COMMENTS SUMMARY ON LARGE INTERNAL COMBUSTION ENGINES NOx REGULATIONS

Original: 2302

Merck & Co., Inc.
West Point, PA

The following comments address the need for the Department to focus on actual emission reductions that can be achieved. Since the purpose of the proposed rulemaking is to reduce emissions of NOx, the rule should target sources where actual emissions reductions can be achieved. Inclusion of sources that infrequently operate will not achieve the actual NOx emission reductions required to meet the Commonwealth's obligation under the NOx SIP call. Additionally, the cost-effectiveness for add-on NOx controls for infrequently operated sources is substantially higher.

Based on preliminary budget proposals, not considering technical feasibility, the cost for installing add-on controls (SCR injection) on one internal combustion engine at the Merck West Point facility is approximately $400,000. Assuming the engine is operated at it's permitted limit – 312 hrs/year (only 11% of the ozone season), the potential emissions reduction is 4.9 tons/ozone season. The calculated cost-effectiveness in $/ton of NOx removed is over $40,000/ton. When taking into account actual hours of operation of the engine, the cost-effectiveness is even higher. For example, this year the unit only operated 27 hours or 9% of it's permitted hours. Using the proposed permit limit, the actual NOx emission reduction for this year would be less than 0.5 tons of NOx at a cost-effectiveness of $400,000/ton. When considering the highest hours of actual operation for the unit since 1999 (84 hours), the actual NOx emission reduction would be 1.3 tons of Nox/ozone season at a cost-effectiveness of over $150,000/ton.

In conclusion, by regulating sources that are infrequently operated, the emissions reductions required will not actually be achieved. While minimal reductions will occur, achieving those emission reductions will not be cost-effective.

COMMENTS ON LARGE INTERNAL COMBUSTION ENGINES NOx REGULATIONS

Merck & Co., Inc.
West Point, PA

The following comments address two of the three specific areas of the proposed regulation that the Board is requesting feedback on. The comments also address the need for the Department to focus on actual emission reductions that can be achieved. Since the purpose of the proposed rulemaking is to reduce emissions of NO_x, the rule should target sources where actual emissions reductions can be achieved. Merck's large internal combustion engines that could potentially be impacted are only permitted to run for 11%, 14% and 27% of the ozone season, assuming that the engines ran only during the ozone season and at no other time during the year. Because the Commonwealth is required to find additional NO_x emission reductions to satisfy it's remaining obligation under the NO_x SIP Call, the Department should ensure that the sources that will be regulated will truly get the NO_x reductions that are required. By regulating sources that are infrequently operated, the actual emissions reductions required will not be achieved. While minimal emission reductions will occur, achieving those emission reductions will not be cost-effective.

Comment 1

The Merck West Point facility operates eight fired boilers, five of which would be impacted by the proposed regulation. Merck intends to use emissions averaging in order to demonstrate compliance with these requirements for one of our infrequently used boilers. The flexibility to allow emissions averaging between boilers should be maintained. The Department should provide more specific guidance on acceptable emissions averaging. Additionally, the Department should provide guidance on acceptable ways to demonstrate that a boiler has met the emissions limitations set forth in the regulation. Certified CEMS quarterly data should suffice to demonstrate compliance with the emission limitations.

Comment 2

The Merck West Point facility operates three large internal combustion engines used as peak shavers that could be impacted by the proposed regulation. A detailed analysis of technical feasibility of add-on controls for the engines has not been conducted. However, presuming that add-on controls are feasible, the potential cost-effectiveness in $/ton of NO_x removed is substantial.

Based on preliminary budget proposals for add-on controls (SCR injection) for each of the three potentially impacted engines, the cost-effectiveness ranges from $13,200/ton to $40,000/ton. This is substantially more than the $4,400/ton discussed in the proposed rulemaking. The cost-effectiveness calculations assume that the engines are operated at

their permitted limits (potential hours of operation) during the ozone season only. For example, one engine is currently permitted to run 312 hrs/year and its current operating level is 11.2 g/bhp_hr. By reducing emissions to 2.3 g/bh_hr there is a potential NOx emission reduction of 8.9 g/bhp_hr. Multiplying the potential emission reduction of 8.9 g/bhp_hr by the potential hours of operation (312 hrs/year) and the size of the unit (1609 bhp) divided by constants of 454 g/lb and 2000 lb/ton, the potential emissions reduction is 4.9 tons/year. The preliminary cost for retrofitting this engine with SCR is approximately $200,000. The calculated cost-effectiveness is over $40,000/ton. The cost-effectiveness increases even more when actual hours of operation are considered. Last year this particular peak shaver ran only 27% of it's permitted hours. This year the unit has run only 8% of it's permitted hours.

Regulating units that only operate 11% to 27% of the ozone season is not the most effective way for the Commonwealth to achieve its emission reductions.

McNees Wallace & Nurick LLC
attorneys at law

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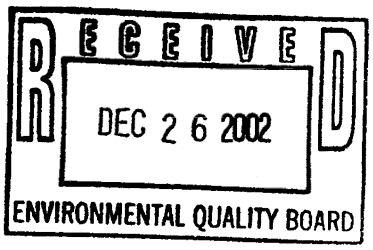
December 24, 2002



Original: 2302
VIA FEDERAL EXPRESS

Environmental Quality Board
Rachel Carson State Office Building
15th Floor
400 Market Street
Harrisburg, PA 17101-2301

RE: Comments to Proposed Rulemaking on Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines [32 Pa. B. 5178]

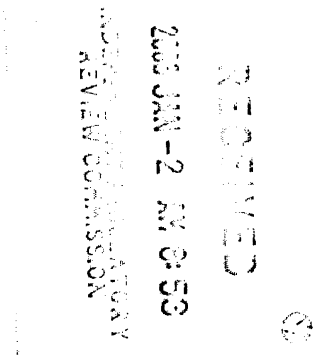
Enclosed please find comments of the Philadelphia Area Business Group to the Proposed Rulemaking on Small Sources of NOx. Also enclosed is our one-page summary for dissemination to each member of the Board. To ensure receipt, we are also transmitting these documents electronically and by overnight delivery. Thank you for the opportunity to provide the comments of the Philadelphia Area Business Group.

Very truly yours,

McNEES WALLACE & NURICK LLC

By
Richard H. Friedman

RHF
Enclosures



One Page Summary of Comments of the Philadelphia Area Business Group to Proposed Rulemaking, Environmental Quality Board, Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines, 32 Pa. B. 5178 (proposal adopted Sept. 17, 2002).

The commenting parties are a group of Philadelphia area business that must ensure a continuous source of power to their operations: Temple University, The Jefferson Health System, and the Philadelphia College of Osteopathic Medicine. The Boeing Company – Philadelphia expressly supports these comments. The PJM Industrial Customer Coalition, a 37-member ad hoc coalition of large industrial and commercial energy consumers in the PJM region, also supports these Comments and the proposals contained therein as being beneficial to electricity consumers in Pennsylvania and neighboring states, from both a reliability and price perspective. The Group is represented by Richard H. Friedman, Esquire and Robert A. Weishaar, Jr., Esquire of McNees Wallace & Nurick, LLP.

Our comments only pertain to the portion of the proposed Rule relating to small sources of NOx and relate to the group of sources that have a primary purpose of supplying emergency power during utility outages, high regional power demand, or power curtailment (hereinafter, "Subset Engines"). Essentially, the emergency exemption to the emissions control requirement is drawn too narrowly and will needlessly adversely affect Subset Engines, de minimis sources of NOx.

The emergency stationary internal combustion engine exemption should be expanded to allow a reasonable number of hours of operation (e.g., 125 hours) of Subset Engines during PJM peak load periods justifying the use of the engines. Also, the regulation should be clarified to provide that the periodic testing of small engines is allowed, without jeopardizing their exemption.

This use of Subset Engines:

- relieves the strain on the regional power grid and local distribution facilities during peak electricity demand periods (ensuring a more resource efficient power system);
- does not cause any significant increase in NOx emissions in comparison to the NOx emissions of the older less emissions efficient peak load generation units of the applicable utilities in the PJM region, the longer start-up and shut-down time required for the utility units, and normal power losses that occur in distribution and transmission lines (2.5 to 7%);
- is cost effective given the limited hours of operation of the units (e.g., 125 hours), the expense of retrofitted controls, and the benefits to all electric ratepayers; and,
- is consistent with efficient use of existing power generation resources and energy conservation measures by PJM.

Furthermore, the environmental and economic cost/benefit analysis conducted by DEP relies solely upon conclusions supplied by the OTC and EPA. By invoking the conclusions of others, the analysis fails to provide a rational basis for the analysis and cannot form the basis of rational rulemaking. Furthermore, the approach makes it impossible to meaningfully critique the analysis. Nonetheless, for Subset Engines, application of common sense and existing information demonstrate that the Group's requested expansion of the emergency exemption provision will not be detrimental to NOx emissions and is cost-effective.

Comments of the Philadelphia Area Business Group to

Proposed Rulemaking
Environmental Quality Board
Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines
32 Pa. B. 5178 (proposal adopted Sept. 17, 2002)

Presented On Behalf of the Group by

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I. Introduction

In conjunction with their review of energy efficiency and pollution preventions efforts, several Philadelphia area businesses reviewed the Pennsylvania Department of Environmental Protection ("DEP"), Environmental Quality Board ("EQB") proposal requiring retrofitting emissions controls on certain small sources of NOx with alarm. Further consideration of the proposed regulation has proven its deficiencies and prompted this comment.

The commenting parties are a group of Philadelphia area business that must ensure a continuous source of power to their operations. They include schools, medical service providers and other crucial service businesses. Temple University, The Jefferson Health System, and the Philadelphia College of Osteopathic Medicine comprise the group offering these comments. The Boeing Company – Philadelphia expressly supports these comments. The PJM Industrial Customer Coalition, a 37-member ad hoc coalition of large industrial and commercial energy consumers in the PJM region, supports these Comments and the proposals contained therein as being beneficial to electricity consumers in Pennsylvania and neighboring states, from both a reliability and price perspective.

While this proposed regulation also addresses cement manufacturing and certain large industrial engines, our comments only pertain to the portion of the Rule relating to small sources of NOx. Moreover, within the small sources of NOx there exists a group of sources that have a primary purpose of supplying emergency power during utility outages, high regional power demand, or power curtailment. Our comments relate to this smaller subset (hereinafter, "Subset Engines"). Essentially, the emergency exemption to the emissions control requirement is drawn too narrowly and will needlessly adversely affect Subset Engines, de minimis sources of NOx.

The emergency stationary internal combustion engine exemption should be expanded to allow a reasonable number of hours of operation of Subset Engines during voltage reduction or curtailment and in instances were PJM alerts to peak loading justifying the use of the engines. Finally, the regulation should be clarified to provide that the periodic testing of small engines is allowed, without jeopardizing the exemption.

II. Stationary Internal Combustion Engines Beneficially Used As Back-Up Power by Certain Facilities

The existence of Subset Engines is driven by one overarching requirement: the need of certain businesses for an assured, uninterrupted power source. In the case of our member medical facilities, the requirement is a matter of life-and-death. To assure continuous power, our members have purchased and installed small stationary internal combustion engines. These engines are costly, and their pay-back minimal. That is, they are maintained and operated as a supplemental, back-up source of power, for use when required, to ensure that crucial operations continue regardless of the state of the regional power grid and local distribution facilities.

More recently, the operations of the power generation market has identified a need and use for these small power sources beyond the situation when the power grid has completely

failed. These units are being used in certain limited situations, where power generators' resources are strained to the maximum and curtailment of electrical use from the power grid is essential to ensuring continuing functioning of the system. In those cases, some of the strain can be lessened by using these Subset Engines.

While there is a monetary benefit to all users within the system, more importantly for the purpose of these comments, there is also an environmental and safety benefit to this use. It does not appear that these environmental and safety benefits were fairly evaluated in the proposal of this regulation and the analysis of its costs and benefits.

The rule should be re-written to expand the definition of "emergency" use to allow Subset Engine units to be dispatched for power generation during peak electricity demand periods, not to exceed 125 hours per ozone season, without requiring additional controls. The rule should also be re-written to allow for continuous periodic testing of emergency stationary internal combustion engines.

III. The Environmental Benefits From This Proposed Rule Are Minimal and Were Not Properly Considered

The proposed rule indicates that it is designed to address NOx emissions and their contribution to ground-level ozone in a portion of the 'Severe' Southeast Pennsylvania nonattainment area (Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties). The proposal also indicates that it may reduce fine particulate matter slightly, as NOx is a PM10 precursor. The proposed rule purports to respond to the commitment required by Pennsylvania as part of the Ozone Transport Commission ("OTC") and as part of the progress toward attainment required by the federal Clean Act regulatory scheme, as implemented by the U.S. Environmental Protection Agency ("EPA") though the NOx SIP call (EPA's 1998 requirement that certain states take extraordinary measures to reduce NOx to certain target levels).

While it is undisputed that Pennsylvania has the proffered obligations under the Clean Air Act, EPA's implementation program, and its inclusion in the OTC, the specific regulatory measures promulgated to respond to its obligations are not specified. Rather, the specific measures to be adopted are left up to individual states, who are in the position to best evaluate the reasonableness of its program elements. In this instance, for Subset Engines, the environmental benefits of the proposed rule are minimal, have not been appropriately evaluated, and may be overstated. Furthermore, expanding the exemption for Subset Engines would not interfere with Pennsylvania meeting its commitments to the OTC and EPA. It would merely be a local program enhancement.

DEP's proposal suggests that the rule will reduce NOx emissions by as much as 3 tons per day in the Philadelphia area. The regulatory record is without any basis for this estimate, so it is difficult to comment on its accuracy. It appears to be from item 17 of the DEP Regulatory Analysis Form for this proposal, wherein DEP states: "[the chapter 139 portion of the proposal is] expected to reduce NOx emissions by approximately 3 tons per day in the Philadelphia area." However, this estimate appears to be overstated.

More specifically, it appears that Subset Engines contribute little, if any to the estimated emissions. Clearly, DEP has the tools to ascertain the number and type of Subset Engines and their emissions. Once calculated, the emissions impact of Subset Engines can easily be compared with the projected additional emissions from utility units that will result in shifting operation from the Subset Engines to the utility units. We anticipate the difference to be de minimis (or even detrimental).

Furthermore, the methodology for the issue of environmental impacts should consider the trade-off required by shifting emissions from Subset Engines to the peak load generation units of the applicable utilities in the PJM region. During peak load conditions, PJM currently relies primarily upon older combustion turbines and diesel-fired generation, whose operating and fuel costs are higher than all other available sources of generation and, thus, are the last units to be dispatched. As a general rule in PJM, units with lower operating and fuel costs (i.e., those with the best "heat rates"), are typically dispatched earlier and for longer period than units with higher operating and fuel costs (i.e., those with worse "heat rates"). Consequently, during peak load periods, PJM is often dispatching the least emissions efficient generation that is owned by utilities or "merchant" generation owners.

To appreciate the actual emissions impact associated with Subset Engines that only operate in peak load timeframes, one must compare the emissions from the Subset Engines to these least emissions efficient generation units that would otherwise be necessary to maintain system reliability during peak load conditions. In addition, because it is possible to start and stop Subset Engines within timeframes of less than an hour, one must also consider the ramp-up and ramp-down times of alternative generation sources and factor these addition operating hours into emissions calculations. Finally, when electrical energy is transmitted through transmission and distribution lines, a certain percentage of the energy is lost. These "losses" typically range from 2.5% to 7%, depending on the size of voltages of the service lines (i.e., the higher the voltage, the lower the energy loss). Subset Engines produce electrical energy at or very close to the point of consumption, which means that Subset Engines do not have to produce more than consumption in order to compensate for electrical losses. With Subset Engines, the amount of energy that needs to be produced, relative to energy from utility or merchant sources, decreases by a noticeable percentage. Loss factors must be taken into account when comparing Subset Engines to merchant/utility generators for purposes of total emissions. In sum, by promulgating this proposed regulation to discontinue the use of Subset Engines during peak load demand periods, DEP will be causing utilities to place emissions inefficient equipment on line and operate them at higher loading (and potentially for longer periods of time) than is necessary. A careful emissions analysis of this situation may well demonstrate that it will result in a net emissions impact that is actually more than what is occurring now. Thus far, the Department has failed to engage in the reasoned analysis and decision-making to ensure that the application of the proposed regulations to Subset Engines is necessary and, further, would not do more harm than good.

Lastly, Subset Engines may be located at sites with varying levels of other emissions, such that some are part of Title V permits, others may fall under state only synthetic minor source permits, and still others, require no permits at all. For facilities in the second category, DEP has been using the synthetic minor air permitting program to ensure that emissions from

Subset Engines are appropriately limited. Essentially, DEP may place yearly caps on operating hours and/or aggregate minor source NOx emissions to effectively control the emissions from Subset Engines. This method of control is emissions effective and, for these facilities, should be extended, as opposed to the proposed regulation requiring retrofitted emissions controls, as the appropriate means of emissions control for Subset Engines subject to synthetic minor permits. Local regulations and permits should be revised to synchronize with this approach, as well.

IV. The Economic Impacts From This Proposed Rule Disproportionately Burden Those Energy Users With Public Service Purposes And Were Not Properly Considered In This Proposed Rule

The proposed rule sets forth that the financial savings, in terms of effects on mortality, hospital admissions, acute bronchitis, acute respiratory systems, worker productivity, corps and forests from this entire regulatory package could exceed $16 million per year. However, this conclusion is not supportable by its cursory analysis. Resort to generalized application of misleading statistics does not satisfy minimal fairness requirements. This figure is, apparently, derived by taking the amount of benefit that EPA estimates will occur "per year in a region affected by the SIP call" (item 13 of the DEP Regulatory Analysis Form for this proposal), and pro-rating it to the population and amount of emissions reduction estimated. Obviously, this broad-brush analysis, without circumstance specific evaluation, is unsupportable.

What is needed (and required for responsible rulemaking) is a rationally based circumstance analysis. Although our Group does not have the informational access or resources to conduct such an analysis, the DEP should. DEP's analysis does not even make clear what life cycle of equipment it was using. In addition, Subset Engines are typically operated less than 125 hours per year; therefore, any cost analysis must be adjusted for this limited use.

EPA estimates that the regulated community will expend between $1,500 and $4,400 per ton of NOx reduction as a result of this regulation. One of our members reported that its cost estimates for retrofitting 4 turbines with a total rated capacity of 14 MW at approximately $1.2 Million, substantially higher than that estimated by DEP (e.g., $3,000 per ton). It should not be a difficult task to better estimate the costs of retrofitting to the regulated community. If the costs to the regulated community are double what DEP estimates, which possibility appears to be reasonably likely using DEP's estimates, the cost of $20 million for regulatory compliance would clearly outweigh the benefits of $16 million. (See item 21 of the DEP Regulatory Analysis Form for this proposal.) It is clear that a more reasonable economic cost and benefits analysis, at least for Subset Engines, is needed.

In terms of benefits, it should also be noted that the methodology apparently employed by DEP and EPA fails to recognize that the emissions reduced by implementation of the rule off-set the emissions that will result in transferring the power generation from small engines to larger utility and merchant generation. Again, the data resulting from these facts are readily accessible to the government, but not our Group, and should be thoroughly examined before applying this rule to Subset Engines.

Furthermore, it is important to note that the economic benefits of this regulation must be weighed by its potential adverse impact on the price of electricity. In this case, the regulation would remove small engines from power generation use during peak demand load periods. However, this will result in direct substantial increases in power purchase costs for all electricity consumers in the PJM region. These costs could be significant and must be factored into any economic analysis.

V. The Rule Would Have A Significant Adverse Impact On Policies Being Implemented By PJM To Address Power Availability During Peak Load Periods

Consideration of the costs and benefits of the proposed regulations on electricity prices requires that the Department expand the exemptions available under the proposed regulations to allow Subset Engines to produce energy during the hours when prices in the PJM control area cost-justify the operation of these units (i.e., not to exceed 125 hours). Exempting these units only for narrowly defined "emergency" circumstances, as proposed, would severely restrict the use of Subset Engines to mitigate price volatility in electricity markets and impose significant costs on electricity customers throughout the PJM control area.

The PJM control area that would be adversely affected encompasses a broad geographic area comprised of Pennsylvania, New Jersey, Delaware, Maryland, the District of Columbia, and portions of Virginia and West Virginia. The geographic scope of the PJM control area is expected to increase further in three phases during 2003: On May 1, 2003, additional portions of West Virginia, as well as portions of Ohio, Michigan, and Indiana will be added; on October 1, 2003, additional portions of Virginia, as well as portions of North Carolina, will be added; on December 1, 2003, a substantial portion of Illinois will be added. As explained in more detail below, because a single energy market-clearing price is calculated throughout the PJM control area for all energy being purchased in the spot market each hour, the geographic scope of the PJM control area and the corresponding amount of load being served in this area are critical elements in assessing the costs and benefits of the proposed rule.

Electricity markets experience extreme price volatility, primarily due to the lack of adequate storage devices, the corresponding need for instantaneous supply and consumption, and a pervasive lack of retail customer exposure to wholesale price volatility in real-time energy markets. On summer days with high temperatures and high humidity, it is not unheard of for the price of energy in the PJM real-time energy market to increase from approximately $30 per megawatt-hour ("MWh") during the early morning hours to approximately $1,000/MWh during the middle of the afternoon (typically between 1:00 and 6:00 pm). For example, on August 9, 2001, the wholesale price of energy in the Philadelphia area (i.e., the PECO Energy zone) increased from $25/MWH to $1,106/MWh in a 10-hour period. To put these prices into perspective, the typical electricity rate for a homeowner is approximately 8¢/kWh, while the price fluctuations that the PJM market has experienced, on a ¢/kWh basis, have ranged from 2.5¢/kWh to $1.10/kWh. No other commodity in the world, particularly a commodity with life-and-death implications like electricity, experiences such price volatility in such a short period of time.

