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Boiler MACT THE BIG SQUEEZE

Trinity Consultants

Proposed Boiler MACT Sets Aggressive Emission Limits

TOM MUSCENTI, PE
MANAGING CONSULTANT—CHARLOTTE

On June 4, 2010, U.S. EPA proposed National Emission Standards for Hazardous Air Pollutants (NESHAP) for industrial,

commercial, and institutional boilers and process heaters at both major and area sources of hazardous air pollutants (HAP) emissions. EPA proposed separate rules for units at major sources of HAP emissions (greater than 10 tons per year [tpy] of any single HAP and/or greater than 25 tpy of total HAP) and area sources of HAP emissions (less than 10 tpy/25 tpy). The Maximum Achievable Control Technology (MACT) standards for units at major sources are found in 40 CFR 63 Subpart DDDDD, while the Generally Available Control Technology (GACT)/MACT standards for units at area sources are found in 40 CFR 63 Subpart JJJJJJ. Once promulgated, the major source NESHAP will establish emission standards for new and existing boilers and process heaters that were previously addressed in a 2004 NESHAP that was vacated by the court in 2007.

Major Source Boiler MACT

The Major Source Boiler MACT affects boilers and process heaters that burn coal, biomass, fuel oil, natural gas, refinery gas, or other gas. EPA estimates that 13,555 existing boilers and process heaters as well as 46 predicted new units to be constructed during the next three years would be affected by the NESHAP.

Applicability

The affected source for the proposed rule is defined as the collection of existing and each new or reconstructed industrial, commercial, and institutional boilers and process heaters that do not burn solid waste at major sources of HAP emissions. The definition of solid waste is found in the Resource Conservation and Recovery Act (RCRA) regulations. A unit is classified as a new source if construction commenced after June 4, 2010. Similarly, sources that are reconstructed (as defined in 40 CFR 63.2) after June 4, 2010 are classified as reconstructed sources. A boiler or process heater is classified as existing if it is not new or reconstructed. The compliance date for new sources is the date the final rule is published in the Federal Register or upon startup, whichever is later. The compliance date for existing sources is three years from the date the final rule is published in the Federal Register.

The following units are exempt from the requirements of the rule:

- An electric utility steam generating unit (> 25MW)
- A recovery boiler or furnace covered by 40 CFR Part 63, Subpart MM
- A boiler or process heater that is used specifically for research and development; this does not include units that provide heat or steam to a process at a research and development facility
- A hot water heater as defined in the rule
- A refining kettle covered by 40 CFR Part 63, Subpart X
- An ethylene cracking furnace covered by 40 CFR Part 63, Subpart YY
- Blast furnace stoves as described in the EPA document, "*National Emission Standards for Hazardous Air Pollutants (NESHAP) for Integrated Iron and Steel Plants—Background Information for Proposed Standards*" (EPA 453/R–01–005)
- Any boiler or process heater specifically listed as an affected source in another standard(s) under 40 CFR Part 63 or subject to a standard established under Clean Air Act (CAA) Section 129
- Temporary boilers as defined in the rule
- Blast furnace gas fuel-fired boilers and process heaters as defined in the rule

Emission Limits

The HAP categories targeted by the proposed rule include mercury (Hg), non-mercury metal HAP, non-dioxin organic HAP, non-metal inorganic HAP, and dioxin/furans. EPA selected hydrogen chloride (HCl) as a surrogate for non-metal inorganic HAP, particulate matter (PM) as a surrogate for metal HAP, and carbon monoxide (CO) as a surrogate for non-dioxin organic HAP. Emission limits were developed based on fuel type for HCl, PM, and Hg, and based on fuel type and boiler design for CO and dioxin.

The units are divided into 11 subcategories depending on the fuel fired and the boiler design. EPA has proposed a 10 percent cutoff (on an annual average heat input basis) for determining the subcategory in which a boiler or process heats falls. The proposed emission limits (and for comparison, the emission limits in the vacated rule) are summarized in Table 1 for new sources and Table 2 for existing sources. As highlighted in the tables, the proposed limits are more stringent than the standards vacated in 2007. Additionally, the proposed rule includes a greater number of subcategories compared to the vacated rule.

Consistent with the vacatur of provisions regarding HAP emissions during startup, shutdown, and malfunction (SSM)[1], the proposed limits would apply at all times (i.e., there is no exclusion from the emission limits for periods of SSM). Periods of

[1] *Sierra Club v. EPA, 551 F.3D 1019 (D.C. Cir. 2008)*

Table 1. Major Source NESHAP Emission Limits for New Boilers and Process Heaters (Units with heat input capacity of ≥ 10 million Btu per hour)

	PM lbMMBtu of heat input		HCl lb/MMBtu of heat input		Hg lb/MMBtu of heat input		CO ppm by volume, dry basis corrected to 3% O_2		Dioxin/Furan ng/dscm (TEQ) corrected to 7% O_2	
Subcategory	Proposed	Vacated	Proposed	Vacated	Proposed	Vacated	Proposed	Vacated[1]	Proposed	Vacated
1. Pulverized coal	0.001	0.025	0.00006	0.02	2.00E-06	3.00E-06	90	400	0.002	NA
2. Stokers/grates - coal	0.001	0.025	0.00006	0.02	2.00E-06	3.00E-06	7	400	0.003	NA
3. Fluidized bed units - coal	0.001	0.025	0.00006	0.02	2.00E-06	3.00E-06	30	400	0.00003	NA
4. Stokers/grates - biomass	0.008	0.025	0.004	0.02	2.00E-07	3.00E-06	560	400	0.00005	NA
5. Fluidized bed units - biomass	0.008	0.025	0.004	0.02	2.00E-07	3.00E-06	40	400	0.007	NA
6. Suspension burners/Dutch Ovens - biomass	0.008	0.025	0.004	0.02	2.00E-07	3.00E-06	1,010	400	0.03	NA
7. Fuel cells - biomass	0.008	0.025	0.004	0.02	2.00E-07	3.00E-06	270	400	0.0005	NA
8. Liquid fuel	0.002	0.03	0.0004	0.0005/0.0009[2]	3.00E-07	3.00E-07	1	400	0.002	NA
9. Other gases	0.003	NA	3.00E-06	NA	2.00E-07	NA	1	400	0.009	NA

[1] *Solid fuel CO limits in the vacated rule were corrected to 7% oxygen.*
[2] *First value shown applied to units rated at 10 MM Btu/hr or greater. Second value applied to units rated at less than 10 MM Btu/hr.*
NOTE: *The remaining two subcategories (metal process furnaces and natural gas/refinery gas) are not subject to emission limits, but have work practice requirements.*

Table 2. Major Source NESHAP Emission Limits for Existing Boilers and Process Heaters (Units with heat input capacity of ≥ 10 million Btu per hour)

	PM lbMMBtu of heat input		HCl lb/MMBtu of heat input		Hg lb/MMBtu of heat input		CO ppm by volume, dry basis corrected to 3% O_2		Dioxin/Furan ng/dscm (TEQ) corrected to 7% O_2	
Subcategory	Proposed	Vacated	Proposed	Vacated	Proposed	Vacated	Proposed	Vacated	Proposed	Vacated
1. Pulverized coal	0.02	0.07	0.02	0.09	3.00E-06	9.00E-06	90	NA	0.004	NA
2. Stokers/grates - coal	0.02	0.07	0.02	0.09	3.00E-06	9.00E-06	50	NA	0.003	NA
3. Fluidized bed units - coal	0.02	0.07	0.02	0.09	3.00E-06	9.00E-06	30	NA	0.002	NA
4. Stokers/grates - biomass	0.02	0.07	0.006	0.09	9.00E-07	9.00E-06	560	NA	0.004	NA
5. Fluidized bed units - biomass	0.02	0.07	0.006	0.09	9.00E-07	9.00E-06	250	NA	0.02	NA
6. Suspension burners/Dutch Ovens - biomass	0.02	0.07	0.006	0.09	9.00E-07	9.00E-06	1,010	NA	0.03	NA
7. Fuel cells - biomass	0.02	0.07	0.006	0.09	9.00E-07	9.00E-06	270	NA	0.02	NA
8. Liquid fuel	0.004	NA	0.0009	NA	4.00E-06	NA	1	NA	0.002	NA
9. Other gases	0.05	NA	3.00E-06	NA	2.00E-07	NA	1	NA	0.009	NA

NOTE: *The remaining two subcategories (metal process furnaces and natural gas/refinery gas) are not subject to emission limits, but have work practice requirements.*

noncompliance during a malfunction will be evaluated on a case-by-case basis and EPA will consider efforts to minimize emissions, root cause analyses, and whether the event was a true malfunction and not the result or poor maintenance and/or careless operation. Although not subject to any emission limits, certain subcategories and heat input capacities are subject to work practice standards. New and existing natural gas- and refinery gas-fired units with a heat input capacity equal to or greater than 10 MMBtu/hr would be subject to a work practice standard consisting of annual tune-ups. Existing units of all fuel types with a heat input capacity less than 10 MMBtu/hr would be subject to a work practice standard consisting of tune-ups every two years.

