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SOUTHERN COMPANY
Energy to Serve Your World®

August 8, 2007

United States of America
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

COMMENTS OF SOUTHERN COMPANY ON SUPPLEMENTAL NOTICE OF PROPOSED RULEMAKING FOR PREVENTION OF SIGNIFICANT DETERIORATION AND NONATTAINMENT NEW SOURCE REVIEW: EMISSION INCREASES FOR ELECTRIC GENERATING UNITS; 72 FED. REG. 26,202 (MAY 8, 2007) (E-DOCKET NO. OAR-2005-0163)

Electronic Submittal: http://www.epa.gov/edocket

Dear Sir or Madam:

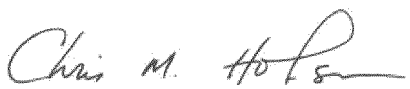
Attached are the comments of Southern Company on the U.S. Environmental Protection Agency's (EPA) proposed emission test for electric generating units. We appreciate the opportunity to submit these comments and look forward to seeing these important issues resolved. These comments are in addition to and supportive of the comments submitted by the Utility Air Regulatory Group.

Southern Company believes this proposed rule is extremely important. This rule will make it clear that the electric utility industry can undertake needed projects to maintain and improve the safety, efficiency, and reliability of its facilities and ensure that electricity is available to the citizens of the United States. Our comments support EPA's preferred Option 1 that adds an hourly emissions rate test to the annual test already established under the existing NSR regulations. This combined approach will provide the most meaningful and comprehensive analysis of the

possible effect a project may have on a unit's emissions, while simultaneously simplifying and clarifying the NSR emissions analysis. Within Option 1, Southern Company supports the adoption of the NSPS maximum achievable hourly emissions rate test. Alternatively, Southern Company would support an input-based statistical approach if revised in accordance with the attached comment to address flaws inherent in the statistical approach as proposed.

Please call me or Dan Warren at 205-257-6947 if you have any questions.

Sincerely,



BEFORE THE
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

Supplemental Notice of Proposed Rulemaking for Prevention of Significant Deterioration and Nonattainment New Source Review: Emission Increases for Electric Generating Units	)	**E-Docket No. OAR-2005-0163**

COMMENTS OF

SOUTHERN COMPANY

SOUTHERN COMPANY
30 Ivan Allen Jr. Boulevard, NW
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August 8, 2007

Supplemental Notice of Proposed Rulemaking for
Prevention of Significant Deterioration and Nonattainment New Source Review:
Emission Increases for Electric Generating Units
72 Fed. Reg. 26,202 (May 8, 2007)

Written Comments of Southern Company

I. Introduction

On May 8, 2007, the Environmental Protection Agency published a Supplemental Notice of Proposed Rulemaking ("SNPR") "recasting" its 2005 proposal to adopt an hourly emissions rate test for determining whether New Source Review ("NSR") applies to projects performed at electric generating units ("EGUs"). 72 Fed. Reg. 26,202 (May 8, 2007). The initial 2005 proposal introduced three options – a maximum achieved hourly emissions test, a maximum achievable hourly emissions test, and an output-based approach – but did not propose specific regulatory language. 70 Fed. Reg. 61,081 (Oct. 20, 2005). The SNPR provides specific regulatory language, and also identifies a list of possible hourly emissions test alternatives upon which comment is requested. On July 9, 2007, EPA extended the original comment period 30 days. 72 Fed. Reg. 37,156.

Southern Company and its subsidiaries operate 39,000 megawatts of electric generating capacity and serve over 4 million customers in the Southeastern United States. Southern Company and its subsidiaries have also been directly affected by the uncertainty associated with NSR applicability, as evidenced most notably by the allegations made against Alabama Power, which are currently on appeal to the United States Court of Appeals for the Eleventh Circuit. As such, Southern Company has a vested interest in revisions to the NSR program, particularly those focused directly on EGUs.

Southern Company fully supports EPA's efforts to adopt an hourly rate test for determining whether a project will trigger NSR preconstruction permitting requirements at EGUs. Southern Company agrees that the adoption of an hourly rate emissions test is well within EPA's discretion, and agrees that an hourly rate test will facilitate the completion of projects that will improve the safety, reliability, and efficiency of the nation's electricity supply without any detrimental impact to the environment. However, Southern Company also believes that the SNPR fails to address the causation aspect of the NSR analysis. Southern Company will not support any NSR applicability test that fails to take into account whether the project analyzed actually results in an emissions increase.

Assuming causation is explicitly addressed as part of any new emissions test, Southern Company supports EPA's preferred Option 1 – that is, the addition of an hourly emissions test to the annual test already established under the existing NSR regulations. This combined approach will provide the most meaningful and comprehensive analysis of the possible effects a project may have on a unit's emissions, while simultaneously simplifying and clarifying the NSR emissions analysis. Under Option 1, Southern Company supports the adoption of the NSPS maximum achievable hourly emission rate test, referred to as Alternative 5 in the SNPR. Southern Company supports Alternative 5 because consistency with the NSPS program will further ease the regulatory burden associated with determining the applicability of new source permitting and regulatory requirements to projects at existing EGUs. Southern Company cannot support the Alternative 1 statistical approach as proposed, but could support a revised version of the "achieved" test, as described in more detail below.

Southern Company appreciates the opportunity to comment on EPA's proposed EGU hourly emissions rate test, and offers the following comments on the supplemental proposal.

II. An Hourly Rate Test Promotes Safety, Reliability, and Efficiency

In its supplemental proposal, EPA restates the conclusion of its June 13, 2002 report to the President:

> EPA concludes that the NSR program has impeded or resulted in the cancellation of projects which would maintain and improve reliability, efficiency and safety of existing energy capacity. Such discouragement results in lost capacity, as well as lost opportunities to improve energy efficiency and reduce air pollution.

72 Fed. Reg. at 26,204. It has been Southern Company's experience that this conclusion is accurate – NSR has indeed served as a barrier to many projects intended to ensure safe, reliable, and efficient electricity production. Even those projects that do not trigger NSR are often delayed, or at least require the expenditure of a significant amount of time and effort to complete the NSR analysis. These constraints have affected Southern Company's efforts to provide the safest and most efficient and reliable energy production for the natural and human resources utilized.

For example, the NSR program has forced Southern Company and its subsidiaries, as well as other utilities around the country, to forgo efficiency projects that would allow existing units to produce the same amount of electricity from less fuel, or more electricity from the same amount of fuel. An hourly rate test will allow for efficiency projects because efficiency projects do not increase emissions on an hourly basis.

An hourly emissions test will also ensure that sources will not be penalized for performing projects that simply make EGUs more reliable. In many of the recent NSR enforcement actions, the current annual test has been used to argue that various component replacement projects could result in an emissions increase simply by theorizing that the unit might avoid a hypothetical future forced outage that might have occurred if the project had not been performed. This interpretation of the annual emissions test is unreasonable in that it fails to

account for the overall availability of the unit both before and after the project. Nevertheless, it discourages reliability projects that the proposed hourly test would allow to proceed. Reliability projects are not only necessary to ensure a dependable source of electricity, they also help ensure that catastrophic failures that could present a safety hazard to utility employees are avoided to the greatest extent possible. By discouraging reliability projects, the annual test, as interpreted in the enforcement initiative, places the nation's power supply at risk and endangers those working to provide that power.[1]

The removal of the disincentives to efficiency and reliability projects through adoption of an hourly emissions rate test will not result in any detrimental impact to the environment. As summarized in the SNPR, and demonstrated more fully in EPA's Technical Support Document ("TSD"), EPA determined that the adoption of an hourly emissions test for EGUs will not result in greater emissions to the atmosphere, even under the very conservative assumptions employed by EPA in its analysis. The TSD clearly shows that even if EGUs alter their operations in ways far more dramatic than actually expected, county-level emissions will not increase and local air quality will not diminish as a result of the adoption of an hourly emissions test for determining NSR applicability.