Although price-inelastic demand pervades most wholesale markets, the prices set in those markets directly impact retail customers. First, many large commercial and industrial customers' rates (including the rates of some of the Group members) are tied directly to the PJM real-time energy market, which means they pay the hourly price that is cleared in those markets for their consumption during that hour and, yes, some retail customers paid $1.10/kWh for power on August 9 of last year. Second, the retail cost of energy is inextricably linked to the cost of energy at wholesale. Thus, if wholesale prices are extremely volatile during peak load periods, the average, load-weighted cost of energy for a 12-month period will be considerably higher than if no price volatility is experienced. This impact occurs both directly in averaged energy costs and indirectly through the cost of price-hedging products. As discussed below, mitigating or eliminating price volatility is the key to reducing costs to retail electric customers throughout the PJM control area.

All Group members, and many other large commercial and industrial electricity customers in the PJM control areas, employ small generators to reduce their reliance on electricity purchases from the wholesale or retail markets during peak load periods. The reduction of this consumption, made possible through the deployment of Subset Engines, has a negligible impact on emissions, but a very noticeable impact on wholesale market-clearing prices. It is important to know that, under PJM real-time energy market, the last bid accepted sets the market-clearing price that applies to all energy that is purchased in the real-time market during that hour. This aspect of the market rules has tremendous implications for the price of energy. For example, PJM has reported that each 100 MW reduction in load during peak hours in 2001 reduced market-clearing prices by $16/MWh. For example, if load is reduced by 1,000 MWs for four hours on a hot afternoon, the total savings to purchasers in the real-time energy market (which typically comprises approximately 21% of PJM peak load of approximately 60,000 MWs) for just that afternoon would be approximately $7.68 million (i.e., 60,000 MWs x 20% x $16/MWH x 4 hours x 10). This example is provided to evidence the extreme impact that a relatively small reduction (in this case, less than 2%) in total consumption could have on market-clearing prices. Thus, this proposed rule, by interrupting the existing working of the power network, could impose a very significant cost on consumers in the multi-state PJM region.

VI. Conclusion

A refined analysis of the costs and benefits of the proposed regulation on Subset Engines may well demonstrate a net negative impact. Accordingly, the Group respectfully requests that, if the proposed regulations are adopted, the emergency exemption for Subset Engines be expanded to allow for the engines' additional use during no more than 125 hours of peak energy demand periods occurring during the Ozone Season, in an effort to avoid power outages and as a means to reduce spikes in peak energy prices. This limited exemption is justified by emissions, economic, and energy policy considerations. Furthermore, the environmental and economic impacts justifications presented by DEP are provided as cobbled from EPA broad analysis and are not appropriately applied to Subset Engines. At a minimum, DEP should be required to conduct a rational analysis, using the methodology suggested to more accurately quantify the costs and benefits of this proposed regulation on the Emergency Engine subset. In addition, and in any case, the Group respectfully requests that the regulation be revised to clearly allow for

routine periodic testing of emergency generators during the ozone season and throughout the year.

We appreciate your fair consideration of this comment document. This Group would appreciate the opportunity to assist regulators in compiling the appropriate data to enable a more appropriate cost/benefit analysis and draft appropriate language to expand the exemption for Subset Engines.

Delaware County Solid Waste Authority

Rose Tree Park - Hunt Club
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Media, PA 19063
(610) 892-9627-9628
Fax: (610) 892-9622

Joseph W. Vasturia, P.E.
Chief Executive Officer

Original: 2302

December 23, 2002

Environmental Quality Board
Rachel Carson State Office Building
15th Floor
400 Market Street
Harrisburg, PA 17101-2301

Re: Proposed Rulemaking: Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines: Chapters 121, 129 and 145
Comments of the American Ref-Fuel Company

Dear Members of the Environmental Quality Board:

The Delaware County Solid Waste Authority (DCSWA) is responsible for the disposal of all solid waste generated in Delaware County, PA. We operate two (2) waste transfer stations in the County and own and operate a Landfill in Berks County. We are presently under contract with American Ref-fuel Company (Ref-fuel) to accept our raw trash at their Resource Recovery Facility (RRF) in Chester City, Delaware County, PA. The ash generated at the RRF is landfilled at our site in Berks County. This agreement extends through the year 2017.

We are in total agreement with the "SUMMARY OF COMMENTS, PROPOSED RULEMAKING: 25 PA. CODE CHS. 121, 129 AND 145, Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines", prepared by Ref-Fuel dated December 19, 2002.

We concur also with Ref-fuel's letter to the Environmental Quality Board dated December 19, 2002 especially the following paragraph:

> "Based upon our company's experience with WTE and recent analyses of SCR at similar facilities, Ref-Fuel estimates the capital cost of installing an SCR system at the Delaware Valley Facility to be at least $30 million. At least two separate

systems would be needed each one serving three boilers. Annual operating costs, including reagent, gas and periodic catalyst replacement is estimated to be about $1.5 million. On a unit basis, the total costs would be equivalent to about $28,000 per ton of NOx removed during the ozone season. Even if the proposed standard were to apply year-round, the unit cost would be approximately $12,000 per ton of NOx. This would constitute a major facility retrofit with a technology that has never been undertaken at a U.S. WTE facility. In accordance with Ref-Fuel's municipal contract as it pertains to changes in law, Delaware County would be directly responsible for 56% of all capital and operating costs."

As noted in the above mentioned paragraph, the residents of Delaware County would be responsible for potential capital costs of $16.8 million with estimated annual operating costs of $840,000.

We request that municipal waste to energy be excluded from the proposed revisions to Chapter 129.

Sincerely,

Joseph W. Vasturia, P.E.
Chairman and C.E.O.
DCSWA

JWV/ajb

Cc: DCSWA Board Members
Delaware County Council Members
The Honorable Matthew J. Ryan
The Honorable Edwin B. Erikson
The Honorable Dominic Pileggi
Derek Grasso, American Ref-fuel
Susan King, American-Ref-fuel

Enclosures

Trostle, Sharon F. - DEP

From: Harold D. Miller [hmiller@accdpel.org]
Sent: Monday, December 23, 2002 1:40 PM
To: regcomments@state.pa.us
Subject: EQB Proposed Rulemaking: Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines [25 PA CODE CHS. 121, 129 and 145]

December 23, 2002 Original: 2302

Environmental Quality Board
Rachel Carson State Office Building
400 Market Street - 15th Floor
Harrisburg, PA 17101-2301

Re: EQB Proposed Rulemaking: Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines [25 PA CODE CHS. 121, 129 and 145]

To the Environmental Quality Board:

I am providing written comments on the above-referenced proposed rulemaking by the Environmental Quality Board, as published in the Pennsylvania Bulletin on October 18, 2002. EQB's proposed rulemaking involves amendments to 25 Pa. Code Chapters 121, 129 and 145, and has two primary components. First, proposed amendments to Chapter 129 would establish additional ozone season nitrogen oxide (NOx) control requirements for certain units that are small sources of NOx in the Counties of Bucks, Chester, Delaware, Montgomery, and Philadelphia. Second, proposed amendments to Chapter 145 would establish ozone season NOx emission limits for large stationary internal combustion engines and Portland cement kilns across the Commonwealth.

The Southwestern Pennsylvania Growth Alliance is submitting comments on the following three issues:
(1) Whether the amendments to Chapter 129 should apply statewide and for the entire year.
(2) Whether the EQB should issue Final Rulemaking on the proposed amendments to Chapter 145.
(3) Whether the EQB should provide greater flexibility in meeting proposed emission requirements in Chapters 129 and 145.

1. The Amendments to 25 Pa. Code Chapter 129, if promulgated as a Final Rule, should be limited to the five-county Philadelphia area and the ozone season.

The EQB has specifically requested comment on whether the proposed amendments to Chapter 129 should apply statewide, as opposed to applying only within the five-county Philadelphia area. The Growth Alliance believes that the proposed amendments to Chapter 129, if issued as final rulemaking, should not apply statewide. Analyses conducted in the 1990s demonstrated that reductions in NOx from the southwestern Pennsylvania region would result in little air quality improvement in areas in the rest of Pennsylvania or the Northeastern United States. The Southwestern Pennsylvania Ozone Stakeholders Group explicitly considered and rejected recommending any additional NOx controls on small businesses in southwestern Pennsylvania because the benefits for air quality were so small. Last year, EPA redesignated the Pittsburgh-Beaver Valley area to attainment status for ozone, and based on recent experience, it is highly likely that any exceedances or violations of current ozone standards within southwestern Pennsylvania would be due to upwind sources of ozone or NOx located outside of Pennsylvania. As such, it would likely be ineffective, as well as unreasonable and unfair, to impose additional unduly stringent controls on sources in southwestern Pennsylvania, rather than additional emissions controls in upwind states. Our understanding is.that the Air Quality

Technical Advisory Committee opposed statewide implementation of the regulations.

Statewide application of Chapter 129 would violate the Pennsylvania statutory prohibition that Pennsylvania emission requirements cannot be more stringent than federal law unless sufficient justification exists for imposing more stringent requirements. See 35 P.S. § 4004.2. The EQB has not made the necessary determination to justify the imposition of requirements on Pennsylvania sources that are more stringent than federal law. In addition, statewide application of the proposed amendments would conflict with Pennsylvania's Regulatory Basics Initiative, a program aimed at creating a level playing field between Pennsylvania and neighboring states so that Pennsylvania can succeed both environmentally and economically. The proposed amendments to Chapter 129 are more stringent than requirements of neighboring states. Both the economy and the environment in southwestern Pennsylvania are harmed when the Commonwealth adopts emission control regulations that are more stringent than in upwind states, since they create a disincentive for businesses to locate and expand in southwestern Pennsylvania and an incentive for them to locate in upwind areas where the emission controls will be less stringent but where their emissions will still affect air quality in southwestern Pennsylvania.

The EQB has also requested comment on whether the proposed revisions to Chapter 129 should apply for the entire year, rather than solely the ozone season, May 1 through September 30. Although the proposed regulations would not apply to southwestern Pennsylvania, the Growth Alliance believes that emission control requirements intended to reduce ozone should apply only during the ozone season. There is no basis for imposing stringent requirements outside the ozone season when there is virtually no chance of any exceedances or violations.

2. The Amendments to 25 Pa. Code Chapter 145 should not be promulgated as Final Rulemaking unless and until upwind states impose similar regulations.

The Growth Alliance believes that the EQB should not promulgate as final rulemaking the proposed amendments to Chapter 145 unless and until upwind states impose similar regulations. While Pennsylvania should do its share to reduce NOx emissions as part of a national effort to address ozone transport, other states are well behind Pennsylvania in imposing controls on NOx sources that significantly contribute to ozone formation. As noted above, both the economy and the environment in southwestern Pennsylvania are harmed when the Commonwealth adopts emission control regulations that are more stringent than in upwind states, since they create a disincentive for businesses to locate in southwestern Pennsylvania and an incentive for them to locate in upwind areas where the emission controls will be less stringent, while their emissions will still affect air quality in southwestern Pennsylvania.

3. The Amendments to Chapters 121, 129 and 145 should provide for flexibility in meeting emission limits.

The EQB also requested comment on whether sections 129.201, 129.202, and 129.203 (which address averaging of emissions of boilers, stationary combustion turbines, and stationary internal combustion engines) should remain the same, allow more flexibility, or allow less flexibility. The Growth Alliance believes that allowing more flexibility in these sections would be beneficial for economic development without harming air quality. In addition, the Growth Alliance suggests that such flexibility be included in the proposed amendments to Section 145 as well, if such amendments are issued as final rulemaking, in order to make it easier for affected sources to comply with the new requirements. Moreover, the EQB should include in any amendments to Chapters 121, 129 and 145 the flexible mechanisms contained in the OTC suggested rule on small sources, including trading of reductions between sources through alternate limits, emission averaging between sources, and emission trading.

Thank you for your careful consideration of the above comments.

Sincerely,

Harold D. Miller
Director
Southwestern Pennsylvania Growth Alliance
Suite 1000
425 Sixth Avenue
Pittsburgh, PA 15219
(412) 281-1890

Wheelabrator Technologies Inc.
A Waste Management Company

4 Liberty Lane West
Hampton, New Hampshire 03842
(603) 929-3000

December 23, 2002

Original: 2302

Environmental Quality Board
Rachel Carson State Office Building
15th Floor
400 Market Street
Harrisburg, PA 17101-2301

Re: Comments to Proposed Rulemaking to Establish Ozone Season Nitrogen Oxide (NOx) Control Requirements for Certain Boilers in the Counties of Bucks, Chester Delaware, Montgomery and Philadelphia

Dear Members of the Environmental Quality Board,

WheelabratorTechnologies Inc. (WTI) is providing comments concerning the Department's proposed amendments to Chapter 129.201 establishing ozone season nitrogen oxide (NOx) control requirements for large boilers. WTI owns and operates the Wheelabrator Falls Inc. (WFI) municipal waste combustion resource recovery or waste-to-energy facility located in Falls Township, Bucks County. As the rules are currently proposed the WFI facility will be subject to additional NOx reductions that are not technically feasible. As requested in the proposed rule making we are providing specific comments on the technical feasibility and potential costs to comply with the proposed amendments. We are also commenting on the applicability of the proposed amendments to large boilers located at waste-to energy facilities.

The WFI facility consists of two (2) eight hundred (800) ton/day, 325 MMBtu/hour municipal solid waste fired waste to energy boilers. The primary purpose of the facility is the safe and environmentally sound disposal of solid waste the recovery of thermal energy from that waste and generation of electricity. The facility also provides other environmental benefits including the reduction of greenhouse gas emissions from offsetting of fossil fuel combustion for electrical generation and the recovery of ferrous and other metals from the ash for recycling. The facility is equipped with the most modern and extensive air pollution controls of any large boiler source in Pennsylvania. Air pollution controls installed at the WFI facility consist of spray dryers for control of acid gases such as SO2, fabric filters for particulate and trace metals control, activated carbon injection for control of mercury and selective non- catalytic reduction (SNCR) for controlling NOx emissions. Such air pollution controls already make the Wheelabrator Falls facility among the cleanest solid waste disposal and electrical generation facilities in the state.

WM
WASTE MANAGEMENT

The proposed amendments to Chapter 129.201 would require additional NOx emission control measures on large non- fossil fueled fired boilers including the Wheelabrator Falls waste- to- energy boilers. We believe that the facility should not be subject to the proposed amendments based on the already extensive air pollution controls installed at our facility and the fact that there are no technically feasible and cost effective NOx control options available to achieve the proposed large boiler NOx limit of 0.17 lb/MMbtu. The Wheelabrator Falls waste to energy boilers are already equipped with SNCR NOx control, currently the only technically feasible and cost effective NOx control technology proven on municipal solid waste- fired waste- to- energy boilers. The only possible NOx control technology for the WFI facility that could potentially achieve the proposed large boiler NOx limit is selective catalytic reduction or SCR. SCR NOx control technology has not been demonstrated on a single U.S. waste-to-energy facility and the cost of installing SCR on an existing facility is prohibitively expensive compared to the cost of NOx control options for existing large fossil fuel- fired boilers.

Applicability of Proposed Amendments-From a review of the rule development including the meeting minutes of the Air Quality Technical Advisory Committee (AQTAC) on January 17 and May 2, 2003, when the proposed amendments were discussed, and the OTC model rule that the amendments are based on, it appears that waste-to-energy boilers were unintentionally made subject to the proposed amendments. The OTC model rule does not include waste-to-energy facility boilers nor are waste-to energy boilers included on the list of fossil fuel fired boilers provided to AQTAC in support of the proposed amendments. Further EPA had specifically excluded waste-to-energy boilers from additional NOx reductions in the October 1998 NOx SIP call under Clean Air Act (CAA) Section 110 since waste-to-energy facilities, such as WFI, were subject to more extensive additional emission controls required by the maximum achievable control technology (MACT) standards developed under sections 111 and 129 of the CAA.

Technical Feasibility of Proposed Large Boiler Emission Limit- The assumption has been made that a single emission limit is appropriate for all large boilers, regardless of boiler fuel type and design or the type of facility. It is our understanding that the proposed NOx emission limit of 0.17 lb/MMBtu was based on what could be cost-effectively achieved by large fossil fuel- fired boilers. The proposed limit converts to an equivalent limit of approximately 99 ppm at 7% O2. The Best Available Technology (BAT) derived NOx limit for the WFI facility is 180 ppm at 7% O2, based on the installation of SNCR NOx control technology. The proposed limit would require an additional 45% reduction in ozone season NOx emissions. This level of additional NOx reduction is not technically feasible for the reasons discussed below.

Waste-to-energy boilers are not designed and constructed nor operated in the same manner as fossil fuel boilers and their fundamental purpose is different. The fundamental purpose of waste- to- energy boilers is solid waste disposal through the conversion of a relatively heterogeneous, municipal solid waste fuel to energy. Municipal solid waste fuel has a lower and much more variable heating value compared to fossil fuels, as well as other combustion properties that make for technical and economical considerations

unique to waste to energy boilers. Due to the lower heating value of the fuel, WTE boilers are less thermally efficient and require relatively larger furnace volumes and higher amounts of excess air than fossil fuel- fired boilers of comparable gross heat input. Waste-to-energy boilers are also designed to achieve the highest efficiency of burn-out of any organic matter, i.e., high furnace temperatures and low Carbon Monoxide (CO) emissions. It is a fundamental fact of solid fuel combustion that high combustion efficiency result in higher NOx emissions. The larger furnace volume, higher excess air requirement, higher furnace temperatures and variable fuel heating value intrinsic to waste-to-energy boilers reduces the NOx reduction capability of the SNCR system. Consequently, potential additional NOx reductions using the existing SNCR system at WFI would be marginal. Other cost effective NOx reduction options available to fossil fuel-fired boilers such as low-NOx burners, fuel switching, load curtailment and load dispatching are not available for waste-to-energy boilers. Waste-to-energy boilers operate to process solid waste and generate electricity 24 hours/day for 12 months of the year. Waste-to-energy facility operations cannot be curtailed, fuel switched or load dispatched to other lower NOx emitting units during the ozone season. In summary, it is not technically or commercially feasible for the WFI facility to comply with the proposed NOx limit using the NOx reductions options available to fossil fuel- fired boilers the proposed limit is based on.

Cost to Comply with Proposed Limit- As stated above, the only potential technology that might possibly achieve the proposed NOx limit for the Falls waste-to-energy facility would be selective catalytic reduction (SCR) NOx control technology. No waste-to-energy facility in the U.S. has been equipped with SCR, because it has been demonstrated to be prohibitively expensive due to the unique technical difficulties and installation and operating costs associated with SCR on waste-to-energy boilers. The SCR unit would have to be installed or "retrofitted" downstream of all existing air pollution controls to provide a "clean gas" to the SCR reactor to eliminate catalyst blinding and poisoning. At this location, the flue gas temperature is too low for the SCR catalyst so reheating of the flue gas using natural gas is required to achieve the necessary SCR reaction temperature. Larger SCR reactor sizes are necessary compared to fossil fuel fired boilers with the same rated gross heat inputs due to the higher excess air requirements of waste-to-energy boilers and therefore higher flue gas volumes.

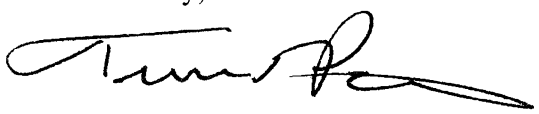
Based on the above, the estimated cost of installing SCR at the WFI facility is approximately $ 12-14 million. Using the average ozone season NOx emissions over the last three (3) years, required ozone season NOx reductions to meet the proposed limit would be 166 tons. With capital and operating costs the estimated cost effectiveness for SCR is approximately $ 13,000-$15,000/ton of NOx removed. This cost effectiveness is approximately 4 to 9 times higher than the estimated cost effectiveness specified for large fossil fuel fired boilers ($1500 - $3500/ton) in the proposed amendments. Clearly, the extremely high cost of SCR compared to the cost effectiveness associated with fossil fuel- fired large boiler NOx reduction options would disqualify SCR from further consideration.

Summary- Although we recognize that making progress toward achieving the ozone national ambient air quality standard is the goal of the proposed amendments it should not be viewed in isolation from the other unique environmental benefits that waste-to-energy facilities provide including solid waste disposal, reductions in fossil fuel use and greenhouse gas emissions, and clean power generation.

As explained in our detailed comments above, NOx reduction options are very limited for waste-to-energy boilers due to the nature of the fuel and the different design and operational characteristics of waste-to-energy boilers with respect to fossil fuel fired boilers of comparable gross heat input. For these reasons large waste-to-energy boilers do not have the cost effective NOx reduction options that are available to fossil fuel fired boilers. Selective Catalytic Reduction (SCR), the only potential NOx control available to meet the proposed NOx emission limit and has not been determined to be technically or economically viable on waste-to-energy boilers. For those reasons and the fact that the WFI facility is already equipped with MACT based NOx controls resulting in NOx reductions of 40%, unlike the large fossil fuel- fired boilers, the proposed amendment for large boilers should not apply to waste-to-energy boilers.

We would be glad to provide any additional information or answer any questions you may have on our comments.

Sincerely,



Timothy J. Porter
Director, Air Quality Management

December 23, 2002

Original: 2302

Environmental Quality Board
Rachel Carson State Office Building
15th Floor
400 Market Street
Harrisburg, PA 17101-82301

Subject: Proposed Rulemaking to Amend Chapters 121, 129 and 145

To The Environmental Quality Board:

Thank you for the opportunity to comment on the proposed rule making to amend Chapters 121, 129 and 145. These comments are being submitted in a written and electronic format prior to the December 26, 2002 deadline.

The stated purpose of the proposed rulemaking is to establish additional ozone season nitrogen oxide (NOX) control requirements for 1) certain boilers, turbines and stationary internal combustion units that are small sources of NOX in the Counties of Bucks, Chester, Delaware, Montgomery and Philadelphia and, 2) large stationary internal combustion engines and Portland cement kilns across the Commonwealth of Pennsylvania.

