NACAA
national association of clean air agencies



August 4, 2011

EPA Docket Center
EPA West (Air Docket)
Attention Docket Nos. EPA-HQ-OAR-2009-0234;
EPA-HQ-OAR-2011-0044
U.S. Environmental Protection Agency
Mail Code 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Sir/Madam:

On behalf of the National Association of Clean Air Agencies (NACAA), thank you for this opportunity to comment on the proposed National Emission Standards for Hazardous Air Pollutants[1] and Revisions to the New Source Performance Standards for Fossil Fuel-fired Electric Generating Units[2], which were published in the *Federal Register* on May 3, 2011 (76 *FR* 24976). NACAA is the national association of air pollution control agencies in 51 states and territories and over 165 metropolitan areas across the country. Attached to this letter is a document containing NACAA's detailed comments on the proposals.

NACAA strongly supports adoption of effective limitations on mercury, toxic acid gas, toxic metal emissions and other pollutants from these large sources. NACAA agrees with EPA's original determination in 2000 that regulating HAPs emissions from EGUs under Clean Air Act section 112 is "appropriate and necessary." We believe that EPA's reversal of that finding in 2005 was incorrect and support EPA's confirmation of the initial determination. We can think of no reason why Congress would seek to limit emissions of HAPs from dry cleaners, electroplaters and other small businesses and, at the same time, exempt the largest sources of HAPs emissions in the country.

Seventeen years have now passed since the 1994 deadline for completion of EPA's utility study and the courts have ruled on every conceivable related issue.

[1] The proposed emission limits, commonly referred to as maximum achievable control technology or "MACT standards," will substantially reduce emissions of hazardous air pollutants ("HAPs") from coal- and oil-fired electric generating units ("EGUs").
[2] The NSPS proposal would, if adopted, provide more stringent limits for emissions of sulfur dioxide ("$SO_2$"), nitrogen oxides ("$NO_x$") and particulate matter ("PM") for new units in these source categories.

The determination of whether mercury emissions from this sector should be regulated has been the subject of two in-depth reviews by EPA, as well as one by the National Academy of Sciences. It is now well past time for EPA to complete these rules and, for the first time, limit emissions of HAPs from this very significant source category, as originally contemplated by Congress over 40 years ago. Updating the NSPS for this source category will ensure that, as the existing, aging fleet of fossil-fuel-fired units retires, the units that replace them will be as clean as today's technology reasonably permits.

The final regulations should meet both the letter and the intent of the statute, and strike the appropriate balance between protecting public health and avoiding the imposition of unnecessary costs on the regulated community. EPA has projected quite substantial reductions in emissions of mercury and hydrogen chloride ("HCl"), as well as substantial reductions in fine particulate matter and $SO_2$ from the proposed requirements. These reductions are needed to protect public health and to improve the environment. The data obtained from the most recent round of industry testing support emissions standards at least as stringent as those proposed by EPA. The technology needed to meet these standards has been in use in this sector for 10 to 40 years, and has been shown to be effective and affordable.

NACAA believes that the proposed emission limitations are, for the most part, protective of public health and supports EPA's rejection of alternate compliance limits under section 112(d)(4) of the Clean Air Act, where there is insufficient scientific information to establish a "safe" threshold for the HAPs at issue. However, while the proposed limits are generally supportable from a policy perspective, the CAA requires a very high degree of protection from HAPs emissions and does not provide EPA the broad discretion in setting MACT floors that it enjoys when promulgating MACT ("beyond the floor") standards and regulating criteria pollutants. As set out in detail in the attached comments, a number of the assumptions and procedures employed in the calculation of certain MACT floors are unsupported or improper and should be revisited.

NACAA believes the subcategories established by EPA are reasonable. We caution against creating additional small subcategories, where insufficient data undermine the calculation of MACT floors. NACAA also recommends that EPA establish standards based on the application of MACT technology, rather than merely calculating MACT floors, and suggests that MACT be no less stringent than BACT. NACAA suggests EPA address organic HAP emissions, including dioxins, furans and products of incomplete combustion, and calculate MACT floors and evaluate MACT technologies for these pollutants in the EGU sector, just as it has done for other sectors. Work practice standards, if employed, should be designed to achieve the same level of emission performance as would be achieved by implementation of an emission limitation.

Finally, these important new requirements will add to the existing workload of state and local air pollution control agencies at a time when additional state and local funding is unlikely to be available. We strongly urge that federal grant funding,

sufficient to support these activities, be provided so this important work can be undertaken.

Thank you for this opportunity to comment on the proposal. Please contact us if we can provide additional information.

Sincerely,

S. William Becker

**COMMENTS OF THE NATIONAL ASSOCIATION OF CLEAN AIR AGENCIES CONCERNING EPA'S PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS AND PROPOSED REVISIONS TO THE NEW SOURCE PERFORMANCE STANDARDS FOR FOSSIL FUEL- FIRED ELECTRIC GENERATING UNITS**

Docket Nos. EPA-HQ-OAR-2009-0234; EPA-HQ-OAR-2011-0044

August 4, 2011

The National Association of Clean Air Agencies ("NACAA"), an association of state and local air pollution control agencies in 51 states and territories and over 165 metropolitan areas across the country, is pleased to submit the following comments concerning the U.S. Environmental Protection Agency's ("EPA") proposal to adopt National Emission Standards for Hazardous Air Pollutants ("NESHAPs") under section 112(d) of the Clean Air Act ("CAA"). The proposed emission limits, commonly referred to as maximum achievable control technology or "MACT standards," will substantially reduce emissions of hazardous air pollutants ("HAPs") from coal- and oil-fired electric generating units ("EGUs").

In addition, EPA has proposed revisions to the New Source Performance Standards ("NSPS") for fossil fuel-fired EGUs and Industrial, Commercial and Institutional Boilers ("ICI Boilers"). These revisions will ensure that, as the existing, aging fleet of fossil-fuel-fired units retires, the units that replace them will be as clean as today's technology reasonably permits. The NSPS proposal would, if adopted, provide more stringent limits for emissions of sulfur dioxide ("$SO_2$"), nitrogen oxides ("$NO_x$") and particulate matter ("PM") for new units in these source categories. These combustion units are among the largest emitters of toxic and criteria pollutants in the country. Accordingly, the benefits to public health and the environment that will result from well-considered rules are substantial.

NACAA strongly supports adoption of effective limitations on mercury, toxic acid gas and toxic metal emissions from these large sources. 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. EPA has conducted analyses employing the Integrated Planning Model ("IPM")[1] that project quite substantial reductions in emissions of mercury and hydrogen chloride ("HCl"), as well as substantial reductions in $PM_{2.5}$[2] and $SO_2$. These reductions are needed to protect public health and to improve the environment. NACAA believes that the data obtained from the most recent round of industry testing support emissions standards at least as stringent as those proposed by EPA. The technology needed to meet these standards has been in use in this sector for 10 to 40 years, and has been shown to be effective and affordable. Seventeen years have now passed since the 1994 deadline for completion of EPA's study of whether MACT standards were needed with the Acid Rain program in place and the Courts have ruled on every conceivable issue. The determination of whether mercury emissions from this sector should be regulated has been the subject of two in-depth EPA reviews, as well as a review by the National Academy of Sciences. It is now well past time for EPA to complete these rules and, for the first time, limit emissions of HAPs from

[1] The IPM is used to evaluate least cost solutions to potential changes in EPA regulations.
[2] Fine particulate matter less than or equal to 2.5 microns in diameter.

these very significant source categories, as originally contemplated by Congress over 40 years ago.

NACAA believes that the proposed emission limitations are within the range of those authorized under the Act and are protective of public health. However, NACAA's review of the record does indicate several instances where limits could and should be more stringent and a number of instances where EPA needs to do a better job of explaining and supporting its proposed decisions.

**"NECESSARY AND APPROPRIATE"**

EPA's attempted reversal, in 2005, of its earlier "necessary and appropriate" finding assumed that regulation under section 112 would not be "necessary" if any other statutory authority could be found to reduce mercury emissions. This interpretation is not supported in the context of the overall statute and was properly rejected by the U.S. Court of Appeals. Congress clearly believed that regulation of HAPs under section 112 was necessary and appropriate for many sectors of the economy – from dry cleaners to cement kilns. The purpose of the utility studies required by Congress, and the question to be answered by EPA, was whether the $SO_2$ and $NO_x$ emission limitations under the Acid Rain program reduced HAPs emissions from the EGU sector to the point where further reductions would be inconsistent with the risks posed by the other sectors for which standards had been or would be implemented.

Importantly, the Court concluded that, having determined in 2000 that regulation of EGUs was necessary and appropriate, the only procedure available to EPA to reverse that decision is delisting under section 112(c)(9)(B) of the CAA. That section requires a demonstration that no source in the category emits carcinogens at a level that would increase the cancer risk to the most exposed population by more than one in one million, that no source in the category emits at a level that exceeds that needed to protect public health[3] with an adequate margin of safety *and that there will be* ***no*** *adverse environmental impact from the source's emissions.* No such showing has been made or attempted.

EGUs generate approximately half of the man-made U.S. emissions of mercury and from 19 to 83 percent of U.S. emissions of antimony, arsenic, beryllium, cadmium, chromium, cobalt, manganese, nickel and selenium. EGUs also emit a large number of different organic HAPs; most of the mass of these emissions is in the form of formaldehyde, benzene and acetaldehyde[4].

It cannot be said that the incidence of cancer, impaired child development and other ailments caused by exposure to these pollutants has decreased to the point that the public health problem identified by Congress in 1990 has been fully addressed.[5] Indeed, the most recent EPA

[3] For many of the HAPs emitted by fossil fuel-fired EGUs, no "safe" level of exposure has been established.

[4] See, 76 FR 24978, 25006, 25006 (May 3, 2011) citing to Strum, M., Thurman, J., and Morris, M., U.S. Environmental Protection Agency. Non-Hg Case Study Chronic Inhalation Risk Assessment for the Utility MACT "Appropriate and Necessary" Analysis. Memorandum to Docket EPA-HQ-OAR-2009-0234. March 1, 2011, the mercury study and the 2005 NATA Inventory.

[5] Similarly, the adverse impacts on the environment associated with these pollutants cannot be said to have been sufficiently reduced by other CAA programs.

assessment[6] of cancer risks from ambient HAPs concentrations estimates that the entire U.S. population at the time of the assessment had an increased cancer risk of greater than 10 in one million,[7] while 13.8 million people have an increased cancer risk of greater than 100 in a million, as a result of breathing HAPs at 2005 ambient levels over the course of their lifetime. Key HAPs contributing to cancer and non-cancer risks include formaldehyde, benzene, arsenic, chromium, nickel and hydrochloric acid, each of which is emitted in significant quantities by EGUs, even after full implementation of the Acid Rain program.

Some have argued that reducing ambient air concentrations of HAPs does not provide meaningful health benefits since most of our daily exposure is to indoor air.[8] Indoor sources of certain HAPs, which are not regulated under the CAA, may indeed in some instances be a major contribution to the exposure of the public to those HAPs.

However, it has also been shown that the HAPs in the ambient air are responsible for a substantial portion of the HAPs found in indoor air. HAPS in the ambient air have been found to be responsible for approximately 20 percent of the indoor levels of formaldehyde and acetaldehyde, and about two-thirds of the benzene found indoors[9]. Strong associations were also found between indoor air and outdoor air concentrations of $PM_{2.5}$ and the associated metal HAPs, such as arsenic and selenium.[10] Congress listed selenium compounds among the HAPs that must be controlled by EPA under section 112. It did so recognizing that exposure to selenium and/or certain of its compounds can result in adverse respiratory effects and that these compounds are possible or probable human carcinogens. The EGUs that are the subject of the proposed regulations are responsible for 83 percent of the selenium emitted to the ambient air.[11]

In its Mercury Study Report to Congress (1997) EPA estimated that 7 percent of women of childbearing age would have blood mercury concentrations greater than that equivalent to the reference dose[12]. This estimate is based on patterns of fish and shellfish consumption and methyl mercury concentrations present in fish and shellfish. Blood mercury analyses in the 1999-2000 National Health and Nutrition Examination Survey (1999-2000 NHANES) for 16- to 49-year-old women showed that approximately 8 percent of women in the survey had blood mercury concentrations greater than the blood mercury level equivalent to the reference dose. Based on these data, EPA has estimated that more than 300,000 infants born each year may have increased risk of learning disabilities associated with in utero exposure to methyl mercury.

NACAA anticipates that some opposed to the proposed regulation of mercury will cite to the existence of a global atmospheric pool of mercury and relatively low projected reductions in average mercury deposition rates associated with the proposed rule in support of their position.

---

[6] *2005 National Air Toxics Assessment*, USEPA, March, 2011.

[7] An excess cancer risk of one in one million is commonly considered a reasonable regulatory threshold.

[8] This does not suggest that overall cancer risks from HAPs are lower since indoor levels of certain carcinogenic HAPs, such as formaldehyde, are generally higher than ambient levels.

[9] Patrick L. Kinney, Steven N. Chillrud, Sonja Sax, James M. Ross, David Macintosh, Ted A. Myatt, and John D. Spengler, Toxic Exposure Assessment: A Columbia-Harvard (TEACH) Study (The Los Angeles Report); (2009).

[10] Teach Study, supra.

[11] 76 FR 24978, supra, at 24978.

[12] A reference dose is an EPA estimate, with uncertainty spanning perhaps an order of magnitude, of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

According to this argument, U.S. EGU emission reductions should have negligible benefits for local and regional environments because the reductions from these sources will be insignificant compared to mercury deposition from the global mercury pool.[13] While a global mercury pool does exist, data collected at a number of U.S. locations over the past decade show that reductions in point source air emissions of mercury produce substantial improvement in the local and regional environment shortly after those reductions are implemented. Indeed, ongoing monitoring efforts in a number of states indicate that mercury levels in fish and other biota have fallen as those states have begun to address sources of mercury pollution.

In November, 2002, an enhanced air monitoring site was established in Steubenville, Ohio to investigate source-receptor relationships for mercury deposition in Eastern Ohio. The site overlooking the Ohio River was in close proximity to several anthropogenic point sources, including EGUs. The data collected during this study demonstrated that approximately 70 percent of the mercury in wet deposition was due to coal combustion and that a significant portion of the mercury deposited in the immediate vicinity of local EGUs was directly attributed to those local sources. The University of Michigan researchers concluded that "it has become evident that near-field impact of coal fired utility boilers on Hg deposition is significant and underestimated by the models that have been utilized in previous policy decision making."[14]

Similarly, wet deposition data collected throughout the Great Lakes over the past decade have demonstrated distinct regional variability that undercuts any suggestion that local mercury emission efforts are of no value. Precipitation samples collected in southeastern Michigan showed a 25- to 35-percent increase in the Hg concentration between urban sites in Detroit and a rural site 40 miles to the east. This phenomenon is not limited to the northern part of the country. Studies in south Florida revealed that the spatial and temporal patterns of wet deposited mercury were also strongly influenced by local sources. National data show similar variability in deposition rates; mercury deposition rates attributable to U.S. EGU emissions at the most affected water bodies are eight times the mean rate of such deposition. EPA's modeling suggests that the proposed rule will reduce this local excess deposition from U.S. EGUs by 80 percent. NACAA believes that such a result would be a significant benefit to public health and the environment.