It is also important to note, as EPA pointed out it its initial 2005 proposal, that NSR "is not designed to cut back on emissions from existing major stationary sources through limitations on their productive capacity, but rather to ensure that they will install state-of-the-art pollution controls at a juncture where it otherwise makes sense to do so." 70 Fed. Reg. at 61,088. As the United States Supreme Court recognized in its landmark Chevron case, Congress intended the nonattainment provisions of the Act "to accommodate the conflict between the economic interest

[1] When causation is properly accounted, the annual test itself focuses very heavily on changes in hourly emission rates.

in permitting capital improvements to continue and the environmental interest in improving air quality." Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837, 851 (1984). Although tension between these competing but fundamental purposes is likely to be overlooked or summarily dismissed by some commenters, Southern Company believes that it is important to allow each of the Clean Air Act programs to work together in the manner designed by Congress. The significant emissions reductions EPA expects to achieve through the implementation of other Clean Air Act programs are a testament to the fact that the Clean Air Act works well as a whole. Programs such as the Clean Air Interstate Rule, the Clean Air Mercury Rule, and the Clean Air Visibility Rule, as well as the process for establishing the National Ambient Air Quality Standards and implementing Reasonably Available Control Technology and Measures to meet those standards, are all designed to reduce emissions and improve air quality to protect public health and the environment. Those programs are expected to achieve significant emissions reductions from EGUs in a remarkably short time frame.

In contrast to these programs, "the primary purpose of the major NSR program is not to reduce emissions, but to balance the need for environmental protection and economic growth." Id.; see also 72 Fed. Reg. at 26,204. The NSR program is simply not designed to reduce emissions, and is a poor substitute for those that are. Any attempt to use the NSR program to continually ratchet down emissions will only distort the very incentives NSR is designed to balance.

Accordingly, Southern Company supports the adoption of an hourly rate test to ensure that it, and other utilities around the country, has the flexibility to perform common-sense projects designed to improve the safety, reliability, and efficiency of existing EGUs.

III. EPA Is Legally Justified in Proposing an Hourly Test

Not only does the hourly test make sense from a practical perspective, an hourly emissions rate test is also well within EPA's regulatory discretion. EPA's 2005 proposal for an hourly emissions test was in part a response to the decision by the United States Court of Appeals for the Fourth Circuit in United States v. Duke Energy, 411 F.3d 539 (4th Cir. 2005), in which the court held that EPA must read the 1980 Prevention of Significant Deterioration ("PSD") regulations to contain an hourly test. However, EPA also justified its hourly emissions test proposal by stating that it would allow owners and operators of EGUs "to make changes that, without increasing existing capacity, promote the safety, reliability, and efficiency of EGUs." 70 Fed. Reg. at 61,083. EPA recognized that the current emissions test discourages EGUs from undertaking such beneficial projects. Id.

The Fourth Circuit's decision was subsequently vacated and remanded by the United States Supreme Court on April 2, 2007. Envtl. Def. v. Duke Energy, 127 S. Ct. 1423, 167 L. Ed. 2d 295 (2007). EPA published the SNPR roughly a month later, noting that the Supreme Court's decision does not foreclose EPA from revising the regulations to adopt an hourly rate test, so long as it has a rational reason for doing so. 72 Fed. Reg. at 26,204. Although EPA recognizes in the SNPR that Duke Energy eliminates the national consistency concerns raised in its initial 2005 proposal, EPA continues to propose the hourly rate test in order to avoid discouraging safety, reliability, and efficiency projects at EGUs. Id. In fact, the Supreme Court's decision in Duke Energy confirmed that the Clean Air Act gives EPA the discretion on how to interpret and apply the statute's definition of "modification." Envtl. Def. v. Duke Energy Corp., 127 S. Ct. 1423, 1434 (2007) ("EPA's construction [of the term 'modification'] need do no more than fall within the limits of what is reasonable, as set by the Act's common definition."). Thus, the

Court's decision does not foreclose an hourly emissions test as some commenters may suggest. Rather, the Court merely determined that the specific NSR regulations promulgated in 1980 do require an annual emissions analysis. Nothing in the Supreme Court's opinion precludes EPA from changing that test as needed to better accomplish the goals of the Clean Air Act.

Likewise, the D.C. Circuit has also recognized that the Clean Air Act does not require an annual emissions test. Instead, the D.C. Circuit has determined that the word "increases" in the definition of "modification" found in the Clean Air Act is ambiguous, thus allowing EPA the discretion to interpret the term in any manner that reasonably comports with the policy of the Act. New York v. EPA, 443 F.3d 880, 888-889 (D.C. Cir. 2006) ("Congress's use of the word 'increases' necessitated further definition regarding rate and measurement for the term to have any contextual meaning."); New York v. EPA, 413 F.3d 3, 23-24 (D.C. Cir. 2005) ("Different interpretations of the term 'increases' may have different environmental and economic consequences, and in administering the NSR program and filling in the gaps left by Congress, EPA has the authority to choose an interpretation that balances those consequences.")

EPA is given deference for any reasonable interpretation of the statute. Chevron, 467 U.S. at 843-44. The adoption of an hourly emissions rate test for EGUs is a reasonable interpretation because it is consistent with the underlying policy of Clean Air Act's NSR program – it allows EGUs to perform needed efficiency and reliability projects to meet growing demand while maintaining the level of environmental protection assured by the Clean Air Act.

The proposed alternatives for an hourly emissions rate test are also consistent with the D.C. Circuit's command that emissions increases be defined in terms of "actual" emissions. See New York v. EPA, 413 F.3d 3, 40 (D.C. Cir. 2005). Each of the six alternatives provided in the

SNPR requires a calculation based on actual emissions data; none of the alternatives rely on allowable or potential emissions.

For example, Alternatives 1 through 4 for determining a unit's maximum achieved hourly emissions rate rely on either a statistical analysis of actual emissions data or a single hour of actual emissions data to measure whether a unit will experience an emissions increase as a result of a project. Likewise, the NSPS-like maximum achievable hourly emissions tests proposed as Alternatives 5 and 6 are based on the level of operations an EGU was actually and legally capable of accommodating in the five years preceding the project. The NSPS regulations make it clear that the achievable test is based on actual emissions by contemplating the use of material balance, continuous monitoring, or manual emissions tests to determine a unit's maximum achievable hourly emission rate where an emissions factor analysis remains inconclusive. See 40 C.F.R. § 60.14(b). Each of these forms of measurement depends on actual emissions data; they are not in any way based on an "allowable" or "potential" emissions calculation (terms associated with *annual* emission totals in any event). Finally, even the output-based alternatives provided in the SNPR, regardless of whether "achieved" or "achievable," are firmly grounded in "actual emissions" – the output-based approach simply measures "actual emissions" per unit of energy rather than per unit of time.

Accordingly, EPA's proposed alternatives for an hourly emissions test for NSR applicability are authorized under the decisions of the United States Supreme Court and the D.C. Circuit Court of Appeals.

IV. Causation

Before addressing the various alternatives in the proposal, it is necessary to comment specifically on the central role of causation in any emissions test. The Clean Air Act itself

clearly establishes a causation requirement for both the NSR and NSPS programs; that is, any emissions increase at a unit must be *caused* by a project before the project will trigger new source permitting and regulatory requirements. Specifically, the NSPS and NSR statutes require causation by defining "modification" as "any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted." 42 U.S.C. § 7411(a)(4); see 42 U.S.C. § 7479(2)(c) (emphasis added).