Energy Assessment

The proposed rule includes a one-time energy assessment of cost-effective energy conservation measures that would be required for affected units. The energy audit must be completed by qualified personnel knowledgeable with evaluating energy systems and should include an assessment of the facility's energy management program and practices using EPA's ENERGY STAR Facility Energy Management Assessment Matrix. Facilities would be required to identify cost-effective solutions (those with a payback period of less than two years), but facilities are not required to implement findings of the audit.

The procedures for an energy assessment are:

- Conduct a visual inspection of the boiler system
- Establish operating characteristics of the facility, energy system specifications, operating and maintenance procedures, and unusual operating constraints
- Identify major energy consuming systems
- Review available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage
- Identify a list of major energy conservation measures
- Determine the energy savings potential of the energy conservation measures identified

- Prepare a comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments

Source Testing

Annual stack testing is required to demonstrate compliance with the emission limits for each regulated pollutant, except for HCl and/or mercury if the fuel analysis option is utilized, or for CO or PM if continuous emissions monitoring is required. The performance tests consist of three, four-hour test runs. Stack testing can be reduced to once every three years if test results for three consecutive years show emissions at or below 75% of the limit. The reduction in stack testing frequency does not apply to dioxin/furan testing. The results of the annual stack test would be submitted using an EPA web-based electronic reporting tool (ERT). A site-specific test plan must be developed for performance tests.

Compliance Monitoring

If facilities use performance tests to demonstrate compliance with emission limits, they must develop a site-specific monitoring plan. The plan must be submitted to the permitting authority upon request, at least 60 days before the initial performance evaluation. The plan must address ongoing operation and maintenance, quality assurance, and recordkeeping and reporting.

For operating limits that require the use of parametric monitoring, facilities will be required to install, operate, and maintain a continuous parameter monitoring system (CPMS). The following parameters, with compliance ranges established during performance tests, must be monitored using CPMS:

- *Wet Scrubber* – Pressure drop, liquid flow rate, pH (for HCl control)
- *Dry Scrubber* – Sorbent injection rate
- *Electrostatic Precipitator (with wet control systems)* – Voltage and secondary current or total power input

Continuous Emissions Monitoring

For units with capacities equal to or greater than 100 MMBtu/hr, continuous emissions monitoring systems (CEMS) would be required for CO and oxygen. Compliance with the CO limit will be demonstrated using a 30-day rolling average.

For coal, biomass, and residual oil fired units equal to or greater than 250 MMBtu/hr, CEMS would be required for PM. Compliance with the PM emissions limit shall be determined based on the 24-hour daily (block) average of the hourly arithmetic average emissions concentrations using the CEMS data.

For units with an applicable opacity operating limit, continuous monitoring is required using a continuous opacity monitoring system (COMS). There are three specified exceptions to COMS monitoring:

- Units equipped with wet scrubbers
- Units with a heat input capacity 250 MMBtu/hr or greater (PM must be monitored)
- Bag leak detection systems for fabric filter systems

The opacity limit is for dry control systems and is 10% opacity on a daily block average basis. As an alternative to installing COMS, for units controlled by fabric filters subject to opacity limits, facilities can install a bag leak detection system (BLDS). To demonstrate continuous compliance using a BLDS, facilities must: 1) initiate corrective action within one hour of a bag leak detection system alarm; 2) complete corrective actions as soon as practical, and; 3) operate and maintain the fabric filter system such that the alarm does not sound more than five percent of the operating time during a six-month period.

Fuel Monitoring

As an alternative to operating add-on controls, facilities may elect to demonstrate the concentration of HAP if the fuel fired by the unit is below the emission limit. To demonstrate compliance with the mercury or HCl limits based on fuel analysis, monthly fuel analyses for each type of fuel burned are required. Facilities must develop and submit a site-specific fuel analysis plan to EPA for review and approval. When burning a new type of fuel, a fuel analysis must be conducted prior to burning the new type of fuel. Fuel usage (type and amount) must be recorded on a daily basis for each unit to demonstrate that no new fuels or solid waste has been burned in the unit.

Emissions Averaging

The option to comply with the emission limits using emission averaging is allowed only for existing affected units within the same subcategory. Emissions averaging is limited to PM, HCl, and mercury. A 10% discount factor is applied to the combined emissions average (i.e., combined emissions cannot exceed 90% of limit). If selecting emissions averaging for compliance, facilities must develop and implement an emissions averaging plan. The plan must be submitted for approval at least 180 days before averaging will begin.

Reporting

The timeline for notifications and reports required by the proposed rule are:

- *Initial Notification* – No later than 120 days after the final rule is published in the Federal Register for existing sources or within 15 days of startup for new sources
- *Notification of Performance Test* – No later than 30 days prior to conducting performance test
- *Notification of Compliance Status* – No later than 60 days after the completion of the performance test/compliance evaluation
- *Notification of Natural Gas Curtailment* - Within 48 hours of the declaration of a period of natural gas curtailment or supply interruption and intention to fire different fuel
- *Semiannual Compliance Report* – Within 31 days from the end of the reporting period (January 1st through June 30th and July 1st through December 31st)

These reports are in addition to any reports required by the general provisions in Subpart A.

Health-Based Compliance Alternative

The current proposed rule does not include the Health Based Compliance Alternative (HBCA) that was included in the vacated 2004 Boiler MACT rule. The HBCA in the vacated 2004 Boiler MACT allowed facilities to comply with the rule without add-on controls if no substantial risk to the public was demonstrated as a result of HCl and chlorine or manganese emissions from the affected sources. However, EPA is seeking comments on possible approaches to implement the HBCA in a final rule. EPA has identified several concerns where comments will be accepted, including the cumulative impact from multiple pollutants, selecting a surrogate pollutant, accounting for multiple sources within a single site or an industrial area, and how to adequately simulate exposure situations.

Area Source Boiler NESHAP

The newly proposed Area Source Boiler NESHAP (also called Area Source Boiler MACT/GACT) will affect boilers at area sources of HAP emission that burn coal, oil, or biomass, or non-waste materials, but not solid waste. EPA estimates that approximate 183,000 existing area source boilers at 92,000 U.S. facilities and approximately 6,800 new area source boilers over the next three years would be affected.

Applicability

The affected source for the proposed rule is the collection of existing and each new or reconstructed industrial, commercial, and institutional boilers at area sources. Note that process heaters are excluded from the proposed Area Source rule. A unit is classified as a new source if construction or fuel switching from natural gas to coal, biomass, or oil is commenced after June 4, 2010. It is important to note that the fuel switching applicability is unique to the Area Source Boiler MACT. Similarly, sources that are reconstructed (as defined in 40 CFR 63.2) after June 4, 2010 are classified as reconstructed sources. A boiler is classified as existing if it is not new or reconstructed. The compliance date for new sources is the date the final rule is published in the Federal Register or upon startup, whichever is later. The compliance date for existing sources is three years from the date the final rule is published in the Federal Register.