EPA has also modeled the reduction in adverse health impacts associated with the proposed reductions in mercury emissions. However, EPA's model is limited in that it includes only self-caught freshwater fish as a food consumption exposure pathway and excludes the impacts associated with mercury found in commercially caught fish or saltwater fish. While there are some communities where self-caught freshwater fish form a significant part of the diet, for most of the U.S. population, commercially caught freshwater fish and saltwater fish constitute the vast majority of the fish consumption and their consumption is the dominant mercury exposure pathway. Thus, EPA's modeling is of limited usefulness in assessing the health impacts of the proposed rules.

---

[13] It should be mentioned that U.S. emissions contribute to the global mercury pool.

[14] Gerald J. Keeler, Matthew S. Landis, Gary A. Norris, Emily M. Christianson, and J. Timothy Dvonch**,** *Sources of Mercury Wet Deposition in Eastern Ohio, USA,* pub *Environ. Sci. Technol.*, 2006, *40* (19), pp 5874–5881.

Given the global dispersion of elemental mercury, excess exposure to mercury will not be reduced to acceptable levels by the proposed MACT standards, or for that matter, by any action that the U.S. could take by itself. Global anthropogenic emissions are in the range of 2,100 to 2,500 tons per year ("tpy"), with global fossil-fueled emissions estimated at 500 to 900 tpy. The U.S. contribution to this amount is less than five percent. However, the U.S. is currently engaged in international efforts to reduce global mercury emissions. The third session of the United Nations Environment Programme ("UNEP") Intergovernmental Negotiating Committee will be held in November 2011 to attempt to prepare a global legally binding instrument for the control of mercury. The UNEP negotiation schedule calls for an agreement to be reached by February 2013. The U.S. position paper on these negotiations, submitted to the UNEP in March of this year, correctly calls for **mandatory** limits on mercury emissions, based on application of Best Available Techniques ("BAT") at all significant source categories, rather than merely encouraging the use of such techniques,[15] as some in the international community advocate. NACAA believes that mandatory mercury emission reductions from the international community are essential if the mercury problem in this country is to be effectively addressed and submits that, if the U.S. fails to require BAT levels of controls of its EGU sector, the prospects for an international agreement will be substantially diminished. For this reason, effective mercury regulation of U.S. EGUs, while not sufficient in and of itself, is nonetheless a necessary component of the larger program that is needed to effectively address excess mercury exposure of sensitive U.S. populations, including U.S. children and pregnant women.

Even though precise quantification of the harm is difficult, the general public and those involved in protecting public health remain concerned about mercury hot spots and fish consumption advisories, and about areas of high cancer incidence that are associated with high local concentrations of carcinogenic HAPs.

While there are a lack of specific epidemiological data concerning HAPs impacts on a national scale, greater information is available concerning the economic and public health benefits of reducing fine particulate matter. This information demonstrates that the proposed rules will provide a very significant positive public health and economic benefit, beyond what is associated with reductions in the HAPs themselves. EPA's estimate is that the annual co-benefits from reducing $PM_{2.5}$ will be 6,800 –17,000 fewer premature deaths, 11,000 fewer non-fatal heart attacks, 12,200 hospital visits avoided and 120,000 fewer cases of aggravated asthma. The economic benefit associated with the reduction in fatalities and health care costs, and the resulting improved productivity, is estimated at between $59 billion and $140 billion per year, as against a cost of $10.9 billion per year. Thus, the rate of return to the public for its investment in improved pollution controls is $6 to $14 for each dollar spent. In addition, some of the most toxic HAP emissions being controlled by this rule are associated with fine particulates. These include toxic heavy metals and toxic particulate organic matter. Therefore, it is critical that EPA proceed to adopt its proposed MACT limits on total fine particle emissions from coal and heavy-oil combustion to address the many particulate HAPs emitted by these sources. EPA's proposed limits for total particulates will appropriately require upgrades for particulate control systems on poorly controlled power plants. Good particulate control is a basic necessity for control of

[15] The United States' submission calls for the use of best available techniques for such sources as soon as practicable, but no later than [a date to be negotiated] years after the entry into force of the Convention. See, http://www.unep.org/hazardoussubstances/Portals/9/Mercury/Documents/INC3/United%20States.pdf.

particulate HAPs. It also enables more effective control of acid gas HAPs and gaseous mercury where reagent injection is used.

The reductions in $SO_2$ and $PM_{2.5}$ required by the proposed rules will also provide substantial assistance to state and local air pollution control agencies as they develop and implement programs to meet health-based air quality standards, as well as regulations intended to reduce haze and improve visibility. Because of the substantial reductions in emissions that will be made at these very large sources under the proposed rules, there will be less of a need for state and local authorities to require pollution controls at smaller sources in order to meet health-based ambient air requirements. Since pollution controls at large EGUs are far more cost effective than controls at smaller facilities, controlling EGU emissions is the lowest cost path to improved public health and a cleaner environment.

**FEASIBILITY**

The emission reductions anticipated by the proposal will, in part, be the result of operators switching to cleaner forms of coal and oil, including, for example, by coal washing prior to combustion. Reductions will also be generated by the application of one or more of the following technologies: fabric filters ("FF," otherwise known as bag houses) for control of many toxic metal emissions: acid gas scrubbers for control of HCl, hydrogen fluoride and hydrogen cyanide; and sorbent injection, including activated carbon injection (ACI), to assist in controlling mercury and organic HAPs. For those units with $SO_2$ scrubbers, an option is provided to meet $SO_2$ emission limits rather than new limits on HCl emissions. Simple work-practice standards, such as combustion system tune ups and regular maintenance of existing equipment, are used to minimize emissions of other toxic air pollutants emitted by these units. While there are always new technologies being developed, and existing technologies are constantly being improved, the proposed emission levels do not rely on such improvements. Rather, these new standards can be met by application of existing technologies. Years, and in some cases decades, of experience demonstrates that these technologies can reliably deliver the expected performance at reasonable cost.[16]

EPA IPM modeling estimates that the proposed limits will result in 83 gigawatt[17] ("GW") of new scrubbing[18] and 65 GW of dry sorbent injection ("DSI") added to the existing 145 GW of capacity that already has scrubbing. It also anticipates adding 98 GW of ACI capacity to the existing 48 GW of ACI-controlled generation capacity. Generating capacity using Selective Catalytic Reduction ("SCR") for $NO_x$ control is projected to increase from 120 GW to 146 GW.[19] Given the age of U.S. coal-fired plants, it is also reasonable to assume that some operators will elect to replace existing coal-fired units with lower cost natural gas-fired generation.

---

[16] See, e.g., National Energy Technology Laboratory, U.S. Department of Energy, *Cost and Performance Baseline for Fossil Energy Plants; Volume 1. Bituminous Coal and Natural Gas to Electricity,* Rev. 2, November , 2010, ES-5, ES-7 http://www.netl.doe.gov/energy-analyses/pubs/BitBase_FinRep_Rev2.pdf.

[17] A gigawatt is one billion watts or 1,000 megawatts ("MW"). The U.S. has approximately 300 GW of coal-fired electric generating capacity.
[http://www.eia.gov/cneaf/electricity/page/capacity/existingunitsbs2008.xls says in 2008 US had 337 GW coal, 64 GW oil, 455 GW gas, totaling 856 GW fossil].

[18] Wet or dry flue gas desulfurization or "FGD."

[19] No increase in the use of selective non-catalytic control technology is projected.

Recent history in reducing emissions (such as the Clean Air Interstate Rule discussed below) demonstrates that these controls can be added in the time frame required by the CAA without disrupting supplies of electricity. ACI and DSI require relatively little capital construction and normally involve installation schedules of less than 12 and 24 months respectively.[20] FGD and SCR control technologies require longer schedules, but industry has already demonstrated its ability to add the projected amount of new controls within the statutory deadline (three years, plus one additional year if needed). The most significant emission reduction programs affecting EGUs in the past 15 years were the $NO_x$ SIP call and the CAIR rule.[21] Source-specific obligations under those programs would not be known until the development and approval of state plans under the federal rule. In each of those programs EPA approval of implementing SIPs occurred less than three years from the applicable compliance date and in each instance compliance was achieved. In 2003, alone, 26 GW of new SCR controls – the amount projected for the current proposal - came on line to meet the $NO_x$ SIP call. In the 2000-2004 time frame approximately 70 GW of SCR and 10 GW of FGD capacity were installed. Similarly, in the four years leading up to the compliance deadline for the Clean Air Interstate Rule. 75 GW of new FGD installations came on line[22]. Importantly, this increase in pollution control capacity was achieved without significant adverse impact on electric system reliability. Attachment 1 to this comment identifies the numerous states that have promulgated mercury limitations for EGUs. To our knowledge, no source has failed to comply with state deadlines for achieving these limitations, and no significant adverse impacts on electric system reliability were encountered as units were upgraded to meet state requirements.

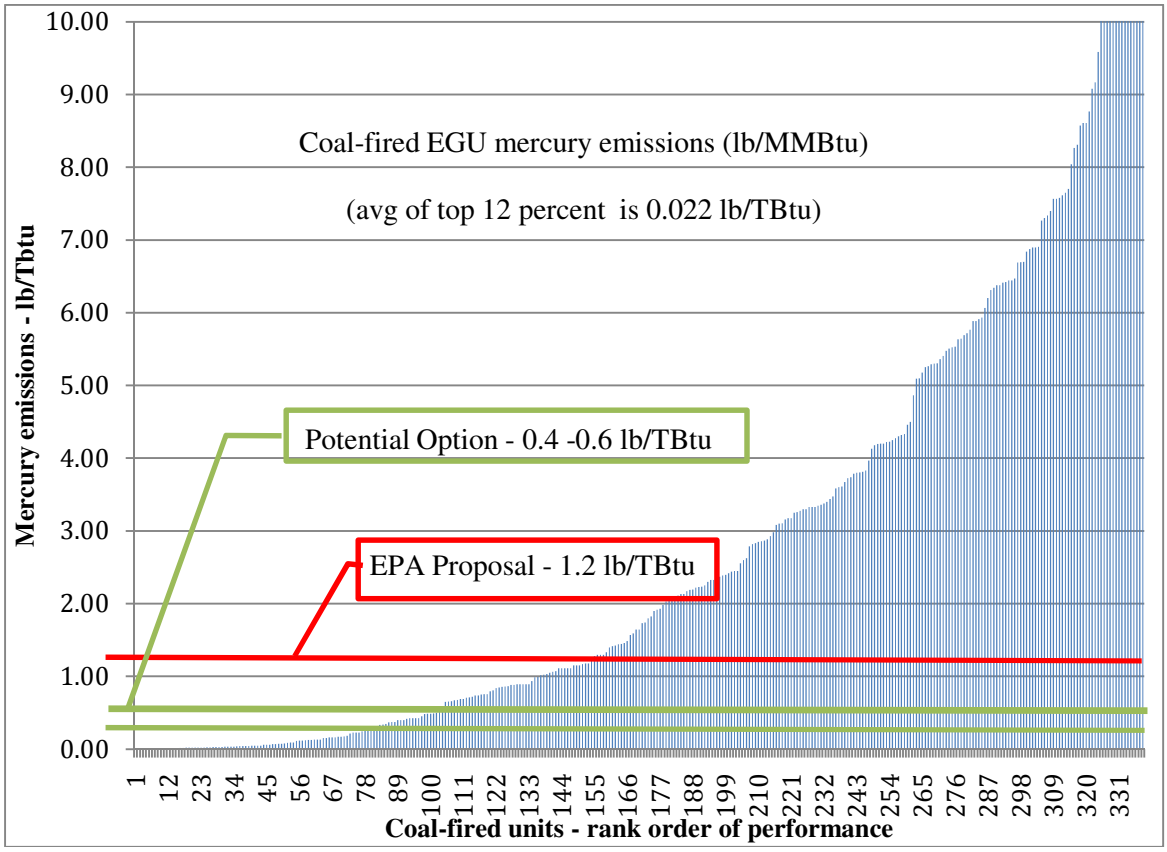
The chart below illustrates the substantial reduction in mercury emissions that will result from implementation of the proposed standard. It also demonstrates that the proposed limits are technically feasible. Nearly half (154/339) of the existing coal-fired units for which EPA has data has already been shown to be able to meet the proposed mercury limits.

[20] See, letter to Senator Carper from David Foerter, Executive Director of the Institute of Clean Air Companies (ICAC), November 3, 2010, http://www.icac.com/files/public/ICAC_Carper_Response_110310.pdf.

[21] The first of many $NO_x$ SIP Call final regulations can be found at 63 FR 57356, October 27, 1998. The CAIR Rule is published at 70 FR 25162, May 12, 2005.

[22] This amount approximates the 83 GW of additional controls projected for the proposed rule. During the same period approximately 25 GW of additional SCR capacity was installed.

Chart 1. Coal-fired EGU Emissions by Unit




**ESTABLISHING A MACT STANDARD**

EPA acknowledges that ACI and FFs are well demonstrated technologies for mercury control, as are FGD/SCR combinations in certain instances. Similarly, EPA concludes that acid gas scrubbing is an effective and feasible strategy for controlling acid gas HAPs emissions and that FFs are effective in controlling metal PM emissions. EPA further agrees that the use of these technologies is common in this sector. If, as EPA assumes, the MACT floor for acid gas emissions will result in 290 MW of capacity to have some form of acid gas scrubbing, what is the rationale for not establishing these technologies as MACT? EPA has not explained why it has not chosen these technologies as MACT and has not discussed the adverse environmental impacts of failing to do so. As proposed, installed control capacity would not have to be fully utilized unless needed to meet the MACT floor-based limit. EPA's model assumes installation of controls whenever an existing unit currently exceeds the proposed limit, but operation only to the extent needed to meet the applicable limit. Establishing these technologies as MACT would have the effect of requiring installed capacity to be fully utilized and of requiring that the remaining 10 GW install these technologies. Since requiring full utilization of installed control devices is a highly cost effective means of reducing pollution, EPA should set forth a clear rationale for any final decision it makes on this issue and, at a minimum, require operators to reasonably minimize HAP emissions by fully utilitizing the capabilities of MACT control systems after installation.