Accordingly, therefore, simply projecting an increase, measuring an increase, or showing that one has occurred at a given EGU, is not the end of the analysis. Once an increase in emissions is identified (on an hourly or annual rate basis), the Clean Air Act requires that the increase must have resulted from some change before NSR can be triggered.

The current NSR regulations implement this causation requirement by defining "major modification" as "any physical change in, or change in the method of operation of, a major stationary source that would result in … a significant emissions increase … and a significant net emissions increase …," 40 C.F.R. § 52.21(b)(2), 52.24(f)(4). The rules clarify this definition by requiring sources to exclude "demand growth" emissions, 40 C.F.R. § 52.21(b)(41)(ii)(c). Specifically, sources must exclude from projected actual emissions "that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions … and that are also unrelated to the particular project, including any increased utilization due to product demand growth." 40 C.F.R. § 52.21(b)(41)(ii)(c). This "demand growth" exclusion has been upheld by the D.C. Circuit. New York v EPA, 413 F.3d 3, 33 (D.C. Cir. 2005).

As is made clear by the discussion in part V of these comments, infra, any statistical method will result in some level of false positives – i.e., emissions increases that are the result of (i) independent factors or, indeed, (ii) the statistical method itself. This fact highlights the critical importance of statutory causation to the NSR analysis.

Southern Company is very concerned however, that the SNPR fails to address (or even mention) the causation aspect of the NSR applicability analysis. Not only does the SNPR fail to specify that the causation element will be incorporated into the proposed EGU hourly emissions test alternatives, but certain statements within the SNPR could possibly be interpreted to mean that causation would not be considered as a part of the new hourly test. For example, EPA states twice in its description of Option 2 that "any increase in the emissions under the maximum hourly achievable emissions test would logically be attributed to the change." 72 Fed. Reg. at 26,206 & 26,220. This statement is not only false – another cause, unrelated but contemporaneous with the change, could result in the calculation of an hourly emissions increase[2] – it also fails to incorporate the statutorily-required causation element of the NSR applicability analysis.

The proposed regulatory language provided in the SNPR also contains a provision that could be easily misinterpreted. Proposed 40 C.F.R. § 51.167(f)(1)(iii), entitled "Post-change emissions – actually achieved," deems an emissions increase to occur if any hourly rate in the five years following the project exceeds the baseline maximum hourly emission rate determined under Alternatives 1 through 4. In the absence of clarification from EPA, this provision could be misinterpreted to mean that either NSR permitting is required, or perhaps even that an NSR violation has occurred, merely because a unit exceeded its baseline hourly emission rate less than

[2] For example, a minute change in the composition of the coal combusted (by definition excluded from NSR) could result in the calculation of an emissions increase under any of the proposed alternatives, even though the increase was not attributable to a particular physical or operational change.

five years after a project. This interpretation fails to acknowledge that any emissions increase must be caused by a non-excluded physical or operational chance before it will trigger NSR permitting. Because this interpretation fails to take causation into account, it would contradict the express requirements of the Clean Air Act.

Option 1, by retaining the annual test, would address causation in the annual total emissions step. Nevertheless, the hourly test itself must also incorporate the causation aspect of the NSR analysis as well so that it may function as a stand-alone test for projects that do not cause an increase in a unit's maximum hourly emissions rate. Accordingly, Southern Company requests EPA clarify that the causation element of the NSR analysis will be incorporated into the new EGU hourly emissions test.

V. Southern Company Supports Adoption of EPA's Preferred Option 1

Assuming causation is properly addressed, Southern Company supports EPA's preferred "Option 1," which adds an hourly emissions rate test to the existing annual emissions test, resulting in a four-step analysis for determining emissions increases under NSR.[3] Southern Company supports Option 1. It represents the most comprehensive and meaningful analysis of a project's effect on emissions. Even though Option 1 involves a four-step analysis, it will clarify and simplify the NSR emissions analysis because the vast majority of projects have no effect on a unit's maximum hourly emissions rate and would therefore only require two steps of the analysis. In addition, Southern Company supports Option 1 because it retains annual netting and significance levels, two essential facets of the NSR emissions analysis. Southern Company prefers Option 1 over Option 2, which, at least for EGUs, would result in the wholesale replacement of the existing (and recently revised) annual emissions test.

[3] The four steps listed in the SNPR are (1) physical change or change in the method of operation, (2) hourly emissions increase, (3) annual significant emissions increase, and (4) annual significant net emissions increase.

In particular, Southern Company believes that the NSR program must retain annual netting and significance levels as a necessary part of the emissions analysis associated with determining NSR applicability for projects at existing EGUs. With regard to netting, the D.C. Circuit has held that the failure to implement a bubble, or netting, approach is unreasonable and contrary to the expressed purposes of the PSD provisions of the Clean Air Act. Alabama Power v. Costle, 636 F.2d 323, 401 (D.C. Cir. 1979). The court's Alabama Power decision makes it clear that "Congress wished to apply the [PSD] permit process … *only* where industrial changes might increase pollution in an area, not where an existing plant changed its operations in ways that produced no pollution increase." Id. (emphasis added). See also New York v. EPA, 413 F.3d 3, 26 (D.C. Cir. 2005) ("Under Alabama Power and the 1980 rule, a physical or operational change constitutes a 'modification' subject to NSR only if it results in a net increase in emissions.").

EPA states in the SNPR that it is "unclear" whether the D.C. Circuit would have required netting if the "test before the Court only considered the increases from the project under review and not source-wide increases from multiple projects." 72 Fed. Reg. at 26,220. On the contrary, the court specifically rejected any test that "only consider[s] increases from the project." The opinion plainly states that "[w]here there is no net increase from contemporaneous changes within a source, . . . PSD review, whether procedural or substantive, cannot apply." Alabama Power, 636 F.2d at 403 (emphasis added). As such, EPA's hypothetical "test [that] only consider[s] the increases from the project" would be just as unlawful under Alabama Power as the 1978 rule struck down by the court. Therefore, Option 2, which fails to allow for contemporaneous netting, is also unlawful under Alabama Power, and should be rejected in favor of Option 1.

In Alabama Power, the D.C. Circuit also addressed significance thresholds. Although the court held that EPA has the discretion to adopt significance levels, the court also expressly indicated that significance thresholds, along with netting, were necessary to "allow for improvement of plants, technological changes, and replacement of depreciated capital stock, without imposing a completely disabling administrative and regulatory burden." Id. at 200. Southern Company agrees with this analysis, and urges EPA to adopt an emissions test that continues to incorporate significance thresholds to help minimize the regulatory burden imposed on projects that will not have a meaningful impact on the environment.

Southern Company supports the adoption of Option 1, which retains significance levels and netting as part of the existing NSR emissions test.

VI. Southern Company Supports Adoption of the NSPS Test (Alternative 5) or, in the Alternative, a Revised Version of the Statistical Approach (Alternative 1)

Within Option 1, the SNPR provides six "alternatives" for consideration and comment. The six alternatives presented in the SNPR are essentially derived from three basic questions:

(1) Should the test be based on "achieved" or "achievable" emission rates?

(2) Should the test be input-based (lb/hr) or output-based (lb/MWh)?

(3) If the test is based on "achieved" emissions, should the test be based on a statistical analysis or on a single historical value (one-in-five-year baseline)?

