

ATTACHMENT

NACAA COMMENT ON PORTLAND CEMENT NSPS

Cement Manufacturing Is a Large Contributor to NO_x Emissions and Ozone Formation

The Portland cement industry is the third largest source of industrial emissions in the nation, emitting approximately 180,000 tons per year of sulfur dioxide and NO_x.¹ Cement manufacturing conditions are particularly favorable for formation of nitrogen oxides (NO_x) because of the high process temperatures and oxidizing atmospheres involved.² Since NO_x is an ozone-forming precursor, uncontrolled, or undercontrolled NO_x emissions from cement manufacturing are widely recognized as exacerbating ozone nonattainment problems. In the context of the current revision of the NSPS for this sector, NACAA urges EPA to recognize that this sector can and should be subject to emission limits and technology standards that reflect the progress that has been made in emissions control since the last revision of the NSPS.

NO_x contributes significantly to ozone formation, which poses potential health risks to the more than 100 million individuals who live in areas that failed to attain the health-based primary standard for ozone. Moreover, EPA's 2008 strengthening of the National Ambient Air Quality Standards from 0.084 to 0.075 ug/m³ means that millions more people are now recognized to live in areas with unsafe ozone levels. People in these regions may suffer from decreased lung function, chest pain, labored breathing, wheezing, coughing, sore throat, nausea, pulmonary and nasal congestion and increased respiratory rate. Prolonged exposure can also cause permanent lung damage, increased susceptibility to severe respiratory infection, and premature death.

Additionally, ozone-forming NO_x emissions are causing pervasive degradation of air quality in numerous parts of the country. Even in some national parks, the air quality not only falls short of achieving the pristine level specified by the Clean Air Act, but flunks the primary health-based ozone standards as well. Unhealthful levels have been measured at Acadia National Park, the Great Smoky Mountains, Grand Canyon, Mammoth Caves, Sequoia/Kings Canyon, Shenandoah, Yosemite and Rocky Mountain National Park.³ Many park monitors also show worsening trends for nitrate in precipitation.⁴ It is also likely that more park areas are likely to be swept into nonattainment with promulgation of the stronger ozone NAAQS. The NO_x contributions of the Portland cement sector must, therefore, be viewed against this dismaying context of the increasing impacts of ozone pollution on human health and the environment.

¹ *United States v. St. Mary's Cement* settlement, September 8, 2008.

<http://yosemite.epa.gov/opa/admpress.nsf/Press%20Releases%20-%20Air!OpenView>.

² 73 *Federal Register* 34078 (June 16, 2008).

³ http://www.nature.nps.gov/air/Pubs/pdf/gpra/GPRA_AQ_ConditionsTrendReport2006.pdf.

⁴ Id.

An NSPS Must Reflect the Best Demonstrated Technology

The Clean Air Act requires that an NSPS reflect the emissions reductions achievable by applying the best system of emission reduction that has been adequately demonstrated, taking into account costs and any nonair quality health and environmental impact and energy requirements. CAA section 111(a) (1). EPA can determine that a system has been “adequately demonstrated” even if the majority of sources are not utilizing it. The D.C. Circuit Court of Appeals has interpreted the standard with regard to cement plants: “[A]dequately demonstrated” does not require that any cement plant now in existence be able to meet the proposed standards. Section 111 looks toward what may be fairly projected for the regulated future, rather than the state of the art at present, since it is addressed to standards for new plants...” *Portland Cement I*, 486 F. 2d 375 at 384 (D.C. Cir. 1973) (emphasis added). The D. C. Circuit has also held that “...Congress also meant for emerging technologies to be given consideration when EPA promulgates NSPS.” *Sierra Club v. Costle*, 657 F. 2d 298 at 346 (D.C. Cir. 1981). The statute and judicial interpretation of it thus require EPA to look toward the emerging technologies of “the regulated future” in determining what emissions reductions have been adequately demonstrated.