States have years of experience with technology-based limits for mercury and other HAPs, including limits that are more stringent for many sources than EPA's proposed limits. See Attachment 1. EPA's primary obligation under section 112 of the CAA is to establish limits based on the application of the maximum achievable control technology. Secondarily, EPA must assure that those MACT limits are no less stringent than the MACT floor. EPA has focused nearly all of its analysis on calculations of the MACT floor and has not put forth a serious analysis addressing its obligation to propose and adopt technology-based MACT limits as required by section 112 of the CAA. From the plain language of the CAA, it would seem reasonable to expect that standards based on the **Maximum Achievable** Control Technology be no less stringent than those based on the **Best Available** Control Technology. We note that 65 of the 192 units in Subcategory 1[23] have demonstrated mercury removal efficiencies (based on fuel-bound mercury content) of 95 percent or more and that several states have experience with standards as low as 0.6 pounds per trillion British thermal units ("lb/TBtu") or as high as 90-percent removal (from Hg concentrations at the inlet of the control device).

At the conclusion of the work of its member agencies as part of the 2001-2002 Clean Air Act Advisory Committee process,[24] NACAA recommended MACT limits of 0.4 to 0.6 lb/TBtu for mercury, with an alternate 90-percent control requirement. We also recommended a MACT limit of 0.015 pounds per million Btu ("lb/MMBtu") for PM and a 95-percent reduction requirement for $SO_2$ and HCl, based on the then-existing recorded BACT decisions. In addition, we recommended a 100 parts per million (ppm) MACT floor for CO as a surrogate for organic HAPs and suggested that a carbon monoxide ("CO") MACT limit, based on BACT levels, be established. NACAA further suggested that EPA consider short-term CO limits to address concerns relating to high emissions of hazardous products of incomplete combustion, due to poor combustion conditions during transient operating conditions. Since 2002, emission control performance has continued to improve while control costs have decreased and our understanding of the adverse effects of the HAPs emitted by fossil-fuel fired EGUs has increased. The emissions performance shown in the most recent testing demonstrates that the earlier NACAA recommendations were readily attainable. We stand by those earlier recommendations, except to recommend that EPA incorporate higher control efficiencies for mercury and $SO_2$ because of the advances in pollution control systems over the past decade and consider recent BACT determinations for PM and CO in setting MACT standards.

EPA has proposed to set MACT standards, as distinct from standards based on Generally Available Control Technology ("GACT"), for EGUs that have a heat capacity of greater than 250 million Btu/hr, even though such sources may not have been shown in the past to emit HAPS above the major source thresholds for these pollutants. EPA has specifically solicited comment on this proposal. Units of this size are indeed very large. Given the variability in

[23] Subcategory 1 includes 1,030 units that combust bituminous and sub-bituminous coal. It is, by far, the largest and most important subcategory in the rulemaking. For this reason NACAA's comments focus on the regulations that affect this Subcategory.

[24] The Utility MACT Working Group was formed by EPA in 2001 with an original constituency of six representatives of state, local and tribal agencies, eight representatives of environmental organizations and 16 representatives of affected sources, fuel producers, suppliers and labor groups. It was charged with providing input to EPA regarding federal air emissions regulations for coal- and oil-fired EGUs that would maximize environmental and public health benefits in a flexible framework at a reasonable cost of compliance. See, Working Group for the Utility MACT Formed Under the Clean Air Act Advisory Committee Subcommittee for Permits/New Source Reviews/Toxics, http://www.epa.gov/ttn/atw/combust/utiltox/utoxpg.html#CAAAC.

HAPs emission rates and HAPs fuel content demonstrated by the record, it is clear that these units have the potential to emit substantial quantities of HAPs. For this reason NACAA supports application of MACT standards, rather than the less stringent GACT standards that would otherwise apply.

**EMISSIONS OF ORGANIC HAPs**

In the past, including in the recently promulgated ICI Boiler MACT that applies to a number of units similar to those in the EGU sector, EPA has employed the use of CO as a surrogate[25] for organic HAPs emissions and has adopted specific emission limits for CO from coal and oil-fired units, and for dioxins and furans ("D/F"). In this instance EPA has elected not to employ CO as a surrogate and not to adopt emission limits for D/F or other organic HAPs. Instead, EPA has proposed a work-practice standard, a "tune up" that it acknowledges will not lead to measurable reductions in organic HAPs emissions. EPA has sufficient CO emissions data to establish a MACT floor, as it has in other sectors, and offers no rationale for its decision not to employ CO as a surrogate for organic HAPs. EPA then argues that emissions of a number of individual organic HAPs, such as benzene, were frequently below the detection limit ("BDL") at the very best performing units and therefore it is infeasible to establish or enforce an emission limitation. However, EPA has established procedures for addressing BDL values in calculating MACT floors and for other purposes. Moreover, the relevant factual issue is whether the emissions from the group at large are below detection limits, not just those of the very best performers.

EPA has not explained why it is infeasible to set a MACT limit or MACT floor using the CO data in its possession. EPA's Multi-pollutant Control Research Facility pilot-scale testing provides useful information as discussed in the proposal's preamble, but only describes the emission performance of units that presumably would comply with the CO MACT floor of less than 100 ppm that EPA would otherwise have calculated (if the agency had done such a calculation). This testing is cited by EPA as demonstrating that at low CO levels there is not a strong correlation between CO and organic HAPs emissions. However, these data provide no reason to believe that reducing CO emissions to 100 ppm from much higher levels would not lead to meaningful reductions in organic HAPs from units currently emitting CO at much higher levels. Thus, this issue requires additional study. NACAA agrees that, if upon examination, there is no correlation between organic HAPs levels and elevated CO emissions, CO should not be used as a surrogate. In this event, however, EPA would be obliged to set a MACT floor and MACT limits for each of the individual organic HAPs of concern. .This approach has successfully been employed by states issuing new source MACT permits.

EPA makes the same argument with respect to D/F, but adds an argument that, in some instances, not all cogeners of dioxins have been found to be above detection limits in some samples. We do not understand the relevance of this argument. Dioxins are extremely hazardous chemicals and, while some congeners are more hazardous than others, the risk posed by dioxins is not dependent on all possible congeners being present.

[25] EPA has employed CO as a surrogate for organic HAPs emissions in MACT standards for several other categories of sources, including ICI Boilers, hazardous waste incinerators, cement kilns and lightweight aggregate kilns.

NACAA does not support the use of CO as a surrogate for D/F. CO can sometimes serve as an indicator of good combustion and relatively low CO levels must be present in order to attain low D/F emissions; however, the chemistry associated with the formation of this class of toxics is complex and low CO levels do not guarantee low D/F emissions.[26] We recognize that D/F testing can be expensive, but the "tune up" identified in the proposal does not attempt to incorporate those work practices that are recognized as minimizing D/F emissions. EPA should adopt numeric emission limits consistent with levels achievable through application of MACT. This limit should be no less stringent than MACT floors calculated using the levels achieved by the best performing units, even if those levels are at or below the detection levels. Where the unit's emissions are reported as below the detection level,[27]the detection level may be substituted.[28] Sources should be required to conduct a stack test, during which the parameters that affect the emission levels of these pollutants, including PM control device temperature, CO and THC levels, soot conditions and entrained PM levels can be monitored and employed thereafter as parametric monitoring conditions. Exceedances or changes in any of the parametric monitoring conditions would then trigger an obligation to conduct a D/F compliance test.

Finally, we note that work practice standards are only intended to address difficulties in measurement and do not authorize a relaxation of the overall performance obligation. For this reason section 112(h) specifically requires that such work practice standards be consistent with section 112(d). Section 112(d) requires that standards be based on maximum achievable control technology and that such standards be no less stringent than the performance achieved by the top performing 12 percent of sources for which the Administrator has data. Thus, a fair reading of section 112(h) would require that work practice standards be designed to provide the level of performance achieved by the best performing 12 percent of sources in the category. EPA has not attempted to demonstrate that its tune-up requirement will improve the performance of the sources in the category up to the level of the top performers or that a tune up really is the maximum achievable control technology.

**"THE BEST PERFORMING UNITS"**

NACAA understands that the Courts have determined that EPA may estimate the performance of the best-performing units under the worst-case testing conditions that "can reasonably be expected to recur" in the course of calculating MACT floors. However, the phrase "reasonable worst case" testing conditions does not mean "highest theoretically conceivable emissions." Rather, it should be understood to encompass the full use of installed pollution control devices, at those regularly used operating loads that maximize emissions and with the range of variation of fuels typically employed by the facility.[29] Importantly, in defining the test conditions that ultimately establish the compliance obligation that sources must meet, EPA

[26] http://www.epa.gov/ttn/atw/iccr/dirsa/dioxinpr.pdf

[27] In many instances sources reported that results were less than the "reporting level" for the laboratory; a figure that is two to four times higher than the detection level. Different laboratories reported different detection limits and EPA has data from several hundred D/F test runs that were above the detection and reporting levels of the laboratory performing the analysis. Obviously, those data should be employed where they are within the top 12 percent of the best performers.

[28] This approach provides industry with the highest reasonable standard based on the data in EPA's possession.

[29] As distinct from fuels that the source could employ, but does not currently purchase.

directs sources to employ the 90th percentile "worst case" fuels, not the 99th percentile worst case fuels.

EPA is not free to select upper prediction limit ("UPL") probability factors without support in the administrative record for its decision[30]. The argument that sources are entitled to a variability factor[31] so large that there is no possibility of a stack test failure goes too far since, for any numerical limit that would be established, there is always a statistical non-zero probability of failure, even if such emission levels could never be reached as a practical matter. The Courts have held that variability estimates that lead to irrational results, such as MACT floors met by all units in the subcategory[32], are not permitted. In the proposed rule EPA has selected the 99th percentile UPL to set the variability levels. In other rules EPA has used the 90th percentile UPL and the 99.9th percentile UPL[33]. We note that in the 2002 Clean Air Act Advisory Committee process, industry sought a variability factor based on the 95th, not the 99th percentile, and that EPA used the 97.5th percentile in calculating MACT floors for EGUs[34] in an earlier iteration of the current rulemaking.

In the proposed rule EPA seems to assume that it has no discretion but to employ the result of a 99th percentile UPL calculation procedure (and the associated data treatment leading up to that calculation). It does so even where that procedure leads to unrealistic estimates of the performance of top units in a subcategory, such as the proposed 11 lb/TBtu mercury MACT floor for conventional EGUs combusting lignite and the proposed variability factor of 56 for Subcategory 1 EGUs. However, the EPA calculation process is not dictated by Congress, but is EPA's own invention. EPA has employed a number of different processes to estimate the performance of the top 12 percent of units over the years. The current process employs a number of discretionary choices with respect to data management. These choices have a significant impact on the resulting floor calculation and must, as other decisions in this rulemaking, be rational and supported by information in the record. At times EPA's current process produces what appear to be reasonable results; at other times it does not. Where the results of this process are at odds with other credible engineering information, as well as several decades of EPA, state and local regulatory experience, EPA is obliged to resolve the issue through examination and analysis of all available information.

Table 1 sets out the results of a sensitivity analysis performed by NACAA to examine the impact of a range of choices available to EPA in evaluating the mercury data for Subcategory 1 sources. It presents what the MACT floor would be, using different choices as to the "percentile" UPL to employ, as well as several different choices available to EPA in data selection and utilization. Table 1 also sets out the "multipliers" of the arithmetic average of the best performing 12 percent of these sources that are associated with each of the options analyzed. These results represent but a few of a larger number of choices available to EPA in calculating the MACT floor.

---

[30] See, *Sierra Club v. United States Environmental Protection Agency*, 167 F. 3d 658 (1999).

[31] EPA has set this factor in the form of a "multiplier" of the UPL that it calculates. Herein, we use multiplier and variability factor interchangeably.

[32] "With these numbers EPA's method looks hopelessly irrational." *Sierra Club, supra,* at 663.

[33] 76 FR 15608 (March 21, 2011).

[34] See, MACT Floor Analysis for Coal- and Oil-Fired Electric Utility Steam Generating Units National Emission Standards for Hazardous Air Pollutants (2003), EPA-HQ-OAR-2002-0056-0034.

Table 1. Subcategory 1 Mercury UPLs and Multipliers

| **Mercury MACT floor (lb/TBtu) multiplier** | **99th percentile UPL** | **95th percentile UPL** | **90th percentile UPL** | **80th percentile UPL** |
|---|---|---|---|---|
| **EPA method (including 4 outliers)** | 1.181<br>55.6 | 0.834<br>39.3 | 0.653<br>30.7 | 0.435<br>20.5 |
| **EPA method (4 outliers removed)** | 0.444<br>21.0 | 0.312<br>14.7 | 0.251<br>11.8 | 0.172<br>8.11 |
| **Average of unit UPL[35]s (including 4 outliers)** | 3.01<br>142 | 0.839<br>39.6 | 0.489<br>23.1 | 0.262<br>12.4 |
| **Average of unit UPLs (4 outliers removed)** | 3.61<br>169 | 0.867<br>40.9 | 0.475<br>22.4 | 0.245<br>11.6 |
| **Average of complying unit UPLs[36]** | 1.13<br>53.1 | 0.327<br>15.4 | 0.182<br>8.54 | 0.092<br>4.32 |
| **Average of individual units with 3 or more data points[37]** | 2.97<br>106 | 0.748<br>32.0 | 0.420<br>19.4 | 0.221<br>10.8 |

In establishing the variability factors to be applied to the information in its data set EPA should consider:

1. the public health impacts of the available options;
2. Congressional intent that some relatively large percentage of sources reduce HAP emissions as the result of MACT standards;
3. the full range of available options in performing a variability analysis;
4. the time frame of the standard and the testing data used to set the standard, compared to the data specified to determine compliance – variations in short term test performance will be less if EPA adopts standards averaged over longer periods of time;
5. the sensitivity of the process to "outliers";
6. the assumptions employed in developing the set of measures by which compliance with the numerical limit will be determined;
7. the variability in test results for similar pollutants (e.g., $SO_2$ as a surrogate for acid gas HAPs and PM as a surrogate for HAPs metals) exhibited by regulated sources over the years;
8. for subcategories with few units, the variability demonstrated by units in other subcategories;

---

[35] Here, NACAA has employed EPA's formula $\bar{X} + t_{df,p}\sqrt{s^2\left(\frac{1}{n}+\frac{1}{m}\right)}$. For the mean, we have used the mean of the lowest value for all of the best performing units, as EPA has. To determine the variability we used the average of the individual unit variance for all units with multiple data points in the set of best performing units. One could also average the individual unit UPL for all units in the set with multiple data points. However, this would effectively disregard the performance of a number of "best performing units" for which there is only one test.