Southern Company provides comments below on each of the above questions. As explained below, Southern Company supports Alternative 5, the "NSPS test," because it provides the greatest level of clarity (by employing a test with which sources are already familiar) and provides the greatest simplification of the analysis (by aligning the first step of the NSR emissions test with the NSPS emissions test), while maintaining the same level of environmental protection as each of the other alternatives. Southern Company would also support a corrected

version of the statistical approach proposed as Alternative 1, should EPA choose to adopt an achieved test.

A. Achieved or Achievable?

Both the achievable and the achieved tests are consistent with the fundamental purpose of NSR, namely balancing the need for environmental protection with the need for economic growth. Southern Company also agrees with EPA's assertion that the achieved test and the achievable test (as defined in the SNPR) will rarely, if ever, lead to different results in light of the statutory causation element of NSR.

However, the achievable and achieved tests differ substantially in the level of difficulty and effort required to complete the analysis. The achievable test will be much simpler to apply to a particular project than the achieved test because EGUs will already have conducted the NSPS achievable emissions test to determine NSPS applicability for the project. On the other hand, if an achieved test is adopted, sources will be required to conduct at least two different emissions analyses for the same project – one for NSPS and at least one for NSR – where a single test would otherwise suffice. If the NSR program is revised to incorporate the NSPS test, as Southern Company recommends, only one emissions test will be necessary for all projects that do not trigger NSPS.

Because a single test would minimize the regulatory burden associated with new source permitting and regulatory requirements while maintaining the same level of environmental protection, and in light of the fact that both the achievable and achieved tests will provide the same result in nearly all cases, Southern Company recommends EPA adopt Alternative 5.

Under this test, EGU's would first make an engineering determination of the impact of a given activity on the projected maximum hourly emission rate of the unit. This rate can be

influenced in three ways: (1) by changing the inherent maximum projected pollutant generating content of the fuel (e.g., increasing the sulfur content of coal); (2) by changing the stoichiometry of the boiler or performance of other systems (such as pollution control equipment) in a manner that affects the maximum projected pollutant formation or removal rate; or (3) by changing the maximum projected hourly fuel input rate. Engineering judgment as to each of these factors would constitute a projection of whether the maximum hourly rate would increase as a result of the project. If the analysis is unclear, material balances, or stack test or emissions monitoring would be used to determine the result.

B. Input-based or Output-based?

Although Southern Company certainly agrees with EPA that efficiency projects help protect the environment by ensuring that our natural resources are utilized in a responsible manner, an NSR applicability test based on output is not necessary to encourage the development and implementation of efficiency projects at EGUs and may, in fact, be counter-productive. NSR aside, utilities already have a strong economic incentive to improve efficiency, given that fuel costs make up a very significant portion of the variable costs associated with the production of electricity. All that is needed to encourage efficiency projects is the assurance that NSR will not inhibit (or prohibit) such projects; no additional incentive is needed.

Furthermore, even if an output-based test could perhaps increase the already-existing incentive to perform efficiency projects, such a test would likely have several undesirable side effects. First, an output-based test would discourage any projects that do not affect efficiency. Unless a project affirmatively improves efficiency, even a slight decline in efficiency in the future could result in the theoretical calculation of an emissions increase for the project – even if no change in the input-based rate occurs. This concern is particularly relevant to EGUs because

all EGUs experience cyclical declines in efficiency over time. Generally, the efficiency of an EGU will slowly degrade between planned outages, and can even fall rapidly if certain components suddenly fail. These losses in efficiency are recovered to the greatest extent possible during the planned outages, and the cycle begins again. As a unit's efficiency slowly degrades between outages, an output-based test would indicate an emissions increase occurred regardless of whether any individual project conducted during the previous outage had any effect on efficiency (or emissions), and even regardless of whether a non-excluded project was performed at all. Accordingly, a mandatory output-based test is unworkable.

Consider the circumstance of a unit which experiences a drop in efficiency due to a malfunction. It may be possible to perform a project that would recover at least some of the lost efficiency so that the unit could continue to operate as efficiently as possible until the next planned outage, when a more complete solution could be implemented. Because this "partial fix" project would not fully recover the efficiency losses caused by the malfunction, an output-based emissions test could indicate that an emissions increase had occurred simply because the unit would have been more efficient before the malfunction than after the project. Faced with these circumstances, the operator of an EGU might forgo the partial fix project, and the associated efficiency improvement. In contrast, an input-based test would allow the pre-existing economic incentive for efficiency improvements to control, and would not interfere with an owner's efforts to ensure its EGUs operate as efficiently as possible at all times.

Additionally, because the efficiency of an EGU generally decreases at lower loads, a unit will have a higher "output-based" hourly emission rate at those lower loads. As a result, an hourly test based on output emission rates could show an "emissions increase" simply because a unit operates a lower load (and lower efficiency) than the load upon which its maximum

historical rate was based.[4] Similarly, certain types of emission control equipment also perform less efficiently at lower loads, which could also result in a higher "output-based" emissions rate than previously calculated. Moreover, sorting and selecting historical data based on maximum heat input exacerbates these concerns by eliminating potentially high "output-based" emissions rates from the calculation. More generally, however, these practical realities reveal the inherent difficulties associated with establishing an NSR applicability test based on output.

Because there already exists sufficient economic incentive for efficiency projects, and because any increased incentive generated through the adoption of an output-based test would come only at the cost of discouraging other needed projects, Southern Company opposes the mandatory output-based tests identified as Alternatives 2, 4, and 6 in the SNPR. However, in light of the straightforward treatment of many efficiency projects under such a test, Southern Company would support using the output-based test as an option which a source could elect to apply at its discretion.

C. Achieved Alternatives: Statistical Analysis or Single Historical Value?

Southern Company believes that both the statistical and historical "achieved" alternatives proposed in the SNPR suffer from several flaws that must be remedied if EPA chooses to adopt an emissions test based on the maximum achieved hourly emissions rate of a unit. As part of Southern Company's effort to review and analyze the proposed maximum achieved hourly emissions rate alternatives, Southern Company personnel conducted a simulated baseline emissions analysis for three EGUs. That analysis revealed that, as currently proposed, each of the achieved emissions tests will be extremely difficult to conduct and will likely produce

[4] See Attachment A, comparing the input-based emission rates of a Southern Company unit to the output-based emission rates of the same unit over various loads. Although the input-based emission rates are a function of load, high apparent output-based rates occur over the entire useful load range. (Data for start-up and shutdown periods have been excluded).

unintended and arbitrary results in many cases. Notably, Southern Company's analysis revealed that the achieved alternatives will usually result in the calculation of an emissions increase even if a unit generates the identical emissions after a project as it did during the lookback period. Southern Company strongly opposes any emissions test that will indicate an emissions increase occurred even if a unit duplicates its baseline emissions performance exactly. However, Southern Company could support a variation of the input-based, statistical alternative described in the SNPR as Alternative 1, if changes are made to address the various concerns noted below.

1. Achieved Alternatives: Initial Concerns

Initially, Southern Company requests that EPA reject the historical "one-in-5-year baseline" approach because it will likely provide a poor representation of a unit's true maximum hourly emission rate characteristics. Relying on a single hour of emissions from the previous five years is simply impractical. Although the proposal would rely on five years of historical data, the maximum emissions rate could easily be exceeded during at least a single hour in the future due to the natural variation in the emissions characteristics of EGUs.