The following units are exempt from the requirements of the rule:

- Any boiler specifically listed as an affected source in another standard(s) under 40 CFR Part 63
- Any boiler specifically listed as an affected source in another standard(s) established under Section 129 of the CAA
- A boiler required to have a permit under Section 3005 of the Solid Waste Disposal Act or covered by Subpart EEE of this part (e.g., hazardous waste boilers)
- A boiler that is used specifically for research and development (not including boilers that only provide steam to a process or for heating at a research and development facility)
- A gas-fired boiler as defined in the proposed rule

Any source that was a major source and installed a control device on a boiler after November 15, 1990, and, as a result, became an area source under 40 CFR Part 63 is required to obtain a Title V operating permit.

Emission Limits

The proposed rule includes standards to limit emissions of mercury, PM (as a surrogate for non-mercury metals) and CO (as a surrogate for organic HAP), depending on new/existing status and fuel type. Existing small boilers (i.e., less than 10 MMBtu/hr) would not be subject to emission limits but would be required to perform a boiler tune-up every two years.

Standards for area sources can be based on either GACT or MACT. The proposed standards for existing coal-fired boilers and all new boilers are based on MACT for mercury and CO, and on GACT for PM. The proposed standards for existing biomass and oil-fired boilers are based on MACT for CO, and on GACT for mercury and PM. Emission limits are summarized in Table 3.

Similar to the proposed Major Source Boiler MACT, the emission limits apply at all times with no exemptions for exceedances during start-up, shutdown, or malfunctions.

Energy Assessment

Similar to the proposed Major Source rule, the proposed Area Source rule includes a one-time energy assessment of cost-effective energy conservation measures that would be required for existing units with heat input capacities greater than 10 MMBtu/hr. The same requirements and procedures for energy assessments required under the Major Source rule apply to area sources.

Table 3. Area Source NESHAP Emission Limits for Boilers

Subcategory	PM lb/MMBtu of heat input	Hg lb/MMBtu of heat input	CO ppm by volume, dry basis[1]
1. Coal - New	0.03	3.00E-06	310
2. Biomass - New	0.03		100
3. Oil - New	0.03		1
4. Coal - Existing (> 10 MMBtu/hr)		3.00E-06	310
5. Biomass - Existing (> 10 MMBtu/hr)			160
6. Oil - Existing (> 10 MMBtu/hr)			2

[1] *Corrected to 7% oxygen. Oil CO emissions are corrected to 3% oxygen.*

Source Testing

Annual stack testing is required to demonstrate compliance with the emission limits for each regulated pollutant (except for mercury if the fuel analysis option is utilized). The performance tests consist of three one-hour test runs for PM and CO and three, two-hour test runs for Hg. Stack testing can be reduced to once every three years if test results for three consecutive

years show emissions at less than 75% of standard. The stack testing frequency reduction does not apply to CO testing. The results of the annual stack test would be submitted using EPA's ERT.

Compliance Monitoring
If facilities use performance tests to demonstrate compliance with emission limits, they must develop a site-specific monitoring plan. The plan must be submitted to the permitting authority upon request, at least 60 days before the initial performance evaluation. The plan must address ongoing operation and maintenance, quality assurance, and recordkeeping and reporting.

For operating limits that require the use of a CMS, facilities will be required to install, operate, and maintain a CPMS. The sorbent injection rate for a dry scrubber must be monitored using CPMS. Other monitoring parameter alternatives are allowed pending approval by EPA.

Continuous Emissions Monitoring
For units with capacities equal to or greater than 100 MMBtu/hr, CEMS would be required for CO and oxygen. Compliance with the CO limit will be demonstrated using a daily average, unlike the 30-day rolling average in the proposed Major Source rule.

For units with an applicable opacity operating limit, continuous monitoring is required using a COMS. The opacity limit is for dry control systems and is 10% opacity on a daily block average basis. As an alternative to installing COMS, facilities can install a BLDS for units controlled by fabric filters subject to opacity limits. To demonstrate continuous compliance using a bag leak detection system, facilities must: 1) initiate corrective action within one hour of a bag leak detection system alarm; 2) complete corrective actions as soon as practical, and; 3) operate and maintain the fabric filter system such that the alarm does not sound more than five percent of the operating time during a six-month period.

Fuel Monitoring
To demonstrate compliance with the mercury limits based on fuel analysis, monthly fuel analyses for each type of fuel burned are required. When burning a new type of fuel, a fuel analysis must be conducted prior to burning the new type of fuel. Fuel usage (type and amount) must be recorded on a monthly basis for each unit.

Reporting
The timeline for notifications and reports required by the proposed rule are:

- *Initial Notification* – No later than 120 days after the final rule is published in the Federal Register for existing sources or within 120 days after the source becomes subject to the standard
- *Notification of Compliance Status* – No later than 120 days after the applicable compliance date unless a performance test is required; in that instance, no later than 60 days after the completion of the performance test/compliance evaluation
- *Annual Compliance Certification Report* – By March 1 of each year for the previous calendar year

These reports are in addition to any reports required by the general provisions in Subpart A.

Proposed Rule Timeline

The timeline of the proposed rules is as follows:

- April 29, 2010 – Proposed rules signed
- June 4, 2010 – Proposed rules published in the Federal Register
- June 21, 2010 – Public hearing
- July 19, 2010 – Comment period ends

The schedule for completing this rule is part of a court order, which requires the EPA Administrator to complete a final rule by December 16, 2010.

EPA Proposes Updates to CISWI Rules

MELISSA HILLMAN
SENIOR CONSULTANT - SEATTLE

On June 4, 2010, the U.S. EPA proposed updates to the Standards of Performance for New Stationary Sources (NSPS) for Commercial and Industrial Solid Waste Incineration (CISWI) Units (NSPS Subpart CCCC) and Emission Guidelines (EG) for Existing CISWI Units (EG Subpart DDDD), collectively referred to as the "CISWI Rules." In order to describe the proposed updates to the CISWI Rules, it is necessary to review the timeline of important EPA and court decisions surrounding the CISWI Rules.

EPA adopted NSPS and EG for CISWI units on December 1, 2000 (2000 CISWI Rules). In 2001, the United States Court of Appeals for the DC Circuit (DC Circuit) granted EPA's voluntary remand, without vacatur, of the definition of "commercial and industrial waste" and "CISWI unit." As such, the definitions included in the 2000 CISWI Rules remain in effect until EPA revises the definitions. In 2005, EPA proposed and finalized the CISWI definitions, which revised the definition of solid waste, commercial and industrial waste, and CISWI unit (2005 definitions rule); each definition is provided in both the NSPS Subpart CCCC and the EG Subpart DDDD. In 2007, the DC Circuit vacated and remanded the 2005 definitions rule. As such, the current regulatory action includes EPA's response to the 2001 voluntary remand of the definitions of "commercial and industrial waste" and "CISWI unit," and EPA's response to the remand and vacatur of the 2005 definitions rule.

Proposed updates to the 2000 CISWI Rules include the following:

- A CISWI unit will now be required to be in compliance with emission standards at all times, including periods of startup, shutdown, and malfunction (SSM)

- Additional CISWI units will be covered by the proposed rule as the list of exemptions will be reduced and energy recovery units are not specifically excluded
- There will be five subcategories of CISWI units while the 2000 CISWI Rules included only a single incinerator category
- Changes to testing, monitoring, reporting and electronic data submittal requirements
- All emission limits will be revised (if necessary) as required by the Clean Air Act (CAA) Section 129, which stipulates a five-year technology review by EPA
- The date for determining if a CISWI unit is new or existing will be updated based on the June 4, 2010 publication date of the proposed rule and the final CISWI rule publication date

NSPS versus EG

A new CISWI unit is required to comply directly with the federal regulations provided under 40 CFR Part 60, Subpart CCCC within six months after promulgation of the rule or upon initial startup, whichever is later. An existing CISWI unit is required to comply with state-specific regulations that have incorporated the EG (40 CFR Part 60, Subpart DDDD) in a State Plan that has been approved by EPA. If EPA has not approved the State Plan, the existing CISWI unit must be in compliance with the Federal Plan, as listed in EG Subpart DDDD. The existing CISWI unit must be in compliance with the EG within three years after EPA approves a State Plan implementing the EG, or five years after the date the EG Subpart DDDD is promulgated, whichever is earlier.