[36] "Complying units" are those whose lowest test result is better (lower) than the average of the top 12 percent (nominally the top 6th percentile). None of the units in the upper 6th percentile had test results that were outliers.

[37] One of the outliers had more than two data points. The outlier value for that unit was excluded in this calculation.

9. that sources were, for the most part, under no obligation to minimize HAP emissions during testing;
10. that EPA has limited information concerning plant operating conditions during testing;
11. that, for the most recent round of testing, sources understood the purpose of the testing, and
12. that, for future testing, sources will know in advance the date of the test and can control the operating parameters of the facility based on earlier tests.

Importantly, where a source's test results include a single test that is significantly different from other tests for that unit, EPA should exclude that test result as an outlier in determining the MACT standards, unless it understands the reason for the high emission rate, can confirm that the facility's pollution control devices were functioning properly during the test and knows that the plant operating condition was within the reasonable worst-case operating parameters for that facility.

## FACTORS AFFECTING THE DETERMINATION OF THE MACT FLOOR

NACAA's analysis indicates that EPA's proposed MACT floor calculation results are primarily influenced by:

1. the inclusion of sources with highly variable results as "best performers;"
2. the choice of the 99$^{th}$ percentile UPL as opposed to the 90$^{th}$ percentile UPL, 80$^{th}$ percentile UPL or other available figure;
3. for the mercury MACT floor for Subcategory 1 – the inclusion of four outliers in a data set of 80 results;
4. rounding and truncating the results of the calculation;
5. inclusion of inter-unit variability; and
6. EPA's treatment of test results near the detection limit.

We address each of these issues in detail below.

Inclusion of units with highly variable results in the pool of "best performers"

EPA initially selects the units based on the single lowest test results of the units in the subcategory and designates the units in the top 12 percent of this group as best performing units. It then includes other test results for those units in determining the UPL for purposes of assigning a variability factor.[38] Because of this, EPA's results include units with highly variable performance, and one low test result, rather than units with *consistently* good performance. In other MACT rulemakings NACAA has commented that EPA's approach is inconsistent and leads to higher MACT floors than are appropriate.[39] EPA should define "best performing units" after consideration of appropriate variability allowances. Available data concerning units in the

[38] We note that this is different from, and preferable to, the approach used in developing MACT floors for the ICI Boiler MACT standard.

[39] This is the process referenced in the initial *National Lime* decision, *National Lime Association v. Environmental Protection Agency*, 627 F2d 416 (1980).

top 12 percent that exhibit large variations in test results should be evaluated to determine the reason for the variation in performance[40].

Choice of the 99th Percentile UPL

> EPA sets out the basis for its choice of the 99th percentile UPL as follows:
>
> "[t]he level of confidence represents the level of protection afforded to facilities whose emissions are in line with the best performers, and consequently, the level of confidence is not arbitrary."[41]

This argument is circular and so, the result is arbitrary. The 99th confidence level "represents the level of protection afforded to facilities whose emissions are in line with the best performers" because EPA has decided to apply this figure. It is also not clear what harm EPA intends to "protect" these sources from since the compliance testing provisions do not mandate such an extreme level of operation. We believe the "level of protection" afforded the public should also be considered. EPA explains that:

> "[t]he 99th confidence UPL was selected as a reasonable upper limit because only 1 percent of future tests of the MACT pool of lowest emitting EGUs will exceed the limit if they are performing as well as the emission test data indicate (i.e., these EGUs will be below or achieve the limit 99 percent of the time in the future). If variability was not accounted for in this manner and a limit was set based solely on the average performance, then these EGUs could exceed the limit half the time or more[42]."

EPA's second argument correctly describes the outcome of its application, but only if future emissions performance continues to be random in nature. Since few state regulations have limited the HAP emissions of the best performers, most of the HAP emissions data in EPA's set are at least semi-random in nature. This behavior will change with the adoption of rules that place an upper bound on emissions. As long as the standard is technically feasible, there is no reason to believe that the probability of noncompliance is predicted by the inter-unit variability of the performance that was achieved by a group of sources in the absence of direct regulation. If the MACT floor were set at the 50th percentile[43] then EGUs in the bottom half of the top 12

---

[40] For example, if no numerical standard applies, or if the unit's emissions are well below the applicable standard, many operators believe that they are under no additional obligation to operate the control device in a manner that minimizes emissions. Indeed, there are instances where operators have turned off $SO_2$ scrubbers when those controls are not needed for acid rain program compliance. Test data collected when control equipment is not operating at full efficiency should not be included when determining the best-performing units or calculating standards.

[41] See, **"**National Emission Standards for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) Floor Analysis for Coal- and Oil-fired Electric Utility Steam Generating Units – REVISED," May 18, 2011, p. 4.

[42] Id., at p.6.

[43] The 50th percentile is the most likely value of the performance achieved by those units.

percent of existing units would have to make some improvements in order to maintain an adequate compliance margin, which we believe was intended by Congress.[44]

EPA's rationale is also of no help in explaining why the 99th percentile is preferable to the 90th percentile or some other level. EPA states that it has used the 99th percentile UPL in other MACT rulemakings. While true, this assertion does not provide a rational basis for a decision to do so here. EPA has used the 90th percentile in an earlier mercury rulemaking applicable to EGUs[45] and in setting the procedure for establishing compliance by means of fuel sampling. EPA has also used far lower estimates of the variability of emissions from complying sources in establishing options for reduced monitoring. Table 1, above, illustrates the impact of different selections of UPL on a number of proposed MACT floors. Clearly, these significant differences will have an impact on public health and the environment. The 90th percentile provides a reasonable balance between protecting public health and avoiding stack test failures at well-controlled and operated units. It is also consistent with the structure of the proposed methods for demonstrating compliance[46]. EPA should evaluate its statistical choices with these impacts in mind and set forth a rational basis for its choice.

Inclusion of Outliers

At several points in the analysis EPA explains that certain data have been excluded as outliers. These exclusions included very low results[47] and very high results that were two orders of magnitude greater than other data in the set. Deletion of outliers in this manner is commonly employed in analyses such as these. The Subcategory 1 mercury variability analysis includes 80 data points for 40 units in the data set. For three of those units[48] one test result is included that is more than two orders of magnitude greater than the test result that qualified the unit as a "best performing unit." For the BL England unit, the outlier test result is 82 times greater than the test result that led to inclusion of the unit, more than 10 times greater than the mean of the other test results for the unit and greater than the 99th percentile UPL of those results.

NACAA calculated the UPL of the mercury content of the coal in EPA's Subcategory 1 data base at the 90th percentile and 99th percentile levels. This calculation showed variability factors of two to five when compared to the mean of that data and five to 40 when compared to the lowest value in the set. We believe this information supports the conclusion that the four test results we have identified are not likely to be the result of variations in fuel content, but are indeed outliers that should be excluded. It also suggests that multipliers in excess of 10 or 20 that are intended to account for variability in the mercury content of fuel are unreasonable.

---

[44] For any data set one would ordinarily expect that those units in the bottom half of the set will emit at levels greater than the average of the set.

[45] 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.

[46] As explained below, the method for demonstrating compliance by way of fuel sampling specifies the use of the 90th percentile worst-case sample.

[47] EPA also excluded several sources from consideration as the "best performing unit" for purposes of identifying the MACT floor because only the final result of the test was provided by the source. NACAA does not believe that this approach is permitted by the statute. There is no information suggesting that the test is not accurate. EPA should use the test result as the "mean" in its UPL calculation and employ other information, such as the variability calculated for the next best source, to assign a variability factor to the mean.

[48] These units are identified by EPA as Spruance Genco, Scrubgrass and Cherokee #4.

Excluding these outliers reduces the 99th percentile UPL from 1.18 to 0.444 lb/TBtu and the 90th percentile UPL from 0.653 to 0.251 lb/TBtu. NACAA suggests that these results demonstrate the importance of EPA's decisions respecting data treatment and that EPA's overall technique is overly sensitive to the inclusion of very high test results submitted by members of the regulated industry.

Rounding and Truncating Data

Rounding and truncating issues should not be allowed to have a significant impact on the determination of a MACT floor, but EPA has permitted these matters to significantly affect the proposed emission levels. EPA's approach to rounding introduces an inappropriate upward bias to the calculation of MACT floors. It should be revised to reflect technically correct rounding procedures and the requirements of the statute. For example, the mean of the top 12 percent of the Subcategory 1 units for arsenic is given as 0.41029 lb/TBtu.. EPA then multiplies this figure by approximately 2.5 to account for variability and calculates an UPL of 1.0816 2988lb/TBtu. Expressed to three significant digits, this result would ordinarily be set out as 1.08 lb/TBtu. EPA's desire to ensure that no source be at risk of a 1-percent false positive result would cause it to raise this figure to 1.09, which could easily be argued is not a significant increase. Expressed to two significant digits this figure would round up to 1.1 lb/TBtu; again, this would represent an increase of no great import. However, EPA nearly doubles the limit by "rounding" to 2.0 lb/TBtu. Table 2 sets out a number of the more significant impacts of this procedure.

Table 2. Impact of Rounding and Truncating Choices on Proposed MACT Floor Calculations

| **Pollutant (lb/TBtu)** | **Average of the top 12 percent** | **99th percentile UPL rounded to 3 and (2) significant digits** | **EPA's proposed Rounded/truncated limit** |
|---|---|---|---|
| **Arsenic** | 0.410 | 1.08 (1.1) | 2.0 |
| **Lead** | 0.536 | 1.28 (1.3) | 2.0 |
| **Beryllium** | 0.0489 | 0.133 (0.13) | 0.20 |
| **Nickel** | 1.41 | 3.39 (3.4) | 4.0 |
| **HCl** | 219 | $1.25 \times 10^3$ ($1.3 \times 10^3$) | $2.0 \times 10^3$ |
| **$SO_2$** | $7.4 \times 10^3$ | $1.70 \times 10^4$ ($1.7 \times 10^4$) | $2.0 \times 10^4$ |
| **Mercury** | 0.0213 | 1.18 (1.2) | 1.2 |

In its initial Subcategory 1 mercury MACT floor calculation, EPA had determined that the MACT floor was slightly less than 0.9 lb/TBtu, which it then rounded to 1.0 lb/TBtu. After a calculation error was identified by industry, EPA revised its UPL calculation to 1.18121634. In this instance, rather than rounding to 2 or 2.0 lb/TBtu, EPA has only rounded up to 1.2. While commendable, EPA's disparate treatment of this standard will likely lead to a claim that the mercury limit should be raised to 2 or 2.0 lb/TBtu.

In most engineering calculations, rounding protocols provide for rounding down as well as up. EPA justifies its decision to only round up by asserting that to do otherwise would deprive sources of the "variability" cushion to which they were otherwise entitled. This position is unbalanced in that it wholly 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.[49] 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 equal to greater than 5) for the final calculation. Where a MACT floor would otherwise be calculated at 1.082, it would seem that rounding a final standard to 2.0 rather than 1.08, 1.09 or 1.1 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.

EPA's rounding policy also addresses the issue of the number of significant digits that should be in an emission standard and states that all then-existing NSPS should be construed as having no less than two, nor more than three significant digits. This was important at the time because the new rounding policy replaced an earlier policy that did not allow rounding at all. If a standard were set at 3, under the earlier policy a test result of 3.0001 would be a failure; under the new policy sources could "round down" to compliance. The expression of a standard in a minimum number of significant digits limited the adverse environmental effect of this change. Since that policy only retroactively changed the number of significant digits in standards in existence, EPA has been careful to set out newly promulgated standards in the appropriate number of significant digits.

Rounding also ordinarily includes truncating the number of significant digits **only at the end of the calculation process**. In the EGU MACT floor memo, EPA truncates many of its calculations to one significant digit and then expresses the resulting value in two significant digits in the proposal – an unheard of and completely unjustifiable approach. The limit for arsenic provides a fair example of the process. The 99$^{th}$ percentile UPL calculated by EPA for arsenic is 1.0816. EPA truncates this result to one significant digit and rounds up to obtain a value of 2, which it then expands back to two significant digits and proposes a limit of 2.0 lb/TBtu. Properly done, this calculation yields a limit of 1.08 (to three significant digits), or 1.1 lb/TBtu (to two significant digits). Having calculated the UPL, EPA's rounding and truncating approach guarantees that the standard will be less stringent than the average performance of the top 12 percent in the category by substantial amounts and is likely unlawful. EPA should employ technically sound rounding protocols, including those that require rounding down at the final step.[50] Should it decide that it must always round up, EPA should promulgate all MACT standards to three significant digits to minimize the adverse environmental impact of rounding up its final UPL calculation when setting a standard.

Inclusion of Inter-unit Variability

NACAA understands the need to incorporate some calculation of the variability in performance that is expected with modern pollution control devices in the determination of a MACT floor. NACAA believes that the arithmetic average of the performance achieved by the best performing 12 percent of existing units for which EPA has data should be adjusted to reflect

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

[50] EPA's rounding/truncating approach occasionally leads to significantly different results between input and output-based limits.

the repeatability of performance of complying units,[51] so that an operator of a unit with a designed adequate compliance margin has a reasonable expectation that the unit will pass a compliance test. As we have commented in the ICI Boiler MACT data acquisition and rulemaking process, this is best accomplished by repeat **controlled** testing of complying units. EPA has chosen not to do so, but has based its proposed assignment of variability on a calculation method that includes the difference in performance between all units in the top 12 percent. The use of inter-unit variability as a surrogate for unit repeatability can lead to an inappropriate calculation of the MACT floor. Congress has specified how to address the inter-unit variability in the performance of the best performing 12 percent of the units in a subcategory – average the results.

In the absence of controlled testing of individual units, EPA has utilized the variability between individual runs[52]of tests to calculate a variability factor for pollutants other than mercury. These analyses have led to multipliers of between 2.15 and 5.71 for the covered pollutants. With the exception of the multiplier for HCl, these multipliers are consistent with the experience of NACAA's member agencies.