Covanta of Lancaster, Inc. (COL) is the operator of the Lancaster Resource Recovery Facility (Facility) owned by the Lancaster County Solid Waste Management Authority. The Facility consists of three municipal waste combustors (MWCs) and is located in Lancaster County. While Lancaster County is not listed as one of the initially affected Counties, the Environmental Quality Board (Board) is specifically requesting comments on whether the proposal should apply statewide and for the entire year. The Facility operated by Covanta of Lancaster could be directly affected by any rulemaking, therefore we are hereby submitting comments on the proposed rulemaking.

The Board has specifically requested detailed information regarding the technical feasibility of the proposed control requirements and the potential cost to comply. COL is supplying this information and has organized it into three separate sections including;

1. Existing technical analysis by the EPA in determining the Maximum Achievable Control technology (MACT) standards for existing MWCs.
2. Alternative NOX control technologies, and;
3. Cost of alternative technologies.

The summary of this technical feasibility study is that the existing NOX emission standards for large existing MWCs established by the EPA and adopted by the PADEP continue to be the appropriate standards for this entire class of generators. While there has been some speculation regarding the potential for alternative air pollution control technologies such as selective catalytic reduction (SCR) to provide lower NOX emissions, these alternatives have never been demonstrated to be capable of achieving better control of NOX on a continuous and reliable basis. If SCR is assumed to be available and capable of reducing NOX to levels lower than that achievable by selective noncatalytic reduction (SNCR), the cost per ton of additional NOX removed is approximately $26,000 to $50,000 which is well above the $1,500 to $3,500 per ton range considered as acceptable for boilers.

In conclusion, MWCs should not be subject to the proposed rulemaking and any new and lower NOX emission limit. COL proposes that the final rulemaking should include language that clearly exempts MWCs from the NOX requirements of Chapters 121, 129 and 145 in conformance with EPA's NOX SIP call final rulemaking and FIP which did not include additional emissions decreases for municipal waste combustors.

Again, thank you for the opportunity to comment on the proposed rulemaking. If there are any questions or comments, please do not hesitate to contact me direct.

Sincerely,

Brian Bahor, QEP
Vice President, Environmental Permitting
Covanta Energy Group
40 Lane Road Fairfield, NJ 07004

Distribution
Jim Klecko (Lancaster)
Jim Warner (LCSWMA)
File

Comments by Covanta of Lancaster, Inc.
On Proposed Rulemaking by the Environmental Quality Board
To Amend Chapters 121, 129 and 145

1.0 Introduction

The stated purpose of the proposed rulemaking is to establish additional ozone season nitrogen oxide (NOX) control requirements for 1) certain boilers, turbines and stationary internal combustion units that are small sources of NOX in the Counties of Bucks, Chester, Delaware, Montgomery and Philadelphia and, 2) large stationary internal combustion engines and Portland cement kilns across the Commonwealth of Pennsylvania.

Covanta of Lancaster, Inc. (COL) is the operator of the Lancaster Resource Recovery Facility (Facility) owned by the Lancaster County Solid Waste Management Authority and is located in Lancaster County. The Facility consists of three large municipal waste combustors (MWC). While Lancaster County is not listed as one of the initially affected Counties, the Environmental Quality Board (Board) is specifically requesting comments on whether the proposal should apply statewide and for the entire year. The MWC operated by Covanta of Lancaster could be directly affected by any rulemaking, therefore we are hereby submitting comments on the proposed rulemaking.

While the proposed rulemaking does not appear to directly include MWCs, the language in draft chapter 129.201(a)(2) could be interpreted to apply to MWCs. Assuming an average higher heating value of 5000 btu's per pound of municipal solid waste, a MWC unit or "boiler" with a firing rate of 600 tons per day or larger would meet the heat release threshold of 250 mmbtu/hr and would therefore be subject to the proposed standard of 0.17 pounds NOX per million btu of heat input. This heat release based NOX standard is equivalent to a volumetric concentration of approximately 100 ppmdv7. This volumetric factor is important when comparing the proposed amendment with existing standards and when evaluating whether there are alternative control methods available at MWCs.

While the majority of these comments address the NOX emission limits at existing MWCs and potential changes, it is important for the Board to recognize that MWC facilities are first and foremost a process for disposing of solid waste with power generation being a secondary function. MSW by its heterogenous nature is more variable in its higher heating value and fuel quality than a fossil fuel fired boiler. As a result of these design and operating considerations, MWC boilers require large amounts of excess air, are thermally inefficient and do not have access to conventional NOX control technologies such as low NOX burners or fuel switching. The only demonstrated NOX control technologies at MWCs in the USA have been combustion control technologies and selective noncatalytic reduction (SNCR) systems. The Board should be aware that combustion control at MWC requires elevated temperatures and high excess air in order to achieve compliance with the carbon monoxide MACT standard and that the same conditions that create low CO create high NOX. As a simple process of elimination, the only viable technology for NOX control is SNCR.

2.0 Technical Feasibility Information

2.1 EPA's MACT Analysis

Section 112 of the federal Clean Air Act (CAA) required EPA to establish category-specific regulations identifying "Maximum Achievable Control Technology" (MACT) requirements for a number of air emission source categories, including combustion turbines and industrial/commercial/institutional boilers. The EPA's MACT analysis resulted in the Emission Guidelines for Large Municipal Waste Combustors found at 40 CFR Part 60, subpart Cb. The MACT analysis, which considered the performance requirements of the top performing MWCs in the country, yielded a determination that MACT for NOX was a function of different fuel/boiler/combustion configurations. The standards for existing large MWCs are summarized below;

Combustion Technology	NOX Emission Limit as ppmdv7 as a daily average (a)
Mass burn waterwall	205
Mass burn rotary waterwall	250
Refuse-Derived fuel combustor	250
Fluidized bed combustor	240

(a) ppmdv7 = parts per million on a dry volume basis, referenced to 7 % O2 (ppmdv7)

The subpart Cb Emission Guidelines also established a set of operating requirements referred to as Good Combustion Practices (GCP) to minimize both formation and emission of dioxins/furans and other trace organics. GCP includes three components; a carbon monoxide (CO) limit, steam load and flue gas temperature at the particulate control device. As a general matter, low CO is achieved through high flue gas temperatures, large amounts of excess air and sufficient mixing of the combustion gases. These same combustion conditions promote high NOX. As a result of GCP's being specific performance requirements of subpart Cb, MWC's are designed and operated to achieve low CO levels. Consequently, combustion control is not available as a method to control NOX emissions.

The "uncontrolled" NOX concentration for a massburn waterwall MWC such as those at the Facility are in the 220 to 350 ppmdv7 range. Therefore, a minimum removal efficiency of 9 to 58 % is required to achieve compliance with the Cb standard. The proposed rulemaking would require a minimum "additional" minimum reduction of approximately 51% in addition to that already being achieved by the SNCR system. This additional reduction **cannot** be achieved through the SNCR system. Some type of new and additional air pollution control technology would have to be added to achieve the lower limit of 0.17 lb/mmbtu (100 ppmdv7).

The U.S. EPA was cognizant of the importance of these MACT limits as they related to other rules, programs and initiatives underway at the time of the MACT rulemaking. This was particularly true in the case of setting ambient and source standards for controlling nitrogen oxides. For example, the EPA's Final "NOx SIP Call" of October,

1998, specifically advises states that the federal environmental agency considers the MACT standards for waste-to-energy as adequate and appropriate for the source. The preamble states: "The USEPA does not assume, in this rulemaking, any additional control measures or lower emissions levels for municipal waste combustors because these combustors are already being controlled through MACT regulations." In addition, in the October 21, 1998 proposed Federal Implementation Plan (FIP) related to the SIP call, EPA reiterated that "...municipal waste combustors should not be required to reduce emissions beyond that already required by the maximum achievable control technology (MACT) rules for NOx required under sections 111 and 129 of the CAA."

All other states have paid deference to this advice and have not implemented a NOx standard comparable to the one proposed by the Department in this rule.

The EPA is currently re-assessing the MACT standards through their residual risk analysis. While a formal conclusion is not presently available, we have every indication that all of the Cb standards including NOX will remain the same. The residual risk re-appraisal of the MACT standards essentially confirms that the original MACT analysis has not changed and that a lower NOX standard is not technically feasible.

2.2 Alternative NOX Control Technologies

To our knowledge, the most recent Prevention of Significant Deterioration (PSD) permit application for a MWC is the one filed in December, 2002 to the Florida Department of Environmental Protection for the expansion of the Lee County Energy Recovery Facility located in Lee County, Florida. NOX was subject to a Best Available Control Technology (BACT) analysis that considered all available control methods. The Board should note that while we are using BACT information in this technical analysis, a BACT analysis is for a new source, not a retrofit that would be the case for the proposed rulemaking. The BACT analysis considered the following NOX control methods;

Combustion Modification	**Flue Gas Controls**
Low Excess Air and Staged Combustion	Selective Catalytic Reduction (SCR)
Flue Gas Recirculation	Selective NonCatalytic Reduction (SNCR)
Gas Reburning	Wet Flue Gas Denitrification
	Electron Beam

None of the combustion modifications was considered to be continuously achievable and there are major unknowns and uncertainties regarding the effects on combustion related pollutants. The only flue gas controls that were considered to have been demonstrated on a commercial basis were SNCR and SCR. SNCR is already installed at the Facility and is required to achieve compliance on a daily basis.

The long-term performance capabilities of SCR are highly debatable given certain disparities between manufacturer claims and long-term performance data that is subject to "compliance" as enforced by EPA or DEP. Marketers of this technology cite European installations with many years of experience that achieve low levels of NOX (50 to 100 ppmdv7) however they did not provide any data that demonstrated continuous compliance with these low levels. Conversely, the only large SCR unit installed at a

MWC facility in North America is at a site in the Peel region of Ontario, Canada. This facility retrofitted with SCR because a retrofit with SNCR was not technically feasible given the staged combustion used by the Consumat combustors. The Peel facility has a daily permit limit of 110 parts per million, dry gas basis, referenced to 11 % O2 (equivalent to 154 ppmdv7) and has been in operation for approximately one year.

2.3 Cost of Alternative Technologies

The Lee county PSD application was for a 660 TPD MWC with a reference higher heating value of 5000 btu/lb. Three vendors were contacted by the applicants consultant for SCR cost estimates. The capital cost estimates from the two vendors with the most experience, after being adjusted for certain scope of work issues, were both approximately $17, 000, 000. The total annualized costs ranged from $ 3.8 MM to $4.8 MM. Theses cost estimates are for one new 660 TPD unit, therefore it is a relatively simple construction project when compared to a retrofit to an existing facility with multiple combustion units. A retrofit is more expensive when considering interfacing with an operating unit, downtime with the operating unit and issues associated with the proximity of the land for the new equipment assuming that additional land is available. The Board should note that the cost for a retrofit at a facility with two MWC units of similar size would be approximately $34, 000, 000 and a facility with three MWCs would be approximately $51, 000,000. Please note that these are general estimates only that do not represent site-specific constraints.

The Lee County PSD application used 260 ppmdv7 as the uncontrolled NOX value and 100 ppmdv7 as the stack emission limit, both as annual averages. This approach is conservative in that the stack limit of 100ppmdv7 is less than the operating permit limit of 154 ppmdv7 at Peel which is the only facility in North America with any operating experience. The PSD application considered five amortization periods that generated a range of cost factors ranging from $8,388 to $15,844 per ton of NOX removed. These BACT cost factors have been adjusted to represent the situation for an existing MWC equipped with an SNCR system that is controlling NOX to 200 ppmdv7 on annual basis but would then have to control NOX to 150 ppmdv for the five-month ozone season (May through September, inclusive). The estimated BACT cost factor is $26,029 to $49, 165 for the above scenario. While this may not be an exact value given some of the estimates, it is apparent that the cost is well above the $1,500 to $3,000 per ton of NOX removed for boilers.

3.0 Conclusion

A review of technical cost and performance data demonstrates that MWCs should not be subject to the proposed rulemaking and any new and lower NOX emission limit. While there has been some speculation regarding the potential for alternative air pollution control technologies such as selective catalytic reduction (SCR) to provide better control of NOX emissions, these alternatives have never been demonstrated to be capable of achieving better control of NOX on a continuous and reliable basis. COL proposes that the final rulemaking should include language that clearly exempts MWCs from the NOX requirements of Chapters 121, 129 and 145.

Montenay and WSA Summary Comments on Small NOx Rule

Original: 2302

In summary, we believe that the Proposed Rule should clarify or be modified to **specifically exclude large Municipal Waste Combustors ("MWCs")**, which are already subject to a strict but technically and economically feasible nitrogen oxide ("NOx") emission limits under Maximum Achievable Control Technology ("MACT") regulations. See 40 C.F.R. Part 60, Subpart Cb. Pursuant to the MACT regulations, in October 1999, Montenay installed and commenced full time operation of an expensive Selective Non-Catalytic Reduction ("SNCR") NOx emission control system at the Montgomery County Resource Recovery Facility (the "Facility"). The SNCR System reduces NOx emissions to the MACT specified limit of 205 ppm for mass burn waterwall combustors. By contrast, the EQB's Proposed Pule would impose an emission limit on the Facility amounting to approximately 90 ppm (0.2 lbs/MMBTU NOx) which is neither technically nor economically feasible for the Facility or any other MWC.

In addition to its technical and economic infeasibility, the proposed emission limit also rests on questionable legal grounds. Section 4006.6 of the Commonwealth's Air Pollution Control Act ("APCA") expressly precludes the EQB from establishing more stringent performance or emission standards than those established under Section 112 of the federal Clean Air Act ("CAA"), which pursuant to CAA 7429(h)(3) includes the MACT performance standards applicable to MWCs. Moreover, while the proposed emission limit is quite clearly a technology-forcing standard (one that will require existing sources to retrofit emissions units with expensive new control technology), it does not appear to be tied in any way to one of the standard-setting authorities under the CAA (i.e. Reasonably Available Control Technology ("RACT"), Best Available Control Technology ("BACT"), Lowest Achievable Control Technology ("LAER"), Maximum Achievable Control Technology ("MACT")). Rules and regulations adopted by the EQB to implement the provisions of the CAA, however, must be consistent with the requirements of the CAA and the regulations adopted thereunder. For these reasons, we question whether the EQB even has the legal authority to promulgate an emission standard for MWCs that is more stringent than the existing MACT standard.

The Proposed Rule also claims to be based on the model rule developed by the Ozone Transport Commission ("OTC"), but the OTC has never considered MWCs to be an affected source under its model rule. Neither the Department of Environmental Protection ("Department") nor the OTC have analyzed whether the Proposed Rule is either technically or economically feasible, as required by Executive Order 1996-1. Similarly, in calculating the benefits to be derived from the Proposed Rule, MWCs were not included in the analyses as required by Executive Order 1996-1. Accordingly, clarifying that MWCs are excluded from this rule will not impact Pennsylvania's ability to demonstrate reasonable further progress in achieving attainment with the National Ambient Air Quality Standards ("NAAQS") in the Philadelphia CSMA.

Both the U.S. Environmental Protection Agency ("EPA") and the Department recently considered the issue of whether further reductions by MWCs of NOx emissions were technically or economically feasible or otherwise warranted in connection with EPA's "NOx SIP Call" and the Department's Chapter 145 regulations implementing the OTC's September 1994 Memorandum of Understanding. In each instance, EPA and the Department specifically determined that MWCs should not be subjected to additional NOx emission limits beyond that required by the recently promulgated MACT standards. In the present case, there is no new feasibility information presented or justification for including MWCs. Unlike other fossil-fuel fired industrial boilers, municipal waste combustors in the five county region cannot achieve the proposed emission reductions through fuel switching, combustion unit modifications, or even installation of additional control equipment.

Accordingly, the proposed standards are more stringent than federal requirements, are not necessary for the achievement of the NAAQS, and are technically and economically infeasible. Montenay and the WSA request that the Department exempt from the proposed rule municipal waste combustors subject to 40 C.F.R. Part 60, Subpart Cb.

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Comments on Proposed Rulemaking, Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines

by
Thomas Murphy, Facility Manager
Montenay Montgomery Limited Partnership
and
Timothy T. Hartman, Executive Director
Waste System Authority of Eastern Montgomery County

Summary

Montenay Montgomery Limited Partnership ("Montenay") and the Waste System Authority of Montgomery County ("WSA") jointly submit these comments regarding the Proposed Rulemaking of the Environmental Quality Board ("EQB") entitled "Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines," 32 Pa. B. 5178 (October 19, 2002).

In summary, we believe that the Proposed Rule should clarify or be modified to **specifically exclude large Municipal Waste Combustors ("MWCs"),** which are already subject to a strict but technically and economically feasible nitrogen oxide ("NOx") emission limits under Maximum Achievable Control Technology ("MACT") regulations. See 40 C.F.R. Part 60, Subpart Cb.

Pursuant to the MACT regulations, in October 1999, Montenay installed and commenced full time operation of an expensive Selective Non-Catalytic Reduction ("SNCR") NOx emission control system at the Montgomery County Resource Recovery Facility (the "Facility"). The SNCR System reduces NOx emissions to the MACT specified limit of 205 ppm for mass burn waterwall combustors. By contrast, the EQB's Proposed Pule would impose an emission limit on the Facility amounting to approximately 90 ppm (0.2 lbs/MMBTU NOx) which is neither technically nor economically feasible for the Facility or any other MWC.

In addition to its technical and economic infeasibility, the proposed emission limit also rests on questionable legal grounds. Section 4006.6 of the Commonwealth's Air Pollution Control Act ("APCA") expressly precludes the EQB from establishing more stringent performance or emission standards than those established under Section 112 of the federal Clean Air Act ("CAA"), which pursuant to CAA 7429(h)(3) includes the MACT performance standards applicable to MWCs. Moreover, while the proposed emission limit is quite clearly a technology-forcing standard (one that will require existing sources to retrofit emissions units with expensive new control technology), it does not appear to be tied in any way to one of the standard-setting authorities under the CAA (i.e. Reasonably Available Control Technology ("RACT"), Best Available Control Technology ("BACT"), Lowest Achievable Control Technology ("LAER"), Maximum Achievable Control Technology ("MACT")). Rules and regulations adopted by the EQB to implement the provisions of the CAA, however, must be consistent with the

requirements of the CAA and the regulations adopted thereunder. For these reasons, we question whether the EQB even has the legal authority to promulgate an emission standard for MWCs that is more stringent than the existing MACT standard.

The Proposed Rule also claims to be based on the model rule developed by the Ozone Transport Commission ("OTC"), but the OTC has never considered MWCs to be an affected source under its model rule. Neither the Department of Environmental Protection ("Department") nor the OTC have analyzed whether the Proposed Rule is either technically or economically feasible, as required by Executive Order 1996-1. Similarly, in calculating the benefits to be derived from the Proposed Rule, MWCs were not included in the analyses as required by Executive Order 1996-1. Accordingly, clarifying that MWCs are excluded from this rule will not impact Pennsylvania's ability to demonstrate reasonable further progress in achieving attainment with the National Ambient Air Quality Standards ("NAAQS") in the Philadelphia CSMA.

Both the U.S. Environmental Protection Agency ("EPA") and the Department recently considered the issue of whether further reductions by MWCs of NOx emissions were technically or economically feasible or otherwise warranted in connection with EPA's "NOx SIP Call" and the Department's Chapter 145 regulations implementing the OTC's September 1994 Memorandum of Understanding. In each instance, EPA and the Department specifically determined that MWCs should not be subjected to additional NOx emission limits beyond that required by the recently promulgated MACT standards. In the present case, there is no new feasibility information presented or justification for including MWCs. Unlike other fossil-fuel fired industrial boilers, municipal waste combustors in the five county region cannot achieve the proposed emission reductions through fuel switching, combustion unit modifications, or even installation of additional control equipment.

Accordingly, the proposed standards are more stringent than federal requirements, are not necessary for the achievement of the NAAQS, and are technically and economically infeasible. Montenay and the WSA request that the Department exempt from the proposed rule municipal waste combustors subject to 40 C.F.R. Part 60, Subpart Cb.

Background of the Commentors

Montenay owns and operates the Facility, which began commercial operation in 1992. This Facility was developed by Montgomery County to serve the municipal waste disposal needs of 22 municipalities in Eastern Montgomery County. The WSA was formed by the County to represent the municipalities in a contractual Service Agreement with Montenay Montgomery Limited Partnership. Under the Service Agreement, the WSA is obligated to pay more than 90% of the cost for change orders due to change in environmental regulations, as well as any other changes in law with respect to operation of the Facility. Therefore, both entities wish to comment on proposed § 129.201 **Standards for boilers** because they should not apply to municipal waste combustors.

Background of Facility

The Facility consists of two nominal 600 tons per day mass-burn water-wall municipal waste combustors. The steam generated by the two boilers is converted into electrical energy by one 32-megawatt steam turbine generator. The maximum rated capacity of each boiler is approximately 350 million BTUs heat input per hour. The air pollution control system presently consists of urea-based SNCR, acid gas scrubbers, carbon injection, fabric filters, and continuous emission monitors ("CEMS").

The municipal waste combustors are not designed and are not operated in the same manner as fossil fuel-fired boilers. Their primary purpose is the effective destruction of heterogeneous, wet municipal solid waste. The combustors are less thermally efficient than fossil fuel-fired boilers because they require a large amount of excess air and are less densely packed heat recovery systems. The EPA and the Department have historically recognized these differences in regulating municipal waste combustors separately and distinctly from fossil fuel-fired boilers. See also 1990 Amendments to Clean Air Act Section 129.

The Montgomery County Resource Recovery Facility was designed and originally permitted by the Department in accordance with the BAT analysis. The original plan approval (1987, 1989) and operating permit (1994) limit on NOx emissions was 300 ppm. The facility was constructed with redundant CEMS to measure more parameters and to meet more stringent data availability specifications than EPA requires of municipal waste combustors and/or fossil fuel-fired boilers.

