-06	1

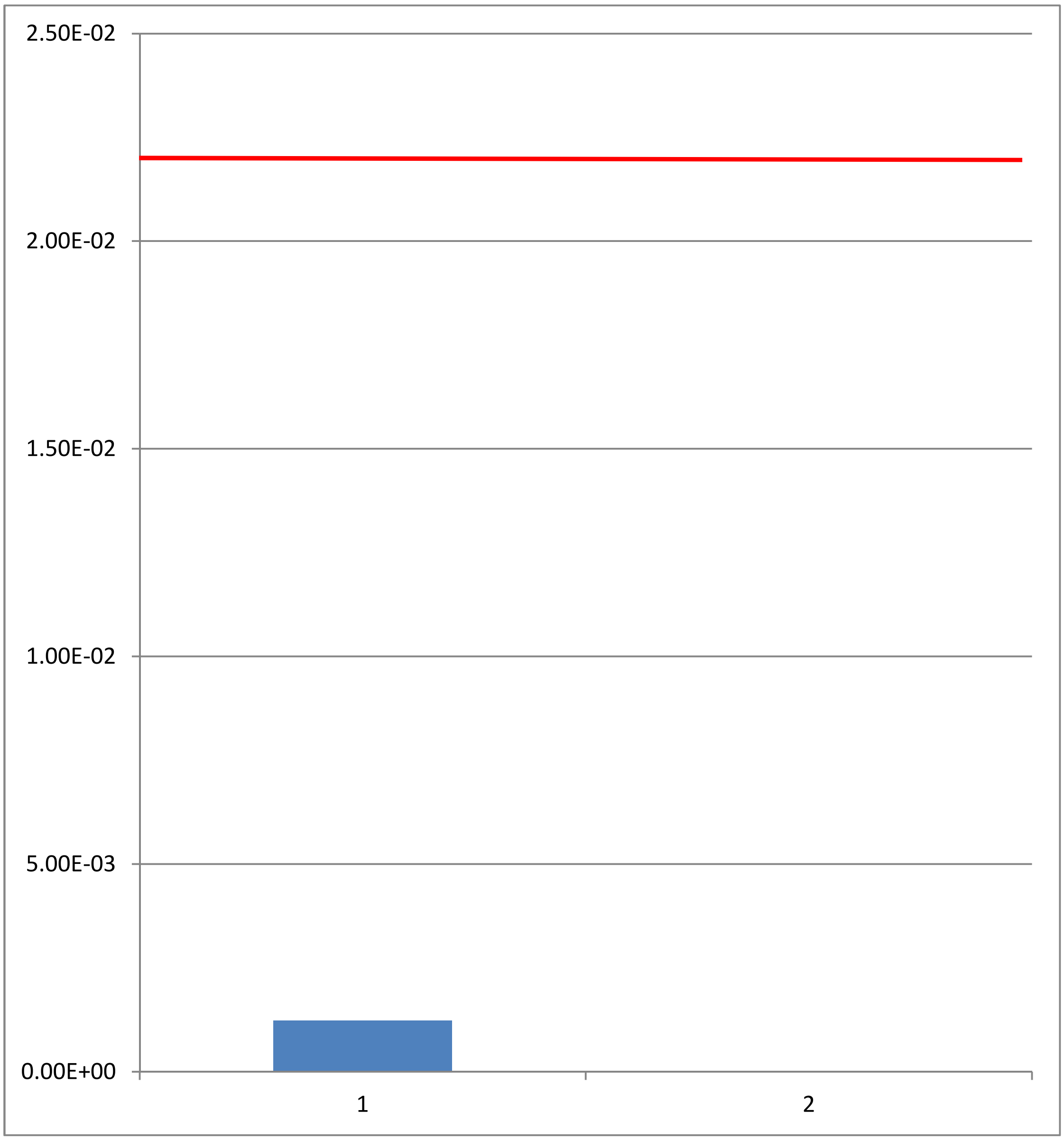
Chart 9a: Unit Rankings for Hg from Process Gas Units (Proposed Limit 7.9 x 10-6 lb/MMBtu)



Appendix B-9b: Unit Rankings for HCl from Process Gas Units (Recommended Option)

FacilityID	UnitID	Minimum Test Average	Number of Tests
WVMountainStateCarbonFollansbee	S1	0.001233	1