Table 3. Multipliers for Non-mercury Pollutants

| **Pollutant** | **Average of Top 12 percent (lb/MMBtu)** | **Multiplier** | **99th percentile UPL (lb/MMBtu)** |
|---|---|---|---|
| **PM total** | 0.0116 | 2.27 | 0.0264 |
| **Metal total** | 0.0000142 | 2.65 | 0.0000376 |
| **Antimony (Sb)** | 2.10E-07 | 2.62 | 5.49E-07 |
| **Arsenic (As)** | 4.10E-07 | 2.64 | 1.08E-06 |
| **Beryllium (Be)** | 4.90E-08 | 2.72 | 1.33E-07 |
| **Cadmium (Cd)** | 9.85E-08 | 2.15 | 2.12E-07 |
| **Chromium (Cr)** | 1.22E-06 | 2.32 | 2.82E-06 |
| **Cobalt (Co)** | 2.82E-07 | 2.52 | 7.12E-07 |
| **Lead (Pb)** | 5.36E-07 | 2.39 | 1.28E-06 |
| **Manganese (Mn)** | 1.68E-06 | 2.49 | 4.20E-06 |
| **Nickel (Ni)** | 1.41E-06 | 2.40 | 3.39E-06 |
| **Selenium (Se)** | 1.62E-06 | 3.41 | 5.53E-06 |
| **HCl** | 0.000219 | 5.71 | 0.00125 |
| **$SO_2$** | 0.0740 | 2.30 | 0.170 |

Of the 40 units in the top 12 percent of EPA's Subcategory 1 data base, 20 units have conducted year-over-year tests for mercury. Using EPA's UPL approach and data, NACAA has calculated the variability demonstrated by each of these units. This variability includes testing, fuel and other operational variability for each of these units, but not inter-unit variability. To evaluate the impact of very small number statistics (sample size of two) on the result, NACAA has also calculated the UPL and multipliers of the mean that would result, using the data for the 13 units in the top 40 that had three or more test results.

[51] It should be noted that nominally half of the units in the top 12 percent should be expected to have to take additional steps to comply with a floor based on the average performance of the group. Only those units in the 94th percentile should be expected to comply without additional efforts.

[52] Federal emission test procedures generally specify that the result of a test is the average of three separate runs.

Table 4. Subcategory 1 Mercury UPLs and Multipliers

| **Mercury MACT floor (lb/TBtu) multiplier** | **99th percentile UPL** | **95th percentile UPL** | **90th percentile UPL** | **80th percentile UPL** |
|---|---|---|---|---|
| **EPA method (including 4 outliers)** | 1.18<br>55.6 | 0.834<br>39.3 | 0.653<br>30.78 | 0.435<br>20.54 |
| **EPA method (4 outliers removed)** | 0.444<br>21.0 | 0.312<br>14.7 | 0.251<br>11.8 | 0.172<br>8.07 |
| **Avg of individual unit UPLs (including 4 outliers)** | 3.44<br>163 | 1.06<br>49.8 | 0.637<br>29.0 | 0.350<br>16.4 |
| **Avg of individual unit UPLs (4 outliers removed)** | 3.43<br>169 | 0.824<br>38.9 | 0.453<br>21.3 | 0.234<br>11.0 |
| **Avg of complying unit UPLs[53]** | 1.13<br>53.1 | 0.327<br>15.4 | 0.182<br>8.54 | 0.0924<br>4.34 |
| **Avg of individual units with 3 or more data points[54]** | 2.25<br>106 | 0.682<br>32.0 | 0.413<br>19.4 | 0.229<br>10.8 |

NACAA does not anticipate that year-over-year test results of well-controlled and operated units will vary by more than an order of magnitude, especially under the compliance conditions of the proposed rule. Procedures that lead to multipliers significantly over 20 are clearly unrealistic (as comparison to Table 3's reasonable multipliers confirms) and should not be employed by EPA in assessing the variability of complying units.

Treatment of Test Results at or Near the Test Method Detection Limit

EPA asserts that in its experience, test results near the detection limit of the test method employed are accurate to within 40 percent, but when the result is three times the detection limit, the expected accuracy of its test methods improves to 15 percent. Thus for example, if the detection limit was 1 ppm, EPA would expect the result to be accurate within a range of 0.6 to 1.4 ppm; while if the result was 3 ppm, the agency would assess the range to be 2.55 - 3. 45 ppm. However, in designing the test program, EPA instructed sources to utilize a very high "detection limit," one set at the 99th percentile, which should increase the confidence level of the result.[55] EPA then assigned a value equal to three times the highest detection limit to any test result in the group that was below the detection limit ("BDL") of the method employed in analyzing the results. Thus, it would assign 3 ppm (not 1.4 ppm) as the test result if the detection limit was 1 ppm[56]. Thereafter, EPA assigns a second variability factor to the results that include this multiplier. The scientific community has adopted several approaches for the use of BDL values, including an assumption of zero, an assumption that the value is half of the detection limit and an assumption that the value is the detection limit itself.

[53] None of the units in the upper 6th percentile had test results that were outliers.
[54] One of the outliers had more than two data points; the outlier value was excluded in this calculation, while the other test results for that unit were utilized.
[55] EPA explains that this means there is only a one percent chance of a false positive in any tests. 76 FR 25041.
[56] At different points, EPA appears to use the terms "detection limit" and "reporting limit" interchangeably.

Since the agency is separately assessing a "variability" factor based on testing of units that incorporate measurement variability as well as inter-unit variability, there is no technical basis for assuming that a value that is reliably reported as **below** the detection limit is **three times higher** than that value. This is especially true where EPA has instructed sources to use a very high value for the detection limit. EPA recognizes that use of three times the minimum detection limit may lead to inappropriately high MACT floor calculations and has requested comment on this issue as well as how to calculate variability, where a significant part of the data is below the detection limit. EPA should use a figure no higher than the detection limit for its calculations

**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. The EGU sector is an appropriate group for this approach, since the product – electricity delivered to the grid – is easier to measure and compare than, for example, outputs from a variety of industrial processes. However, 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 generation.

For most of the proposed standards, a heat rate of 10,000 Btu/kWh results from converting[57] the input-based (lb/MMBtu) to output-based (lb/MWh) standards. Sources whose heat rate is already lower than this figure will choose the output-based standards and comply with limits that are up to 10 percent less stringent than would otherwise be the case. The majority of sources with a heat rate above 10,000 Btu/kWh will choose to comply with the input-based standard.[58] Thus, 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.

[57] This conversion is accomplished by dividing the output-based ((lb/MWh) standard by the input-based (lb/MMBtu) standards that are asserted to be equivalent in stringency.

[58] Some sources with a heat rate above 10,000 Btu/kWh may elect output-based standards, depending on the effect of EPA's rounding and truncating of the various limits and the conversion factors employed.

Opportunities for improvement in the heat rate of existing EGUs are relatively small. t[59]. In addition, many efficiency improvement options, such as soot removal, are not permanent and require ongoing maintenance to sustain improved performance. EPA should develop a record in its upcoming EGU GHG regulations that would enable accurate measurement and determination of sustainable efficiency improvements. The record in this rulemaking is not sufficient to establish such procedures.

EPA has acknowledged that it does not have data reflecting net electrical output of the "best performing units" at the time that the testing was conducted and that it identified the "best performing units" on an input basis. Moreover, our review of EPA's data reveals serious discrepancies in the conversion of rates from lb/MMBtu to lb/MWh. EPA proposes output-based limits for most pollutants and categories that reflect a heat rate of 10,000 Btu/kWh, slightly less than the average heat rate for all coal-fired EGUs, and substantially less than the average heat rate for oil-fired EGUs. However, there are a number of proposed limits where the imputed heat rates are unrealistically low, while others are far higher than experienced in practice. These variations occur both within and across subcategories and are far, far larger than any efficiency improvements that one might anticipate. For mercury, the imputed heat rates range from 6,667 Btu/kWh to 18,181 Btu/kWh across the five proposed subcategories; while within Subcategory 5, imputed heat rates for different metals range from 1,818 Btu/kWh to 17,500 Btu/kWh. NACAA recommends that EPA revisit each of its proposed output-based limits and resolve the apparent discrepancies.

EPA suggests that it may be too difficult for existing sources to measure their net electrical output. For this reason EPA proposes to adopt an output-based standard based on gross electrical output, which would only provide incentives for efficiency improvements at part of the facility. NACAA finds it difficult to accept the assertion that most EGUs do not know their net electric output at all times, as well as the assertion that it would be technically challenging for EGUs to measure net electric generation at the point of connection to the grid. Measuring electric generation at the bus bar would appear to be far less technically challenging than providing accurate determinations of the quantity and heat content of the fuel being consumed at any point in time. NACAA suggests that this issue an important matter that deserves a fuller evaluation. EPA should identify the specific information that it relies on in rejecting net output-based standards and state why, especially for new sources, measuring electric delivery to the point of interconnection to the grid (which is where commercial sales of electricity generally occur) is technically infeasible.

If sufficient reliable data were available, EPA could establish a single net output standard in this rulemaking and not promulgate an input-based limit at all. EPA could develop the list of "best performing units" initially in terms of the emissions per unit of net electric output[60]of the unit at the time of the test, rather than using a conversion factor for all units at the end of the

---

[59] See, http://www.epa.gov/nsr/ghgdocs/electricgeneration.pdf; http://www.netl.doe.gov/energy-analyses/pubs/ImpCFPPGHGRdctns_0410.pdf.

[60] Given the variability that appears to be present in year-over-year determinations of heat rate, this should be based on the heat rate obtained at the time of the test or on emissions divided by net MWh generated during the test. By the CAA-required eight-year review of the MACT standards, there will be a rich dataset of mercury data from CEMS and sorbent traps to use to inform appropriate approaches for establishing net output-based standards for existing units.

calculating process. As data to support such an approach are not in the record, NACAA recommends an alternate approach to encourage and reward efficiency improvements, without increasing overall HAPs emissions. NACAA understands that, as part of its NSPS rulemaking for greenhouse gas ("GHG") emissions from EGUs, EPA may develop standardized procedures for quantifying efficiency improvements at regulated EGUs. NACAA recommends that the EGU MACT standards be adopted as input-based standards in this rule and that, EPA establish procedures by amendment of this rule that would allow a conversion to an output basis on a plant-specific basis and adjustment of the applicable limit, based on demonstrated efficiency improvements in individual units. In this way, a unit that demonstrated an actual improvement in its efficiency would receive a benefit without adverse impact to the public. Similarly, NACAA recommends that the conversion factor for new units be based on a heat rate that is consistent with the decision of the agency in its GHG rulemaking as to the minimum acceptable generating efficiency for such units.

**NON-MERCURY FLOORS**

In calculating the Subcategory 1 mercury floor, EPA used test results for the top 12 percent of the units for which it had data, as specified in the statute. In developing the non-mercury floors, however, EPA used an approach that minimized the testing burden to the industry, but may create an unwelcome legal issue. Using its section 114 authority, EPA requested existing non-mercury emission data for all 1,091 coal-fired units. At the same time, EPA directed operators of what it deemed were the top 15 percent of existing units (163 units) to conduct new testing. It also directed testing of 50 additional units that were not part of the top 15 percent, but stated that those results would not be used in calculating MACT floors. EPA determined the average, the variability factors and ultimately the MACT floors based on the lowest tested 131 units, which is 12 percent of the 1,091 units in the Subcategory, but not the top 12 percent of the units for which EPA has data.[61] EPA asserts that this process was agreed to by representatives of environmental groups and industry.

NACAA agrees that EPA has substantial latitude in determining the performance achieved by the best performing 12 percent of the units for which it has data. We also agree that the results in this instance are reasonable and what would be expected based on 1999 data and our members' experience. We further believe that this approach provides the most useful data for the least cost and avoids problems associated with the use of statistical procedures and small data sets.

Our concern is that environmental groups will correctly argue that the floor should be based, not on all 131 test results, but on the top 12 percent of those results (i.e., the best 16 test results), while at the same time industry will correctly argue that to do so would result in the floor being based on "the top 12 percent of the top 12 percent." EPA's approach also comes perilously close to its earlier approach of defining the "best performers" by the technology that a unit employs rather than its emissions – an approach that was rejected by the U.S. Court of Appeals. It is not entirely clear, but it appears that EPA did not include any results from its

[61] We assume that EPA selected the best performing 131 of the sources in its pool of the top 15 percent.

section 114 request or from the set of 50 "poor performers" in its determination of the "best performing units."[62]

At this point in time it is too late for EPA to fully address the issue. NACAA recommends that EPA: (1) set out in far greater detail the basis for its conclusion that the units ordered to conduct testing are in fact the best 15 percent performers and (2) continue to assume that the 131 units are the best performers, but substitute any units where other testing, including the responses to the section 114 request and the results of its 50 unit random testing, identifies better performing units.

**PARTICULATE MERCURY**

EPA discusses three forms of mercury and observes that particulate-bound mercury emissions can comprise 2 to 5 percent of the total mercury emissions from a source.[63] However, it is unclear, from the form of the mercury emissions limit and the compliance methodology, whether EPA intends that the mercury limitations include total mercury or only vapor-phase mercury. The limits are listed for "mercury." According to the proposal, continuous compliance can be demonstrated by the use of mercury Continuous Emission Monitoring Systems ("CEMS"), which measure only vapor-phase mercury. EPA also mentions of the use of Method 29 or Method 30B for demonstrating compliance. Method 29 measures total mercury whereas Method 30B measures only vapor-phase mercury. Additionally, in its discussion of allowable certification methods for mercury CEMS, EPA references the use of the Ontario Hydro Method or EPA Method 29, each of which measures total mercury.

Particulate mercury is of substantial relevance in the pending rulemaking in that this form of mercury is far more likely to be deposited near the source of emissions than the elemental vapor form of mercury. Accordingly, reductions in particulate mercury are an important element in reducing mercury "hot spots" near large EGUs. We note that EPA identifies PM as a surrogate for the "non-Hg" metals and provides alternate specific emission limits for HAP metals other than mercury. If EPA intends for the limits to apply to vapor-phase mercury only, EPA should provide an explanation for why particulate-bound mercury is excluded. If EPA has determined that the proposed MACT particulate limit is low enough to ensure that particulate mercury emissions would be insignificant compared to potential gaseous mercury emissions, EPA should state this. We do note that for this to be the case, EPA does need to adopt a sufficiently stringent particulate limit.

**EMISSION LIMITS FOR OIL-FIRED EGUs**

EPA's determination of the mercury MACT floor for the best performing oil-fired EGUs yielded a result of 0.05 lb/TBtu. This is more than an order of magnitude lower than limits proposed for coal-fired EGUs and, indeed, most oil-fired units have very low mercury emission rates that are one or two orders of magnitude less than coal-fired units. For this reason, it makes more sense to require additional emission reductions from coal-fired EGUs than to require low emitting units to add pollution controls, so as to be able to meet these very low levels. EPA

[62] It seems reasonable to anticipate that at least some test results from the large group of 1,091 units would show lower emissions than the highest emitter from the top 15 percent pool.
[63] 76 FR 24975, 25003, May 3, 2011.

addresses this issue by proposing a "metals plus Hg" limit of 30 lb/TBtu that sources could choose to meet in lieu of the mercury-specific floor. For most units this proposal is reasonable. However, there are several gross emitters of mercury in EPA's data set for oil-fired units that currently emit in the range of 50 to 90 lb/TBtu. There is no reason why a handful of oil-fired units should be permitted to emit mercury at levels that exceed emissions of coal-fired units. NACAA recommends that EPA establish a mercury-specific cap of 0.4-0.6 lb/TBtu in the alternate for the "metals plus Hg limit." EPA proposes that this limit be in lieu of PM limits for oil-fired units.