Southern Company also remains concerned that neither of the proposed achieved tests will alone suffice because the proposed tests are only well-suited for regulated NSR pollutants that are monitored continuously. Although EGUs generally monitor more pollutants continuously than most other source categories, there are still a number of regulated NSR pollutants that EGUs do not measure continuously. Given that EGUs only continuously monitor some of the regulated NSR pollutants, EPA will have to adopt multiple emissions tests if either the statistical or the historical achieved alternatives is selected. EPA recognizes this concern in the SNPR with regard to the statistical approach, and states that another emissions test will also be adopted should EPA choose to adopt either Alternative 1 or 2. 72 Fed. Reg. 26,216

("Because Alternatives 1 and 2 can be used only if one has CEMS or PEMS data, we cannot adopt these alternatives alone.")

However, the lack of continuous hourly data is also a concern for the historical approach as well (Alternatives 3 and 4) because the maximum historical achieved value taken from non-continuous measurement data (such as stack tests) will not take into account the natural variability of a source's emissions characteristics. It will be a very rare case indeed when a brief, periodically-performed Reference Method test will coincide with the maximum achieved hourly emissions rate at a unit. Thus, if either the statistical or historical approach is eventually chosen, additional tests must also be adopted for those regulated NSR pollutants for which continuous data is unavailable, unnecessarily complicating the NSR emissions analysis that could more easily be accomplished with a single test.

Both the statistical and historical approaches also fail to take into account the use of adjustment factors in calibrating the continuous emissions monitors ("CEMs") that provide the hourly data used to complete the analysis. CEMs are calibrated every three months during the required quarterly Relative Accuracy Test Audit ("RATA tests"). As part of the calibration, a certain adjustment factor is adopted to correct the CEMs readings to match the results of a contemporaneous Method test. As that adjustment factor changes over time, the same level of emissions may result in slightly different CEMs readings, once corrected with a slightly different adjustment factor. There remains a significant possibility that these slight adjustment factor changes could result in a CEMs reading that exceeds either the highest single historical hourly emissions rate previously recorded, or the Upper Tolerance Limit ("UTL") calculated as part of the statistical approach, even at the exact same level of emissions. Failure to take changes in

these adjustment factors into account could result in the calculation of an emissions increase even if the emissions profile of the unit has not changed whatsoever.

2. Achieved Alternatives: Simulated Analysis of Alternatives 1 & 2

Despite the initial concerns noted above, Southern Company conducted a simulated analysis of the statistical approach to determine how the proposed emissions tests would operate in practice. The comments below describe Southern Company's simulated analysis, the problems encountered, and possible solutions that Southern Company could perhaps support as an appropriate and viable "maximum achieved hourly emissions rate" test. Each of these revisions to the proposal would be a natural outgrowth of the UTL method proffered in the SNPR.

To perform the simulated achieved hourly emissions rate analysis, Southern Company used the statistical approaches proposed in the SNPR as Alternatives 1 & 2 to determine the baseline "maximum achieved hourly emissions rate" through calculation of the UTL based on continuous emissions data for three units for SO_2 and NO_x. The test was designed to determine the maximum achieved hourly emission rate from those units as if a project was scheduled to be performed at those units in the near future. The purpose of the simulation was to determine the level of difficulty associated with implementing the proposed tests and to compare the input-based and output-based alternatives of the statistical approach. The simulation also allowed Southern Company personnel to compare the various statistical approaches to the historical approach and to the NSPS achievable test as well.

Southern Company calculated the UTL as proposed, using the top 10% of the data for each of the three selected units in four different ways: (1) input-based, sorted by heat input, (2) input-based, sorted by hourly emissions rate, (3) output-based, sorted by heat input, and (4)

output-based, sorted by hourly emissions rate. Calculating these four scenarios at each of the three selected units for both SO_2 and NO_x provided Southern Company a total of 24 scenarios for comparison to help determine how the proposed statistical test would operate in practice.

The enormous effort required to conduct these simulated calculations revealed that the statistical approach is time intensive. Under the proposed statistical approach, a source must analyze every possible 365-day period during the five years preceding the change to determine which 365-day baseline period provides the "maximum achieved hourly emission rate" for each project. It took many man-hours for Southern Company to perform the emissions analyses. First there are 830 individual 365-day periods in every five year lookback period. Each individual scenario required managing 8760 hours of data. Accordingly, to do the UTL calculation, each pollutant at each unit required manipulating nearly 7.3 million data points for each version (heat-input / emissions / output-based sorting). Southern Company dedicated significant computer resources at once to the analyses in order to ensure they would be completed prior to the deadline for submission of comments on the supplemental proposal.

One of the more difficult aspects of the baseline calculations involved the exclusion of certain data points. Specifically, excluding data points that occur during periods of malfunction is an extremely difficult and time-consuming process that requires searches through historical records and event logs and comparison of those records with specific CEMs data points. Although perhaps a more automated process could be developed in the future to attempt to manage this administrative burden, Southern Company remains concerned that the burden this analysis places on regulated sources would be unnecessarily heavy, and many companies may not have the resources to conduct such an intensive analysis themselves and would be forced to hire consultants to perform the analysis. Determining the UTL for every 365-day period over a

five-year baseline for every non-excluded project will place a considerable burden on sources, particularly when compared to the relatively simple NSPS approach proposed as Alternative 5.

Most importantly, the results of the simulated baseline analyses also revealed a critical flaw in the statistical approach – the statistical test will almost always show an emissions increase, regardless of whether any change in emissions occurs at all. Of the 24 different scenarios analyzed 23 scenarios resulted in a UTL that was lower than many of the individual data points in the baseline period itself. This result occurred even when calculating the UTL for the 99.9th percentile of the population at a 99 percent confidence level.[5] In fact, in one scenario, the baseline emissions data contained nearly 400 individual data points that exceeded the UTL-derived "maximum achieved hourly emissions rate" that was determined according to the proposed statistical approach.[6] In other words, the analysis showed that even if a unit duplicates its lookback period emissions exactly in the years following a project, hour-by-hour, the proposed statistical calculation will almost always result in the calculation of emissions increases.

These results are not unique to Southern Company's units. Rather, as proposed, the UTL statistical method itself predicts that the natural variability of the data will result in several exceedances of the UTL in the future, even if the unit continues to operate exactly as it did during the lookback period.

The 99.9 percentile UTL defines a level at which there is a high confidence that 99.9 percent of the data used to generate the UTL lies below that level. In other words, only 1 in

[5] In addition, Southern Company's analysis reveals that performing the statistical test on anything less than the 99.9th percentile of the population or at anything lower than a 99 percent confidence level will only exacerbate the concerns noted above. As such, Southern Company strongly opposes any lower percentile or confidence level.

[6] See Attachment B, comparing actual hourly emission rate data against the UTLs calculated as proposed (sorted by emissions).

1000 data points in the underlying data set should lie above the UTL. But the UTL is then compared against more than 1000 data points. It is compared against 8760 hours/per x 5 years = 43,800 data points. A failure rate of 1 in 1000 would positively predict that the UTL would be exceeded 44 times! Unfortunately, any predicted and expected failures of the emissions increase test based solely on the statistical method chosen is not acceptable given the possible ramifications of triggering NSR.

Given this approach, the odds of a given EGU showing an emissions increase are very high. With a 99.9 percentile UTL, and assuming the idealized situation of statistical independence for illustration, there would be a $(0.999)^{43,800}$ = 0.00000000000000009% chance of no failures in a five year period. In other words, there is an essentially 100% chance that a given unit will show an emission increase where the baseline data is simply repeated in the future. Even if one assumes that the top 10% of the data is normally distributed (it is not), such that the resulting UTL need only be compared against the top 10% of the data for expected failures, and on top of that accounts for giving sources the choice of a single 365 day-based UTL by restricting the comparison period to a single year, the absolute best that could be said is that there is a $(0.999)^{876}$ = 42% chance that a given unit will show an increase in emissions in five years if the data simply repeats itself. The actual instances of a unit which show an increase (taken from Southern Company's work (1 of 24) and from Tables 9 & 11 of the technical analysis attached to the comments of the Utility Air Regulatory Group (2 of 32)) suggests a failure rate of over 95%. This result is arbitrary and meaningless as a test for NSR applicability.