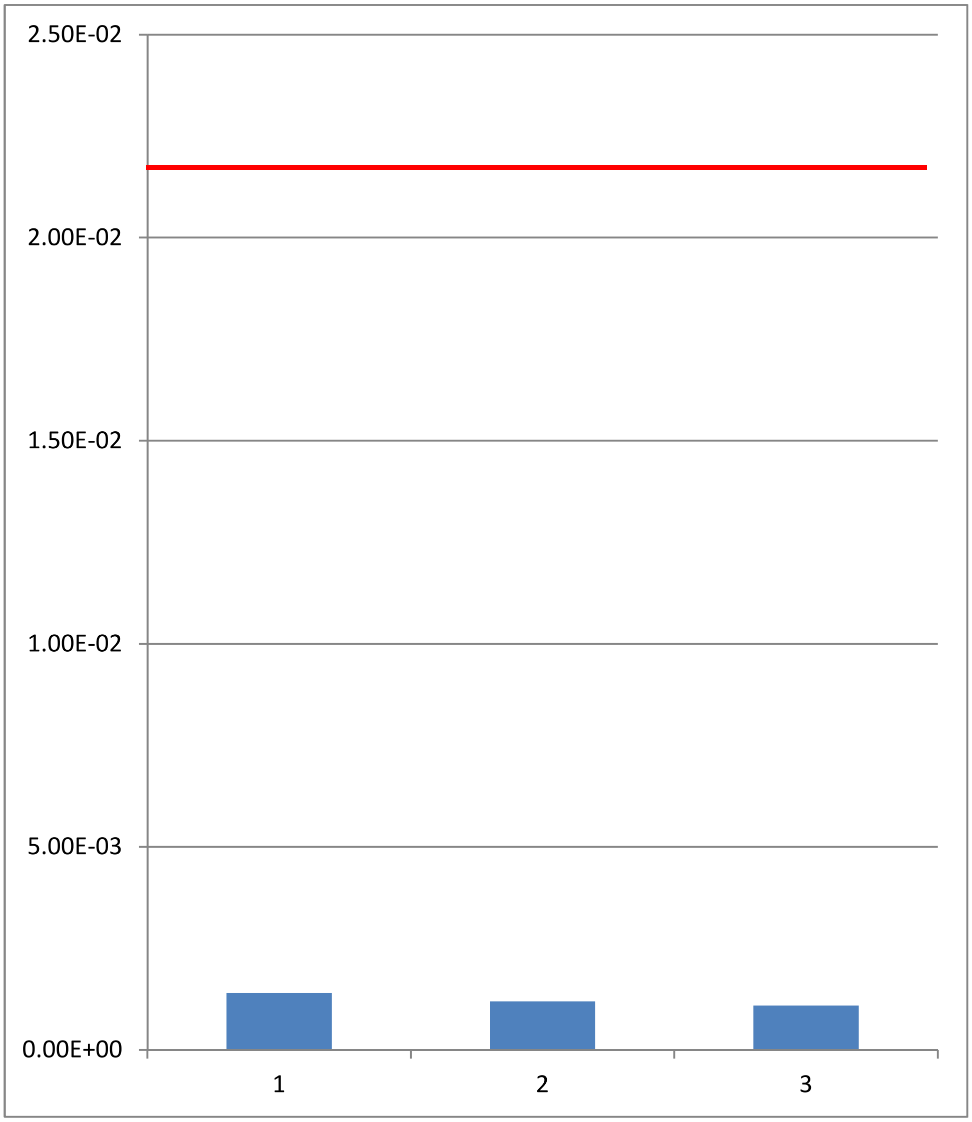
Chart 9b: Unit Rankings for HCl from Process Gas Units (Proposed Limit 2.2 x 10^{-2} lb/MMBtu)



Appendix C-6b (i): Process Gas HCl Run Data (Recommended Option)

FacilityID	Test Run Emission Value
WVMountainStateCarbonFollansbee	0.0014
WVMountainStateCarbonFollansbee	0.0012
WVMountainStateCarbonFollansbee	0.0011

Chart 9b (a): Process Gas HCl Run Data (Proposed Limit 2.2 x 10^{-2} lb/MMBtu)[67]