As calculated by EPA, the average rate of emissions of nickel for the top 12 percent was 2.39 lb/TBtu and the 99$^{th}$ percentile UPL was 7.25 lb/TBtu. EPA then rounded this number up to 8 lb/TBtu. Consistent with our earlier comments, we believe the appropriate floor for nickel should be no higher than the 90$^{th}$ percentile UPL of 4.62 lb/TBtu. EPA's "metals plus Hg" option would allow oil-fired units to comply with a 30 lb/TBtu limit, which may allow nickel emissions in the range of twice the proposed limit and three or four times the limit we believe is appropriate. Because nickel emissions from oil-fired EGUs represent the single greatest health risk[64] associated with fossil fuel-fired EGUs, we believe emissions of nickel should either be excluded from the "metals plus Hg options" or capped within that limit at the 4.62 lb/TBtu level.

EPA has requested comment on whether the opacity standard and PM limits should be eliminated for owners/operators of affected facilities burning ultra low sulfur (i.e., 15 ppm sulfur) distillate oil. NACAA supports this option. We believe it will provide additional flexibility and reward those facilities that adopt this fuel, which is environmentally superior to other forms of oil. We do not support this option for other forms of oil, especially for #4 Oil and higher grades. EPA has also proposed a total metals limit for oil-fired EGUs that includes Hg, in lieu of a PM limit, based on compliance through fuel analysis. Again, we support this concept for ultra-low sulfur oil, but not for more polluting grades of oil that can be expected to have high levels of particulate organic matter. We note that EPA's proposed fuel analysis incorporates the 90$^{th}$ percentile of fuel variability and have commented elsewhere that the compliance obligation should be consistent with the assumptions used in establishing the standard.

## THE PROPOSED NSPS IS CONSERVATIVE

NACAA's review of the proposed emission levels for new EGUs and ICI Boilers and the methods used by EPA to develop them suggests that the proposed emission limits are well within what can be expected of new boilers using current technology, and may be overly conservative. The proposed $SO_2$ removal efficiency limitation illustrates the issue. EPA's database contains continuous emission results showing $SO_2$ removal efficiency of up to 99 percent maintained on a consistent basis at each of three new units that have now been operating for over a year. Given the length of time it takes to design and build such units, these units can be considered to reflect the development of the relevant technologies of five years ago. EPA has rejected this indication of performance on the basis that each of the units had only been operating for one year[65]. EPA

[64] See, http://www.epa.gov/ttn/atw/utility/pro/non-hg_risk_tsd.pdf.

[65] EPA does not appear to have considered the fact that three units, not one, have sustained the higher level of performance. Moreover, the test data relied on by EPA is from calendar year 2009. Given the importance of this

also overlooked three other units whose lowest (i.e., worst) monthly average removal efficiency was greater than 98 percent. The highest monthly average emission rate among these five units was 0.37 lb/MWh, well below the proposed NSPS $SO_2$ emission rate of 1.0 lb/MWh and in compliance with the proposed optional[66] MACT $SO_2$ emission rate of 0.4 lb/MWh.

The EPA proposal reflects a reasoned analysis of the differences in performance between wet and dry scrubbers, reasons why dry scrubbers might be preferable at certain locations and an ample allowance for the differences in sulfur content of various coals used by EGUs nationwide. EPA's proposed limits of 1.0 lb/MWh or 97-percent removal should be easily met by new and reconstructed units employing current technologies. Similarly, EPA's proposed NSPS for $NO_x$ and total PM are well within the range of what should be expected of new and reconstructed units employing current technologies.

EPA proposes more lenient limits for pressurized circulating fluidized bed boilers ("CFB"), for units that combust waste coal and for EGUs subject to the CAA, but located outside of the continental United States. It is our understanding that CFB EGUs burning conventional coal in Puerto Rico and CFB EGUs in Pennsylvania that burn waste coal[67]have exhibited extremely good $SO_2$ and mercury emission levels. We also suspect that the reasons for historically less stringent "non-continental" emission levels may have disappeared with the passage of time, especially for more populated and commercially developed locations. Accordingly, we believe EPA should reconsider these proposals, revise as appropriate and provide additional analysis and data in support of its final decision with respect to these proposals.

**$NO_x$ PLUS CO LIMITS**

EPA has proposed a $NO_x$ NSPS limit of 0.70 lb/MWh for new, modified and reconstructed units. This limit is approximately 0.07 lb/MMBtu and is a conservative level that should be readily achievable by new or modified units. EPA's preferred approach, however, is to set a combined limit for $NO_x$ plus CO, which recognizes the tradeoff that can occur between control of $NO_x$ and control of CO. Under the EPA-preferred option, $NO_x$ plus CO would be set at 1.2 lb/MWh for new units and 1.8 lb/MWh for modified and reconstructed units; equivalent to 0.12 lb/MMBtu for new units and 0.18 lb/MMBtu for modified and reconstructed units. EPA asserts that this approach provides an equivalent or superior level of environmental protection.

NACAA is familiar with the CO/$NO_x$ tradeoff that is associated with the use of low $NO_x$ burners and NACAA's members report that it is common practice to optimize for combined CO/$NO_x$ performance when permitting new units. However, EPA's proposed $NO_x$ plus CO limits do not reflect the performance expected of new units and are set higher than necessary to optimize system performance. Importantly, this proposal does not provide a level of environmental protection equivalent to the proposed $NO_x$ and CO limits that would result from application of a MACT floor. Under EPA's preferred option, a new source meeting a $NO_x$ limit

---

information and the relative ease of obtaining it from its own Clean Air Markets Division, EPA should review these sources' emissions for calendar year 2010 and ascertain whether the earlier performance has been sustained.

[66] EPA has proposed a new source MACT $SO_2$ emission limit that operators may choose to comply with in lieu of a limitation on HCl as the surrogate for control of acid gas HAPs.

[67] A waste coal- fired CFB in Virginia has also been permitted at very low $SO_2$ and mercury levels and is under construction.

of 0.07 lb/MMBtu would only have to meet a CO limit of 0.05 lb/MMBtu (70 ppm); a similarly situated modified or reconstructed unit would only have to meet a CO limit of 0.11 lb/MMBtu (260 ppm). As the CO data collected by EPA for purposes of EGU MACT and ICI Boiler MACT development demonstrate, many existing sources emit at levels far less than 260 ppm[68] and the best-performing sources emit at CO levels of 10 ppm or less. Under the proposal, these sources would be allowed to emit $NO_x$ at greater levels than today's technology warrants.

EPA relies on the data set out in Table 20 of the Notice of Proposed Rulemaking in support of the proposed levels, but these data do not establish that the proposed limits are appropriate, since none of the units listed in Table 20 was under a significant permit constraint on CO limits. Allowing inappropriately high CO levels will simply permit sources to use less effective SCR controls and emit higher levels of organic HAPs than would limits that are based on the level of $NO_x$ reduction and CO levels achievable by high efficiency SCRs controls. Rather than adopt a combined limit for $NO_x$ and CO, a better option would be to set a maximum MACT CO limit that avoids poor combustion." Therefore, we believe EPA should lower the proposed CO emission limits in the final rule.

**COAL-FIRED UNITS DESIGNED TO COMBUST COAL LESS THAN 8,300 BTU/LB**

EPA has proposed a lignite-fired subcategory that is described as "coal-fired units designed to combust coal with heat content less than 8,300 Btu/lb." This definition would apply to any covered unit that burned any amount of virgin coal with heat content less than 8,300 Btu/lb, provided the unit has a height-to-depth ratio of 3.82 or greater. The proposed limits for this subcategory are identical to those proposed for units that are designed to burn higher rank coals, except the proposed existing source MACT floor for mercury emissions is substantially less stringent – 11 lb/TBtu rather than 1.2 lb/TBtu. EPA has proposed a "beyond the floor" existing source mercury MACT limit of 4 lb/TBtu to compensate for some of this difference. The rationale put forward in the proposal for establishing the proposed mercury subcategory is that no unit meeting this definition was within the top 12 percent of performing sources in Subcategory 1.

EPA has emission test data for 330 of the 1,061 units in Subcategory 1, but only for two of the 30 units in the smaller subcategory. However, if the performance of the two subcategories is the same, one would expect the two tests for the small subcategory to be randomly distributed throughout the 340 results of Subcategory 1. Thus, the fact that those two results were not in the top 40 results of the larger group does not, by itself, demonstrate that there are engineering reasons to set a separate subcategory. We submit that two test results are insufficient to characterize the emission performance of a group and point out that the two sources for which EPA has data may be among the worst performers in the lignite group. Thus, even if it were permissible to establish subcategories based on emission test results (absent an engineering basis for doing so), the EPA test data argument does not appear to support a separate subcategory.

The real basis for EPA's proposal for a separate subcategory include the facts that (1) lignite generally has higher mercury content than other forms of coal and (2) several lignite-burning facilities in EPA's data base were equipped with ACI and FF and tested higher than 1.2

[68] Almost all of the sources for which EPA has data emit CO at levels well below 260 ppm.

lb/TBtu. We also are aware of EPA's earlier assertion that all known lignite- burning units are "mine mouth" units or nearly so. EPA should simply acknowledge these facts and argue that it is entitled to treat lignite as a separate subcategory of fuel for purposes of mercury control, just as it does oil and petroleum coke.

As would be expected with small sample sizes, EPA does not have sufficient data to establish a credible MACT floor for the proposed lignite group and has no way to ascertain the performance of the best performing 12 percent of the subcategory. EPA can only determine which of the few units in the subcategory for which it had data performed better. Further, as would be expected with such small categories, small sample statistics generate excessively high variability factors and inappropriate MACT floors. Here, the variability factors employed by EPA are so large that all of the "lignite subcategory" units apparently currently meet the proposed MACT floor[69].

The definition of this subcategory gives rise to some concerns that many sources, other than those contemplated by EPA, may qualify for these relaxed limits. The definition of the subcategory applies to any EGU with a height-to-depth ratio of 3.82 or greater that burns **any amount** of low-rank coal. Most, if not all, coal-fired EGUs have the capability of burning some amount of low-rank coal, especially if the low-rank coal is pre-blended with higher quality coal. We have not found any information in the record that systematically identifies the number of conventional boilers that may in the past have burned small amounts of lignite, or may choose to do so in the future, to take advantage of the more lenient mercury limits proposed for lignite-fired conventional boilers. To prevent such gaming, any definition of lignite-fired units should include a requirement that any such unit must have used lignite for no less than 75 percent of its heat input over each of the last three years. One NACAA member with experience in permitting lignite-fired facilities has confirmed that there are a number of facilities that do not combust lignite on a regular basis, but are in a position to take advantage of the more lenient mercury limits for lignite-fired units if the rule is adopted as proposed.

## CONTINUOUS MONITORING

NACAA supports EPA's proposal to require continuous monitoring and electronic reporting of Hg, $SO_2$, PM and HCl. Such requirements are quite reasonable and efficient given the state of technology at this time.

## DEFINITION OF ELECTRIC UTILITY STEAM GENERATING UNIT

In the proposed rules, EPA defines an EGU as a fossil fuel-fired combustion unit of more than 25 MWe output, as follows:

> *Electric utility steam generating unit (EGU)* means a fossil fuel-fired combustion unit of more than 25 megawatts electric (MWe) that serves a generator that produces electricity for sale. A fossil fuel-fired unit that cogenerates steam and

[69] See, Table 5 of EPA's "Beyond the Floor" analysis, memo from S. Johnson and S. Boone *"National Emission Standards for Hazardous Air Pollutants (NESHAP) Beyond the Maximum Achievable Control Technology (MACT) Floor Analysis for Coal- and Oil-fired Electric Utility Steam GeneratingEGUs,"* March 14, 2011.

> electricity and supplies more than one-third of its potential electric output capacity and more than 25 MWe output to any utility power distribution system for sale is considered an electric utility steam generating unit.

It is unclear in the definition if the determination of whether the unit can produce more than 25 MWe is based on its maximum rated capacity, short-term peak capacity, or if it is based on the unit's current ability taking into consideration the age of the unit and its thermal efficiency. We request that EPA clarify in the final regulations how "25 MWe" is to be determined.

**MONITOR DOWNTIME**

EPA proposes not to infer emissions of mercury and possibly other pollutants during periods of monitor downtime, simply to note the downtime. Sources should be required to infer emissions at the highest daily rate over the past 90 days during each hour that a monitor is not in service. Alternatively, various NSPS rules that do not require emissions to be inferred during monitor downtime should instead contain an enforceable maximum allowed monitor downtime.

**REDUCED MONITORING FOR LOW-EMITTING UNITS**

NACAA agrees that units that have demonstrated an ability to consistently limit emissions substantially below applicable limits should be eligible for reduced monitoring. EPA has proposed to allow reduced testing for sources based on the results of a single test and has proposed to allow reduced testing where the source's emissions are as high as 70 percent[70] of the applicable limit. EPA's proposal would allow a unit to qualify for reduced testing for mercury if the source's emissions were either less than 25 percent of the applicable limit or less than 22 lb/year. In contrast, in calculating the mercury MACT floor, EPA asserts that even the best performing units can reasonably expect year-over-year stack test results to vary by a factor of 50 because of statistical variability, operational variability, measuring system variability and variability in fuel. EPA has also estimated that the proposed rules would reduce mercury emissions by approximately 58 lb/unit, so that (on average) remaining emissions would be approximately 45 lb/unit. Where the reductions sought are approximately 58 lb per unit per year and remaining emissions are 45 lb per unit per year, emissions of 22 lb per year at a unit cannot be considered trivial or "de minimis."

NACAA recommends that the thresholds for reduced testing be based on a demonstrated record of performance over several years, be accompanied by parametric monitoring and/or compliance assurance monitoring and be set at more protective levels. NACAA is not convinced that year-over-year compliance testing of well-performing units will demonstrate the variability that EPA asserts in its MACT floor proposals, but we do suggest that EPA be consistent[71] in its treatment of these issues.

---

[70] EPA proposes several different thresholds for reduced testing frequency for different pollutants. For $NO_x$ testing the proposed threshold is 70 percent of the applicable limit.

[71] In its floor calculation, EPA asserts that the variability in mercury emissions from well-performing sources is 50-fold; while in the monitoring proposal it assumes that the variability is less than four-fold and sets the threshold for reduced monitoring at 25 per cent of the limit.