Overview of the 2000 CISWI Rules

The 2000 CISWI Rules provide emission standards for commercial or industrial combustion units that combust commercial or industrial waste. Note that the 2000 CISWI Rules specifically exclude units that recover energy from the combustion of solid waste, which is defined specifically in each Subpart. A new incineration unit is one constructed after November 30, 1999, or reconstructed or modified on or after June 1, 2001. A new incineration unit is subject to NSPS Subpart CCCC. An existing incineration unit commenced construction on or before November 30, 1999, and is subject to either the State Plan approved by EPA, or if a State Plan has not been approved by EPA, the unit would be subject to the Federal Plan described in EG Subpart DDDD.

There are 15 exemptions listed in the 2000 CISWI Rules: pathological waste incineration units; agricultural waste incineration units; municipal waste combustion units; medical waste incineration units; small power production facilities; cogeneration facilities; hazardous waste combustion units; materials recovery units; air curtain incinerators; cyclonic barrel burners; rack, part, and drum reclamation units; cement kilns; sewage sludge incinerators; chemical recovery units; and laboratory analysis units. Please note the scope of the exemptions is significantly changed in the proposed rule, as discussed below.

The emission standards provided in the 2000 CISWI Rules apply to only one category of CISWI units, labeled "Incinerators." The pollutants regulated include cadmium, carbon monoxide (CO), dioxins/furans (toxic equivalency basis [TEQ]), hydrogen chloride (HCl), lead, mercury, opacity, oxides of nitrogen (NO_x), particulate matter (PM), and sulfur dioxide (SO_2).

Proposed Revisions to the 2000 CISWI Rules

The following sections provide a general overview of the proposed changes to the 2000 CISWI rules.

CISWI Unit and Solid Waste Definitions

The 2000 CISWI rules included a definition of solid waste within NSPS Subpart CCCC and EG Subpart DDDD that differed from the definition of solid waste under the Resource Conservation and Recovery Act (RCRA). Because the D.C. Circuit ruled that CAA Section 129 requires that the term "solid waste" have the same meaning established by EPA under RCRA, EPA must incorporate the RCRA solid waste definition in the proposed CISWI Rules. As such, EPA is proposing the following definition for a CISWI unit: "any distinct operating unit of any commercial or industrial facility that combusts any solid waste as that term is defined in 40 CFR Part 241 [RCRA] … ." Although the proposed change in definition and other rule changes broaden the scope of the CIWSI rules, subjecting more types of units to the CISWI rules, there are still some categories excluded from the CISWI rules, as discussed below.

In a parallel regulatory action, EPA has amended the definition of solid waste provided under 40 CFR Section 241 to add an exclusion for "non-hazardous secondary wastes" that would otherwise qualify as solid waste under 40 CFR Section 241. Please refer to the article titled "New Solid Waste Definition Proposed" on page 10 of this EQ publication for additional details.

Applicability and Exemptions

Under the proposed rule changes, a CISWI unit will be considered a new unit, and therefore, subject to NSPS Subpart CCCC if:

1. Construction commences after June 4, 2010, or
2. Reconstruction or modification commences six months after the final rules are promulgated by EPA, which is expected in December 2010.

EPA projects that there will not be any new units constructed over the next three years as it will be too expensive to add controls that will allow the new unit to comply with the proposed emission limits.

A CISWI unit will be considered an existing unit, and therefore subject to the state regulations incorporating EG Subpart DDDD if:

1. Construction commenced on or before June 4, 2010, or
2. Reconstruction or modification commences no later than six months after the final rules are promulgated by EPA, which is expected in December 2010.

Please note that a unit that meets the definition of a new CISWI unit under the 2000 CISWI Rules will be considered an existing CISWI unit under the proposed CISWI Rules if the unit was constructed on or before June 4, 2010. However, these units would be required to remain in compliance with the 2000 NSPS emission limits as provided in Table 2, until the units are considered existing sources under the amended standards, which would be three years after EPA approved the State Plan or five years after the final rules are promulgated by EPA, whichever is earlier.

The following exemptions are proposed to be removed from the 2000 CISWI Rules: agricultural waste incineration units; cyclonic barrel burners; rack, part, and drum reclamation units; cement kilns; chemical recovery units; and laboratory analysis units. All other exemptions will remain in the updated CISWI rules. The revised exemption list will include the following: pathological waste incineration units: municipal waste combustion units; medical waste incineration units; small power production facilities; cogeneration facilities; hazardous waste combustion units; materials recovery units; air curtain incinerators; and sewage sludge incinerators.

CISWI Unit Subcategories and Emission Limits

The proposed CISWI Rules will include five subcategories of CISWI units, as follows:

1. Incinerators
2. Energy Recovery Units
3. Waste Burning Kilns
4. Burn-off Ovens
5. Small, Remote Incinerators

Each subcategory will have different emission limits. EPA set emission limits using the maximum achievable control technology (MACT) procedures as required by Section 129 for new and existing sources. Therefore, the emission limits for new CISWI units reflect the best limits that are achievable in practice by the best controlled similar unit, and the emission limits for existing CISWI units reflect the emission limits achieved by the top twelve percent of comparable CISWI units. EPA performed a MACT analysis on each of the five subcategories.

It was necessary for EPA to determine if the unit combusted solid waste in order to determine if a unit met the definition of a CISWI unit. Therefore, EPA was forced to use the definition of solid waste, including the proposed revisions regarding non-hazardous secondary wastes, to determine if a unit would be subject to the CISWI Rules. If EPA changes the proposed exclusions for non-hazardous secondary wastes, the entire MACT analysis will need to be revised. Note that energy recovery units and waste-burning kilns are the only subcategories that could potentially use the non-hazardous secondary waste exclusion currently under review.

As an example, if a boiler combusted a solid waste that qualified for the non-hazardous secondary waste exclusion, that boiler would not have been included in the MACT analysis for Energy Recovery Units. If EPA finalizes the RCRA definition of solid waste and removes the non-hazardous secondary waste exclusions, the boiler would be considered a CISWI unit because the unit would combust a solid waste. As such, the boiler will have to be considered in the MACT analysis, which may impact what was set as the MACT floors for both new and existing CISWI units.

Tables 1 and 2 include the original 2000 CISWI Rule emission limits and the proposed emission limits for existing and new CISWI units, respectively. Please note that the proposed rule eliminates the exemption from emission limits during period of SSM; therefore, the proposed emission limits will apply at all times.

Control Devices

In order to comply with the emissions standards provided in Tables 1 and 2, sources will most likely have to install one or more control devices on the CISWI unit (if the CISWI unit owner continues to combust solid waste instead of using an alternative disposal option, such as a landfill). The proposed CISWI Rules provide operating parameters for the following control technologies: wet scrubber, activated carbon injection, selective noncatalytic reduction (SNCR), and electrostatic precipitator (ESP). Should a

Table 1. Comparison of Existing Source Emission Limits for 2000 CISWI Rule and the Proposed Existing Source Emission Limits [Based on the primary proposed definition of solid waste in the Solid Waste Definition Rule]

Pollutant (units)[1]	Incinerators (2000 CISWI limit)	Proposed CISWI subcategories (Existing Source)				
		Incinerators	Energy recovery units	Waste-burning Kilns	Burn-off ovens	Small, remote incinerators
HCl (ppmv)	62	29	1.5	1.5	130	150
CO (ppmv)	157	2.2	150	710	80	78
Pb (mg/dscm)	0.04	0.0026	0.002	0.0027	0.041	1.4
Cd (mg/dscm)	0.004	0.0013	0.00041	0.0003	0.0045	0.26
Hg (mg/dscm)	0.47	0.0028	0.00096	0.024	0.014	0.0029
PM, filterable (mg/dscm)	70	13	9.2	60	33	240
dioxin, furans, total (ng/dscm)	(no limit)	0.031	0.75	2.1	310	1600
dioxin, furans, TEQ (ng/dscm)	0.41	0.0025	0.059	0.17	25	130
NO_x (ppmv)	388	34	130	1,100	120	210
SO_2 (ppmv)	20	2.5	4.1	410	11	44
Opacity (%)	10	1	1	4	2	13