In April 1999, the Department issued Permit No. OP-46-0010A which contained the Department's final determination of RACT for the control of NOx for the Facility. See 25 PA Code Sections 129.91 through 129.95. The Department determined that RACT required no further controls, based on the technical feasibility and cost-effectiveness information provided by Montenay and the WSA regarding SCR and SNCR. The April 1999 permit specified that the emission limit was 300 ppm, corrected to 7% O2 daily average, and 0.638 lbs/MMBTU, 159.5 lbs/hr and 615 tons per year. See 4/20/99 Permit, Condition 5(A)(4). See also, 28 Pa. Bull. 1847 (April 18, 1998); 29 Pa. Bull. 27 (January 2, 1999).

Under section 111(d)/129 of the Clean Air Act, the EPA promulgated Emission Guidelines to control the emission of combustor gases from existing large municipal waste combustors (December 19, 1995 and August 15, 1997). The guidelines are codified at 40 C.F.R. Part 60, Subpart Cb. These guidelines comprehensively regulate emissions of specific pollutants, including NOx, for all large (capable of combusting more than 250 tons per day) waste-to-energy facilities constructed on or before September 20, 1994. The guidelines are based on "maximum achievable control technology" standards, which are technology forcing standards that are more stringent than RACT. The Department implemented the Emission Guidelines by publishing a State Plan and incorporating the applicable requirement of 40 C.F.R. Part 60, Subpart Cb into Federally Enforceable State Operating Permits ("FESOPs"). EPA has approved of

Pennsylvania's State Plan and the relevant FESOPs, and the 205 ppm NOx emission limit has also been incorporated into Montenay's Title V permit.

Because the Facility could not meet the new MACT-based 205 ppm NOx emission limit, Montenay applied for and received a plan approval for the operation of a SNCR system to reduce NOx emissions to the Subpart Cb emission limit. See, e.g., July 12, 1999 Plan Approval issued to Montenay. In October 1999, Montenay commenced full time operation of its SNCR system, substantially reducing its NOx emissions. Although Subpart Cb did not require compliance with the NOx limit until December 2000, Montenay and the WSA have been proactive in the operation of the resource recovery facility regarding the reduction of NOx. The WSA has spent in excess of $1.7 million to install the SNCR system. In addition, due to the significant shortfall of NOx emission reduction credits (ERC's) in the severe ozone nonattainment area, Montenay and the WSA have been investigating the over control of NOx below the existing permit limits. This could lead to substantial emission reductions of NOx from the Facility on a year round basis. Even after the sale of ERCs, substantial reductions of NOx are expected both through the 1.3 to 1 offset requirements of the Pennsylvania New Source Review rules, and possibly through the substitution of a cleaner, newer energy source in place of an older power plant.

Comments

1. **The Department should not include municipal waste combustors in the proposed rules because neither the Department nor the OTC intended to include MWCs, and neither the Department nor the OTC considered the technical or economic feasibility of achieving the 0.2 lb/MMBTU NOx limit**

The Department claims that the proposed rule is based upon the OTC model rule and was approved by the Air Quality Technical Advisory Committee ("AQTAC"). However, the proposal before us today deviates substantially from the OTC model rule and from the draft proposal submitted to the AQTAC. It is evident that the Department's decision to include MWCs as affected sources was conceived as "an afterthought" without any supporting analysis of the relative air quality benefits and costs associated with additional NOx control of MWCs. Absent this benefit/cost analysis, it would be arbitrary, capricious, and contrary to law to include MWCs in this rule-making.

In drafting the proposed rulemaking, the Department states that it relied on the OTC's Model Rule and the analysis presented in "Control Measure Development Support Analysis of Ozone Transport Commission Model Rules" (E.H. Pechan & Associates, Inc. for Ozone Transport Commission, March 31, 2001) ("Pechan Report") for their assessment of the NOx Model Rule regarding boilers. An examination of this OTC Model Rule and the Pechan Report clearly establishes, however, that (i) municipal waste combustors were not intended to be affected by the model rule, and (ii) no examination has been performed by OTC, Pechan, or the Department regarding the technical feasibility or cost effectiveness of the 0.2 lb/MMBTU NOx limit as applied to MWCs.

The OTC's Draft Model Rule Overview, which was published at the December 11, 2000 OTC Special Meeting, also states clearly that, with respect to boilers, the model rule was intended to apply only fossil fuel fired industrial boilers greater than 250 MMBTU/hr not already regulated under the EPA NOx SIP Call.[1] The emission limits proposed for boilers greater than 250 MMBTU/hrs specifically refer to "gas fired," or "oil or gas-fired boilers." See Table 1 to OTC Draft Model Overview. Similarly, the Pechan Report, which analyzed the anticipated feasibility and benefits of the proposed rule, establishes that MWCs were not intended to be part of the proposed rule. First, the Pechan Report indicates that the purpose of the rule is to achieve NOx reductions from stationary point sources that are too small to be regulated by either the EPA NOx SIP Call or Phase III of the OTC NOx Memorandum of Understanding (MOU).[2] The Report also indicates that affected industrial boiler sources are "boilers that are used to heat institutional, commercial, and large residential building complexes, and for heat and power in industrial applications." MWC facilities, which combust municipal waste primarily for source reduction purposes as part of a comprehensive waste management plan and secondarily for generation of electricity, do not fit within this category. Moreover, Table III-1 of the Pechan Report shows that only "gas fired" or "oil, coal fired" industrial boilers are intended to be covered by the model rule.[3] Most importantly, the Pechan Report in Appendix B specifically lists the Source Classification Codes ("SCC") of the units that will be affected by the rule, and the SCC code for MWCs (e.g., 50100102, Solid Waste Disp.;Government;Municipal Incin.;Mass Burn: Single Chamber) is not listed.[4]

Similarly, as part of the technical/economic cost effectiveness analysis, the Pechan Report did not consider MWCs or municipal solid waste as a fuel type. See Appendix C of the Pechan report, NOx Model Rule Control Cost Summaries, NOx Control Methods for Industrial Boilers, Table C-1.

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[1] See http://www.sso.org/otc/Publications/2000/001122_mod_sum_NOx.PDF.

[2] See CHAPTER III, NOx Model Rule Analysis, Methods, http://www.sso.org/otc/Publications/2001/OTC_PechanReport_Final.pdf.

[3] The EPA 1996 National Emission Trends Inventory was the starting point for the Pechan analysis. The states, including Pennsylvania, provided emission updates, additional capacity information, and identification of sources affected by the NOx SIP Call or OTC MOU, and case-by-case RACT limits (where applicable). The data base was then modified by excluding the source types that are not subject to the regulation under the OTC draft model rule. Pennsylvania regulations affecting non EGU NOx emissions were determined on a case-by-case basis.

[4] SCC or Source Classification Code is a code developed and used by the USEPA to categorize processes which result in air emissions for the purpose of assessing emission factor information. Each SCC represents a unique process or function within a source category logically associated with a point of air pollution emissions. Any operation that causes air pollution can be represented by one or more SCC's. None of the SCC code typically used by municipal waste combustors appear on the Pechan Report in Appendix B. (even the very limited auxiliary use of natural gas or fuel oil in a municipal waste combustor is covered by another SCC code not listed in the Pechan Report -- e.g., SCC 5-01-001-04).

Moreover, the Pechan Report did not consider MWCs in its rule-benefits analysis.[5] None of the model plant types considered by Pechan involved a MWC or municipal waste as solid fuel. In fact, the Pechan spreadsheet that shows the anticipated benefits of the Proposed Rule in Pennsylvania (which the Department recently provided to Montenay's consultant upon its request) shows that no MWC in the 5 county area was considered.

It is equally clear that the Department also did not consider MWCs to be an affected source when it reviewed the proposed OTC Model Rule. This is demonstrated by, among other sources, a review of the AQTAC minutes and materials. The Department presented the proposed rule at the January 17, 2002 AQTAC meeting, where it described the proposed rule as:

> based on an Ozone Transport Commission (OTC) model rule. The proposed Pennsylvania regulation would apply to combustion units and stationary turbines rated at 100 million Btu's and greater and to stationary internal combustion (IC) engines rates at 200 Hp and greater. The OTC model rule applies to units as small as 20 Hp. The emission limits in the proposed regulation are consistent with those in the OTC model rule for the respective sources.

See http://www.dep.state.pa.us/dep/subject/advcoun/aqtac/2002/MIN01172002.pdf. It is important to recall that the AQTAC did not concur with the Department's recommendation to move the proposal to the EQB for formal rulemaking due to a number of concerns about applicability and cost. Instead, the AQTAC requested that the Department provide a list of affected sources and anticipated emissions reductions at the next AQTAC meeting. Thereafter, at the AQTAC's May 2, 2002 meeting, the Department distributed a preliminary list of boilers in the five county area subject to the rule. See http://www.dep.state.pa.us/dep/subject/advcoun/aqtac/2002/NOXSRCLST.pdf (Preliminary List of Boilers Bucks, Chester, Delaware, Montgomery Counties and Preliminary Internal Combustion Engine (ICE) List Philadelphia County). Noteworthy in its absence from the list of affected boilers is any reference to MWCs. Plainly, therefore, neither the Department nor the AQTAC considered MWCs to be boilers subject to additional NOx control at the time of the AQTAC deliberations. We confirmed this fact through discussions with committee members. Accordingly, it is evident that the Department's decision to include MWCs as affected sources was conceived only at the "eleventh hour" without any supporting analysis of the relative air quality benefits and costs associated with additional NOx control of MWCs.

Under these circumstances, inclusion of MWCs in the final rulemaking would violate the public review and comment process mandated by Section 4002(b)(1) of the APCA. This provision requires that OTC air pollution control strategies be developed in a process that

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[5] Pechan used the 1996 emission estimates and projected them for 2005 and 2007 using the expected NOx SIP Call emission control levels and SIC code based growth factors. The emission benefits of the model rule were then estimated by comparing the actual source emission limits with the limits imposed by adoption of the model rule. The least stringent of the emission limit, or the percentage reduction was used to estimate the rule benefits at each unit.

involves public review and opportunity for comment. Plainly, the Department did not follow this participatory process with respect to owners and operators of MWCs, who were notified that they would be affected under this rule only after promulgation of the proposed rule in November 2002. The United States and Pennsylvania Constitutions, Section 4002 of the APCA and Executive Order 1996-1 require that regulations be reasonable, technically feasible, cost-effective and consider benefits. This analysis must occur before a regulation is promulgated. In the case of MWCs, this analysis was not performed.

For these reasons, inclusion of MWCs with this rule would be arbitrary, capricious, and not in accordance with the law.

2. **The proposed rule, if applied to municipal waste combustors (MWCs), is more stringent than federal requirements and prior determinations by both EPA and the Department, and the emission limits proposed are not reasonably necessary to show reasonably further progress or to achieve or maintain the NAAQS**

The proposed rule also rests on questionable statutory grounds. The APCA contains two separate provisions that preclude the EQB from promulgating emission standards that are more stringent than the federal standards. The statutory bar against more stringent state standards is similarly echoed by Executive Order 1996-1 which states that "where federal regulations exist, Pennsylvania's regulations shall not exceed federal standards unless justified by a compelling and articulable Pennsylvania interest or required by state law." Finally, because the proposed emission limitation for MWCs finds no support in the OTC's model rule and is not based on any of the standard-setting authorities under Title I of the CAA, the emission standard lacks an adequate statutory basis under the APCA and the CAA.

First, Section 4006.6 of the APCA expressly precludes the EQB from establishing more stringent performance or emission standards than those established under Section 112 of the federal Clean Air Act ("CAA"), which pursuant to CAA 129(h)(3), includes the MACT performance standards applicable to MWCs. Because EPA's existing MACT standards under 40 C.F.R. Subpart Cb are "deemed standards under 7412(d)(2)," the EQB's imposition upon MWCs of a more stringent emission standard contravenes the APCA.

Second, Section 4004.2 of the APCA expressly precludes the EQB from establishing control measures or other requirements more stringent than those required by the CAA, unless the EQB determines that it is reasonably necessary to achieve or maintain ambient air quality standards.[6] Here, there is no question that the proposed rule as applied to

[6] Section 4004.2 of the APCA states:

> (a) In implementing the requirements of section 109 of the Clean Air Act, the board may adopt, by regulation, only those control measures or other requirements which are reasonably required, in accordance with the Clean Air Act deadlines, to achieve and maintain the ambient air quality

MWCs is more stringent than the CAA. As discussed previously, NOx emissions from MWCs are already subject to stringent federal standards and the Department has failed to articulate any reason to depart from these strict standards. In contrast, most of the non-MWC sources to be regulated under the Proposed Rule have no NOx limits applied to them.

Similarly, the application of the rule to MWCs cannot be justified by claiming the measure was determined to be necessary to achieve attainment with the NAAQS in the Philadelphia CSMA. Since the OTC and the gDepartment did not include NOx emission reductions from MWCs in determining the benefits of the proposed rulemaking, it is difficult to see how the Department can now consider additional NOx control on MWCs to be necessary in order to show reasonably further progress or to achieve attainment of the ozone NAAQS. Reducing NOx emissions by 3 tons per day in the Philadelphia area can be achieved by emission reductions or fuel switching at the other sources.[7]

Third, the proposed emission limitation lacks an adequate statutory basis under the APCA and CAA because it does not meet the definition of an "additional control measure" under CAA Section 184 and the Department has failed to articulate any other statutory basis for the proposed rule. While the Department states that the emission limitation for boilers was derived from the OTC's model rule, as previously discussed, the model rule did not regulate MWCs. Therefore, the Department can find no statutory support for the proposed rule in the CAA's grant of authority to the OTC. See CAA

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standards or to satisfy related Clean Air Act requirements, unless otherwise specifically authorized or required by this act or specifically required by the Clean Air Act.

(b) Control measures or other requirements adopted under subsection (a) of this section shall be no more stringent than those required by the Clean Air Act unless authorized or required by this act or specifically required by the Clean Air Act. This requirement shall not apply if the board determines that it is reasonably necessary for a control measure or other requirement to exceed minimum Clean Air Act requirements in order for the Commonwealth:

(1) To achieve or maintain ambient air quality standards;

(2) To satisfy related Clean Air Act requirements as they specifically relate to the Commonwealth;

(3) To prevent an assessment or imposition of Clean Air Act sanctions; or

(4) To comply with a final decree of a Federal court.

35 P.S. 4004.2.

[7] The ability of additional NOx reduction to assist with ozone attainment in the Philadelphia area is suspect for another reason. The Philadelphia area and other portions of the severe ozone nonattainment area are "VOC limited." A VOC limited region is one where the concentration of ozone depends on the amount of VOC in the atmosphere, rather than the amount of NOx. Indeed, in certain VOC limited areas, decreasing NOx emissions can (paradoxically) result in increased ambient ozone concentrations. The Department and EPA, in recognition of these facts and the NOx ERC shortfalls, have recently approved of VOC for NOx substitution for offset purposes in New Source Review permitting in the Philadelphia CSMA.

Section 184, 42 U.S.C. § 7511c. Nor can the Department find statutory support for the proposed rule in any other CAA emission limitation authority as it failed to conduct any technical or economic analysis in support of the proposed emission limitation for MWCs. This failure is problematic because rules and regulations adopted by the EQB to implement the provisions of the CAA must be consistent with the requirements of the CAA and the regulations adopted thereunder. See APCA Section 4005(a)(8). Thus, while the proposed emission limitation for MWCs is quite clearly a technology-forcing standard (requiring existing sources to retrofit emissions units with expensive new control technology), the Department fails to articulate whether its proposed emissions limitation of 0.2 lbs/MMBTU NOx is based on a RACT analysis (i.e. the available control options with a reasonable potential for application to a source based on existing controls for the source category and technology transfer controls applied to similar source categories), a BACT analysis (i.e. the maximum degree of reduction determined to be achievable taking into account energy, environmental and economic impacts and other costs), or even a LAER analysis (i.e. the most stringent emission limitation contained in the implementation plan of any state for such class or category of source unless such limitations are not achievable).

Accordingly, because the proposed NOx emission limitation lacks support under the CAA, so too must it lack support under the APCA by virtue of Section 4005(a)(8). For these reasons, we question whether the EQB even has the legal authority to promulgate the emission standards proposed.

3. **Application of the Proposed Rule to MWCs is Inconsistent with Prior Determinations by the Department and EPA in Similar Rulemakings**

Both EPA and the Department have previously considered whether additional NOx controls on MWCs are warranted for purposes of achieving or maintaining the NAAQS for ozone. In EPA's NOx SIP call rule (on which the proposed rule, the OTC Model Rule, and the Chapter 145 rule are all based), EPA unequivocally stated that MWCs would not be included because of the current MACT regulations governing NOx, and since additional control measures or lower emission limits would not be cost-effective. See 63 Fed. Reg. at 57403-57404 and 57418 (October 27, 1998). Accordingly, it is difficult to see how the Department can now consider additional NOx control of MWCs to be necessary in order to achieve attainment.

Similarly, the Department's interpretation that the proposed rulemaking is applicable to MWCs is not consistent with the scope of the NOx Budget Rule nor with previous determinations of applicability with specific sources. The Department appears to rely on the terms "solid or liquid fuel" in Chapter 145 to support an extension of the proposed rules to MWCs. In Chapter 145, the definition of "boiler" is limited to fossil-fuel fired boilers because the applicability provisions of Chapter 145 divide NOx budget sources into "electric generating units" and "non-electric generating units." Chapter 145 further defines "units" as fossil-fired stationary boiler, combustion turbine or combined cycle system." The reference to "solid fuel" in Chapter 145 refers back to language used in the Chapter 145 definition of "fossil fuel" as "natural gas, petroleum, coal, or any form of

solid, liquid or gaseous fuel derived from this material." Chapter 145 accordingly defines "fossil-fired units" as those that "commenced operation before January 1, 1996, the combination of fossil fuel, alone or in combination with any other fuel, where fossil fuel actually combusted comprises more than 50% of the annual heat input on a Btu basis during 1995, or, if a unit has no heat input in 1995, during the last year of operation of the unit prior to 1995," which is clearly not applicable to MWCs.[8]

4. **The proposed rule, if applied to MWCs, is unreasonable because the emission limit proposed is not economically feasible**

In its regulatory impact analysis of the NOx SIP Call, FIP, and Section 126 Petitions, EPA based its analysis of costs and economic impacts for non-electric generating units on low NOx burners as the default, and in some cases, SNCR. EPA applied a cost-effectiveness benchmark of $2,000 per ton of NOx removed. See 64 Fed. Reg. 28250, 28299 (May 25, 1999). To achieve the reductions at MWCs, however, would require selective catalytic reduction (SCR) technology that has a marginal cost far in excess of EPA's benchmark of $2,000 per ton of NOx removed. A selective non catalytic reduction (SNCR) system such as the one that is installed on the Facility is not capable of reducing NOx emissions down to the level of the proposed rule, (approximately 90 ppmdv corrected to 7% oxygen), 0.20 lbs/MMBTU. This system would have to be supplemented or replaced with a potentially more effective technology such as SCR. SCR has been used on fossil fuel boilers, but has not been successfully implemented on municipal waste combustors in the United States.[9]

Our preliminary estimate of the costs for reducing NOx emissions from the Montgomery County Resource Recovery Facility using SCR is estimated to exceed $16,304 per ton during the five month ozone season. This estimate is based on a capital cost of $17,000,000 and ozone season O&M cost of $1,075,428. Therefore, had the Department performed the requisite cost-effectiveness analysis, it would have determined that the costs of the proposed emission standard far outweigh any marginal air quality benefits.

Based on the foregoing analysis, the Proposed Rule NOx emission limit of 0.20 lbs/MMBTU, as applied to MWCs, is not technically feasible or cost effective.

[8] Montenay limits its annual capacity factor for fossil fuel consumption (auxiliary fuel) to less than 10%.

[9] Montenay and the WSA have previously addressed the technical feasibility issues associated with SCR in numerous submissions to EPA and the Department, including but not limited to the RACT proposals (supplemented in 1999). Likewise our review of EPA's RACT/BACT/LAER Clearinghouse indicates that no MWC has installed SCR control technology.

Thank you for the opportunity to submit comments on the Proposed Rulemaking for Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines.

Respectfully Submitted,

Thomas Murphy
Facility Manager
Montgomery County Resource Recovery Facility

On behalf of Montenay Montgomery Limited Partnership
and the Waste System Authority of Eastern Montgomery County

Sunoco, Inc.
Ten Penn Center
1801 Market Street
Philadelphia PA 19103-1699

December 23, 2002

Original: 2302

Environmental Quality Board
P. O. Box 8477
Harrisburg, PA 17105-8477

Re: Comments to Proposed Regulation
NOx Control/Cement Kilns and Large Internal Combustion Engines
[25 PA. Code Chs. 121, 129 and 145]

Sunoco, Inc wants to express its support of those initiatives by the Pennsylvania Department of Environmental Protection, Industries and other interested entities aimed at bringing the state of Pennsylvania in compliance with National Ambient Quality Standards in conjunction with State's continuos economical growth. With that in mind, we submit the following comments to the proposed referenced regulation.

129.201 Standards For Boilers

Boiler definition

The provisions under this section will apply to boilers as defined in Chapter 145.2 (Interstate Pollution Transport Reduction). Application of the boiler definition under the proposed rule must be consistent with previous applications under Chapter 145, which excluded sources without transferring heat to a recirculating medium. The exclusion, therefore, included process heaters. Moreover, this exclusion is supported by the Environmental Protection Agency exclusion of process heaters from the requirements of 40 CFR Part 97, Federal NOx Trading Program, based on the cost/benefit analysis conducted by the Agency for installing controls in process heaters.

In order to further clarify the applicability of the proposed rulemaking under Chapter 129 only to boilers, we submit the following modifications to the definition of boilers under 145.2 for your consideration. We believe that these proposed modifications, while better defining the intended applicability of the proposed rule, are consistent with previous DEP determinations. Proposed modifications are in italics and underlined.