## RESOURCE IMPLICATIONS

EPA's proposal contemplates that state and local permitting authorities will:

1. respond to industry questions about the applicability of the proposed rules;
2. respond to requests for a one year extension of the compliance deadline;
3. modify Title V permits to incorporate new requirements;
4. develop and approve emission reporting formats; and
5. approve site-specific monitoring plans and work practice plans.

In addition, EPA has proposed a number of alternate compliance options that will reduce compliance costs for industry, but increase the cost of administering the program. Finally, in delegated states, permitting authorities will also conduct inspections and commence enforcement actions where sources are found to be in noncompliance.

These activities are extremely important because of the large amount of toxic air emissions that are involved, but cannot be undertaken without resources. State and local funding for these activities will be very difficult to obtain in the time frame when most of the implementation activities will be needed. We recognize that federal resources for the foreseeable future will also be limited, but recommend that this area be considered a priority and that adequate funding be provided under sections 103 and 105 of the CAA during those years when the majority of the implementation activities will occur.

## CONCLUSION AND RECOMMENDATIONS

NACAA strongly supports EPA's efforts to finally adopt emission limits for HAPs from fossil fuel-fired EGUs. NACAA agrees with EPA's original determination in 2000 that regulating HAPs emissions from EGUs under Clean Air Act § 112 is "appropriate and necessary." We believe that EPA's reversal of that finding in 2005 was incorrect and support EPA's confirmation of the initial determination. We can think of no reason why Congress would seek to limit emissions of HAPs from dry cleaners, electroplaters and other small businesses and, at the same time, exempt the largest sources of HAPs emissions in the country. NACAA also strongly supports EPA's rejection of alternate compliance limits under section 112(d)(4) of the CAA, where there is insufficient scientific information to establish a "safe" threshold for the HAPs at issue. EPA's proposed regulations are more consistent with the statutory requirements of the Clean Air Act, and far more protective of public health than the path chosen in 2005.

NACAA believes that the proposed emission limitations are within the range of limits that should be considered reasonable. Chart No. 1, above, shows that EPA's proposed limits will, indeed, lead to significant mercury emission reductions and are supportable from a policy perspective. However, the CAA requires a very high degree of protection from HAPs emissions and does not provide EPA the broad discretion in setting MACT floors that it enjoys with respect to promulgating MACT standards ("beyond the floor") and to regulation of criteria pollutants. Many of the assumptions underlying the calculation of certain MACT floors are unsupported and/or inappropriate. NACAA suggests that use of the 99$^{th}$ percentile UPL is not in the public interest, and that the proposal's treatment of outliers and significant digits in the calculation

process is inappropriate. NACAA's 2002 recommendation for the Category 1 mercury MACT floor of 0.4-0.6 lb/TBtu is supported by the more recent data and can provide the basis for a final rule that is more protective of public health and that rests on a sounder legal footing than the current proposal. While we generally support the use of output-based emission standards, we do not support simply providing an option to existing sources to select a less protective limit, and have significant concerns that the quality of the existing heat rate data for EGUs is not adequate to support development of such standards at this time.

NACAA believes that the subcategories established by EPA are reasonable and cautions against creating additional small subcategories, where insufficient data undermine the calculation of MACT floors. In particular, NACAA is opposed to any further subcategorization based on coal rank. Since many sources blend several ranks of coal on a regular basis, establishing coal rank subcategories would create numerous opportunities for sources to game the regulations and substantially increase emissions. There is no need for such an approach since modern pollution controls can accommodate a wide range of coals. Similarly, we do not support a subcategory for sources that combust tire-derived fuels.

NACAA recommends that EPA establish standards based on the application of MACT technology, rather than merely calculating MACT floors, and suggests that MACT should be no less stringent than BACT. Finally, NACAA recommends that EPA address organic HAP emissions, including dioxins, furan and products of incomplete combustion. EPA should calculate MACT floors and evaluate MACT technologies for these pollutants in the EGU sector, just as it has done for other sectors. Work practice standards, if employed, should be designed to achieve the same level of emission performance as would be achieved by implementation of an emission limitation.

Lastly, we note that these important new requirements will add to the existing workload of state and local permitting authorities at a time when additional state and local funding is unlikely to be available. We recommend that CAA grant funding, sufficient to support these activities, be identified as a priority for those years when major resource demands will occur.

**ATTACHMENT 1**
**National Association of Clean Air Agencies**
**State/Local Mercury/Toxics Programs for Utilities[1]**
**May 1, 2011**

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| **Region 1** | | | |
| Connecticut | Emissions from coal-fired electric generating units (EGUs) are limited to 0.6 lbs Hg/TBtu or a 90% reduction pursuant to section 22a-199 of the Connecticut General Statutes; compliance is determined through quarterly stack testing.<br>The owner or operator of any coal-fired EGU is required to apply for and obtain a new source review permit pursuant to section 22a-174-3a(n) of the Regulations of Connecticut State Agencies. | Ric Pirolli<br>860-424-3450 | CGS section 22a-199:<br>http://www.cga.ct.gov/2007/pub/Chap446c.htm#Sec22a-199.htm<br><br>RCSA section 22a-174-3a:<br>http://www.ct.gov/dep/lib/dep/air/regulations/mainregs/sec3a.pdf |
| Maine | Waiting for federal MACT.<br>Statutory limits applicable to all facilities in state – 35 lb/year, reduced to 25 lb/year January 2010. | Lisa Higgins<br>(207) 287-7023<br>Lisa.Higgins@maine.gov | |
| Massachusetts | Adopted rule 310 CMR 7.29 requires 85% capture or 0.0075 lb/GW-hr by 1/1/2008 and 95% capture or 0.0025 lb/GW-hr by 10/1/2012. Averaging between units at the same facility allowed. Requires continuous Hg monitoring by 1/1/2008.<br>Hg monitoring rulemaking replacing vacated Part 75 provisions under development. Expected mid 2011. | Marc Wolman<br>(617) 292-5515<br>Marc.wolman@state.ma.us<br><br>Sharon Weber<br>(617) 556-1190<br>Sharon.weber@state.ma.us | http://www.mass.gov/dep/service/regulations/regsarch.htm#camr |

[1] Blank state entries indicate that the agency did not provide information. This does not necessarily mean there is no program.