[1] *All emission limits are measured at 7% oxygen.*

Table 2. Comparison of New Source Emission Limits for 2000 CISWI Rule and the Proposed New Source Emission Limits [Based on the primary proposed definition of solid waste in the Solid Waste Definition Rule]

Pollutant (units)[1]	Incinerators (2000 limit)	Proposed CISWI subcategories (New Source)				
		Incinerators	Energy recovery units	Waste-burning Kilns	Burn-off ovens	Small, remote incinerators
HCl (ppmv)	62	0.074	0.17	1.5	18	150
CO (ppmv)	157	1.4	3	36	74	4.0
Pb (mg/dscm)	0.04	0.0013	0.0012	0.00078	0.029	1.4
Cd (mg/dscm)	0.004	0.00066	0.00012	0.0003	0.0032	0.057
Hg (mg/dscm)	0.47	0.00013	0.00013	0.024	0.0033	0.0013
PM, filterable (mg/dscm)	70	0.0077	4.4	1.8	28	240
dioxin, furans, total (ng/dscm)	(no limit)	0.0093	0.034	0.00035	0.011	1,200
dioxin, furans, TEQ (ng/dscm)	0.41	0.00073	0.027	0.000028	0.00086	94
NO_x (ppmv)	388	19	75	140	16	210
SO_2 (ppmv)	20	1.5	4.1	3.6	1.5	43
Opacity (%)	10	1	1	1	2	13

[1] *All emission limits are measured at 7% oxygen.*

facility determine that use of an alternate air pollution control device is necessary, or that emissions will be limited in another manner, the facility must submit a petition to EPA requesting approval of the proposed operating parameters that will be monitored to demonstrate compliance with the emission limits. EPA must approve the petition prior to any performance testing.

The following operating parameters will need to be monitored using a continuous parameter monitoring system (CPMS), depending on what type of control device is used to reduce emissions:

1. *Wet scrubbers* – charge rate, pressure drop or current, scrubber liquid flow rate, scrubber liquid pH
2. *Activated carbon injection* – mercury sorbent injection rate
3. *Fabric filters* – bag leak detection system
4. *SNCR* – charge rate, secondary chamber temperature (if applicable), reagent flow rate
5. *ESP* – voltage and current

One significant addition in the proposed rules is a requirement to develop and submit a site-specific monitoring plan for each continuous monitoring system required by the rule. The plan must be submitted at least 60 days before the initial performance evaluation of the continuous monitoring system. Proposed testing and monitoring requirements are identified below in Table 3.

What to Expect?

EPA is accepting public comments on the proposed CISWI rules through August 3, 2010.

EPA is specifically interested in comments on the following key topics (this list is not comprehensive):

- Should existing units other than energy recovery units be required to install a CO and PM CEMS?
- Was EPA's approach for establishing the dioxin, furan, and opacity limits appropriate?
- Is EPA justified in reducing the sources that are proposed to be exempt from the CISWI rule?
- Is it appropriate to use previously conducted performance tests?
- Is it practical to require energy recovery units with a capacity of 100 MMBtu/hr to install a PM CEMS?

The final CISWI rules are expected to be published by December 2010.

Table 3. Proposed Testing and Monitoring Requirements

Proposed CISWI Subcategories	Annual Performance Testing[1]											CEMS/COMS Requirements			
	HCl	CO	Pb	Cd	Hg	PM	NO_x	SO_2	Dioxin/Furan	Opacity	Fugitive Ash	CO[2]	Hg	PM	Opacity[3]
Incinerators	E, N					E, N				E, N	E, N	N			
Energy recovery units, ≤ 250 MMBtu/hr	E, N		E, N	E, N	E, N	E, N	E, N	E, N	E, N	E, N	E, N	E, N			E, N
Energy recovery units, >250 MMBtu/hr	E, N		E, N	E, N	E, N		E, N	E, N	E, N		E, N	E, N		E, N	E, N
Waste-burning Kilns	E, N					E, N	E, N	E, N		E, N	E, N	N	E, N		
Burn-off ovens	E, N					E, N				E, N	E, N	N			
Small, remote incinerators	E, N					E, N				E, N	E, N	N			

KEY: E = existing CISWI units; N = new CISWI units
NOTE: All CISWI units are required to perform initial compliance testing for all pollutants for which an emission limitation exists.
[1] *Annual performance testing can be reduced to a three year testing cycle for HCl, PM, opacity, and fugitive ash if testing demonstrates that emissions are less than 75% of the associated emission limitation.*
[2] *Note that the text of the rule does not require a CO CEMS on all new CISWI units; however, Tables 5-9 clearly require a CO CEMS. The preamble to the CISWI Rules clearly states that the intent is for all new CISWI units to install a CO CEMS (FR 31948).*
[3] *COMS is only required for energy recovery units that do not install a wet scrubber.*

New Solid Waste Definition Proposed

When the Boiler MACT rule was vacated in 2007, one key element in the court challenge was that many non-fossil fuel materials burned in industrial boilers should be classified as solid wastes and regulated accordingly. Along with the recently proposed Boiler MACT and rules for commercial/industrial/solid waste incinerators (CISWI), EPA proposed criteria to determine whether non-hazardous secondary materials (NHSM) qualify as solid waste. Under the proposal, "solid waste incineration units" are defined as units which burn "any solid waste material from commercial or industrial establishments."

The proposed criteria for determining solid waste status include whether the material:

- Is a traditional fuel
- Was initially discarded
- Is managed with the control of the generator
- Has been sufficiently processed
- Meets the legitimacy criteria
  - Is managed as a valuable commodity
  - Has a meaningful heating value
  - Contains contaminants at levels comparable to or lower than traditional fuels which the unit is designed to burn

The rule defines "traditional fuels" as specific fossil fuels and specific clean cellulosic biomass materials. NHSM are not considered solid wastes if they remain within the control of the generator and meet the three legitimacy criteria identified above. Even if NHSM have been discarded, they can qualify as fuels if they meet the legitimacy criteria and have been sufficiently processed to remove or destroy contaminants and improve the fuel characteristics, energy content, and ingredient characteristics.

EPA has proposed a petition process for materials used as fuels outside the control of the generator. To petition, the material must not be discarded and must be indistinguishable in all relevant respects from a fuel. To qualify as fuel, the petitioner must demonstrate that the material is handled as a fuel in the market, that its physical and chemical identity is comparable to commercial fuels, that it will be used in a reasonable time frame, that its constituents will be released to the environment in levels comparable to traditional fuels, and other factors.

Materials specified by the rule as generally not solid waste include clean biomass, clean biofuel from solid waste, wood products and pulp & paper mill residuals, and TDF (where steel belts and wires have been removed), and on-spec used oil. Materials that are generally defined as solid waste include painted wood, some treated wood, whole or untreated tires, municipal sewage sludge, abandoned coal refuse, and contaminated construction and demolition debris.

Industry may have concerns related to issues such as implementation of the legitimacy criteria, the level of processing required for previously discarded material, and the petition process which may allow states to make individual determinations. The comment period was extended to August 3, 2010.

New NO_2 Air Standards Prove Technically Challenging

DEBORAH WALDEN-HERSH, PE
MANAGING CONSULTANT—AUSTIN

On February 9, 2010, the U. S. Environmental Protection Agency (EPA) established a new National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide (NO_2). The new NO_2 NAAQS is a one-hour standard set at 100 parts per billion (ppb), which is approximately 188 micrograms per cubic meter ($\mu g/m^3$). Effective on April 12, 2010, the new one-hour standard is intended to protect against peak exposures to NO_2, particularly from mobile source emissions associated with major roadways. Even though the new standard is intended to protect against peak exposures from mobile sources, the new standard has significant impacts on industrial point source air quality compliance.

NO_2 is the largest component of a group of gases referred to as oxides of nitrogen (NO_x). EPA established the first NAAQS for NO_2 in 1971 as an annual average set at 53 ppb (100 $\mu g/m^3$). All areas of the country currently meet this standard. Between 1971 and the present, EPA has reviewed the annual average NO_2 standard twice, with no proposed changes or additions to the NO_2 NAAQS. The existing *annual* NO_2 NAAQS remains unchanged with this proposal.