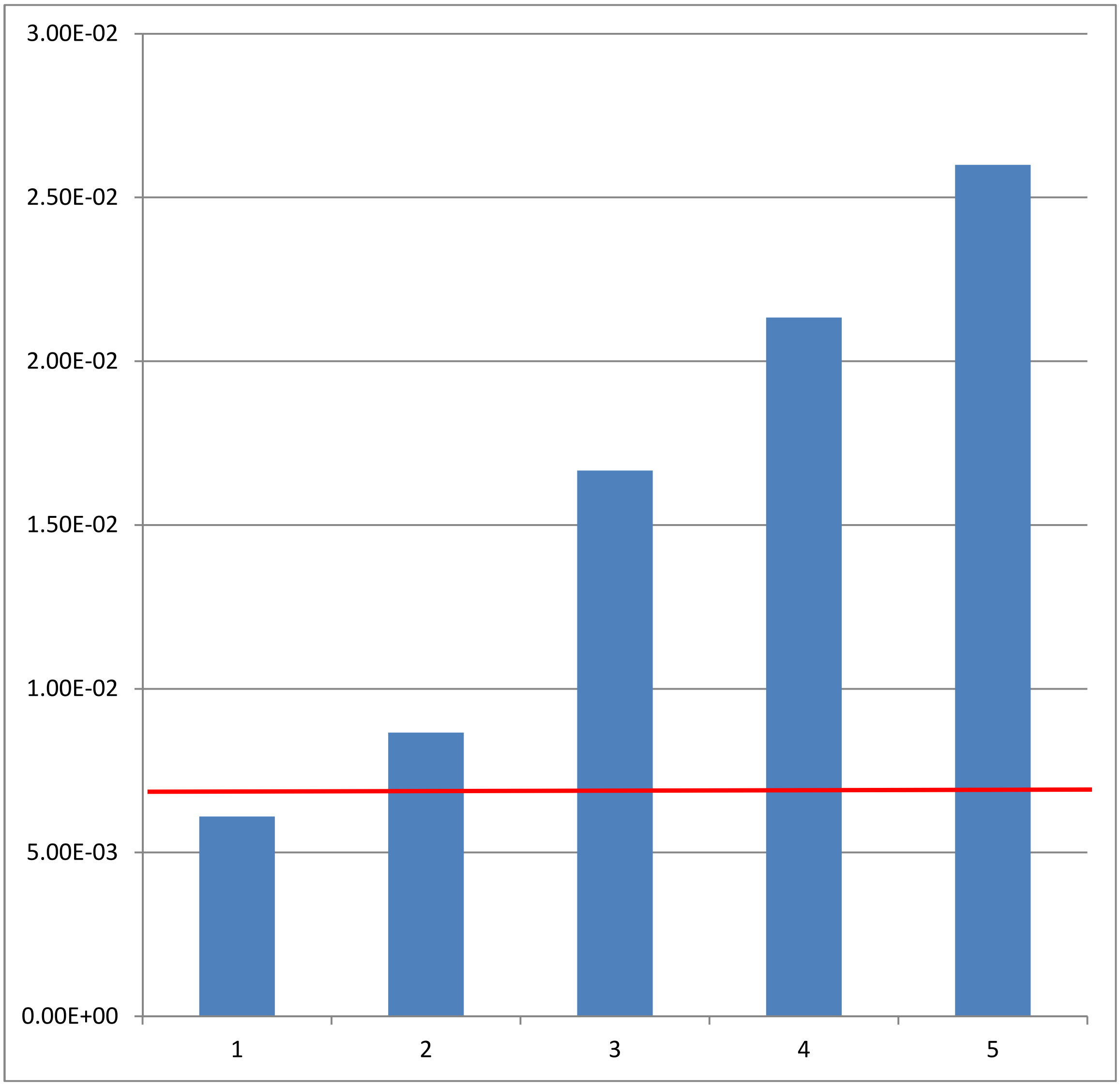
[67] Includes all data, not just minimum value.