**Please provide updates to this table to Mary Sullivan Douglas of NACAA at mdouglas@4cleanair.org.**

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| New Hampshire | RSA 125-O Multiple Pollutant Reduction Program requires reductions in mercury and other pollutants from coal-burning EGUs (Merrimack 1 and 2 and Schiller 4, 5, and 6) by 2013.<br><br>This statute requires installation of a wet FGD system (scrubber) at Merrimack 1 and 2 to control mercury emissions at the maximum sustainable rate by July 1, 2013.<br><br>For all affected units, the aggregated total annual reduction in mercury emissions shall be a minimum of 80 percent relative to the 2003-2005 baseline mercury input level of the coal burned. | Pat North<br>patricia.north@des.nh.gov | http://www.gencourt.state.nh.us/rsa/html/X/125-O/125-O-mrg.htm |
| Rhode Island | RI has no applicable EGUs. | Barbara Morin<br>barbara.morin@dem.ri.gov | |
| Vermont | Vermont does not have any eligible EGUs. | Heidi Hales<br>(802) 241-3848<br>Heidi.hales@state.vt.us | |
| **Region 2** | | | |
| New Jersey | Adopted state rule requires control efficiency of 90% or 3 mg/MW-hr by 12/15/2007, for coal-fired boilers of any size. A multi-pollutant approach can reduce the initial reduction required and extend compliance to 12/15/2012. | Sunila Agrawal<br>(609) 292-9202<br>Sunila.Agrawal@dep.state.nj.us | http://www.state.nj.us/dep/aqm/Sub27.pdf |
| New York | On 1/27/07, NYSDEC promulgated 6NYCRR Part 246 for the control of mercury emissions from coal-fired electric utility steam generating units that incorporates a Phase I emission cap in the years 2010-2014 and beginning in 2015 establishes a unit-based emission limit for each applicable unit. | Steve DeSantis<br>sxdesant@gw.state.ny.us | Details of the regulation can be found at: www.dec.state.ny.us/website/dar/air_regs.html#recent<br><br>Annual Stack testing was required for the years 2008 and 2009. |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | Phase I of the state proposal imposed annual facility-wide mercury emission limitations, based upon the state mercury budget EPA distributed to NY under the delisted CAMR. The annual facility-wide emission limitations will be in effect from 2010 to 2014. Starting in 2015, Phase II, in conjunction with other electric sector regulations such as the Regional Greenhouse Gas Initiative (RGGI) and EPA's Transport Rule, the state mercury regulation will establish a facility-wide emission limit for Hg 0.6 lbs Hg/TrBtu. | | Hg CEMs have been installed and operating since 2009. New York has three facilities operating CEMs and one facility using Appendix K sorbent tube methodology. |
| **Region 3** | | | |
| Delaware | Delaware promulgated Regulation 1146 in December 2006. Regulation 1146 implements Hg emissions limits for Delaware's large (>25MW) coal-fired EGUs in two phases. Phase 1 became effective January 1, 2009 and implemented a Hg emission rate limit of 1.0 lb/TBTU, or 80% reduction from baseline. Phase 2 becomes effective Jan.1, 2013 and implements a Hg emissions rate limit of 0.6 lb/TBU, or 90% reduction from baseline. For coal-fired units subject to Regulation 1146, the regulation established annual Hg mass emissions caps for each individual unit (trading for compliance is not permitted). The Hg mass emissions caps are also implemented in a staged manner, with Phase 1 running 2009 through 2012, and a more stringent Phase 2 for 2013 and beyond. | Robert Clausen<br>robert.clausen@state.de.us | **Regulation 1146 may be found at:**<br>http://regulations.delaware.gov/AdminCode/title7/1000/1100/1146.shtml#TopOfPage |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| Maryland | Under Maryland's Healthy Air Act, which was signed into law on April 6, 2006, coal fired utilities must meet the following mercury emission limitations:<br><br>(1) For the 12 months beginning Jan. 1, 2010 and ending with the 12 months beginning December 1, 2012 to December 1, 2013, each affected facility shall meet 12-month rolling average removal efficiency for mercury of at least 80 percent.<br>(2) For the 12 months beginning Jan. 1, 2013 and thereafter, each affected facility shall meet 12-month rolling average efficiency of at least 90%.<br>Implementing regs are found at COMAR 26.11.27. | Karen Irons<br>410-537-3230<br>kirons@mde.state.md.us | http://www.dsd.state.md.us/comar/comarhtml/26/26.11.27.03.htm |
| Pennsylvania | PA Mercury Rule was vacated by the Commonwealth Court. In response to the Department's appeal, the Pennsylvania Supreme Court affirmed the Commonwealth Court ruling on December 23, 2009. Pennsylvania will implement the final Federal Mercury MACT for the EGU sector. | Krishnan Ramamurthy<br>kramamurth@state.pa.us | |
| Virginia | Virginia is awaiting the new federal MACT for EGUs | Patty Buonviri<br>Patricia.buonviri@deq.virginia.gov | |
| West Virginia | With the WV Code requirement to be no more stringent than federal rules, and the results of the state "Mercury Study", we are awaiting the promulgation of the new federal MACT rule for EGUs. However, certain EGUs are subject to consent orders (state or federal) requiring the use of SCR's for NOx control all year. Co-beneficial HAP reduction may occur as a result. | Laura Crowder<br>Laura.M.Crowder@wv.gov | |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| **Region 4** | | | |
| Alabama | Alabama is awaiting the new federal MACT for EGUs. | James Carlson<br>(334) 271-7875<br>jhc@adem.state.al.us | |
| Florida | | | |
| Georgia | Georgia is awaiting new federal MACT.<br><br>State rule 391-3-1-.02(2)(sss) "Multipollutant Control for Electric Utility Steam Generating Units" requires installation and operation of SCR and flue gas desulfurization (which gives co-benefit reduction for mercury) on specified schedule. This rule also requires the implementation of sorbent injection technology on four units at Georgia Power Plant Scherer for mercury control.<br><br>State rule 391-3-1-.02(2)(ttt) "Mercury Emissions from new Electric Generating Units" requires use of best available control technology to control mercury emissions from new ESGUs.<br><br>New Information (March 2, 2010):<br>State rule 391-3-1-.02(2)(uuu) "SO2 Emissions from Electric Utility Steam Generating Units" specifies numerical limits for SO2 controls – this should provide some level of reduction in mercury emissions. | Karen Hays<br>karen.hays@dnr.state.ga.us<br><br>Jim Kelly<br>james.kelly@dnr.state.ga.us | www.georgiaair.org/airpermit/html/aqrules/aqrules.htm |
| Kentucky | Kentucky is awaiting the new federal MACT. | John Lyons<br>john.lyons@ky.gov | |
| Louisville, KY | Louisville developed and is implementing a program | Paul Aud | www.louisvilleky.gov/APCD/STAR/ |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | for Strategic Toxics Air Reduction (STAR) which addresses toxics from every source sector | paul.aud@louisvilleky.gov | |
| Mississippi | Mississippi is awaiting the new federal MACT. | BJ Hailey<br>B_J_Hailey@deq.state.ms.us | |
| North Carolina | North Carolina is realizing major reductions of mercury emissions from coal-fired boilers as a direct cobenefit of the N.C. Clean Smokestacks Act in 2002 (G.S. 143-215.107D).<br><br>NC anticipates additional reductions of atmospheric mercury as a result of CAIR.<br><br>NC mercury rule for coal-fired EGUs requires a mercury emission control plan from each utility on January 1, 2013 that identifies the technology proposed for use at each unit owned or operated by the utility; the schedule for installation and operation of mercury controls at each unit; and shall identify any units that will be shut down.<br><br>Any unit that has not installed controls as specified in an approved mercury control plan by December 31, 2017 shall be shut down. | Michael Abraczinskas<br>(919) 715-3743<br>michael.abraczinskas@ncdenr.gov<br><br>Joelle Burleson<br>(919) 733-1474<br>Joelle.burleson@ncdenr.gov | http://daq.state.nc.us/rules/rules/D2511.pdf |
| South Carolina | South Carolina developed a state version of the CAMR, which has now been removed from our regulations (as of May 2010). After the federal CAMR was vacated, we entered into a Memorandum of Agreement with our state's utilities to either install Hg monitors or test coal fired units in SC by July | Robert Brown (CAMR contact)<br>(803) 898-4105<br>brownrj@dhec.sc.gov<br><br>Heinz Kaiser (Air Toxics | http://www.dhec.sc.gov/environment/baq/CAMR.aspx |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | 2009 to provide source specific Hg emission data.<br><br>As with other states we are seeing Hg reductions through the implementation of the NOx SIP call and CAIR controls.<br><br>We are relying on 112(g) for new (EGU) sources and are waiting on the new federal MACT for further Hg reductions.<br>We are relying on 112(g) for new (EGU) sources and are waiting on the new federal MACT for further Hg reductions. | contact)<br>(803) 898-4089<br>kaiserh@dhec.sc.gov | |
| Tennessee | TN is waiting for promulgation of the new federal MACT. | Travis Blake<br>(615) 532-0617<br>Travis.blake@state.tn.us<br><br>Elizabeth Peeler<br>(615) 532-9200 | |
| **Region 5** | | | |
| Illinois | Illinois has adopted a state rule regulating mercury (Hg) emissions from coal fired power plants, beginning in July 2009. The basic components of the rule are:<br>PHASE I: (thru December 31, 2012)<br>1. 90% reduction from input Hg emissions or an output based emission standard of 0.008 lb/GW-hr on a system-wide basis. (Hg reduction of at least 75 % input, or meet a Hg emission standard of 0.02 lb GW-hr output basis, required on a plant by plant basis.) | Laurel Kroack<br>217-785-4140<br>laurel.kroack@illinois.gov<br><br>Jim Ross<br>jim.ross@illinois.gov | The Illinois Hg rules (which include the multi-pollutant standards and combined pollutant standards) can be found at http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp. 35 Ill. Adm. Code Part 225, "Control of Emissions from Large Combustion Sources," Subparts B & F. |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | 2. A Temporary Technology Based Standard (TTBS) available for up to 25% of a system's capacity, allowing the system to select units to be "excused" from the specified Hg reduction rates. To qualify for a TTBS, the eligible units must have ACI and must inject sorbent at a specified rate. TTBS available until June 1, 2015.<br>PHASE II: (beginning January 1, 2013 and beyond)<br>1. 90% reduction from input Hg emissions or an output based emission standard of 0.008 lb/GW-hr on a plant by plant basis.<br>2. A Temporary Technology Based Standard (TTBS) available for up to 25% of a system's capacity, allowing the system to select units to be "excused" from the specified Hg reduction rates. To qualify for a TTBS, the eligible units must have ACI and must inject sorbent at a specified rate. TTBS available until June 1, 2015.<br>3. ALTERNATIVE – MPS & CPS: Systems may opt-in to a multi pollutant compliance approach (MPS) and combined pollutant standard approach (CPS) for SO2, NOx and Hg. Installation of Hg controls designed to meet 90% removal and a minimum sorbent injection rate through 2014 required on at least 96% of capacity. Systems participating in an MPS or CPS may exempt units representing 4% of capacity or less from Hg control until 12/31/2012. These units must install Hg control and meet minimum sorbent injection rates | | |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | beginning January 1, 2013. Beginning January 1, 2015, MPS & CPS systems must meet 90% reduction from input Hg emissions or an output based emission standard of 0.008 lb/GW-hr on a plant by plant basis. (The units representing 4% or less of capacity do not have to get 90% reduction.)<br><br>The MPS and CPS for SO2 and NOx vary by system—based on age of units, coal type, interim and final emission rates and compliance deadlines. | | |
| Indiana | Indiana is awaiting the new federal MACT. | Susan Bem<br>sbem@idem.in.gov | |
| Michigan | Michigan's state rule requires mercury reductions from coal-fired electric generating units starting January 1, 2015. The basic components include three compliance options:<br>1. A minimum of 90% reduction* from baseline input mercury levels or an output-based emission standard of 0.008 lb/GW-hr*.<br>2. A multi-pollutant compliance demonstration project which must achieve 75% reduction* from baseline input mercury levels along with significant reductions in nitrogen oxides and sulfur dioxide.<br>3. Very Low Mass Emitting (VLME) unit that is limited to 9 pounds of mercury per 12-month rolling time period with an alternative compliance demonstration project.<br>* 12-month rolling average basis. | Technical contact:<br>Julie Brunner<br>517-373-7088<br>brunnerj1@michigan.gov<br><br>Administrative rules contact:<br>Teresa Cooper<br>517-335-2247<br>coopert@michigan.gov | Michigan's mercury rules - Part 15, Part 10, and Part 11 can be found at: http://www.deq.state.mi.us/apcrats/toc_collapsible_2.shtml |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | The rules include the compliance options, technical and economic exceptions, monitoring, testing, record keeping, and implementation.<br><br>Other HAPs (including mercury) are currently regulated under the state toxics rules. | | |
| Minnesota | State Legislation in 2006 requires the state's three largest electric power plants (6 units) to reduce mercury emissions 90% by 2015. In 2005 these three plants emitted 70% of the sector's emission.<br><br>Remaining facilities emitting greater than 5 lb/year will reduce by 70-90% by 2025, mostly sooner. This reduction will be accomplished by proposed state rule. | Primary contact:<br>Anne Jackson<br>651-757-2460<br>anne.jackson@state.mn.us<br><br>Alternate:<br>Ned Brooks<br>651-757-2247<br>ned.brooks@state.mn.us | More information about 2006 legislation:<br>http://www.pca.state.mn.us/publications/p-p2s4-08.pdf<br>Mercury air emissions strategy:<br>http://www.pca.state.mn.us/air/mercury.html |
| Ohio | Ohio is waiting for the new federal MACT for EGUs as the replacement for Ohio's rescinded CAMR program regulation. | Lee F. Burkleca<br>(614) 728-1344<br>Lee.burkleca@epa.state.ohio.us | |
| Wisconsin | A revised mercury rule became effective December 1, 2008. Large coal-fired power plants (those with a nameplate capacity of 150 Megawatts (MW) and greater) must achieve a 90% mercury emission reduction through one of two compliance paths.<br><br>1) 90% mercury reduction or limit the concentration of mercury emissions to 0.0080 pounds of mercury per gigawatt-hour by January 1, 2015. | Marty Burkholder<br>608-264-8855<br>martin.burkholder@wisconsin.gov<br><br>Tom Karman<br>(608) 264-8856<br>thomas.karman@wisconsin.gov | www.legis.state.wi.us/rsb/code/nr/nr446.pdf |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | 2) 90% mercury reduction by January 1, 2021 under a multipollutant option that requires a nitrogen oxides ($NO_x$) emission standard of 0.07 pounds of $NO_x$ per million BTU and a sulfur dioxide ($SO_2$) emission standard of 0.10 pounds of $SO_2$ per million BTU by January 1, 2015.<br><br>An interim mercury reduction goal targets January 1, 2015 to achieve a 70% mercury reduction or limiting the concentration of mercury emissions to 0.0190 pounds of mercury per gigawatt-hour. Beginning January 1, 2018 an 80% mercury reduction or limiting the concentration of mercury emissions to 0.0130 pounds of mercury per gigawatt-hour must be achieved. The percent reduction standard is measured from the mercury content in the coal combusted.<br><br>Four major utilities, Dairyland Power Cooperative, We Energies, Wisconsin Power & Light Company and Wisconsin Public Service Corporation, must reduce their mercury emissions 40% by Jan. 1, 2010.<br><br>Small coal-fired power plants (> 25 MW and < 150 MW) must reduce their mercury emissions to a level defined as Best Available Control Technology (BACT) by January 1, 2015. | | |
| **Region 6** | | | |
| Arkansas | AR is awaiting further direction from EPA before | Elizabeth Sartain | |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | proceeding with regulations to control mercury emissions from EGUs. | (501) 682-0719<br>Sartain@adeq.state.ar.us | |
| Louisiana | | | |
| New Mexico | New Mexico is waiting for the new federal MACT. | Bob Spillers<br>Robert.spillers@state.nm.us | |
| Oklahoma | Oklahoma is awaiting the new federal MACT | Cheryl Bradley<br>(405) 702-4218<br>Cheryl.bradley@deq.ok.gov | |
| Texas | | | |
| **Region 7** | | | |
| Iowa | Iowa is waiting for a new federal MACT rule but has adopted alternative mercury monitoring requirements for EGUs. The alternative requirements are for mercury monitoring only (they do not establish emission limits or control requirements) and became effective in November 2009. | Christine Paulson<br>(515) 242-5154<br>christine.paulson@dnr.iowa.gov | |
| Kansas | KS is waiting for a new federal MACT rule. | Miles Stotts<br>mstotts@kdheks.gov | Using case-by-case for new sources as needed. |
| Missouri | MO is awaiting the promulgation of the new federal MACT rule for EGUs. | Aaron Basham<br>573 751-4817<br>aaron.basham@dnr.mo.gov | New sources reviewed on a case by case basis. |
| Nebraska | NE is waiting for a new federal MACT rule. | Melissa Ellis<br>melissa.ellis@nebraska.gov | Using case-by-case for new sources as needed. |
| **Region 8** | | | |
| Colorado | State-only rule sets Hg standards for existing, new, modified and reconstructed coal-fired power plants on a rolling 12-month average basis, exempting low emitters and new units with existing permits in place. Existing units are subject to the following: | Dena Wojtach<br>(303) 692-3147<br>dena.wojtach@state.co.us | Rule adopted on 2/6/07; revised 10/18/07 to address new, modified and reconstructed units; revised 11/20/08 to incorporate Hg monitoring. See Regulation 6, Part B, Section VIII |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | • 2012: Pawnee and Rawhide 0.0174 lb/GWh or 80% inlet Hg capture;<br>• 2014: 0.0174 lb/GWh or 80% inlet Hg capture; and<br>• 2018: 0.0087 lb/GWh or 90% inlet Hg capture.<br>New, modified and reconstructed units are subject to:<br>Modified units with existing permits in place:<br>• Upon startup: Comanche 3 – 0.020 lbs/GWh;<br>• Upon startup: Lamar 4 – Bit. Coal 0.020 lbs/GWh or Subbit. Coal 0.097 lbs/GWh; and<br>• Upon startup: Craig 3 – 0.066 lbs/GWh.<br>Future modified units:<br>• Upon startup if <12/31/14: 0.0174 lb/GWh or 80% inlet Hg capture.<br>• Upon startup if >1/1/15: 0.0087 lb/GWh or 90% inlet Hg capture.<br>Future new or reconstructed units:<br>• Upon startup: Best Available Mercury Control Technology Standard<br>  ○ 95% Hg capture goal; and<br>  ○ 90% Hg capture minimum.<br><br>The rule provides for an Alternative Standard (a.k.a. "soft landing") to be established if a unit demonstrates to Colorado that it cannot meet the applicable standard. This rule also allows averaging of units at the same plant, except for new and reconstructed units. Finally, this rule largely incorporates CAMR's Hg monitoring requirements, including the 1/1/09 monitoring date, with the some | | (http://www.cdphe.state.co.us/regulations/airregs/100108stationarysources.pdf ).<br><br>Hg monitoring exceptions:<br>• Units that shut down prior to January 1, 2014 are exempt from Hg monitoring requirements.<br>• Units that have Hg permit terms and conditions as of November 20, 2008 shall follow their permit requirements specific to Hg monitoring.<br>• Units are not required to use data substitution routines, and instead report measured actual Hg emissions to Colorado.<br>• Units are not required to follow Electronic Data Reporting requirements, and instead submit written quarterly and annual summary reports to Colorado.<br>• Units are not required to follow the NIST Traceability Protocol, relating to Hg CEMS certifications. NIST Traceability Protocol requirements are not applicable in Colorado until EPA finalizes the protocol and Colorado adopts those requirements.<br>Units are not required to follow CEMS QA/QC testing, reporting and recordkeeping of Hg related monitoring equipment (stack flow monitor, CO2 monitor, moisture monitor) |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| | exceptions (see comments). | | already regulated under the Acid Rain Program. |
| Montana | Montana finalized a state rule for mercury control from EGUs in October of 2006. It requires the following starting January 1, 2010:<br>• Compliance with 0.9 lb/TBtu mercury limit, calculated as a 12-month rolling average for non-lignite facilities or<br>• 1.5 lb/TBtu mercury limit for lignite facilities<br>• application for and approval by MT DEQ of a mercury control strategy (applications required by Jan. 2009; all but one have been approved and finalized, the last will be final on 7/16/09).<br><br>By July 1, 2011, facilities may apply for an alternative emission limit (AEL, with a ceiling in rule) if unable to meet original emission limit.<br><br>All EGUs are subject to an every 10-year mercury BACT analysis (EGUs with approved AELs must provide BACT analysis by January 1, 2014 instead of waiting the full ten years initially) | Debbie Skibicki<br>(406) 444-1472<br>dskibicki@mt.gov | Regulation: Administrative Rules of Montana 17.8.771<br>http://deq.mt.gov/dir/legal/Chapters/CH08-07.PDF<br><br>With the federal vacatur, MT has put significant work with its regulated community into developing Hg monitoring strategies that are effective and make sense out of what is left of Part 75. All of the EGU permits now contain mercury-monitoring attachments that will probably be refined over time. |
| North Dakota | ND is awaiting the promulgation of the new federal MACT rule for EGUs. | Tom Bachman<br>(701) 328-5188<br>tbachman@nd.gov | |
| South Dakota | | | |
| Utah | | | |
| Wyoming | | | |
| **Region 9** | | | |
| Arizona | | | |

| State or Local Agency | State's strategy for addressing emissions of mercury and other HAPs from EGUs following vacatur of Clean Air Mercury Rule<br><br>(e.g., we have implemented or are implementing our own state rule [please describe briefly]; we are developing a state rule [please briefly describe]; we are awaiting the promulgation of the new federal MACT rule for EGUs.) | State/Local Contact Information | Additional Information or Comments (including link to regulations) |
|---|---|---|---|
| California | California is waiting for the promulgation of the new federal MACT rule for EGUs. | Todd Wong<br>(916) 324-8031<br>twong@arb.ca.gov<br><br>Duc Tran<br>(916) 322-5558<br>dmtran@arb.ca.gov | |
| Hawaii | Rules were never adopted. Awaiting further guidance for implementing 112(j) requirements. | Scott Takamoto<br>( 808) 586-4200,<br>scott.takamoto@doh.hawaii.gov | |
| Nevada | The state recently (effective 7/21/10) repealed the state program that was based on the federal CAMR, and is awaiting a new federal MACT rule. Nevada never got to implement the state program. | Adele Malone<br>amalone@ndep.nv.gov | |
| **Region 10** | | | |
| Alaska | Awaiting new MACT rules. Permittees with affected sources have adopted the vacated MACT terms and conditions until new rules become adopted. | Jim Baumgartner<br>[907] 465-5108<br>Jim.baumgartner@alaska.gov | Awaiting further guidance for implementing 112(j) requirements |
| Idaho | Idaho has no applicable EGUs. | Carl Brown<br>(208) 373-0206<br>Carl.brown@deq.idaho.gov | |
| Oregon | | | |
| Washington | We are awaiting the promulgation of the new federal MACT rule for EGUs. | Elena Guilfoil<br>360-407-6855<br>guilfoil.elena@ecy.wa.gov | |