The newly promulgated NO_2 standard not only establishes a new one-hour averaging period for the NO_2 NAAQS, but also establishes a new "form" for the one-hour standard. The form of the new one-hour NO_2 NAAQS is the three-year average of the 98th percentile of the yearly distribution of daily maximum one-hour average concentrations.

Immediate Impacts to Industrial Point Sources

With the recent promulgation of the new NO_2 NAAQS, all sources (major or minor) with a proposed NO_2 emissions increase that were not approved by April 12, 2010 may be impacted by the new standard. Compliance must be demonstrated by performing an air quality dispersion modeling analysis. Based on guidance provided by EPA, some states are requiring NO_2 modeling analyses for all permit applications involving NO_2 emissions, even for projects that previously might have been exempt from modeling requirements. Many companies that have performed air quality dispersion modeling for the one-hour standard have found demonstrating compliance with the new standard to be challenging, resulting in significant delays and hurdles in major and minor source permit processing and approvals. Some of the main challenges companies have been faced with are summarized as follows:

- Higher impacts from relatively low-emitting sources
- New form of the standard
- Significant Impact Levels (SILs)
- Case-by-case approval required for NO_2 modeling techniques
- Lack of clear guidance for modeling methodology

Higher Impacts from Relatively Low-Emitting Sources

Many companies have found that their largest NO_2 emitting sources do not always have the largest one-hour impact in the air quality dispersion modeling analysis. Smaller sources, which may also have stacks with the least desirable dispersion characteristics (e.g., short stacks, horizontal releases, low air flows, near ambient temperature exhaust, etc.), may be the largest contributors in one-hour NO_2 NAAQS demonstrations. For example, demonstrating compliance with the one-hour NO_2 NAAQS at a site with diesel-driven emergency engines located near buildings and/or within close proximity to the fenceline, has been found to be problematic for many sites. Companies will need to closely evaluate emission rates, timing and duration of releases, and stack parameters for these smaller emission sources.

New Form of the Standard

The "workhorse" of near-field dispersion models and the model recommended by EPA's *Guideline on Air Quality Models,* AERMOD, is currently not capable of processing results in the form of the new standard (three-year average of the 98th percentile of the yearly distribution of daily maximum one-hour average concentrations). EPA has indicated that a new AERMOD post-processor will be released that will be able to calculate results in the form of the new standard. Additionally, some modeling software, such as *BREEZE*, have updated post-processors that calculate modeling results in the form of the new one-hour NO_2 NAAQS. In the meantime, lack of an approved method for demonstrating compliance in the form of the new standard has led to differing guidance among states in how to best approximate NO_2 modeling results for comparison to the form of the standard. A suggested conservative method is to use the highest eighth high (H8H) modeled concentration from AERMOD.

Significant Impact Levels (SILs)

Initially, EPA had not defined or even proposed Significant Impact Levels (SILs) or Class I / Class II Increment Levels associated with the new one-hour NO_2 NAAQS under the Prevention of Significant Deterioration (PSD) regulations. This absence of SILs has led to guidance that any increase in NO_2 emissions would be considered significant; therefore, a full NAAQS analysis would be required for increases in NO_2 emissions. A full NAAQS analysis includes modeling site-wide NO_2 emissions, nearby off-property sources, and adding a representative background concentration. Furthermore, a SIL is necessary to determine the distance from the source that should be used in determining which off-property sources to model in the full NAAQS analysis.

On April 21, 2010, the Northeast States for Coordinated Air Use Management (NESCAUM) recommended the use of 10 $\mu g/m^3$ as an interim SIL. Many states have begun to follow the proposed NESCAUM interim SIL or have established their own interim SIL for use in air quality dispersion modeling analyses. On June 28, 2010, EPA issued guidance recommending an interim SIL of 4 ppb (approximately 7.5 ug/m^3). The recommendation by EPA was not intended to supersede state adopted interim SILs but can be used until a SIL has been promulgated for the one-hour NO_2 standard.

Case-By-Case Approval Required for NO_2 Modeling Techniques

Section 5.2.4 of EPA's *Guideline on Air Quality Models* includes a multi-tiered approach method to modeling NO_2 emissions based on the fact that NO_x is emitted in many forms, not exclusively as NO_2. EPA's Tier 3 screening, which may include the Ozone Limiting Method (OLM) or other similar methodologies, requires the most detailed level of analysis and produces the least conservative, and presumably the most representative, results. One such method is the Plume Volume Molar Ratio Method (PVMRM), which is a modeling technique included in AERMOD that is considered to provide more realistic NO_2 modeling results.

PVMRM adjusts NO_x emissions to estimate more realistic ambient NO_2 concentrations by modeling the conversion of NO_x to NO_2. Additional information needed to use PVMRM includes the NO_2/NO ratio within each NO_2 emitting stack (typically 0.05-0.3), the ambient NO_2/NO_x ratio (0.75-0.9), and background ozone concentrations.

The use of PVMRM as a Tier 3 screening method requires case-by-case approval for use in a modeling analysis. Applicants must obtain approval to use PVMRM for all projects triggering federal permitting requirements, and, for some states, for all projects triggering state permitting requirements.

More conservative modeling techniques, such as modeling all NO_x emissions as NO_2 or using the Ambient Ratio Method (ARM), which assumes 75 percent of NO_x is converted to NO_2, are Tier 1 and Tier 2 techniques that would not typically require EPA approval for use in major or minor source permit applications. However, these modeling techniques may overestimate actual NO_2 impacts and may be too conservative for a source to demonstrate compliance with the new NO_2 one-hour NAAQS.

As an example, the figure on page 14 presents a case study of an electric utility generating station that has two main boilers, combustion turbines, emergency engines, and auxiliary boilers that are located inside a large fenced property owned by the utility. While the site-wide modeled average NO_x concentration is 20 percent of the annual NO_2 NAAQS, the same emissions result in an exceedance of the new one-hour NO_2 NAAQS by a factor of two with a Tier 1 analysis. Using a Tier 2 analysis (ARM), site-wide impacts still exceed the one-hour NO_2 NAAQS (even prior to the addition of a background concentration). Only by utilizing a Tier 3 analysis (PVMRM) will modeled concentrations meet the one-hour NO_2 NAAQS.

(Continued on page 14)

EPA Promulgates the PSD and Title V GHG Tailoring Rule – Are You Ready to Respond?

KATHERINE N. BLUE
PRINCIPAL CONSULTANT, CLIMATE CHANGE SERVICES—ATLANTA

Environmental managers are currently facing the perplexing challenge of trying to anticipate how greenhouse gas (GHG) emissions will be regulated and to constitute an appropriate compliance strategy for their organizations. The U.S. EPA recently promulgated the PSD and Title V GHG Tailoring Rule which will impose GHG permitting requirements on existing major sources with major modifications and certain new major sources. In order to develop an appropriate response strategy, environmental managers must understand the permitting requirements and the potential impacts to operations.

After receiving nearly a half-million public comments on the subject, on May 13, 2010, EPA finalized an approach for tailoring Clean Air Act permitting programs to address GHG emissions - the so-called PSD and Title V GHG Tailoring Rule. The final rule, published in the Federal Register on June 3, 2010, (75 FR 31514), is intended to limit permitting requirements initially to only large utility and industrial sources that account for an estimated 70 percent of all stationary source GHG emissions. The regulation will be implemented in phases with the first phase beginning in January 2011. The effective date of the final rule is August 2, 2010.

PSD Implications

Under "Step 1" of the rule implementation, on January 2, 2011, all new industrial sources that are "major" for at least one non-GHG criteria pollutant and that will emit or have the potential to emit 75,000 tpy CO_2e or more will be subject to Prevention of Significant Deterioration (PSD) permitting requirements for GHGs (i.e., Best Available Control Technology [BACT] for GHGs). All existing major industrial facilities undertaking a modification that results in a PSD-significant emissions increase for at least one non-GHG pollutant and that will also result in an increase of GHG emissions of 75,000 tpy CO_2e or more will also be subject to PSD permitting requirements for GHGs. Essentially, a facility must already trigger PSD via non-GHG pollutants and also exceed the new 75,000 tpy CO_2e threshold before PSD requirements for GHG pollutants are required during the Step 1 timeframe.