"Boiler- An enclosed fossil fuel or other fuel-fired combustion device used to produce heat, *primarily to produce steam,* and to transfer the heat to *internally* recirculating water, steam, or other medium. *This tern does not include process heaters."*

Effective Date

The proposed rule establishes May 1, 2005 as the date by which the affected sources must be in compliance with the control requirements. Depending on the date that the rule becomes final, affected sources will have approximately two years to meet the requirements. The allotted time will not be sufficient in many cases for designing, procuring, planning and installing the required control devices or implementing compliance strategies. We recommend granting three years after the effective date of the regulation for the facilities to become into compliance.

Actual 1990 NOx Emission Rate

The NOx emissions during the year 1990 are the base emission rate for determining the 60% reduction alternate emission rate under this section. Under the Federal NOx Budget Program, the year 1995 was used to determining the allowable NOx emission rate for the first control period. We recommend modifying paragraph 129.201(a)(I) and (ii) as follows:

"... NOx emission reduction from the actual *highest 1990 or 1995* NOx emission rate..."

This will help ease the cost of compliance for facilities whose 1990 emissions were not representative of normal operation.

Boilers With Rated Capacity Greater Than 250 MMBTU/Hr

Boilers subject to the proposed emission limitation under 129.201(a)(2) should be afforded the same compliance option as those subject to the control requirements under 129.201(1). We proposed the following modification to paragraph 129.201(2):

"...or 0.17 pounds NOx per million Btu heat input *or an alternative emission rate approved by the Department that achieves a NOx emission reduction of 60% from the actual 1990 or 995 NOx emission rate..."*

Averaging Emissions

We strongly support the inclusion of the averaging provisions under 129.201(b). This has proven to be an environmentally sound, cost-effective way of reducing

emissions. To maximize the potential benefits of the flexibility that emission averaging could provide, we submit the following recommendations:

1. Clarifying that averaging could include affected sources within the affected counties and not only within a facility fence line.

2. We submit that averaging should be allowed over the entire ozone season. This will be consistent with the compliance provisions under previous (Chapter 123) and existing (Chapter 145) ozone season NOx regulations which call for account reconciliation at the end of the ozone season. At a minimum, averaging should be allowed on a 30 day-rolling average basis.

3. Where multi-source averaging is not be used, compliance with the proposed emission limitations under 129.201(1) and (2) should still be demonstrated for the entire ozone season and not on a daily basis. At a minimum, averaging should be allowed on a 30 day-rolling average basis.

Chapter 145. Interstate Pollution Transport Reduction

Subchapter B. Emissions of NOx From Stationary Internal Combustion Engines

The proposed regulatory modifications under Subchapter 12.202. (b) includes an exemption for emergency gas turbines and fire-fighting turbines. Even though a definition for emergency stationary internal combustion engines is being proposed, an exemption similar to the one for emergency gas turbines and fire-fighting turbines is not included under the proposed modifications to Chapter 145. We believe that the same justification to exempt emergency gas turbines and fire-fighting turbines should be used to exempt emergency stationary internal combustion engines. Furthermore, the exemption should include those affected engines that are used infrequently. We recommend modifying the proposed language of Subchapter B as follows:

(e) Emergency stationary internal combustion engine and fire-fighting stationary internal combustion engines, as those terns are defined in Subchapter 121.1, are exempt from this section.

(f) Wet-weather storm water pumps are exempt from this section.

(g) Stationary internal combustion engines that are used 500 hours or less during a year are exempt from this section.

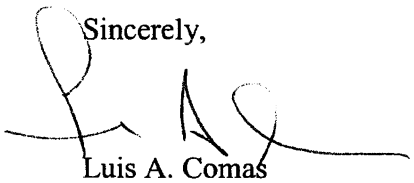
General Comments

In the Pennsylvania Bulletin of October 19, 2002, The Environmental Quality Board indicates that the proposed rulemaking establishes additional ozone season NOx requirements for certain boilers, turbines and stationary internal combustion

units that are small sources of NOx in five counties. Since this rulemaking is being justified on the reduction of NOx during the ozone season, it should apply only during the ozone season. However, there could be sources located outside the five county area whose NOx emissions have a direct impact on the air quality of the affected counties. In addition, limiting the applicability of this rulemaking to the five counties could represent a competitive disadvantage to the affected sources in those counties.

If you have question regarding Sunoco, Inc comments, do not hesitate to call me at 215-977-3456 or Gary Rabik at 215-977-3857

Sincerely,



Luis A. Comas

December 23, 2002

Environmental Quality Board
15th Floor, Rachel Carson State Office Building
P.O. Box 8477
400 Market Street
Harrisburg, PA 17105-8477

Dear Sir or Madam,

Outlined below please find comments submitted on behalf of the Procter and Gamble Paper Products Company on the Environmental Quality Board's proposed rulemaking concerning Small Sources of NOx, Cement Kilns, and Large Internal Combustion Engines, 25 PA Code Chapters 121, 129, and 145. As the proposed rule making has potential to affect our operations, we're pleased to have the opportunity to offer these comments.

General Comments

As we have commented during development of prior NOx control regulations and in discussions with the Department's Air Quality Technical Advisory Committee, we support the Board's approach to address both the EPA-required State Implementation Plan (SIP) NOx reductions and the Philadelphia area ozone attainment progress via a flexible "cap and trade" program. We believe this approach will provide for effective, targeted emissions reductions at the least possible cost. While we believe there continues to be a need for more aggressive mobile source controls as a component of this strategy, we generally support the current proposed rulemaking as part of the ongoing attainment process. We also encourage the Department to continue steps to minimize to the greatest extent possible administrative requirements (small source continuous emissions monitoring, monitoring program approval, etc.) for the smaller sources addressed in portions of this rule.

Please note that while the Portland cement kiln standards are included as part of this rulemaking, our comments are specifically focused on the small NOx source and stationary internal combustion engine portions of the proposed regulation.

Specific Comments

Chapter 129 Small NOx Source Control Applicability

We support the Department's proposal to apply the control requirements for small sources of NOx to those areas identified in the rule (sources in Bucks, Chester, Delaware, Montgomery, or Philadelphia County). The NOx emissions reductions targeted with this rulemaking are necessary to assist with Southeastern Pennsylvania's ozone attainment strategy, and additional controls are logically focused on sources in the region where reductions are expected to improve ambient ozone levels. Larger sources of NOx emissions statewide have existing control

requirements arising from the Chapter 145 NOx allowance program. In addition, all of the smaller NOx sources statewide have been subject to Reasonably Available Control Technology (RACT) requirements as part of PA's earlier NOx control regulations. Given the sizable statewide emissions improvement resulting from the existing programs, we believe the rulemaking is appropriate in targeting further emission reductions at those sources contributing to the local ozone attainment issues

As detailed below, we also believe it is appropriate to enable compliance with these NOx reduction requirements with a flexible ozone-season allowance approach. This approach would tend to result in ozone season emissions reductions, rather than year round requirements. While there would be some additional level of general environmental benefit to year round NOx reductions, we believe the approach to reductions from the smaller sources should mirror that of the larger sources and focus on ozone-season emissions improvement. It would seem particularly inappropriate for the smaller NOx sources to control emissions on a year round basis while the larger sources are controlling on a seasonal basis under the cap and trade allowance program.

Compliance Flexibility (Sections 129.201 – 129.203 and Section 145.114

We support the Department's proposed approach of allowing averaging of emissions across certain sources as an element of compliance flexibility in the regulation. However, we believe the rule as proposed does not provide sufficient flexibility for cost effective compliance, and will impose a relatively larger compliance burden on the smaller NOx sources affected by this rule than currently exists for those larger sources regulated under the Chapter 145 NOx allowance program.

While a source has the ability to "opt into" the NOx allowance program today using the Department's existing Chapter 145 requirements, the additional complexity of monitoring, reporting, etc. associated with opting into this program will effectively prevent sources from pursuing this option as a viable compliance alternative. We would encourage the Board to modify the regulation to permit the smaller sources to purchase NOx allowances from Chapter 145 sources located within the same attainment designation area (e.g. within the 5-county Philadelphia area for affected sources within this area) as an additional means of demonstrating compliance with the emission reduction requirements. We believe this could be fairly simply managed by requiring the source to either demonstrate compliance directly with the emission rate requirements detailed in this rule or to obtain sufficient allowances from the NOx allowance program in an open market purchase to demonstrate compliance. We believe the Department has expressed concern that these allowances will be too expensive or limited in number to provide for adequate flexibility for the affected sources. While the availability or cost of allowances is driven by source operating and market conditions, we think this additional mechanism will provide an effective means to help insure the NOx reductions from smaller sources are achieved at the most cost effective means possible.

Emission Monitoring Requirements

We support the Department's proposal to require each affected source to propose appropriate monitoring and record keeping to demonstrate compliance with the rule. We do not believe continuous emissions monitoring is necessary for the majority of these sources, and given the cost of installing and operating monitors would encourage the Department to approve simplified procedures (e.g. periodic testing and / or parametric monitoring) for demonstrating compliance.

We believe this simplified monitoring approach is warranted for all of the smaller NOx emissions sources, including those sources pursuing averaging or allowance purchase as a means of demonstrating compliance with the emissions requirements.

While we acknowledge there is some small benefit to insuring that sources are meeting NOx emissions levels on a daily basis, this requirement goes beyond that applied to even the largest NOx sources, where demonstration of compliance with NOx emissions levels is required only on an ozone-seasonal basis. We would suggest deleting the requirement for the smaller sources to demonstrate compliance on a daily basis.

Emergency / Fire Fighting Internal Combustion Engines and Turbines

We support the Department's proposal at Section 129.203 of the rule to exempt sources used for emergency back-up from meeting the NOx emissions reduction requirements. These sources would generally be infrequently used, would not be expected to contribute significantly to regional ozone levels, and would not provide cost effective ($/ton NOx) emission reductions.

Similarly, we believe the application of the Chapter 145 requirements to internal combustion engines with more than 153 tons per ozone season of actual emissions will properly exempt those emergency or back-up units which are infrequently operated and which would have much lower emissions control cost effectiveness.

We are aware of the specific concern raised by operators of larger internal combustion engines with the technical feasibility of the 90 and 91 % NOx control requirements established for these sources at Section 145.113. While we are not in a position to comment technically on the feasibility of these levels, given recent (August 22, 2002) US EPA guidance published on this issue we would encourage the Department to review the control levels and insure requirements for these sources in the final rule are technically feasible and provide compliance flexibility consistent with the federal guidance. As highlighted earlier, we believe use of an allowance-based approach would enhance cost effectiveness and compliance flexibility for these sources as well.

We appreciate the opportunity to offer comment on this important proposed rulemaking. Please feel free to contact me with any questions on our comments.

Sincerely,

J. Andrew Hadley, P.E.
Site Environmental Manager

Original: 2302

Trostle, Sharon F. - DEP

From: Lane Smith [lsmith@gchi.com]

Sent: Friday, December 20, 2002 3:50 PM

To: regcomments@state.pa.us

Cc: Steve Holt; Rocco Marinaro (E-mail); Fred Osman (E-mail)

Subject: Proposed Rulemaking, EQB, 25 PA. Code CHS. 121, 129 and

Attached please find comments from Keystone Cement Company regarding the Proposed Rulemaking, Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines. A hard copy is being sent today via US Certified Mail. Thank you.

Lane H. Smith
Manager, Environmental Projects
Keystone Cement Company
320-D Midland Parkway
Summerville, South Carolina 29485
(843) 851-5669
lsmith@gchi.com

<<Final NOx SIP EQB Comment Letter (12-20-02).doc>>

Via Electronic Mail and US Certified Mail

December 20, 2002

The Honorable David E. Hess
Environmental Quality Board
P.O. Box 8477
Harrisburg, Pennsylvania 17105-8477

Re: Proposed Rulemaking, Small Sources of NO_X, Cement Kilns and Large Internal Combustion Engines

Dear Secretary Hess:

Keystone Cement Company (Keystone) is located in Bath, Pennsylvania, and operates two Portland cement kilns subject to the proposed rulemaking regarding NO_X emissions. While Keystone supports efforts to improve the ground-level ozone issues in Pennsylvania, our position is that necessary reductions should be accomplished in a framework of providing as much flexibility as possible to the regulated community so long as the ultimate goals are achieved. In this spirit, Keystone would like to offer the following comments on the proposed regulation.

1. In the preamble to the regulation, the Board states that eight cement kilns will need to install continuous emission monitors (CEMs). The implication is that these are the only compliance costs for Portland cement kilns encompassed in this regulation. This point is further supported by the discussion of compliance costs in the preamble. The paragraph entitled "Compliance Costs" in Section F. *Benefits, Costs and Compliance*, speaks only to the need for some cement kilns (i.e., eight kilns) to install CEMs, with the clear implication that there are no costs for any source to come into compliance, apart from monitoring considerations. Finally, the discussion contained in the paragraph entitled "*Paperwork Requirements*" is mentioned as support for the interpretation that the Board believes all Portland cement kilns are already in compliance, because if this were not the case, paperwork would need to be filed for plan approval applications to implement any required control technology, contrary to the implication of this section in the preamble.

   While most of the cement kilns in Pennsylvania have already installed the controls required by this proposed regulation, this is not true of Keystone's cement kilns. Since the decisions on what controls are required are partially based on economic considerations, Keystone's concern is that if there was a misconception of what was required to comply, there may be also be an error in the basis for the standards of compliance.

It is Keystone's understanding that there is a misperception that all Portland cement kilns in Pennsylvania installed low NO_X burners to meet the previously established RACT limits. Keystone was able to demonstrate to the satisfaction of the Department and EPA that combustion optimization was the appropriate RACT control for Keystone and thus low NO_X burners were not installed. Furthermore, according to the *NO_X Control Technologies for the Cement Industry Final Report*[1], low-NO_X burners can only be installed on an indirect-fired kiln; Keystone's cement kilns are direct-fired. Consequently, the installation of low-NO_X burners is not a technically feasible option for Keystone. It would require a complete redesign and modification of the combustion system. A program of this nature is not practically achievable for a facility that is utilizing waste derived fuels in its combustion process for energy recovery. In general, lower NO_X emissions are achieved by lower combustion temperatures, and lower combustion temperatures generally result in lower destruction efficiencies. Similarly the introduction of mid-kiln firing would be a major, expensive undertaking for these cement kilns.

Keystone respectfully requests the Board to reconsider the control technologies required in view of the information that Keystone would need to implement control technologies not envisioned by the decisions that went into the proposal of this regulation. Two potential solutions to Keystone's dilemma are included in subsequent paragraphs, either of which would provide a more cost effective means of complying with the regulation.

2. The original Board proposal for Portland cement plants and the Federal Implementation Plan (FIP) for Portland cement plants identified four types of kilns that were subject to the rule: long wet kilns, long dry kilns, preheater kilns, and preheater/precalciner or precalciner kilns. Keystone operates a short wet kiln, which was not encompassed in either the original Board proposal or the FIP. Furthermore, the aforementioned NO_X emissions documents for Portland cement plants do not evaluate control technologies for short wet kilns. The current proposal does not exempt this short wet kiln and is consequently more stringent than the requirements proposed by EPA for controlling Portland cement plants. Keystone believes there are economic reasons why the short kilns should be excluded. The cost of control for a short kiln, in terms of low-NO_X, burners is not significantly different than that for a long kiln. Thus the inclusion of short kilns in the regulation results in a higher cost per ton of NO_X controlled than that which was considered in the FIP, and this represents a cost inequity for the short kilns. Keystone requests that the proposed rule be modified to exempt short kilns from the proposed regulation in accordance with the intent of EPA.

3. The original PADEP proposal to regulate NO_X emissions from Portland cement kilns (proposed in 2000) offered two methods of compliance that are not available in the current proposal; participation in the NO_X budget trading program or alternatively,

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[1] This document, dated September 19, 2000, updates the information contained in the document *Alternative Control Techniques (ACT) Document – NOx Emissions from Cement Manufacturing*, dated March 1994.

compliance with alternate emission rate limits. Keystone requests that the Board reconsider and reinstate these compliance options in the current proposal.

With regard to the NO_X budget trading program, Keystone requests that language be added to the proposed regulation that states that any cement kiln that elects to participate in the NO_X budget trading program in accordance with 25PA Code §145 be deemed to be in compliance with Subchapter C. This compliance alternative would allow any cement manufacturing facility to participate in an existing NO_X control program if participation in the program is appropriate for a given facility.

A second method of compliance that was previously proposed was a pounds of NO_X emitted per ton of clinker produced standard based on the type of kiln (e.g., 6.0 lbs NO_X/ton of clinker produced on a long wet kiln). It is apparent from the EPA regulation and the previous PADEP proposed regulation that a long wet kiln with an emission rate of 6.0 lbs NO_X/ton of clinker produced is acceptable for demonstrating compliance with the regulation. Furthermore, Keystone believes that an appropriate compliance program for a facility would be to achieve this emission rate (i.e., 6.0 lbs NO_X/ton of clinker produced) during the ozone season when averaged for all cement kilns at a facility for which this regulation is applicable. This would allow a facility with two cement kilns the flexibility to demonstrate compliance with an equivalent "facility wide" emissions limit while meeting the intent of the EPA and proposed PADEP regulation. A compliance program allowing affected cement kilns to average emissions during the ozone season would also be consistent with the intent of proposed PADEP Rule §129.201 **Standards of Boilers**. Condition (b) of this proposed rule allows for two or more affected boilers to average emissions to demonstrate compliance with the additional NO_X requirements of Chapter 129 of the PADEP regulations. It is our opinion that cement kilns should be provided a similar opportunity to demonstrate compliance with average emission rates for affected units. Therefore, Keystone believes that the PADEP regulation should reinstate the previously proposed kiln-type emission limit compliance option as well as specifically allow for emissions averaging over all kilns at a facility to which this regulation is applicable.

4. The EQB has requested comments specifically for whether the proposed requirements NO_X control requirements should apply for the entire year. Keystone Cement Company believes that it is inappropriate to impose the proposed requirements year-round for the reasons noted below.

   First, as stated in the Section D. *Background and Purpose* of the proposed rule, the purpose of the rulemaking is to ultimately reduce ground-level ozone such that attainment of the ozone National Ambient Air Quality Standard (NAAQS) can be achieved within the Commonwealth and in the regional "downwind" areas. The non-attainment issue at hand has been proven to only be a concern during the period from May 1 through September 30. Implementation of the proposed regulations during that period may provide some contribution to achieving the stated purpose. Continuing to impose the requirements beyond that annual period would neither serve the stated purpose, nor serve

to address any other known air quality non-attainment issue. Therefore, year-round imposition of the proposed requirements is unnecessary.

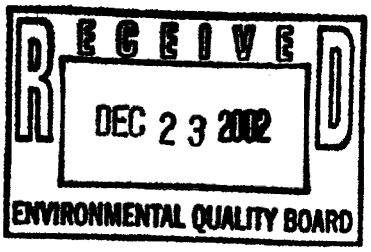
Second, as stated above, according to the Pennsylvania Air Pollution Control Act, the Department cannot promulgate rules that are more stringent than what may be required under the federal Clean Air Act. In the absence of any existing and proven air quality concern covered by the Clean Air Act, imposition of the proposed requirements year-round would be contrary to the Air Pollution Control Act.

Keystone appreciates the opportunity to comment on this regulation. If you have any questions or require additional information, please contact Mr. Rocco Marinaro at (610) 837-3213 or me at (843) 851-5669.

Sincerely,

Lane H. Smith, P.E.
Manager, Environmental Projects

cc: Stephen J. Hayden, Keystone
Stephen P. Holt, Keystone
Rocco Marinaro, Keystone



December 20, 2002

Environmental Quality Board
Rachel Carson State Office Building
15th Floor
400 Market Street
Harrisburg, PA 17101-2301

Original: 2302

Re: Proposed Rulemaking: Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines: Chapters 121, 129 and 145
Comments of Integrated Waste Services Association

Dear Members of the Environmental Quality Board:

The Integrated Waste Services Association (IWSA) is pleased to offer the following comments regarding proposed rulemaking for small sources of nitrogen oxide air emissions, cement kilns and large internal combustion engines. The IWSA is a national trade group representing the waste-to-energy industry that safely disposes of municipal solid waste and generates clean, renewable electricity using modern combustion technology equipped with state-of-the-art pollution control systems. Nearly 100 waste-to-energy facilities operate nationwide, including five facilities that convert Pennsylvania's trash into clean, renewable power. IWSA members include American Ref-Fuel Company, Covanta Energy Company, Montenay Power Corporation and Wheelabrator Technologies Inc., as well as 25 municipalities that are served by waste-to-energy plants and several dozen other organizations that work in the municipal waste management and energy fields. IWSA members own and/or operate facilities in Falls Township, Lancaster, Chester, York County, and Montgomery County. Together, these Pennsylvania power plants dispose of nearly 8,000 tons of trash each day and generate about 250 MW of electricity.

The U.S. Environmental Protection Agency recently released a comprehensive nationwide inventory of emissions from waste-to-energy facilities documenting a dramatic, and in EPA's own words, "outstanding performance" of waste-to-energy facilities in reducing air emissions due to the industry's compliance with new Clean Air Act standards. The industry and their municipal partners spent more than one billion dollars to equip every large unit facility with state-of-the-art pollution control equipment. Large units represent greater than 90% of the national capacity for municipal waste combustion. Small units are completing a similar retrofit of existing plants that will be completed by 2005.

1401 H Street N.W., Suite 220 • Washington, DC 20005 • 202-467-6240 • FAX: 202-467-6225

These Clean Air Act standards, promulgated under the "Maximum Achievable Control Technology" (MACT) provisions of the Act, include strict emissions limits for nitrogen oxides. Furthermore, the research and analysis required of EPA under the recent MACT decision-making process yielded an emission limit that is tough, but that fairly weighs the cost and benefits of imposing the strictest standard. EPA understood that the most expensive NOx control equipment may not be the best, if the cost is so great as to make safe trash disposal prohibitive to the communities served by waste-to-energy.