Appendix B-9c: Unit Rankings for Filterable PM from Process Gas Units (Recommended Option)[68]

FacilityID	UnitID	Minimum Test Average	Number of Tests
WVMountainStateCarbonFollansbee	S1	0.0061	1
KYAKSteel-WestWorks	No. 13 Boiler	0.008667	1
KYAKSteel-WestWorks	No. 7 Boiler	0.016667	1
KYAKSteel-WestWorks	No. 6 Boiler	0.021333	1
KYAKSteel-WestWorks	No. 5 Boiler	0.026	1

[68] MACT limit based on best performing source (top 12 percent)

Chart 9c: Unit Rankings for Filterable PM from Process Gas Units (Proposed Limit 6.7 x 10^{-3} lb/MMBtu)



Appendix B-9e: Unit Rankings for CO from Process Gas Units (Recommended Option)[69]

FacilityID	UnitID	Minimum Test Average	Number of Tests
WVMountainStateCarbonFollansbee	S5	3.0966667	1
WVMountainStateCarbonFollansbee	S1	3.5498226	2

[69] The MACT floor is based on the best performing unit (top 12 percent)

Chart 9e: Unit Rankings for CO from Process Gas Units (Proposed Limit 4 ppm)

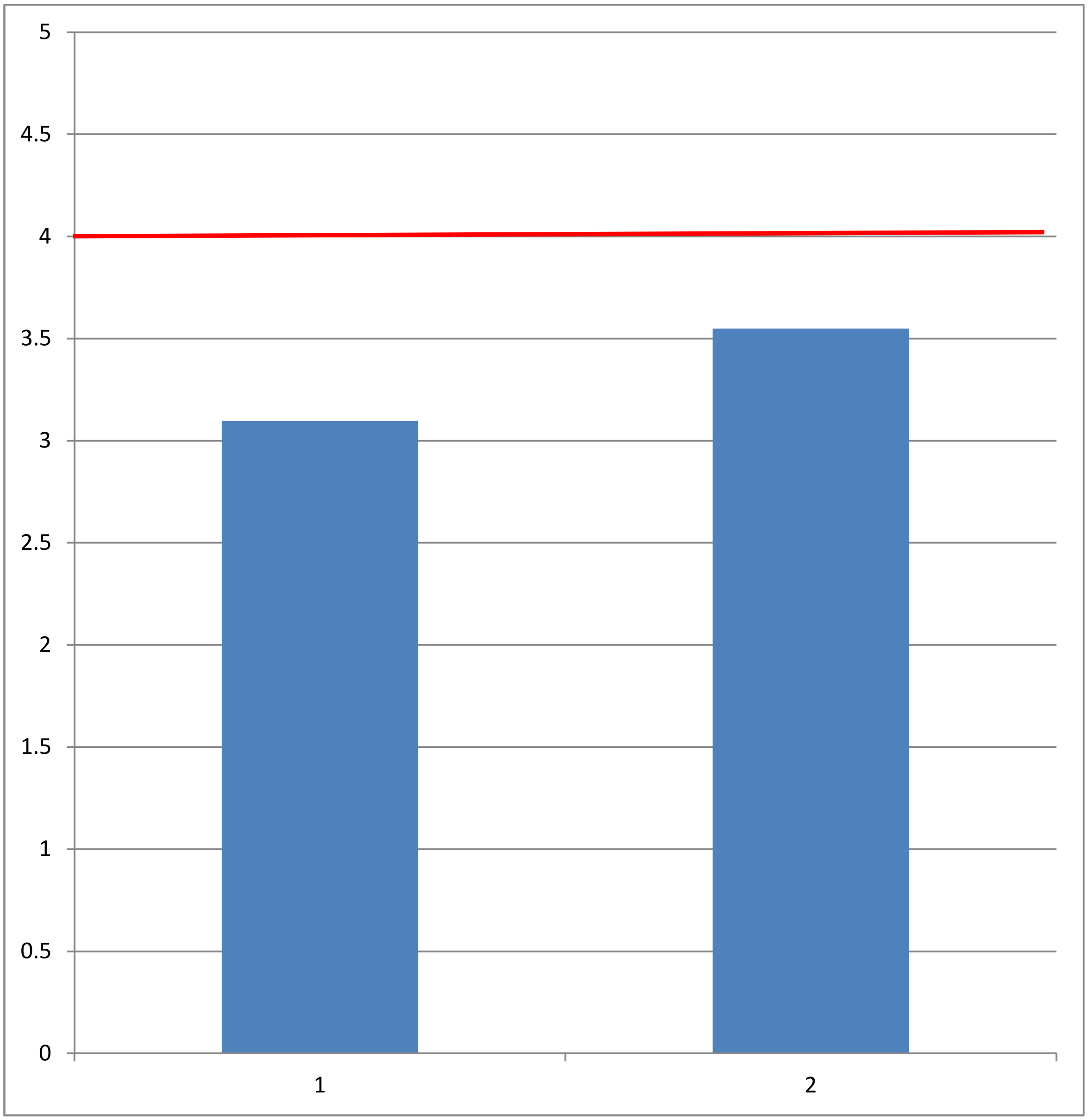


Chart 10a: Unit Rankings for Filterable PM from Solid Units (Alternative Option) (Proposed Limit 3.5 x 10^{-2} lb/MMBtu)