Under "Step 2" of the rule implementation, on July 1, 2011, a new PSD major source threshold of 100,000 tpy CO_2e will become effective. All new sources with potential GHG emissions above 100,000 tpy CO_2e will be subject to PSD permitting requirements for GHGs. Modifications to existing major sources (defined relative to the new 100,000 tpy threshold for CO_2e or the 100/250 tpy threshold for traditional NSR regulated pollutants) that result in an increase of GHG emissions by 75,000 tpy CO_2e or more will be subject to PSD permitting requirements for GHGs. So, unlike Step 1, on July 1, 2011, PSD for GHG pollutants alone can be triggered regardless of whether PSD is also triggered for non-GHG pollutants.

To determine PSD (or Title V) major source or major modification applicability, the quantity of GHGs emitted must not only equal or exceed the new higher 100,000 tpy or 75,000 tpy thresholds on a CO_2e basis, but the sum of emissions of each GHG pollutant not adjusted for their global warming potential must also exceed the applicable threshold for non-GHG regulated pollutants (i.e., 100 tpy for Title V or 100 tpy/250 tpy for PSD, depending on whether the source is on the list of 28 PSD categories).

EPA's BACT task force, formed through the Clean Air Act Advisory Committee, issued a Phase 1 report on February 3, 2010, which summarized the areas of agreement and areas of future consideration with respect to administering BACT for GHGs. The committee plans to release BACT "white papers" and technical tools/databases in July 2010 for approximately six sectors: power generation, industrial boilers, refining, cement, nitric acid plants, and pulp & paper. The emphasis for the white papers will be a summary of possible BACT options, which in most instances will tie directly to efficiency measures for combustion equipment. Other areas that will be addressed in the white papers include: the form of the emissions limit (e.g., lbs CO_2/MWhr), timeframe for the limit (e.g., annual versus a 24-hour limit), use of methods to account for startup, shutdown, low load and idling of units, accommodation for the type of unit (new versus old), work practice requirements, and the scope of BACT (to what degree the fundamental business purpose of the project should be considered).

Title V Operating Permits

With respect to the Title V operating permit program, beginning January 2, 2011, new or existing Title V major sources will also be subject to Title V requirements for GHGs. That means, for example, that existing major sources renewing their Title V permit after January 2, 2011, must address GHGs in their applications. However, until a facility actually triggers PSD for GHGs, there are likely few applicable requirements with respect to GHGs to incorporate into a Title V permit. Furthermore, the EPA GHG Mandatory Reporting Rule (MRR) does not meet the definition of an applicable requirement under Part 70, so MRR requirements would not be included. There has been no guidance from EPA on what *de minimis* thresholds (e.g., for insignificant activities) would be applied relative to GHG emissions provided in Title V applications.

Beginning July 1, 2011, facilities with potential CO_2e emissions of 100,000 tpy or more will be subject to Title V permitting requirements (i.e., even if they were previously not a major Title V source via comparison of non-GHG pollutants to traditional thresholds). If the facility was not previously subject to Title V, the facility would be required to submit

a Title V permit application in accordance with federal and/or state/local requirements, which is typically within one year of meeting the applicability criteria. Therefore, most non-Title V sources that become newly subject to Title V via the Tailoring Rule will need to submit initial applications by July 1, 2012 (or sooner depending on specific state program procedures).

Future Reductions in Applicability Thresholds

The Tailoring Rule gives EPA flexibility to propose rulemaking on potentially lower CO_2e thresholds by July 1, 2012 with an effective date of July 1, 2013. Accordingly, EPA plans to solicit comments on whether to further reduce GHG permitting thresholds under PSD and Title V; however, EPA will not consider limits lower than 50,000 tpy during that timeframe. By April 30, 2015, EPA must determine whether further reductions to levels below 50,000 tpy CO_2e are warranted and, if so, EPA must promulgate reduced levels by April 30, 2016.

Other Details

In the final rule, there were no exclusions provided for biomass, pollution control projects, or fugitives. For implementation purposes, EPA is relying on the states' interpretation of "subject to regulation" and is requiring that states submit their plans within the 60 day period (by August 2, 2010) on if (or how) they will be able to implement the Tailoring Rule. EPA also noted that they recognize the need for guidance on potential to emit (PTE) and streamlining techniques such as presumptive BACT, permits by rule, lean permitting techniques, and other elements; however, EPA noted that none of these streamlining techniques would be developed before Step 2 begins. Finally, the rule does not provide for exemptions or grandfathering provisions to address the transition to PSD/Title V permitting for GHGs. Therefore, PSD permits must be issued and final before January 2, 2011; after that date, PSD permits must address GHGs if the applicable thresholds are exceeded. Furthermore, EPA noted that PSD permits issued prior to January 2, 2011 would not be re-opened or amended to incorporate GHG requirements.

Path Forward

This rule is the latest step by EPA in regulating GHG emissions via current mechanisms available through the CAA, following the Endangerment Finding and the Light Duty Vehicle rule. In the meantime, Congress continues to consider alternate or supplemental means of addressing GHG emissions through cap-and-trade legislation such as the American Power Act with a draft bill issued May 12, 2010. More specific guidance on the PSD/Title V permitting process for GHGs will be forthcoming from EPA, likely in Fall 2010. And as previously mentioned, BACT guidance will be forthcoming in July 2010 through "white papers" for six sectors.

Industrial sources, particularly those that are existing or potentially new PSD major sources planning significant modifications or planning for new construction of large emitting facilities, should pay close attention to this rule. Prudent steps to take for risk mitigation and compliance planning include the following:

- Evaluate future projects and the timing of these projects relative to January 2, 2011 and July 1, 2011 trigger dates
- Develop a schedule and strategy for PSD permitting (if applicable). If possible, try to ensure a PSD permit is issued by the January 2, 2011 or July 1, 2011 deadline depending on major source status
- Recognize that if you are a major source for GHGs (July 1, 2011), PSD permitting requirements for non-GHG pollutants may also apply to future major modifications
- Evaluate options for taking synthetic minor limits (PSD/Title V) for source status or for planned modifications (PSD)
- Understand your state's interpretation of "subject to regulation" under the rule and whether there may be any implementation delays
- Understand what BACT may mean for your proposed project as details emerge
- Accept that there will likely be significant delays and learning curve issues with state implementation of this rule

For questions, please contact your local Trinity office at (800) 229-6655, or Katherine Blue, Principal Consultant, Climate Change Services at *kblue@trinityconsultants.com.*

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For over 25 years, *BREEZE* Software has developed a wide range of applications including air dispersion, accidental release, and explosion safety assessment models. In addition to the *BREEZE* product line, the development staff evaluates, develops, and adapts dispersion modeling algorithms for specific needs and builds custom software for government and various industries worldwide. The adaptability of*BREEZE* software is apparent in these demonstrations.

NO_2 Post-Processing Utility

On April 12, 2010, the U.S. Environmental Protection Agency (EPA) enacted a new hourly standard for nitrogen dioxide (NO_2). The new standard lacked a direct calculation method within EPA's AERMOD modeling system to generate the desired "three-year average of the 98th-percentile of the yearly distribution of 1-hour daily maximum concentrations." *BREEZE* responded by developing a NO_2 post-processing utility to seamlessly integrate into *BREEZE* 3D Analyst. *BREEZE* designed 3D Analyst to be a universal program, one that handles output from a wide variety of models and can be easily updated with solutions to meet the needs of an ever-expanding customer base. The outcome allowed users to quickly calculate, analyze, and visualize the results of their NO_2 modeling using *BREEZE* 3D Analyst and the NO_2 post-processing utility.