First and foremost, it is important to understand that the existing NOx standards are more stringent comparably sized fossil fuel fired boilers. The air permits governing operation of Pennsylvania facilities contain stringent, source-specific emissions limits. Since December of 2000, waste-to-energy facilities have operated successfully under these MACT standards promulgated under 40 CFR Part 60 Subparts Cb and Eb, pursuant to Section 129 of the 1990 Clean Air Act Amendments. The MACT limits are at least as stringent as those limits placed on the best-performing 12% of waste-to-energy facilities nationwide. Pennsylvania submitted a State Plan to implement the new MACT standards, and EPA approved this plan on August 23, 1999. Pennsylvania's State Plan involved the incorporation of the new MACT standards into each waste-to-energy facility's federally enforceable state operating permit (FESOP). One of the several pollutants regulated under this new standard is NOx.

The U.S. EPA was cognizant of the importance of these MACT limits as they related to other rules, programs and initiatives underway at the time of the MACT rulemaking. This was particularly true in the case of setting ambient and source standards for controlling nitrogen oxides to achieve the national ambient air quality standard for ozone. For example, the EPA's Final "NOx SIP Call" of October 1998, specifically advises states that the federal environmental agency considers the MACT NOx standards for waste-to-energy facilities as adequate and appropriate for the source. The preamble states: "The USEPA does not assume, in this rulemaking, any additional control measures or lower emissions levels for municipal waste combustors because these combustors are already being controlled through MACT regulations." In addition, in the October 21, 1998 proposed Federal Implementation Plan (FIP) related to the SIP call, EPA reiterated that "...municipal waste combustors should not be required to reduce emissions beyond that already required by the maximum achievable control technology (MACT) rules for NOx required under sections 111 and 129 of the CAA."

All other states have paid deference to this advice and have not implemented a NOx standard comparable to the one proposed by the Department in this rule.

Pennsylvania's proposed Chapter 129 standards appear to be based on the performance of fossil fuel-fired boilers. However, one standard cannot and does not fit all. The Clean Air Act recognizes this fact and the MACT standards setting process implement that recognition. Waste-to-energy's MACT standards were promulgated after years of technical review of the capabilities of these unique types of facilities, and they represent the maximum level of control that are technically feasible, cost effective and therefore can be reasonably attained. Emission standards for a particular type of boiler or

fuel source should be based upon the technical feasibility and cost effectiveness of controls for each specific sources in that category. One common emission standard is not appropriate for all source types and fuels.

IWSA recommends that Pennsylvania recognize that waste-to-energy boilers are not designed, constructed or operated in the same manner as fossil fuel boilers. The facilities have a different fundamental purpose. Waste-to-energy boilers' primary purpose is the conversion of relatively heterogeneous, wet municipal solid waste into energy. They do not use a uniform and consistent fuel. There are technical and economic considerations that are unique to these types of units. Due to the nature of municipal solid waste and its properties as a fuel, the units are less thermally efficient than fossil fuel fired boilers of comparable heat input, thereby requiring larger amounts of excess air and less densely-packed heat recovery systems. For these reasons, waste-to-e energy boilers also do not have access to NOx reduction options available to other types of units such as low-NOx burners, fuel switching during the ozone season, or load curtailment.

Equally important, Pennsylvania should recognize that the proposed rule would require control technology that is prohibitively expensive, and has not even been demonstrated to be technically feasible on waste-to-energy boilers. The EPA MACT emissions limit is based on operation of a selective noncatalytic reduction (SNCR) system. The proposed rule would require the installation of selective catalytic reduction (SCR). No waste-to-energy facility in the U.S. is equipped with SCR, in part because its cost has been shown to be prohibitively expensive for such relatively small facilities.

Due to the nature of the fuel, waste-to-energy units are larger than fossil fuel boilers of comparable heat input and consequently have much higher gas flows per unit of heat input. No waste-to-energy facility in the U.S. has been equipped with SCR, because it has been demonstrated to be prohibitively expensive due to the unique technical difficulties and installation and operating costs associated with SCR on waste-to-energy boilers. The SCR unit would have to be installed or "retrofitted" downstream of all existing air pollution controls to provide a "clean gas" to the SCR reactor to eliminate catalyst blinding and poisoning. At this location, the flue gas temperature is too low for the SCR catalyst, so reheating of the flue gas using natural gas is required to achieve the necessary SCR reaction temperature. Larger SCR reactor sizes are necessary compared to fossil fuel fired boilers with the same rated gross heat inputs due to the higher excess air requirements of waste-to-energy boilers. SCR is typically considered only for large dedicated power production facilities where economies of scale apply.

IWSA member companies estimate the capital cost of installing SCR systems at the affected Pennsylvania waste-to-energy facilities would to be at least $100 million to $150 million. Ozone season operating costs, including reagent, gas and periodic catalyst replacement is estimated to be about $500 thousand. On a unit basis, the total cost would be equivalent to about $15,000 per ton of NOx removed during the ozone season. This is far in excess of the estimate of $1,500 to $3,500 per ton estimated by the Department and shows that waste-to-energy facilities were never considered in the development of the

proposed rules. This would constitute a major facility retrofit with a technology that has never been undertaken at a U.S. waste-to-energy facility. Most service contracts with municipalities provide that the local government is directly responsible for most of the capital and operating costs for new systems such as installation of SCR.

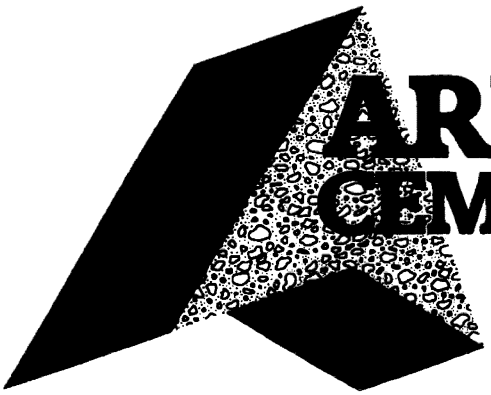
In conclusion, IWSA urges Pennsylvania to exclude municipal waste-to-energy facilities from the proposed revisions to Chapter 129. Emissions of NOx from this industry have already been regulated pursuant to a separate set of Federal and State rulemakings. There is currently in place a strict, appropriate standard that has been derived specifically for the unique design, operation and purpose of waste-to-energy units. Applying an emissions standard to waste-to-energy boilers that is based upon the operation and design and NOx reductions options available only to fossil fuel-fired boilers is inappropriate and unfair. Waste-to-energy facilities are a vital component of environmentally safe solid waste management by converting municipal solid waste into electricity using a renewable, no-fossil fuel, reducing the need for land disposal by greater than 90%, and avoiding the release of more than 11 million metric tons of greenhouse gases into our atmosphere on an annual bases according to the U.S. EPA. Waste-to-energy also promotes metals and other forms of recycling, additional components to sound solid waste policy.

The most expedient way of changing the proposed rule would be to substitute the word "boilers" in the proposed text with the word "units". The definition of "unit" in Chapter 145.2 specifically limits the applicability to fossil fuel-fired boilers.

Thank you for the opportunity to comment. Please feel free to contact me at (202) 467-6240 with any questions or comments.

Sincerely,

Maria Zannes
President



ARMSTRONG CEMENT & SUPPLY

December 23, 2002

Original: 2302

Environmental Quality Board
P.O. Box 8477
Harrisburg, Pennsylvania 17105-8477

RE: Proposed Rulemaking: Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines (25 Pa. Code Chs. 121, 129 and 145)
32 *Pa. Bull.* 5178 (October 19, 2002)

To Whom It May Concern:

Armstrong Cement & Supply Corp. ("Armstrong Cement") is hereby submitting comments to the above referenced proposed rulemaking. Our comments are limited to Subchapter C (Emissions of NOx From Cement Manufacturing). In addition, we are including a one-page summary of comments for distribution to each of the Environmental Quality Board ("EQB" or "Board") members at the meeting in which the final rule will be considered.

Our comments focus on flexibility of compliance options and the stringency of the requirements. In general, we suggest that the Subchapter C requirements provide as much flexibility as possible while still meeting the EPA-mandated emissions budget and not be any more stringent than required by the EPA mandate.

I. Background

The proposed rule provides that the Subchapter C requirements "are needed to satisfy the Commonwealth's remaining obligation under the NOx SIP Call." 32 *Pa. Bull.* at 5178. The referenced SIP Call required states to meet a state wide NOx emissions budget for the ozone season. While the EPA provided states with the flexibility to meet the budget in whatever means the state chose, it also provided guidance and a proposed Federal Implementation Plan ("FIP") which specified the sources and reductions that EPA suggested that each state pursue. The proposed Subchapter C requirements are clearly modeled after the EPA FIP but have some significant differences as discussed below. To the extent that the proposed rules deviate from the FIP, making the Pennsylvania rules more stringent than federally required, Armstrong Cement objects and suggests that such a rulemaking is beyond the Board's authority as provided in the Pennsylvania Air Pollution Control Act.

A Snyder Associated Company

Armstrong Cement & Supply Corp.
100 Clearfield Road
Cabot, PA 16023-9521
(724) 352-4471

II. Specific Comments

1. Armstrong Cement Objects to the CEMS Requirements of Subchapter C

The proposed Subchapter C rules impose an obligation on the owner/operator of a cement kiln to install and operate a NOx continuous emission monitoring system ("CEMS") to demonstrate the continual effectiveness of the control measure selected under 25 Pa. Code 145.143. *See* proposed 25 Pa. Code 145.144(b). Armstrong Cement believes that the NOx CEMS requirement is unnecessarily and impermissibly included in Subchapter C.

First, Armstrong Cement notes that the express reason for installing and operating the CEMS is to "demonstrate the continual effectiveness of the compliance option selected under 145.143." The compliance options listed in 145.143 include the installation and operation of: (1) low NOx burners; (2) mid-kiln firing; or (3) an alternative control approved by DEP. None of these compliance options impose any numerical emission limits or NOx budgets. Accordingly, installation and operation of a CEMS is unnecessary to demonstrate the continual effectiveness of the selected control measure. Armstrong Cement notes that several other states that have adopted the control measure approach to regulating NOx emissions from cement kilns (*e.g.*, low NOx burners or mid-kiln firing) do not require CEMS. *See, e.g.*, Indiana (326 IAC 10-3-4(a)(requiring operation and maintenance in accordance with a preventative maintenance plan)); Illinois (35 Ill. Admin. Code 217.406(b)(4)(operate according to a plan that includes parametric monitoring indicated in the manufacturer's specifications)); Michigan (Mich. Admin. R. 336.1817(8)(annual stack testing or CEMS)); West Virginia (WV CSR 45-1-100.6 (annual stack testing)). We ask the EQB to consider that a CEMS will impose additional and unnecessary costs without furthering the stated benefit of demonstrating the effectiveness of the control measure selected. The estimated cost of up to $100,000 for installation of the CEMS and the ongoing operating and maintenance costs are a significant financial burden on a small business such as Armstrong Cement, particularly when the benefit derived from this expenditure is not demonstrable.

Second, the FIP does not require CEMS but instead provides for annual stack testing. *See* 40 C.F.R. 98.44(b) (63 Fed. Reg. 56,427 (October 21, 1998)). Accordingly, the EQB's proposal to require CEMS is not in accordance with the suggested approach advocated by the EPA as part of the federal rulemaking. Approval of the Pennsylvania rules as part of the SIP should be considerably easier if Pennsylvania follows the proposed FIP.

Finally, the imposition of the CEMS requirement is impermissibly more stringent than required under federal law. Section 4004.2(b) of the Pennsylvania Air Pollution Control Act ("APCA") restricts the EQB's authority to promulgate rules such that Pennsylvania rules cannot be more stringent than required under the federal Clean Air Act. Specifically, this section provides:

> Control measures or other requirements adopted under subsection (a) of this section shall be no more stringent than those required by

> the Clean Air Act unless authorized or required by this act or specifically required by the Clean Air Act.

35 Pa. Cons. Stat. 4004.2(b).

This restriction on the EQB's rulemaking authority does not apply if the EQB determines that the more stringent state rule is reasonably necessary in order for the Commonwealth to: (1) achieve or maintain compliance with a NAAQS; (2) satisfy Clean Air Act requirements as they specifically relate to the Commonwealth; (3) prevent an imposition of sanctions; or (4) comply with a final decree of a Federal court. *Id.* Nowhere does the EQB suggest that one of these limited exceptions applies, nor does Armstrong Cement believe that any of the exceptions could possibly apply, in light of the fact that EPA's own proposed rulemaking does not require CEMS nor do several other state rules that have been developed under the same federal mandate. Armstrong Cement suggests that the EQB promulgate a final rulemaking that is consistent with the FIP (*e.g.*, requires annual stack testing) or that provides flexibility (*e.g.*, annual stack testing or CEMS or emission calculations with approved emission factors).

2. Subchapter C should allow flexibility by including additional compliance options

As currently proposed the operating requirements at §145.143 call for either the installation and operation of a prescribed NOx control technology, or the implementation of an alternate technology that achieves a 30% reduction from the actual 1990 baseline. Armstrong Cement suggests that the rule provide additional flexibility by allowing cement plants to also comply with the numerical emission limits stated by EPA in the FIP. Several other states have adopted this approach of providing several compliance options including EPA's proposed numerical emission limitations. *See, e.g.,* Michigan (Mich. Admin. Code 336.1817(5)(install and operate specified control technology or meet NOx emission limit (lbs/ton clinker) averaged over the ozone season)); Maryland (COMAR 26.11.29.15)(specified control technology or EPA emission limits based on 30-day average); Indiana (326 IAC 10-3-3(a)(specified controls or EPA emission limit averaged over the ozone season)); Illinois (35 Ill. Admin. Code 217.402)(specified controls or EPA emission limitations).

3. The requirements of proposed §145.143 should not apply outside the "Ozone Season"

The EQB requested comment on three specific issues, one of which is whether the proposed requirements should apply for the entire year. *See,* 32 *Pa. Bull.* at 5180. Armstrong Cement believes that it is inappropriate and impermissible to impose the proposed requirements year-round.

As stated in the Background and Purpose of the proposed rule, the purpose of the rulemaking is to ultimately reduce ground-level ozone such that attainment of the ozone NAAQS can be achieved within the Commonwealth and in the regional "downwind" areas. Ozone non-attainment has been generally accepted to be a concern only during the

ozone season of May 1 through September 30. Implementation of the proposed regulations during the ozone season is required by the SIP Call, but year-round NOx control is not. Imposition of NOx control requirements beyond the ozone season would not serve the stated purpose. In addition, such an imposition would be beyond the EQB's authority pursuant to Section 4004.2(b) of the APCA.

Armstrong Cement again appreciates the opportunity to provide comment on the proposed regulations.

Sincerely,

Richard L. Smith
V.P. of Operations

cc: Michael H. Winek, Esquire

Armstrong Cement & Supply Corp.
One-page Summary of Comments to
Proposed Rulemaking: Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines (25 Pa. Code Chs. 121, 129 and 145)
32 *Pa. Bull.* 5178 (October 19, 2002)

1. CEMS should not be required for cement kilns under 25 Pa. Code Chapter 145, subchapter C (Emissions of NOx from Cement Manufacturing).

   - The Federal Implementation Plan requires annual stack testing and not CEMS
   - Many other states have allowed for annual stack testing in place of CEMS
   - CEMS are not necessary to demonstrate the effectiveness of a rule that does not impose numerical emission limitations but instead requires a type of control measure (e.g., low-NOx burners or mid-kiln firing)
   - Imposition of CEMS pursuant to this rulemaking in impermissible under the Pennsylvania Air Pollution Control Act ("APCA") because this requirement is more stringent than federally required in violation of section 4004.2(b) of the APCA
   - The estimated costs of installation of a CEMS (up to $100,000) plus annual operating and maintenance costs are significant for a small business such as Armstrong Cement. Such costs are not necessary to further the goals of the rulemaking.

2. The Subchapter C rules should allow flexibility by providing additional compliance options as supported by the FIP and as instituted by other states

   - Many other states allow cement plants to install the prescribed control measures or to meet numerical emission limits
   - The EPA provided applicable numerical emission limits in the preamble to the FIP
   - Subchapter C should provide the owner or operator of an affected cement kiln the option of complying with the numerical emission limits proposed by EPA and used in many other states' NOx rules
   - Compliance with numerical emission limits should be based on an ozone season average emission rate to further the purposes of the season wide NOx controls as is allowed for electric generating units and large industrial boilers

3. Subchapter C rules should apply only during the ozone season.

   - It is well established that ozone nonattainment is a seasonal issue and is a concern only during the hot summer months
   - Imposition of NOx controls year round is unrelated to the ozone attainment issue and is unnecessary
   - The FIP and other states' rules regulate NOx emissions only during the ozone season.

DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER
CARDEROCK DIVISION

NAVAL SHIP SYSTEMS
ENGINEERING STATION
5001 S. BROAD STREET
PHILADELPHIA, PA 19112-1403

IN REPLY REFER TO

5090
Ser 02/77

20 DEC 2002

Environmental Quality Board
Rachel Carson State Office Building
400 Market Street, 15th Floor
Harrisburg, PA 17101-2301

Original: 2302

Subj: COMMENTS TO PROPOSED RULEMAKING
SMALL SOURCES OF NOx, CEMENT KILNS AND LARGE INTERNAL COMBUSTION ENGINES

Dear Sir or Madam:

The Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSES) is hereby submitting comments to the above-referenced rulemaking. Enclosure (1) is a one-page Executive Summary. Our full comments are provided in enclosure (2).

Please contact Mr. Patrick Schauble at (215) 897-7057 or the above address if further information is required regarding these comments.

Sincerely,

S. L. JOSEPH
Captain, U.S. Navy
Commanding Officer

Encl:
(1) Executive Summary
(2) Full Comments

Copy to:
Commander Navy Region III Environmental Coordinators Office (c/o Gary Koerber)

Executive Summary
Comments in Response to Proposed Rulemaking
Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines

Submitted By: Naval Surface Warfare Center, Carderock Division,
Ship Systems Engineering Station
Philadelphia, Pennsylvania

Date: 20 December 2002

The Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSES), submits these comments in response to the Environmental Quality Board's September 17, 2002 proposed rulemaking to amend 25 P.A. Code Chapters 121, 129, and 145 (PA Bulletin, DOC. No. 02-1824). The NSWCCD-SSES recommends that the proposed rulemaking be amended to exempt those facilities whose main purpose is research, development, testing/evaluation, and training where the replication of shipboard (uncontrolled) conditions is required. After careful review and analysis, NSWCCD-SSES has determined that 1) the proposed NOx emissions control requirements are not technically feasible in a facility that does research, development, testing/evaluation, and training, 2) NSWCCD-SSES actual emissions are much less than permitted levels due to the limited source operations at varying power levels during testing and training and 3) even if technically feasible, the costs to install NOx emission control devices would be prohibitive given the limited operating schedule and varying power levels associated with testing and training.

NSWCCD-SSES is unique in its use of power generation sources and as such should not be subject to the proposed limitations on NOx emissions. Add-on NOx control equipment would render the services provided at NSWCCD-SSES, including research, development, testing and evaluation, and training, technically infeasible since we would be unable to replicate shipboard conditions. Although NSWCCD-SSES is classified as a major source based on our potential emissions, our actual NOx emissions are relatively insignificant. If the commercially available NOx control devices were technically feasible, the costs associated with the installation and operation of these NOx control devices would be prohibitive considering our limited operating schedule. Implementation of the Proposed Rule would significantly impair our ability to perform our mission to support the current and future US Navy Fleet and would jeopardize the future viability of NSWCCD-SSES in Philadelphia. NSWCCD-SSES requests that the potentially affected emission sources intended for marine application, including boilers, gas turbines, and internal combustion engines, which are used to directly support our main purpose of research, development, test, evaluation and training be exempt from the proposed NOx rule.

Enclosure (1)

Comments in Response to Proposed Rulemaking
Small Sources of NOx, Cement Kilns and Large Internal Combustion Engines

Submitted By: Naval Surface Warfare Center, Carderock Division,
Ship Systems Engineering Station
Philadelphia, Pennsylvania

Date: 20 December 2002

I. Introduction

The Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSES), submits these comments in response to the Environmental Quality Board's September 17, 2002 proposed rulemaking to amend 25 P.A. Code Chapters 121, 129, and 145 (PA Bulletin, DOC. No. 02-1824). These comments address the proposed rulemaking amendments to Chapters 121 and 129 to establish additional ozone season nitrogen oxides (NOx) control requirements for certain stationary boilers, turbines, and internal combustion units that are small sources of NOx in the Counties of Bucks, Chester, Delaware, Montgomery, and Philadelphia. The NSWCCD-SSES recommends that the proposed rulemaking be amended to exempt those facilities whose main purpose is research, development, testing/evaluation, and training where the replication of shipboard (uncontrolled) conditions is required. After careful review and analysis, NSWCCD-SSES has determined that 1) the proposed NOx emissions control requirements are not technically feasible in a facility that does research, development, testing/evaluation, and training, 2) NSWCCD-SSES actual emissions are much less than permitted levels due to the limited source operations at varying power levels during testing and training and 3) even if technically feasible, the costs to install NOx emission control devices would be prohibitive given the limited operating schedule and varying power levels associated with testing and training.

II. Background of the NSWCCD-SSES

NSWCCD-SSES was established in 1910 as the United States Navy (USN) Fuel Oil Test Plant to address technical issues resulting from the conversion from a coal to oil based fuel. Over the years, NSWCCD-SSES has been assigned additional mission areas that have culminated in the engineering responsibility for all non-nuclear Hull, Mechanical and Electrical machinery for both surface ships and submarines. Additionally, the machinery research facilities previously located in Annapolis, Maryland has been moved to Philadelphia as a result of the Base Realignment and Closure (BRAC) Act of 1995. Today, NSWCCD-SSES is the Navy's principal center for Research, Development, Test and Evaluation (RDT&E) for naval marine machinery. NSWCCD-SSES has life cycle management responsibilities for many machinery systems, including boilers and steam turbines, diesel engines, and gas turbines. In these areas, NSWCCD-SSES provides a full spectrum of engineering services from concept development to supporting the equipment in service for its lifetime. A major part of this responsibility is operation of test facilities that replicate shipboard operating conditions. NSWCCD-SSES is the only organization,

both public and private, that has the facilities necessary to provide the testing and training to support the USN. Without these facilities, NSWCCD-SSES would not be able to perform the following activities crucial to the USN:

- Testing/evaluation of existing naval propulsion and power generation equipment.
- Development of prototype propulsion and power generation equipment (fuel cells, etc) that are more efficient and less polluting.
- Evaluating engine retrofits and fuel options to reduce emissions.
- Resolution of Fleet technical issues.
- Development and testing of machinery control system hardware and software.
- Training of Ship crews.