Moreover, these results are particularly troubling in light of EPA's statement in the SNPR that "you must treat an emissions increase as occurring if the emissions rate actually achieved in any 1 hour during the 5 years after the change exceeds the pre-change maximum actual hourly

emissions rate." 72 Fed. Reg. at 26,216. This requirement renders the statistical test absolutely unworkable – a test that results in the calculation of an emissions increase even if a unit precisely duplicates every single hour of its past emissions performance cannot possibly function as an appropriate test for determining an emissions increase under NSR.[7]

In addition, demanding a comparison of every single future hour to a statistics-based UTL is also problematic due to the lack of meaningful guidance on the method for predicting, prior to a given project, future maximum hourly emission rates. The SNPR contains only a single paragraph regarding the method for projecting a "Post-Change Emissions Rate" that provides no practical advice on how to predict future maximum hourly emissions rates. See 72 Fed. Reg. at 26,225. The lack of meaningful guidance on the method for projecting future maximum hourly emission rates, combined with the significant likelihood that a future hourly emission rate will exceed the statistically-derived UTL, leaves sources in a very precarious position when deciding whether to obtain a pre-construction permit, particularly given the effort and expense required to obtain a permit and the possible consequences of improperly failing to do so.

Comparing the statistically-derived UTL to every future hourly emissions rate could also lead to other unintended and inappropriate consequences due to the heavy influence of variability in the baseline emissions on the UTL. The 24 scenarios calculated by Southern Company confirmed that the variability of the baseline data is a key factor in the baseline UTL – the greater the variability in the top 10% of the emissions data, the higher the standard deviation and therefore the higher the UTL. It is certainly appropriate to take into account the natural variability of a source's emissions profile to some extent, but an emissions test that depends so

[7] It also seems to ignore the statutory causation requirement, which must be incorporated.

heavily on the variability of baseline emissions, particularly when coupled with the problems identified above, punishes units that maintain a more consistent level of emissions performance. For instance, under the statistical approach, units with large and frequent upsets, whose emissions data points are very scattered throughout the baseline period, will have a much higher UTL than a similar unit with an identical mean emissions rate but a much more stable hourly emissions rate overall. Peaking units, units whose operations vary seasonally, and units with more variability in fuel content will also have a higher standard deviation and a higher UTL than base-loaded units whose operations do not fluctuate as dramatically.

It is also important to note that a unit's emissions variability is not always constant. An EGU's hourly emissions rate may become more or less variable over time. A unit that experiences greater variability in emission rates following a project will be restricted by an inappropriately low UTL even if the increase in variability is not the result of the project. Because variability is even more difficult to predict than actual maximum emissions, these circumstances also add to the complexity and difficulty of relying on a statistically-derived baseline without also employing a statistical analysis for purposes of assessing post-project emissions.[8]

In short, the comparison of a statistically-derived baseline maximum hourly emission rate to the maximum hourly emission rate achieved during a single hour after a project is simply unworkable as proposed, and will result in the calculation of an emissions increases following nearly every project, regardless of whether the a project actually has any affect on emissions.

3. Achieved Alternatives: Suggested Corrections on Alternative 1

[8] See Attachment C, comparing actual hourly emission rate data against UTLs calculated as proposed (sorted by emissions). This illustrates the severe impact of variability on the relative magnitude of the UTL versus the mean of the actual data.

As noted above, Southern Company's chief concern with the statistical approach is the requirement that sources compare a very large set of individual post-project hourly emissions rates (over 43,000) to a statistically-derived baseline rate. In addition, Southern Company remains concerned about the absence of meaningful guidance on projecting future emissions rates. Southern Company believes that both of these concerns can be addressed through the adoption of the achievable test. Alternatively, EPA could revise the proposed a statistical method in one or more of the following three ways.

1. Increase the UTL to achieve a true, 99% likelihood that a given unit will not show an emissions increase when the data is simply repeated.
2. Reduce the number of data points against which the UTL must be compared in the future to ensure a 99% likelihood that a given unit will not show an emissions increase when the data is simply repeated.
3. Use a statistical approach to measure future emissions rates in order avoid comparing statistical calculations to individual data points

Taking each possible revision in turn, first, increasing the UTL could ensure that 99% of all data points within a repeated baseline would lie below the UTL over a five year period. To approximate this statistically, the 365-day, top 10% effective UTL must be set at 99.9989%.[9] Again, this assumes that the top 10% of data points are normally distributed, meaning that this number may still be too low. This could easily and appropriately be accomplished within the framework of EPA's proposal by simply calculating the UTL over a shorter baseline period. Use of a shorter baseline period within the 5 year lookback is logical given that the new hourly test is intended to measure the short-term maximum emissions rates of a unit. There is nothing

[9] The UTL must be set such that $x^{876} = 99\%$. Solving gives $x = 0.9999885$.

inherently appropriate about the choice of a year's worth of data or even the top 10% of a year's worth of data, and such a choice is arguably inconsistent with the desire for focusing on short-term maximum emission rates. A possible approach to addressing this concern is to use a full data set, but over a smaller contiguous block of hourly data. If contiguous blocks of 24 hours or 168 hours are used to calculate the mean, the standard deviation, and the UTL using 99.9% percentage of interval and 99% confidence level, the UTL calculation will be more sensitive to the real variability of the data, and will more accurately capture the true, short term maximum emissions rate of a unit. UTL calculation could also then be compared to any single hour in the period after the change is made without resulting in as many false positives, i.e., those instances where the UTL is exceeded merely through the natural variability of a unit whose emissions has not in fact changed at all.[10]

With this possible corrections to the proposed UTL approach in mind, Southern Company used the three units and emissions data points discussed above and derived a UTL for the five-year period from each 24-hour and 168-hour period instead of from the top 10% of each 8760 hour period. As projected, this significantly reduced the number of scenarios in which the test would indicate an emissions increase occurred even if the unit precisely duplicated its baseline emissions levels exactly for the five years following a project.[11] Choosing a 24-hour UTL helps capture the maximum performance of a given unit, and, therefore, there is no need to

[10] Selecting 24 hours of data would approximate a relative 0.002% false positive rate, while choosing a UTL based on 168 hourly points would approximate a relative false positive rate of 2.8%. These would seem to bound the range of reasonable choices for such a test. [UTL for Z derived from 24 points = effective tolerance of 99.99992%; $1 - 0.9999992^{24} = .002\%$; and, UTL for Z derived from 168 points = effective tolerance of 99.9828% ; $1 - .999828^{168} = 2.8\%$]

[11] See Attachment D, comparing actual hourly emissions rate data against UTLs calculated based on 168 hour data sets. All the data, including low emissions data, is used to generate each UTL, not just the top 10%, so no sorting is required.

restrict the data to only the top10%. This avoids completely the question of sorting data by emissions or by heat input because all the data points are included.