Combining Model Outputs: Buoyant Line Plume and AERMOD

BREEZE developers also have a wealth of experience in creating solutions for unique modeling scenarios. A client needed to combine output from the Buoyant Line Plume (BLP) model with results from an AERMOD model run. With a limited amount of time to perform the analysis, *BREEZE* developers formulated an effective solution since no "off-the-shelf" solution existed. Careful modifications were made to the BLP output format without affecting the data integrity. After modification, the BLP output file was merged with AERMOD output data using functionality in *BREEZE* 3D Analyst.

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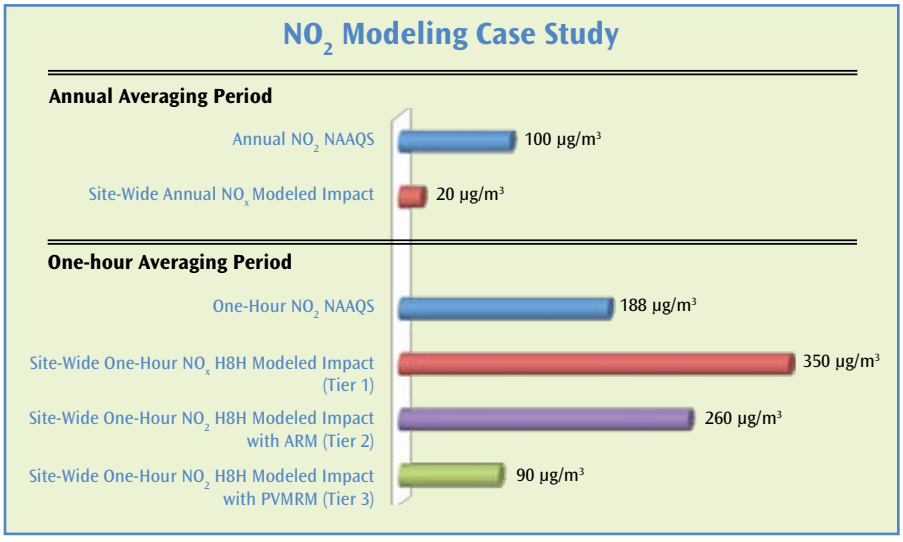
New NO_2 Air Standards Prove Technically Challenging *(Continued from page 11)*

However, NO_2 background concentrations vary significantly throughout the country (between 11-164 µg/m³ based on 2006-2008 data). Therefore, additional refinements may be necessary to demonstrate that site-wide emissions with an appropriate NO_2 background concentration and the addition of nearby off-property sources are compliant with the new NO_2 one-hour NO_2 NAAQS.

The requirement to obtain EPA approval for PVMRM has begun to slow down the permitting process for many applicants. Estimates of the additional review time needed for PVMRM approval are currently unknown. However, as more applicants submit requests to use PVMRM, agency review times may increase. In addition, the use of lower in stack NO_2/NO_x ratios (<0.3) are expected to require site-specific testing or monitoring data to support the use of the proposed NO_2/NO_x ratio. This requirement for site-specific data will increase the time needed to prepare a request for use of PVMRM.



Lack of Clear Guidance for Modeling Methodology

Without clear guidance from EPA, the implementation of the new one-hour NO_2 standard has been incongruous between states and challenging for industrial sources. In some areas, applicants have found that guidance on demonstrating compliance with the new standard changes on a weekly, or even daily, basis. EPA issued new one-hour NO_2 modeling guidance on June 28, 2010. However, the guidance does not provide answers so much as identifies additional questions that will need to be addressed when modeling hourly NO_2 emissions.

Additional Impacts from the New NO_2 NAAQS

New NO_2 Monitors Required

With the new standard, EPA has added requirements for the establishment of new NO_2 monitors, summarized below. All new NO_2 monitors must begin operation by January 1, 2013.

- Approximately 126 near-road monitors in 102 urban areas will be added based on two criteria:
  (1) At least one monitor located near a major road in an urban area with a population ≥500,000 people, *and*
  (2) a second monitor may be located near a major road if an urban area:
  (a) has a population ≥2.5 million people, *or*
  (b) one or more road segments have an annual average daily traffic count ≥250,000 vehicles.
- Approximately 53 community-wide monitors will be added in urban areas with a population ≥ one million people.
- EPA will identify locations for 40 additional monitors in communities that are determined to be susceptible and vulnerable to NO_2 related health effects.

Anticipated new NO_2 monitoring locations are shown in the following maps.

NO_2 Emissions

Based on the current network of NO_2 monitors and data from 2006 to 2008, only one monitor in Cook County, Illinois, showed a violation of the new one-hour standard. However, EPA anticipates that new monitors added near major roads could show NO_2 concentrations approximately 30-100 percent higher than monitors at non-road locations. According to the U.S. EPA, mobile sources account for 58 percent of all NO_x emissions. Utilities are the next largest contributor of NO_x emissions, making up 22 percent of all NO_x. A pie chart depicting NO_x emission sources is shown to the right. The U.S. EPA expects overall NO_x concentrations to decrease as new NO_x standards for heavy-duty engines are phased in for 2007-2010 model years.

Implementation

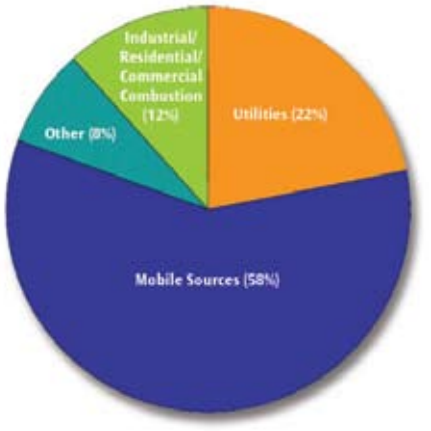
States have until January 22, 2011 to submit proposed designations under the new one-hour NO_2 NAAQS based on the current monitoring network. However, a second designation recommendation will be required after all new NO_2 monitors have begun operation (approximately 2015). The implementation schedule for the new NO_2 NAAQS is summarized above.

Implementation Schedule

MILESTONE	DATE
State Designation Recommendations to EPA	January 2011: One year following promulgation (based on existing network data)
Designations	January 2012: EPA designates all/most areas as "unclassifiable" (because near road monitors not in place)
New NO_2 Monitoring Network	January 1, 2013: All monitors operating
Next NO_2 NAAQS Review Completed	January 2015: Anticipated time frame
Nonattainment Re-Designations (discretionary)	January 2016/2017 (depending on date that sites become operational)
Attainment Date	January 2021/2022 (5 years after date of nonattainment designations

Source: U.S. EPA Website, http://www.epa.gov/air/nitrogenoxides/pdfs/20100124presentation.pdf

Sources of NO_2 Pollution



Source: U.S. EPA Website, http://www.epa.gov/air/nitrogenoxides/pdfs/20100124presentation.pdf

EPA Plans to Monitor NO_2 Concentrations Near Roads in 102 Urban Areas

Minimum Near-Road NO_2 Monitoring Requirements

- **78 areas would require 1 monitor** (≥ 500,000 population)
- **24 areas would require 2 monitors** (≥ 2.5 million population or road segments with annual average daily traffic counts ≥ 250,000 vehicles

126 total monitors

Approximately 40 additional monitors will be placed in locations to help protect communities that are susceptible and vulnerable to NO_2-related health effects.

Source: U.S. EPA Website, http://www.epa.gov/air/nitrogenoxides/pdfs/NO2MonitoringSiteMaps.pdf

EPA Plans to Monitor NO_2 Concentrations Community-Wide in 53 Urban Areas

Minimum Community-wide NO_2 Monitoring Requirements

- **53 areas would require 1 monitor** (≥ 1 million population)
- **418 existing NO_2 monitoring sites in 2008**
  Many of these sites would satisfy the proposed community-wide monitoring requirements.

Source: U.S. EPA Website, http://www.epa.gov/air/nitrogenoxides/pdfs/NO2MonitoringSiteMaps.pdf

Summary

The implementation of the new one-hour NO_2 NAAQS will have widespread impacts on industrial point sources that must demonstrate air quality compliance. Compounding the challenge for companies is EPA and state agencies' struggle with providing clear and consistent guidance to air permit applicants. For the latest guidance in your state, contact your nearest Trinity Consultants office at (800) 229-6655.

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12770 Merit Drive, Suite 900
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