III. Affected Sources

The affected sources are limited to those sources that are used for research, development, testing/evaluation, and training. The remaining stationary boilers and gas turbines operated by NSWCCD-SSES have a capacity outside of that affected by the Proposed Rule. NSWCCD-SSES also operates several stationary internal combustion engines that are used for emergency use only (emergency generators and fire pumps). Table 1 provides a description of each affected source, source type, proposed NOx standard, estimated NOx emissions and the capacity of each source. Table 2 provides the actual operating hours and NOx emissions for the affected sources during the period from 1999 to 2001. A more detailed description of the affected sources and a discussion of their unique operations for the purposes of testing and training are provided below.

A. Marine Boilers

The proposed regulation would affect three of the four marine boilers (DDG-15, CG-32, and DDG-37). The remaining boiler (CV-60) has a capacity greater than 250 million BTU per hour (mmBTU/hour) and is regulated under the NOx Budget Trading Program (25 PA Code Chapter 145). These marine boilers were installed between 1955 and 1968 and have not been used regularly since 1992 (the DDG-15 was operated briefly in 1998). These boilers were recently approved for reactivation in September 2002. The existing marine boilers are necessary to facilitate rapidly varying steam requirements during transient testing scenarios of submarine and aircraft carrier systems. Commercially available package boilers are not designed to accommodate these testing requirements.

B. Existing Gas Turbines

The USN requires testing of gas turbines under the same conditions as would exist shipboard for both military testing and crew training purposes. Operation of the gas turbines is performed on a limited basis for testing and training purposes only. These tests are typically of a short duration and transient in nature. Operation of these units is in support of Navy development and testing requirements such as:

- Prototype testing of organic and Original Equipment Manufacturer (OEM) developed Engineering Change Proposals (ECPs).
- Testing of next generation/upgrades to Full Authority Digital Engine Controllers (FADEC).
- Research and development testing of Condition Based Maintenance (CBM) algorithms to increase engine operating efficiency, reliability and to reduce maintenance/shipboard manning.
- Research and development testing of new/additional engine sensors in support of CBM.
- Test and evaluate OEM propulsion plant enhancements that improve turbine efficiency and/or reduce emissions to ensure system applicability to shipboard operational and environmental conditions.
- Resolve Fleet technical issues.
- Develop and Test machinery control system hardware and software.

The existing gas turbines are also used to provide state-of-the-art hot plant training to ensure military crew readiness.

C. Existing Diesel Engines

The USN requires testing of diesel engines under the same conditions as would exist shipboard for both military testing and crew training purposes. The operation of these engines is performed on a limited basis for testing and training purposes only. These tests are typically of a short duration and a transient nature. Operation of these units is in support of Navy development and testing requirements such as:

- Alternate Fuel evaluation.
- Emission reduction technology evaluation.
- Prototype testing of organic and OEM developed ECPs.
- Testing of next generation/upgrades to FADEC.
- Research and development testing of CBM algorithms to increase engine operating efficiency, reliability and to reduce maintenance/shipboard manning.
- Research and development testing of new/additional engine sensors in support of CBM.
- Resolution of Fleet technical issues.
- Military crew training.

D. Proposed P-104 Marine Gas Turbine (MGT) Test Cell

NSWCCD-SSES has been directed by Congress to construct and operate a new test cell (P-104 MGT Test Facility) located at the Philadelphia Naval Business Center for testing a variety of large and small gas turbines and fuel cells for the Navy's next generation surface combatants. This test cell, scheduled for construction in 2003, will be used to support research and development testing of a variety of gas turbines and hybrid gas turbine/fuel cell combinations for the next generation of naval propulsion and power generation systems. NSWCCD-SSES also anticipates using the test cell facility for

military crew training on next generation naval propulsion plants. The various No. 2 distillate oil fired gas turbine platforms to be installed in the test cell will be designed to simulate shipboard conditions. Much of the proposed testing will be conducted for the purpose of researching techniques to increase turbine efficiency and reduce emissions. These operations will include:

- Prototype testing of organic and OEM developed ECPs.
- Qualification testing of decommissioned LM2500 gas turbine assets for quality assurance prior to being installed on active duty naval vessels.
- Testing of next generation/upgrades to FADEC.
- Research and development testing of CBM algorithms to increase engine operating efficiency, reliability and to reduce maintenance/shipboard manning.
- Research and development testing of new/additional engine sensors in support of CBM.
- Testing of hybrid turbine-fuel cell propulsion and power systems for development of next generation ship service power plants for U.S. Navy vessels. Current testing facility (LBES) is too small and does not have utilities and support infrastructure to support such testing.
- Test and evaluate OEM propulsion plant enhancements that improve turbine efficiency and/or reduce emissions to ensure system applicability to shipboard operational and environmental conditions.
- Qualification and endurance testing of next generation surface combatant ship propulsion plants (i.e. LHD 8, DD(X)) including but not limited to the GE LM2500+ (35,000 hp).
- Provide military crew training on next generation surface combatant ship propulsion plants (i.e. LM2500+ for the LHD 8).

IV. Technical Feasibility

The application of NOx emission control technologies to meet the requirements of the Proposed Rule is not technically feasible for the affected power sources used for military testing and training purposes. Technical feasibility was evaluated for each source category and is discussed accordingly.

A. Marine Boilers

Naval marine boilers have extremely high power density compared to any industrial boiler of similar steam output. Naval design requirements include compact size, high capacity, high temperature steam, and the ability to respond to rapidly varying load changes. Consequently, marine boiler furnace heat release rates and gas temperatures are very high compared with commercial boilers. To achieve this, compact, high temperature flames are required. In comparison, the typical industrial boiler designed for low NOx burners cannot respond to rapid load changes due to the large size required to contain the very long and relatively low temperature flame within the furnace.

During the reactivation plan approval process, three of the boilers (DDG-37, CG-32, and CV-60) that had been inactive for more than 5 years were required implement the Best Available Technology (BAT) per Pennsylvania Regulations. During the BAT Analysis, NSWCCD-SSES evaluated low NOx burners and/or flue gas recirculation to control NOx emissions per the BAT requirement. However, because of the compact design and high temperatures associated with the marine boilers, these technologies were determined to be technically infeasible as discussed in Attachments 1 and 2.

In order to satisfy the BAT requirement, NSWCCD-SSES agreed to derate three of the four marine boilers (DDG-37, CG-32, and CV-60) by approximately 18% and accept additional fuel caps reducing the total allowable fuel cap by 38% beyond what was required by the Reasonably Available Control Technology (RACT) Plan. The permit was approved and three of the boilers have been reactivated. The remaining boiler will be reactivated in January 2003. Based on historical test data, NSWCCD-SSES anticipates that these boilers will emit approximately 0.3 lbs/mmBTU of NOx, which exceeds the proposed standard. The NOx concentration from each boiler will be determined during source testing scheduled to occur in February-March 2003.

Any additional restrictions on the operations of the marine boiler plant would render the facility unusable because the minimum steaming requirements discussed in Attachment 2 could not be achieved.

B. Gas Turbines

The existing LM2500 (LM2500-2A, LM2500-2B, and the APPGTS LM-2500) gas turbines and the proposed P-104 MGT Test Facility are designed to simulate shipboard conditions to support testing and crew training operations. Emissions from these gas turbines are uncontrolled.

Pre-combustion NOx controls such as steam or water injection would typically be implemented by power generation utilities, which operate gas turbines at steady state near full power conditions, to achieve the proposed emission requirements. However, pre-combustion controls alter the gas turbine operating characteristics and would invalidate test results. Therefore, these pre-combustion NOx controls are not feasible for testing or training facilities. Post-combustion controls, specifically selective catalytic reduction (SCR) would also alter the gas turbine operating characteristics. SCR would not be technically feasible under the rapidly varying exhaust flow rates over short durations that would be experienced during transient load testing and training operations.

Regarding the P-104 MGT Facility, the capacities of gas turbines planned for testing range from 150 horsepower (hp) to 35,000 hp. SCR sized for the largest turbine (35,000 hp) would not be compatible with the smaller turbines. Technical difficulties associated with the control of NOx emissions from aircraft engine test cells were acknowledged by the US Environmental Protection Agency (EPA-453/R-94-068, September 1994). The EPA Study concludes that since no full-scale add-on NOx controls have been applied to aircraft engine test cells, an accurate feasibility analysis is not possible. Since the

affected marine gas turbines are derived from aviation gas turbine platforms, the conclusions of EPA's study are also relevant to marine gas turbine test cells. Add-on emission controls have not been applied to any gas turbine test facilities in the US to date.

The existing gas turbines typically operate on a limited schedule (<200 hours annually) as indicated on Table 2. NSWCCD-SSES requested a fuel cap for the P-104 based on the maximum potential operating schedule of 1,000 hours annually. However, typical operations for the P-104 MGT Test Facility are anticipated to be similar to the existing gas turbines on average.

NSWCCD-SSES requested and obtained a determination from EPA that the P-104 MGT Test Facility is exempt from the Subpart GG NSPS for NO_x emissions based on the anticipated tests and military training to be conducted in the test facility. The determination is included as Attachment 3.

A detailed BAT/Lowest Achievable Emission Rate (LAER) analysis was performed to support the P-104 MGT permit application and is included as Attachment 4.

C. Diesel Engines

The addition of SCR would be necessary to meet the proposed NOx standard for our diesel engine testing and training platforms. Because these test sites are designed to simulate shipboard conditions for testing and training purposes, the addition of SCR would affect the operating characteristics of the marine diesel engines and would invalidate test results. Marine engines operated at NSWCCD-SSES are typically designed to meet mobile source emission requirements and would not achieve the more stringent standards for land based stationary sources.

The existing diesel engines typically operate on a limited schedule as shown on Table 2. Recently permitted diesel engines have been restricted to 500 hours of operation or less whenever possible.

V. Actual NOx Emissions

Although potential NOx emissions for NSWCCD-SSES are approximately 2,400 tons per year (tpy), actual NOx emissions for the facility, including sources not affected by Proposed Rule, have averaged only 15 tpy over the past 7 years. Emissions summaries for the affected sources during the last three years are included as Table 2. As shown on this table, the actual NOx emissions are normally less than 1% of the potential emissions. This is due to the limited operating schedule associated with testing and training operations.

VI. Cost

The cost of add-on NOx controls was not rigorously evaluated as it was precluded by the technical infeasibilities discussed above. However, annualized cost calculations were prepared during recent permit applications for the following sources:

- P-104 MGT Test Facility.
- Caterpillar 3512B Engine (Diesel Engine Test Cell).

The NOx emission control cost for the P-104 MGT Test Facility (Table 3) includes both installation and operation and maintenance (O&M) of an SCR system sized for the largest gas turbine planned for installation at the facility. The NOx emission control cost for the Caterpillar engine (Table 4) includes only the cost of the SCR equipment and O&M.

Conceptual cost estimates indicate that it is cost prohibitive to add SCR control systems to diesel engine or gas turbine platforms that are operated infrequently for limited durations. If the P-104 MGT Test Facility were equipped with SCR, it would not achieve optimal NOx removal efficiency due to the transient nature of our operations driving the effective cost per ton of NOx removed even higher.

VII. Regulatory Precedence

Allowing exemptions for those sources that do not meet the standard definition of NOx emitting sources is not unique. Federal and state regulations routinely provide exemptions for emission sources that do not operate in a steady-state, fully loaded mode. These exemptions have included sources that are operated for limited durations during testing, sources used intermittently for military crew training, and sources used for research and development to increase efficiency and reduce emissions.

Examples include Title II of the Clean Air Act which allows an exemption for new motor vehicles or new motor vehicle engines that are necessary for the purposes of research, investigations, studies, demonstrations, or training, or for reasons of national security. Another example is the proposed Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) for stationary combustion turbines (subpart YYYY) that recognizes limited use turbines as a separate subcategory. In addition, the EPA's proposed NESHAP (subpart PPPPP) for engine test cells recognizes test facilities as being unique and is proposing to not limit emissions from combustion turbine test cells. Military gas turbines for use at other than garrison facilities or for military training facilities are exempt from New Source Performance Standards (NSPS) for NOx. (40 C.F.R. 60.332(g)) Finally, Pennsylvania code allows for exemptions. In accordance with 25 PA Code 126.504(5) military tactical vehicles or engines are exempt from the proposed regulation for heavy duty diesel engines. All of these rules recognize that there are certain sources that do not fit the standard definition of sources that emit NOx and as such must be handled with special language allowing for exemptions.

VIII. Proposed Regulatory Language

We propose that the rule be amended to include a definition of the type of facilities that we operate and that those types of facilities be exempted. Provided below is suggested wording:

Definitions: Research, Development, Testing and Evaluation, and Training Facilities: Military facilities whose purpose is research, development, testing and evaluation, and training associated with naval marine machinery. At these facilities, sources are operated at transient power levels on an intermittent basis, based on specific research, development, testing, and training requirements.

Exemption: A facility for research, development, testing and evaluation, and training, as described above is exempt from theses rules.

IX. Conclusion

In conclusion, NSWCCD-SSES is unique in its use of power generation sources and as such should not be subject to the proposed limitations on NOx emissions. Add-on NOx control equipment would render the services provided at NSWCCD-SSES, including research, development, testing and evaluation, and training, technically infeasible since we would be unable to replicate shipboard conditions. Although NSWCCD-SSES is classified as a major source based on our potential emissions, our actual NOx emissions are relatively insignificant. If the commercially available NOx control devices were technically feasible, the costs associated with the installation and operation of these NOx control devices would be prohibitive considering our limited operating schedule. Implementation of the Proposed Rule would significantly impair our ability to perform our mission to support the current and future US Navy Fleet and would jeopardize the future viability of NSWCCD-SSES in Philadelphia. NSWCCD-SSES requests that the potentially affected emission sources, including boilers, gas turbines, and internal combustion engines, which are used to directly support our main purpose of research, development, test, evaluation and training be exempt from the proposed NOx rule.

Should you have any questions or need additional information, please contact:

Patrick Schauble
NSWCCD-SSES, Code 357
5001 South Broad Street
Philadelphia, PA 19112-1403
Phone: (215) 897-7057
Fax: (215) 897-1304

List of Tables

List of Attachments

TABLES

TABLE 1
PROPOSED RULE (PA Bulletin Doc. No. 02-1824)
NSWCCD-SSES AFFECTED SOURCES

GROUP ID	AMS ID	Description	Source Type	Capacity[(1)] (mmBTU/hour)	Proposed NOx Standard	Estimated NOx Emissions	Comments
xx	CU-M148	Bldg 633 Portable Compressor	Diesel Engine	1.1	2.3 grams/bhp-hr	>2.3 grams/bhp-hr	Permitted in 2002
3	CU-M111	DDG-51 GT LM-2500-2A	Gas Turbine	226	65/75 ppmvd	314 ppmv	
17	CU-M112	DDG-51 GT LM-2500-2B	Gas Turbine	226	65/75 ppmvd	314 ppmv	
22	CU-M140	GT APPGTS LM-2500	Gas Turbine	226	65/75 ppmvd	314 ppmv	
xx	PROPOSED	P-104 MGT Test Cell	Gas Turbine	238	65/75 ppmvd	350 ppmv	Proposed
12	CU-B101	Boiler DDG 37	Marine Boiler	196.7	0.2 lbs/mmBTU	0.3 lbs/mmBTU	Reactivated in 2002
13	CU-B102	Boiler CG-32	Marine Boiler	215.5	0.2 lbs/mmBTU	0.3 lbs/mmBTU	Reactivated in 2002
14	CU-B108	Boiler DDG-15	Marine Boiler	216.4	0.2 lbs/mmBTU	0.3 lbs/mmBTU	Reactivated in 2002
2	CU-M115	Diesel Engine LSD-41 Alpha	Test Engine	21.6	2.3 grams/bhp-hr	>2.3 grams/bhp-hr	
7	CU-M110G	Test Cell #1 North	Test Engine	11.5	2.3 grams/bhp-hr	11.75 grams/bhp-hr	Repermitted in 2002
11	CU-M118	Diesel Engine FFG-7	Test Engine	9.8	2.3 grams/bhp-hr	>2.3 grams/bhp-hr	Reactivated in 2002
16	CU-M116	Diesel Engine LSD-41 Bravo	Test Engine	21.6	2.3 grams/bhp-hr	>2.3 grams/bhp-hr	
18	CU-M110H	Test Cell #2 South	Test Engine	3.2	2.3 grams/bhp-hr	18.78 grams/bhp-hr	Permit Pending
xx	CU-M144	Bldg 87 Diesel Generator Testing	Test Engine	2.6	2.3 grams/bhp-hr	5.1 grams/bhp-hr	
xx	CU-M145	Bldg 77H Test Generator (Insig)	Test Engine	0.5	2.3 grams/bhp-hr	>2.3 grams/bhp-hr	Insignificant

Notes:

Only sources affected by the proposed rule are listed.

(1) Based on permit applications.

TABLE 2
PROPOSED RULE (PA Bulletin Doc. No. 02-1824)
NSWCCD-SSES OPERATING SUMMARY

GROUP ID	AMS ID	Description	Source Type	Capacity[1] (mmBTU/hour)	CY 1999 Operations[2]		CY 2000 Operations[2]		CY 2001 Operations[2]		Comments
					Hours	NOx (tpy)	Hours	NOx (tpy)	Hours	NOx (tpy)	
xx	CU-M148	Bldg 633 Portable Compressor	Diesel Engine	1.1	NA	NA	NA	NA	NA	NA	Permitted in 2002
3	CU-M111	DDG-51 GT LM-2500-2A	Gas Turbine	226	194	2.3	200	2.8	193	3.4	
17	CU-M112	DDG-51 GT LM-2500-2B	Gas Turbine	226	170	2.0	198	2.9	154	2.9	
22	CU-M140	GT APPGTS LM-2500	Gas Turbine	226	178	2.2	121	1.4	247	4.8	
xx	PROPOSED	P-104 MGT Test Cell	Gas Turbine	238	NA	NA	NA	NA	NA	NA	Proposed
12	CU-B101	Boiler DDG 37	Marine Boiler	196.7	0	0	0	0	0	0	Reactivated in 2002
13	CU-B102	Boiler CG-32	Marine Boiler	215.5	0	0	0	0	0	0	Reactivated in 2002
14	CU-B108	Boiler DDG-15	Marine Boiler	216.4	0	0	0	0	0	0	Reactivated in 2002
2	CU-M115	Diesel Engine LSD-41 Alpha	Test Engine	21.6	1	NA	1	0.03	1	0.005	
7	CU-M110G	Test Cell #1 North	Test Engine	11.5	30	0.2	0	0	36	0.3	Repermitted in 2002
11	CU-M118	Diesel Engine FFG-7	Test Engine	9.8	500	7.5	44	0.6	0	0	Reactivated in 2002
16	CU-M116	Diesel Engine LSD-41 Bravo	Test Engine	21.6	1	NA	1	0.03	1	0.005	
18	CU-M110H	Test Cell #2 South	Test Engine	3.2	NA	NA	NA	NA	NA	NA	Permit Pending
xx	CU-M144	Bldg 87 Diesel Generator Testing	Test Engine	2.6	NA	NA	NA	NA	7	<1	
xx	CU-M145	Bldg 77H Test Generator (Insig)	Test Engine	0.5	NA	NA	NA	NA	NA	NA	Insignificant
SOURCE TOTAL					-	14.2	-	7.8	-	11.4	
FACILITY TOTAL[2]					-	34.3	-	12.7	-	15.8	

Notes:

Only sources affected by the proposed rule are listed.

(1) Based on permit applications.

(2) Based on annual emission inventories.

TABLE 3

Annualized NOx Control Costs (P-104 LM2500+ Gas Turbine)

Capital Investment*	$6,439,000
Capital Recovery Factor (10% Interest, n=15 years)	0.1315
Annual O&M Cost	$200,000
Total Annual Cost	$1,046,729

Anticipated NOx Emissions (Based on 500 hours)	85.5 tpy
NOx Removed (assume 98% removal)	83.79 tpy
Cost of NOx treatment (per ton NOx)	$12,492.28

Notes

All costs are conceptual and are intended for budgetary estimates only.

* - Capital cost is for equipment and installation.

TABLE 4

Annualized Cost Estimate for NOx Control (CAT3512B)

Capital Investment*	$220,000
Capital Recovery Factor (10% Interest, n=3 years)	0.4021
Annual O&M Cost	$10,000
Total Annual Cost	$98,462

Potential NOx Emissions	9.37 tpy
NOx Removed (assume 98% removal)	9.18
Cost of NOx treatment (per ton NOx)	$10,722.67

Notes

All costs are conceptual and are intended for budgetary estimates only.

* - Capital cost is for equipment only and does not include costs associated with installation .