The second correction would be limiting the number of future data points against which the UTL is compared to ensure a 99% confidence that a given unit would not have a false positive. Reducing the number of data points could best be accomplished in a manner that also addresses the manifest variability in the data. Specifically, instead deriving the UTL from single hourly rate data points, the UTL may be calculated over a year's worth of hourly rate data based on short term averages of that hourly data. Essentially, 52 weekly averages of the hourly emissions rate (after excluding startups, shutdowns, and malfunctions) would be used to calculate a 99.9% UTL for each 52 week period in the lookback period. Using weekly averages to calculate the UTL would then allow for a comparison against weekly averages of hourly emissions rates in the future. Importantly, this would still represent a test of maximum hourly emission *rates*, but the calculation would smooth the data to obtain a more representative view of the unit's operations and reduce the severity of the impact a change in data variability has on the test.[12] A UTL based on weekly averages in the manner described above could still result in 0.5% of units expecting UTL exceedances even if future emissions remain identical to past emissions,[13] but this would significantly improve the viability of the UTL test.

Finally, a statistical analysis could be applied to post-project data to allow for a more appropriate comparison to the statistical analysis of the pre-project data. For example, a mean to mean comparison between high instances in the pre-project and post-project periods could be performed. A student t-test, as used in the current NSPS program, could be applied to the top 3

[12] See Attachment E, comparing actual hourly emission rate data averaged over 168 hours against UTLs calculated from rolling 52 week averages.

[13] Again, this is approximate and illustrative in light of the lack of statistical independence among the emissions rates.

hours of data before and after a project to determine whether a statistically significant change in the mean maximum hourly emissions rate had occurred.

4. Backstopping False Positives

Regardless of which correction is used to minimize false positives, they will occur. In order to eliminate the internal inconsistency inherent in the UTL of showing increases where future data exactly mimics historic data, a backstop is required. The best and simplest method to achieve this is to automatically allow the same number of UTL exceedances in the future as occurred during the lookback period. In the idealized circumstance, EPA's proposal predicts 44 exceedences when the future precisely mimics the past. Because the proposed rule does not use normally-distributed data, many units have a much higher prevalence of exceedences. Accordingly, the final rule should provide that at least 0.5% of the post-change hours must exceed the UTL before an emissions increase has been identified. This would be set as a safe harbor level to ease the burden of implementing an already very complicated rule, but the rule must make clear, in order to make the test internally consistent, that each EGU can further exclude from its future data the any additional number of data points as lay above the calculated UTL during the lookback period.

VII. Miscellaneous Comments

In addition to the specific comments provided above with regard to each of the proposed options and alternatives, Southern Company would also like to offer the following additional comments on EPA's proposed hourly emissions test for EGUs.

A. Recordkeeping and Reporting

The SNPR specifically requests comment on EPA's proposal to rely on existing recordkeeping and reporting obligations to ensure compliance with the new EGU hourly

emissions test rule. 72 Fed. Reg. at 26,217. Southern Company fully supports EPA's efforts to avoid duplicative reporting, and agrees that sufficient recordkeeping and reporting requirements already exist to ensure state and federal regulatory authorities have the information they will need to implement and enforce the NSR program based on the new EGU hourly emission test.

B. Nationwide Coverage and Application to All Regulated NSR Pollutants

Southern Company would also like to express its support for the application of the new EGU hourly emission test to all EGUs throughout the country, and for all regulated NSR pollutants emitted from those facilities. Southern Company supports comprehensive application of the hourly test for the same reason it supports adoption of the NSPS test for the NSR program – a single, nationwide test for all units and all pollutants (and all programs) will both clarify and simplify the analysis of whether a project is expected to trigger new source permitting and regulatory requirements. A single test that maintains the same level of environmental protection, but at a fraction of the regulatory burden, is obviously superior. To avoid the unnecessary complication of the NSR emissions test through the adoption of multiple alternatives, Southern Company recommends the adoption of the hourly emission test for all EGUs and all pollutants.

VIII. Conclusion

As described in detail above, Southern Company generally supports EPA's efforts to adopt an hourly emissions test for EGUs, but requests EPA clarify how the causation aspect of the analysis will be incorporated into the proposed tests. Southern Company specifically supports EPA's preferred Option 1 and Alternative 5 because use of the NSPS test to determine NSR applicability will facilitate projects that are needed to maintain and improve the safety, reliability, and efficiency of the nation's power supply. Southern Company could also support a variation of Alternative 1 if the statistical approach in the proposal is corrected as outlined above.

Regardless of alternative, however, EPA's analysis makes clear that the adoption of an hourly emissions rate test for determining NSR applicability to EGUs will not result in any detrimental impact to the environment. Rather, Southern Company agrees with EPA's assertion that an hourly emissions rate test will maintain the environmental protections established by the Clean Air Act while minimizing the administrative burden on the regulated community, thus better serving the underlying policy of the NSR program.

Southern Company appreciates the opportunity to comment on EPA's supplemental proposal and urges EPA to adopt a final EGU hourly emission rate test as soon as possible.

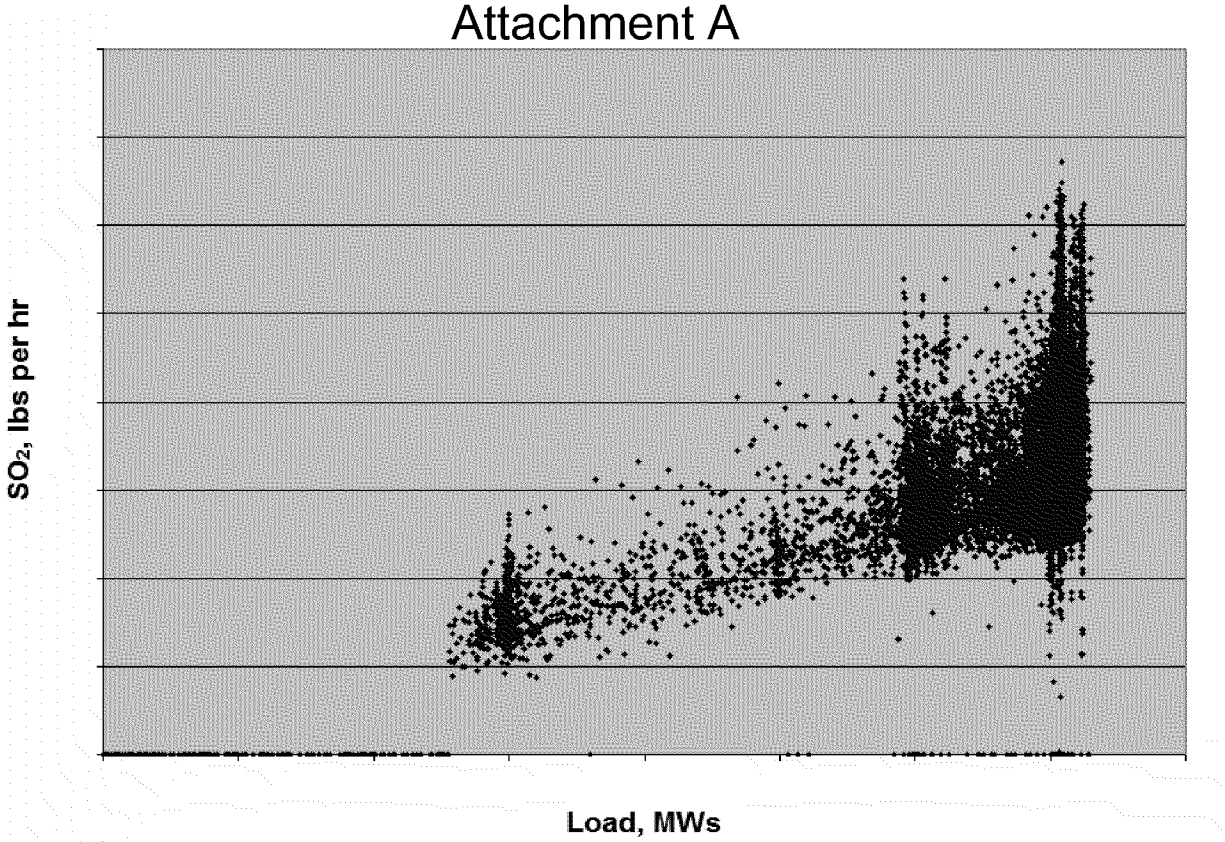

Figure A1. SO_2 emissions in lbs per hour as a function of unit load.