Selective Catalytic Reduction is the “Regulated Future” for Cement Plants and Will Enable Plants to Meet and Exceed the 1.5 lb/ton Clinker Standard

EPA states in its proposal that all new kilns will be required to install Selective Noncatalytic Reduction (SNCR) systems to meet its proposed standard of 1.5 lb/ton of clinker NO_x. The agency has not, however, proposed requiring Selective Catalytic Reduction (SCR) for new Portland cement kilns even though SCR achieves significantly greater NO_x reductions. Specifically, SNCR achieves on average 50 percent NO_x emission reduction; SCR achieves 80-90 percent reduction.⁵ The agency has requested comment on SCR.

Section 111 requires that EPA identify the emission levels that are “achievable” with technology that can enable the industrial sector to meet such levels, or, “adequately demonstrated technology.”⁶ NACAA believes that EPA’s proposed NO_x emission limit of 1.5 lb/ton clinker seriously underestimates the reductions that are achievable with SCR technology. If SCR systems are installed, Portland cement facilities will achieve far greater reductions than the 1.5 lb/ton estimated to be achievable with SNCR. In fact, by EPA’s own estimate, they will be able to achieve reductions of 0.5 lb/ton clinker with SCR, compared to the 1.5 lb/ton clinker that EPA estimates is achievable with SNCR.⁷ Therefore, NACAA recommends that SCR be identified as BDT for this sector. This technology is “the regulated future” for cement kilns.

⁵ 73 *Federal Register* 34079 (June 16, 2008).

⁶ *Sierra Club v. Costle*, 657 F.2d 298 at 329-32. “Parsed, section 111 most reasonably seems to require that EPA identify the emission levels that are “achievable” with “adequately demonstrated technology.”

⁷ *Supra*, note 5.

EPA itself has stated: “In general, operational histories of SCR installations at coal-fired power plants and the one cement plant indicate that NO_x reductions are being achieved in a reliable manner....Advances in SCR technology have resulted in present-day SCR systems that are typically achieving 90 percent or greater.”⁸ Moreover, the agency notes that hybrid combinations of SNCR and SCR could be used in new cement kilns to achieve greater reductions than would be possible with SNCR alone.⁹ SCR is also named by EPA as available technology for cement kilns in the *Regulatory Impact Analysis for the Final Clean Air Visibility Rule or the Guidelines for Best Available Retrofit Technology (BART) Determinations Under the Regional Haze Regulations*.¹⁰ In fact, as far back as 1999, EPA included SCR in a list of control technologies available for both dry and wet cement manufacturing processes,¹¹ as did a Pechan & Associates Report prepared for EPA’s Office of Air Quality Planning and Standards in September 2005.¹² Therefore, SCR technology for the cement manufacturing sector has been considered feasible technology by EPA for some time.

State and Industry Reports on SCR Also Conclude That It Is Viable and Effective Technology

Other reports and studies conclude that SCR is the most effective technology available, and lend support to a conclusion that the NSPS should now require it as BDT for new plants rather than waiting another eight (or more) years. A study prepared for the Texas Commission on Environmental Quality stated:

As “add-on” technology, which can achieve 90% or greater NO_x reduction, with demonstrated performance at hundreds of coal-fired power plants, SCR is a viable technology that is available for both dry and wet kilns. SCR has been installed and successfully operated at one cement plant in Germany and SCR is now commonly used to control NO_x emissions from coal-fired power plants...The experience of the German plant may be sufficient to demonstrate that the concerns regarding catalyst poisoning and fouling have been addressed with the development of a special catalyst specifically designed for the cement industry. The advantages of SCR are: It can potentially provide a high degree of NO_x removal, with the power industry achieving 90%-94% range; it is an add-on or end-of-pipe control technology, a big advantage

⁸ Bill Neuffer and Mike Laney, Alternative Control Techniques Document Update—NO_x Emissions from New Cement Kilns, EPA-453/R-07-006 at p. 88 (November 2007)

⁹ *Id.* at p. 97.