ATTACHMENT 1

DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER
CARDEROCK DIVISION

NAVAL SHIP SYSTEMS
ENGINEERING STATION
PHILADELPHIA, PA 19112-5083

IN REPLY REFER TO
9221
Ser 9222/039
MAY 3 0 2001

Mr. Roger Fey
City of Philadelphia
Department of Public Health
Air Management Services
321 University Avenue, 2nd Floor
Philadelphia, PA 19104-4543

Subject: NAVSEA PHILADELPHIA BOILER REACTIVATION

Dear Mr. Fey:

Thank you for your letter of 30 April 2001. The Naval Surface Warfare Center (NSWCCD-SSES) is committed to the use of Best Available Technology (BAT) to reduce emissions from our test plant, and any new steam generator we install will be of a design to achieve this goal. However, NSWCCD-SSES was incorrect when we advised you that we could reduce emissions by installing low NOx burners on our existing naval boilers. Flue gas recirculation is also incompatible with the operation of these boilers. In this letter we will explain the reasons for the above, and propose for your consideration a revised definition of BAT for naval-design boilers. The following is a brief overview of the technical and economic considerations:

Low NOx Burners

a. Naval boilers have extremely high power density compared to any industrial boiler of similar steam output. Naval design requirements include compact size, high capacity, high temperature steam, and the ability to respond to rapid load changes. Consequently, naval boiler furnace heat release rates and gas temperatures are very high. To achieve this, compact, high temperature flames are required. In comparison, the typical industrial boiler designed for low NOx burners cannot respond to rapid load changes due to the large size required to contain the very long and relatively low temperature flame within the furnace.

b. A low NOx flame will extend beyond the naval boiler furnace, raising steam temperature beyond design. Tubes, headers and piping that come in contact with superheated steam will be damaged. It is also probable that portions of the low NOx flame will be quenched when leaving the furnace, upon contact with relatively cold tube surfaces. This would result in incomplete combustion and unacceptable stack emissions.

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c. The design maximum furnace heat release rates compatible with low NOx burners are 200 KBTU/hr-ft^2 of radiant heating surface, or 100 KBTU/hr-ft^3 of furnace volume. The full power heat release rates of the three naval boilers in question are:

	KBTU/hr-ft^2	KBTU/hr-ft^3
CV-60	927	408
CG-32	1011	578
DDG-37	1111	440

To put this in perspective, the typical low NOx boiler furnace comparable in steam output to the CV-60 boiler is 30 to 40 feet long. The CV-60 boiler furnace is 9.5 feet long. Naval boilers are so far beyond the design limits for low NOx burners that neither of the major manufacturers, (COEN Company, Todd Combustion) have ever recommended a conversion.

Flue Gas Recirculation

a. Flue gas recirculation (FGR) is incompatible with naval boilers because increasing boiler gas flow 15 to 20 percent will increase the boiler draft loss by 30 to 45 percent. This is not insurmountable in a package boiler where draft loss at maximum output is typically 15 inches H_2O. The full power draft loss of the CV-60 boiler will increase from 50 inches H_2O to 70 inches H_2O with the installation of FGR. This will require replacement of the turbine-driven forced draft blowers with larger units, and strengthening of the boiler air casing. The increased gas velocity can cause flow-induced noise or potentially devastating tube vibration problems.

b. The boiler combustion air handling system will not allow sufficient time for the FGR to mix with the combustion air before entering the burner. This will result in damaging vibration at all load conditions.

c. The increased blower steam consumption would reduce the already marginal plant steam output. The equipment we plan to test will require the full capacity of our steam plant (for approximately 100 hours).

d. Any modification that would require de-rating the existing boilers would render us incapable of performing our mission. The impact of FGR is similar for the other two boilers.

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Economic Feasibility

a. NSWCCD-SSES' mission is to test and evaluate emergent naval propulsion technology. Consequently, the NSWCCD-SSES steam facility operation tracks these advances. Typically, our 50-year-old facility will operate intermittently for several years during test of the new equipment. The facility is then virtually idle for 10 to 15 years until the next generation of prototype steam propulsion machinery is developed. Enclosures (1) and (2) show our fuel consumption and estimated NOx emissions since 1986. NSWCCD-SSES next major steam propulsion equipment test is anticipated to be a $120M effort, commencing in the year 2007. NSWCCD-SSES is also planning a $20M facility upgrade for the test. However, we will not be able to do either under the present definition of BAT, because the test requires the rapid load changes unique to naval boilers. NSWCCD-SSES is the Navy's only full-scale steam propulsion equipment test facility. No significant future operations are possible without reactivating the CV-60, CG-32 and DDG-37 boilers. NSWCCD-SSES hopes that you will consider the low utilization rate and economic impact, as well as the technical considerations, when you reconsider our air management requirements.

In light of the technical unfeasibility of low NOx oil burners and flue gas recirculation on naval boilers, we propose Best Available Technology consist of:

a. Assuring the oil burners are adjusted to design specifications.

b. Tuning the boiler control systems to reduce emissions to the maximum extent possible.

Additionally, NSWCCD-SSES will:

a. Continue to log fuel usage and estimate NOx emissions using the reactivation emissions test results as a basis.

b. Train operators with emphasis on maintaining optimal combustion conditions.

c. Prepare and implement the required reactivation plan.

d. Continue to implement the maintenance plan while the boilers are inactive.

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e. Perform the testing and monitoring requirements of the Title V Operating Permit, including the installation of smoke indicating devices

f. Re-evaluate the PSD modeling analysis to include the deactivated sources.

In closing, NSWCCD-SSES regrets misinforming you about the feasibility of installing low NOx burners on naval boilers. NSWCCD-SSES looks forward to discussing this issue with you, and hopes you will reconsider the issue of BAT for naval boilers. Resolution of this issue by 30 June 2001 will allow the boilers to be properly reactivated prior to being out of service for ten years.

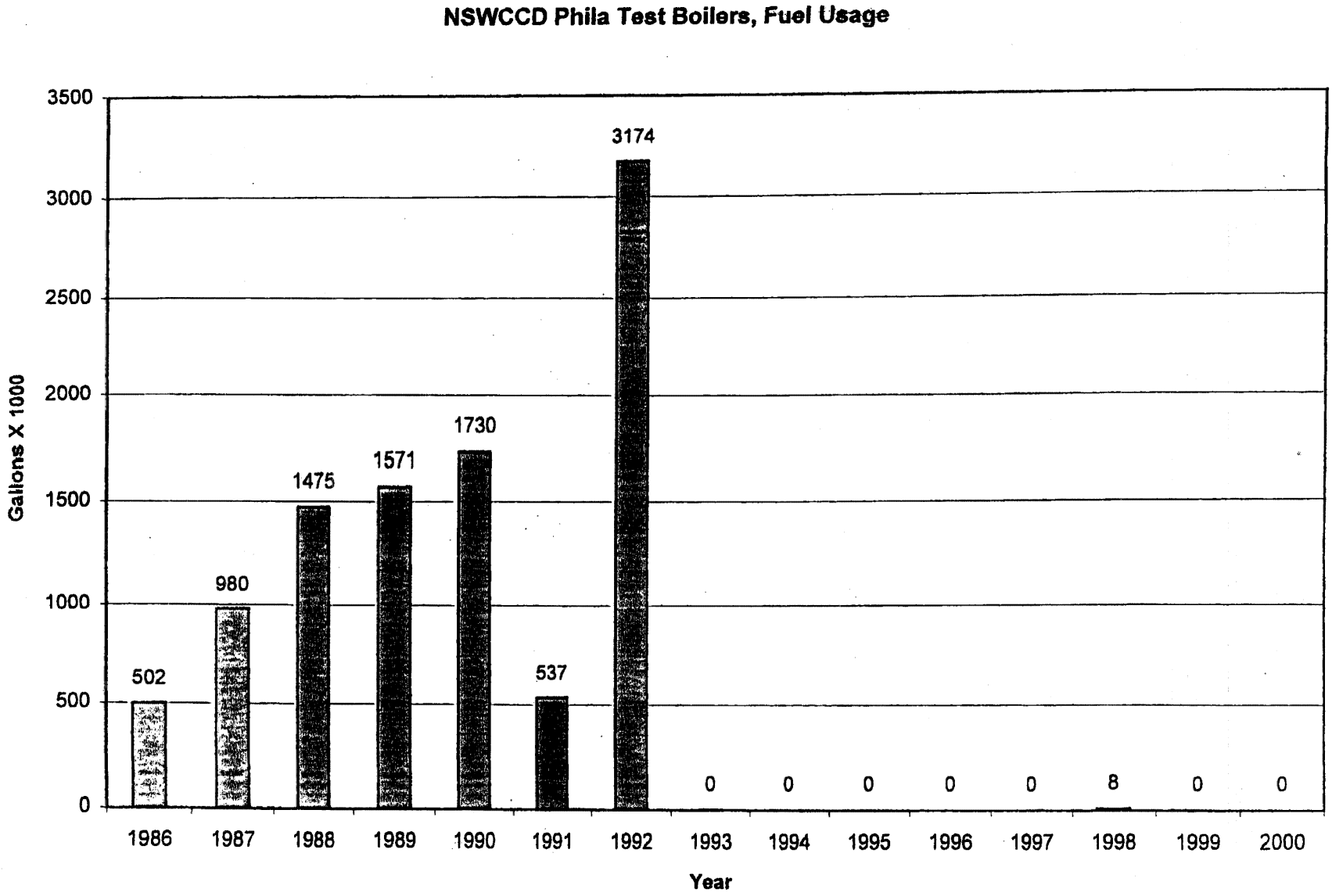
NSWCCD-SSES technical point of contact for boilers is Mark Rebold, telephone (215) 897-7188. NSWCCD-SSES technical point of contact for environmental issues is Patrick Schauble, telephone (215) 897-7057.

Sincerely,

K. J. Kiesel
By direction of the Commander

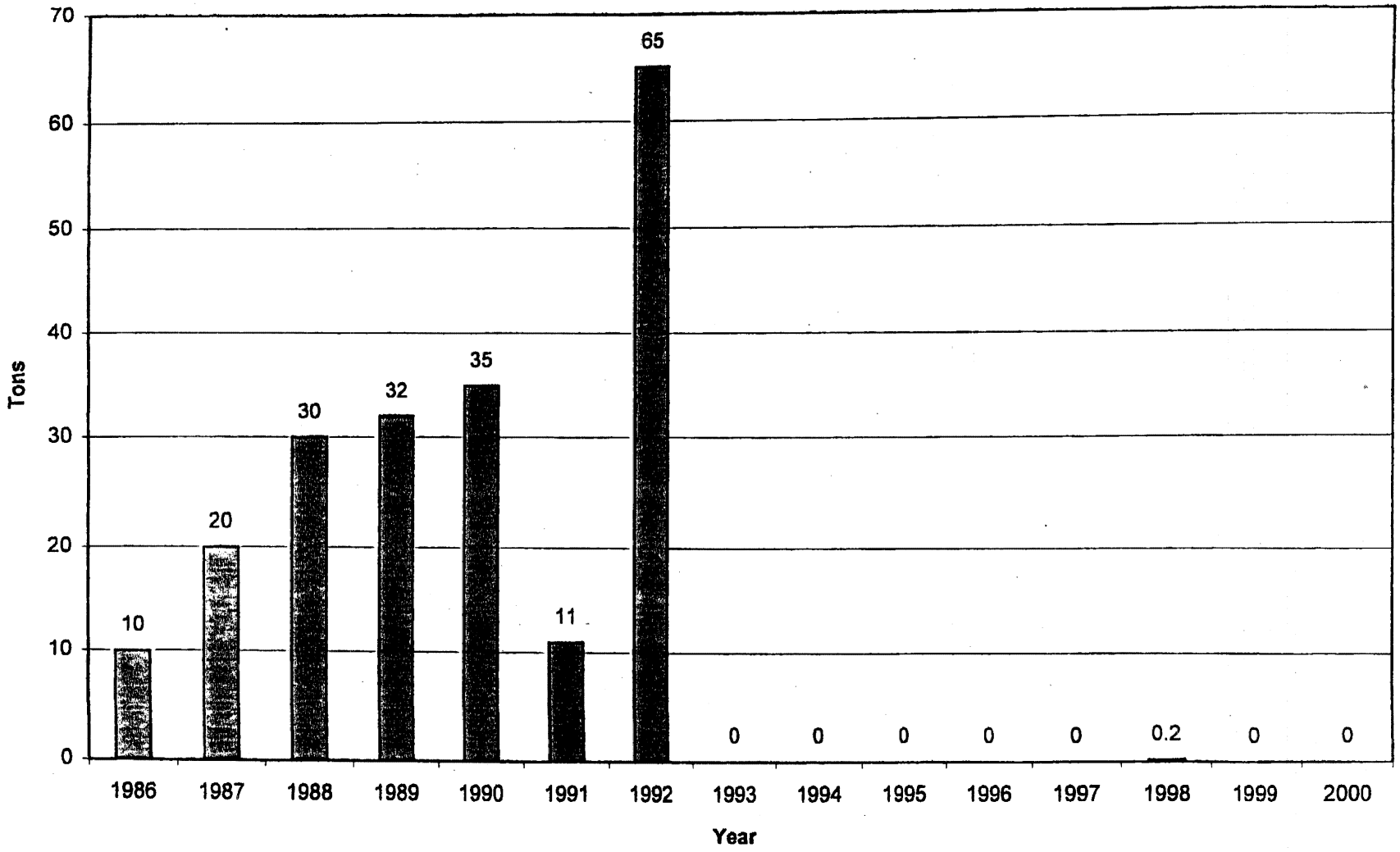
Encl:
(1) NSWCCD Phila Test Boilers, Fuel Usage
(2) NSWCCD Phila Test Boilers, Estimated NOx Emissions

Copy to:
Commanding Officer
Naval Facilities Engineering Command, Code 1811
Engineering Field Activity Northeast
10 Industrial Highway, MS #82
Lester, PA 19113-2090


NSWCCD Phila Test Boilers, Fuel Usage
Gallons X 1000
3500
3000
2500
2000
1500
1000
500
0
502
980
1475
1571
1730
537
3174
0
0
0
0
0
8
0
0
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year

Encl (1)

NSWCCD Phila Test Boilers, Estimated NOx Emissions



Encl (2

ATTACHMENT 2

EVALUATION OF THE BEST AVAILABLE TECHNOLOGY

Background

Per Philadelphia Air Management Services (AMS) email of 18 October 2001, derating the boilers to achieve a reduction in NO_x emissions similar to that anticipated for FGR (30-55% reduction) could be performed to satisfy the Best Available Technology (BAT) requirement to reduce NOx emissions. This BAT requirement applies to the following naval boilers: CU-B101 (DDG-37), CU-B102 (CG-32), and CU-B107 (CV-60). Low-NOx burners and flue gas recirculation were previously eliminated as emission control technologies because they are not technically feasible on these compact naval boilers. Consequently there is no track record of proven success. This is discussed in our letter to AMS (Serial No. 9222/039) dated 30 May 2001 included as enclosure (7).

Test Schedule and Steam Requirements

The planned testing schedule and associated steam requirements for the six possible tests that will require steam from the marine boilers are tabulated below.

Test Name	**Year**	**Steam Required (10^3lbs/hr)/Operating Hours**		
SSN Electric Drive	2006	632/500	253/500	126/500
CVNX MTG or SSTG or Crew Training	2007	500/500	200/500	100/500
Electric Drive Test 1	2008	500/500	200/500	100/500
Electric Drive Test 2	2009	500/500	200/500	100/500
Electric Drive Test 3	2010	500/500	200/500	100/500
Electric Drive Test 4	2011	500/500	200/500	100/500

Technical Feasibility

The target 30-55% NOx reduction desired by AMS will require a corresponding reduction in the allowable boiler firing rate. Derating 30% will reduce the steam output of the test plant as follows:

Boiler	Original Capacity (lbs/hr)	30% Derated Capacity (lbs/hr)
CV-60	261,500	183,050
CG-32	166,000	116,200
DDG-37	166,000	116,200
Subtotal	593,500	415,450
DDG-15*	137,500	137,500
Total	731,000	552,950

*not subject to BAT

The largest planned test, a 20 megawatt (MW) naval electric drive, will require 632,000 lbs/hr full power steam flow for a total duration of 500 hours. Consequently, the three boilers subject to BAT can only be derated an average of 17%. If these boilers were derated by 30%, an additional 79,050 lbs/hr capacity of steam would be required for the 500 hour 20 MW test. The steam requirements for all other planned tests could be achieved with a 30% average derating.

Emission Estimates

The projected NOx emissions for the 500 hour 20 MW SSN electric drive test using naval boilers derated 17% (Scenario 1) are compared to the 30% derated naval boilers supplemented by a new package boiler (Scenario 2):

Naval boiler NOx emission factor: 0.14 lb/mmBTU (from AP-42 for uncontrolled industrial boilers)

Package boiler NOx emission rate: (assume 50% reduction for LNB/FGR) 0.07 lb/mmBTU (50% of AP-42 emission factor)

BTUs required to generate 632,000 lb/hr of 1,200 psi @ 925°F steam for 500 hours:

Enthalpy of superheated steam h=1,455 BTU/lbm for 925°F steam @ 1,200 psi (from ASME steam tables, 6^{th} edition)
1,455 BTU/lbm (632,000 lbm/hr) 500 hr = $4.6X10^{11}$ BTU

Scenario 1: Total naval boiler NOx emissions:

$0.14X10^{-6}$ lb/BTU ($4.6X10^{11}$ BTU) = $6.44X10^{4}$ lb
= 32.2 tons

Scenario 2: Total naval boiler plus package boiler NOx emissions:

Weighted average emission rate- $\frac{0.14 \text{ lb/mmBTU } (552{,}950) + 0.07 \text{ lb/mmBTU } (79{,}050)}{632{,}000}$

$= 0.13$ lb/mmBTU

0.13×10^{-6} lb/BTU $(4.6 \times 10^{11}$ BTU$) = 5.98 \times 10^{4}$ lb

$= 29.9$ tons

NOx reduction due to 30% derating compared to 17% derating- 2.3 tons

Justification for Proposed Derating

Installation of a new 79,000 lbs/hr package boiler in our test plant providing 1200 psi @ 925°F steam will cost approximately $2,885,000. This is based on the cost estimate in the feasibility study prepared by Woolpert LLP for a 480,000 lbs/hr test plant upgrade. The costs shown below were reduced to reflect a smaller boiler:

Item	**1000 Dollars**
Boiler	900
Boiler delivery	135
Boiler installation	75
Foundation upgrade	150
Structural	170
Piping	100
Feedwater distribution	40
Stack	200
Demolition	605
Fuel oil distribution	25
OMSI (at 1.25%)	30
Subtotal	2,430
5% Contingency	122
Subtotal	2,552
6% SIOH	153
Total construction cost	2,705
Permitting	180
Grand total	2,885

The estimated capital cost that would be incurred to provide the required steam if the existing boilers were derated by 30% is $2,885,000 for the new boiler. This scenario results in a potential NOx reduction of only 2.3 tons during the year that the 20 MW test is performed. This corresponds to $1,254,348/ton-year for a one-time 500 hour test. Compared with the $10,000/ton as a benchmark for BAT economic feasibility, the costs associated with a 30% derating are clearly not feasible. The 17% average derating is cost effective, and results in NOx emissions only 2.3 tons greater than the 30% derating during the 500 hour test.

Based on the results of this evaluation, NSWCCD proposes to permanently deactivate one oil burner from each of the three boilers to satisfy the BAT requirement. Burners will be deactivated by removing the fuel atomizer assembly. The associated fuel line will be capped. This will result in an average derating of approximately 18%. We anticipate that the slight deficit in heat input resulting from the proposed derating would be acceptable. The proposed derating is cost effective and technically feasible. Further derating and subsequent installation of a new package boiler to accommodate the planned 500 hour 20 MW test is not cost effective or technically practical.

ATTACHMENT 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

AUG 0 9 2002

Mr. Patrick Schauble
Department of the Navy
Naval Surface Warfare Center
Carderock Division
Ship Systems Engineering Station
5001 S. Broad Street
Philadelphia, Pennsylvania 19112-1403

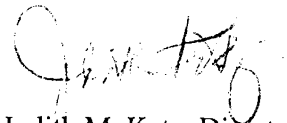
Dear Mr. Schauble:

The Philadelphia Regional Office of the U.S. Environmental Protection Agency (EPA) Region III has received and reviewed your request to the Philadelphia Air Management Services (AMS), dated July 29, 2002, requesting an exemption from the New Source Performance Standards requirements for Nitrogen Oxides (NOx) emissions under 40 C.F.R. Part 60, Subpart GG covering stationary gas turbines. After a review of your submitted package, and discussions with both Research Triangle Park and Headquarters personnel, Region III has decided to approve your exemption request. Section 60.332 (g) and (h) both allow EPA to exempt turbines that are owned by the military, other than those used in a garrison facility, and those used by manufacturers in research and development activities for emission control technique development and efficiency improvements. EPA believes that the objectives of the Navy proposal are consistent with the requirements of this Section and , therefore, agrees that the project qualifies for the exemption. According to your July letter, the Navy is proposing to install a MILCON P-104 Marine Gas Turbine Test Facility in Philadelphia, Pennsylvania to provide the Navy with a variety of testing capabilities for both current General Electric Model LM2500 turbine propulsion systems and the research and development of ship propulsion and power plants for future surface combatants and auxiliary vessels. According to your submission, one of the uses for the new facility will be to test and evaluate propulsion plant enhancements that improve turbine efficiency and/or reduce emissions to ensure system applicability to shipboard operational and environmental conditions. It is EPA's current understanding that the installation permit for the new testing facility will contain federally-enforceable conditions on annual fuel usage and limit the operating hours to approximately 2000 hours per year. The Navy has indicated that the actual operating hours will be around 500 hours on a typical basis.

Please work with the AMS to obtain the necessary permits for the new facility in a timely manner consistent with the Philadelphia portion of the Pennsylvania State Implementation Plan regulations. This determination is consistent with past EPA determinations on this same issue as evidenced by the EPA Applicability Determination Index database, specifically Control Numbers 9600038 and 9700081 both issued by Region 1.

If you should have any comments or questions in regard to this matter, do not hesitate to contact James W. Hagedorn, of my staff, at (215) 814-2161.

Sincerely,



Judith M. Katz, Director
Air Protection Division

cc: Rafael Sanchez, OECA
Thomas Barsley, AMS
John Slade, PaDEP- Harrisburg Headquarters Office