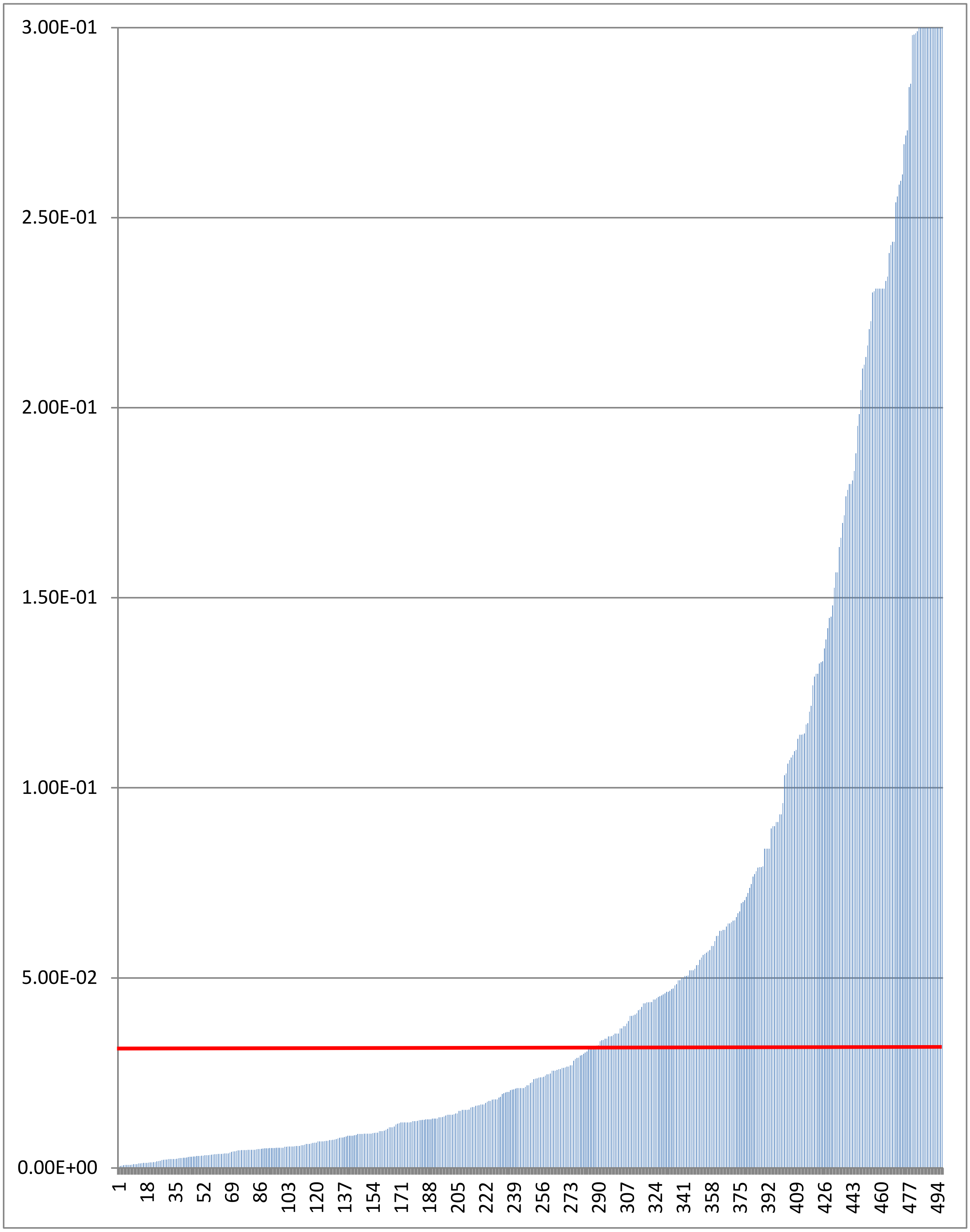


Chart 10b: Unit Rankings for Filterable PM from Liquid Units (Alternative Option) (Proposed Limit 8 x 10^{-3} lb/MMBtu).