¹⁰ EPA/Air Quality and Standards Division, Emission, Monitoring and Analysis Division, and Clean Markets Division, *Regulatory Impact Analysis*, EPA-452/R-05-004 p. 8-18 (June 2005): “NO_x control technologies available for cement kilns include those available to industrial boilers, namely LNB, SCR, and SNCR.”

¹¹ EPA/Office of Air Quality Planning and Standards, *Serious and Severe Ozone Nonattainment Areas: Information on Emissions Control Measures Adopted or Planned and Other Available Control Measures* (November 24, 1999) at p. 17.

¹² Pechan & Associates, Version 4.1 Documentation Report, September 2005 at p. B-2.

over the SNCR process, which must be carried out in process conditions; and it can use urea rather than ammonia as the reducing agent.”¹³ (Emphasis added)

A consultant’s report issued in support of a PSD permit application for a new cement facility in Brooksville, Florida similarly concluded that SCR was a control that had been proven effective by full scale application on cement plants.¹⁴ Another report emphasizes the co-benefits achieved through control of other pollutants, concluding that, “SCR is an effective and proven technology to reduce nitrogen oxide emissions from cement kilns...by greater than 90%...In addition, there is accumulating data on the ability of SCR to simultaneously control emissions of other pollutants, including VOCs, dioxins and furans, ammonia, and mercury. SCR can achieve this performance with cost effectiveness of approximately \$1500-3800/ton NO_x for dry kilns, and \$5500-6100/ton NO_x for wet kilns, easily within the regulatory cost thresholds for many NO_x control programs”¹⁵ (emphasis added).

Moreover, SCR can be used with other technology to increase NO_x emissions reductions. For example, the Northeast States for Coordinated Air Use Management (NESCAUM), in coordination with the MidAtlantic/Northeast Visibility Union (MANE-VU) states, “it is not uncommon to combine combustion technologies with post-combustion technologies...and this could be done for cement kilns in some cases. It is also possible to combine multiple combustion technologies on cement kilns...[T]echnologies such as CemStar might be combined with a combustion technology such as mid-kiln firing to provide combined benefits, and it may be feasible to use SNCR or SCR in combination with other controls for cement kilns.”¹⁶ Other cement experts note that hybrid systems, such as a mini-SCR system combined with SNCR, are economical and appear to be able to achieve 90% reductions. And, as noted, EPA’s Alternative Control Technology report for this sector points out the benefit of hybrid SNCR/SCR systems.¹⁷

In sum, NACAA urges EPA to require the Portland cement industry to utilize the technology that is, indeed, the “best” demonstrated technology rather than defer this logical “next step” for these facilities another eight (or far more) years. SCR will provide the greatest NO_x reductions and the greatest corresponding benefits for public health and the environment. Like the utility sector and European cement plants, the United States cement industry can and should be required to adopt the technology that will most effectively reduce its NO_x emissions.

¹³ ERG, Inc. *Assessment of NO_x Emissions Reduction Strategies for Cement Kilns—Ellis County: Final Report*, TCEQ Contract No. 582-04-65589 (July 14, 2006) pp. 4-4 and 4-8.

¹⁴ “Report in Support of an Application for a PSD Construction Permit Review, Cemex, Inc. Kiln 3 Project, Brooksville Cement Plant,” October 12, 2006, prepared by Koogler and Associates, p. 116.

¹⁵ Armendariz, Al, Ph.D., *The Costs and Benefits of Selective Catalytic Reduction on Cement Kilns for Multi-Pollutant Control*, Department of Environmental and Civil Engineering, Southern Methodist University (February 11, 2008).

¹⁶ NESCAUM/MANE-VU: *Steam Electric Boilers, Industrial Boilers, Cement Plants, and Pulp and Paper* (March 2005) at p. 4-18.

¹⁷ Footnote 9, supra.