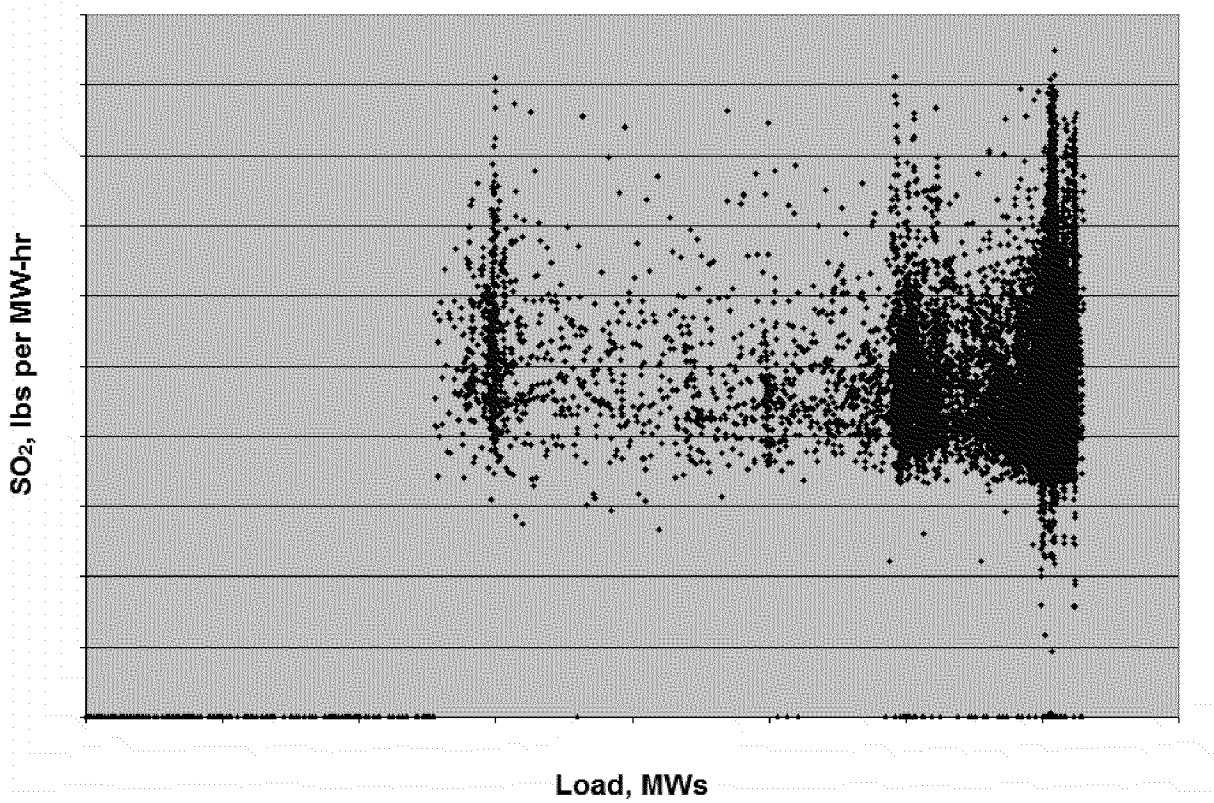

Figure A2. SO_2 emissions in lbs per MW-hour as a function of unit load, showing that mid-load output-based emissions are similar to full-load emissions.

Attachment B

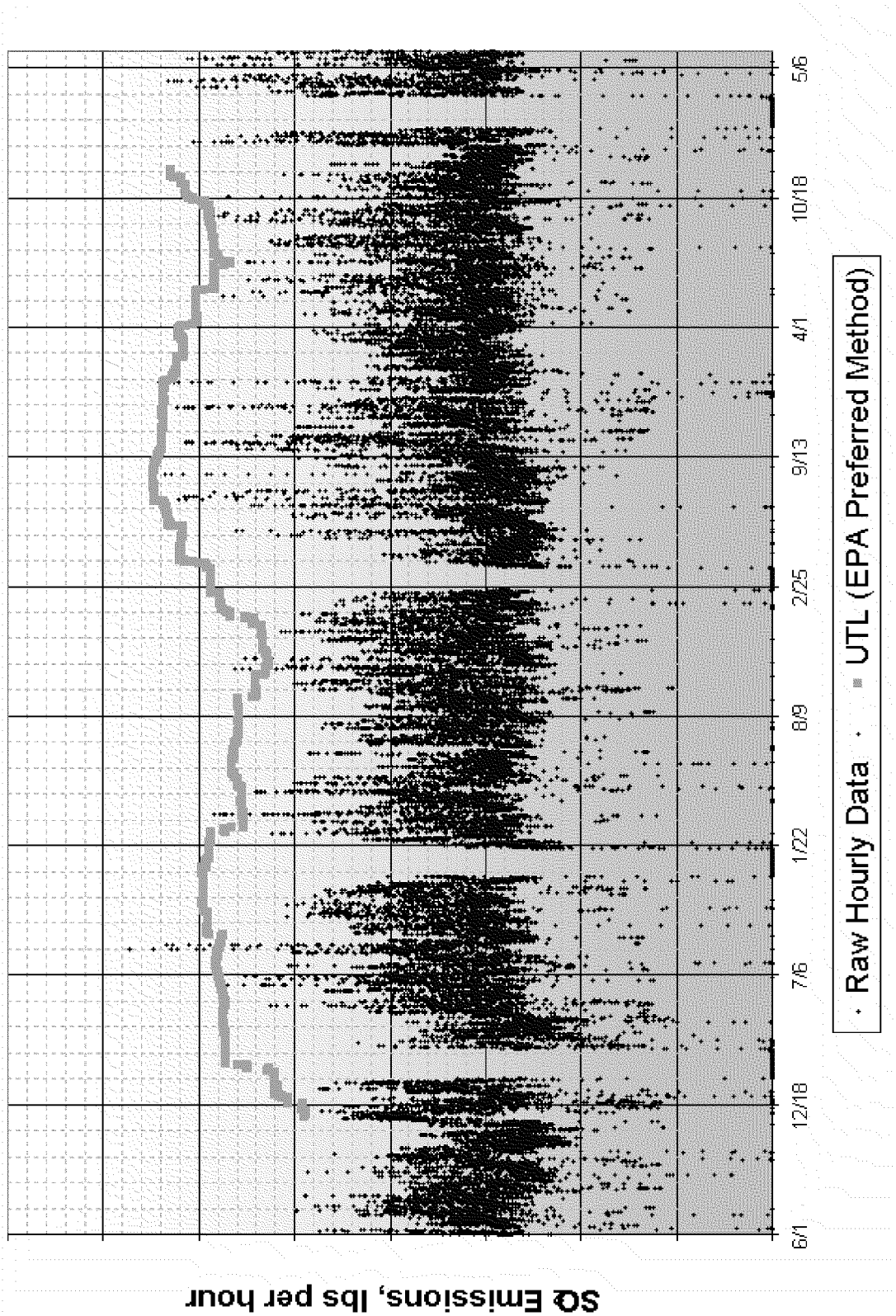

Figure B1. SO_2 emissions in lbs per hour for 5 years compared to the UTL calculated as the EPA method from the top 10% sorted by emissions rate.

Attachment C

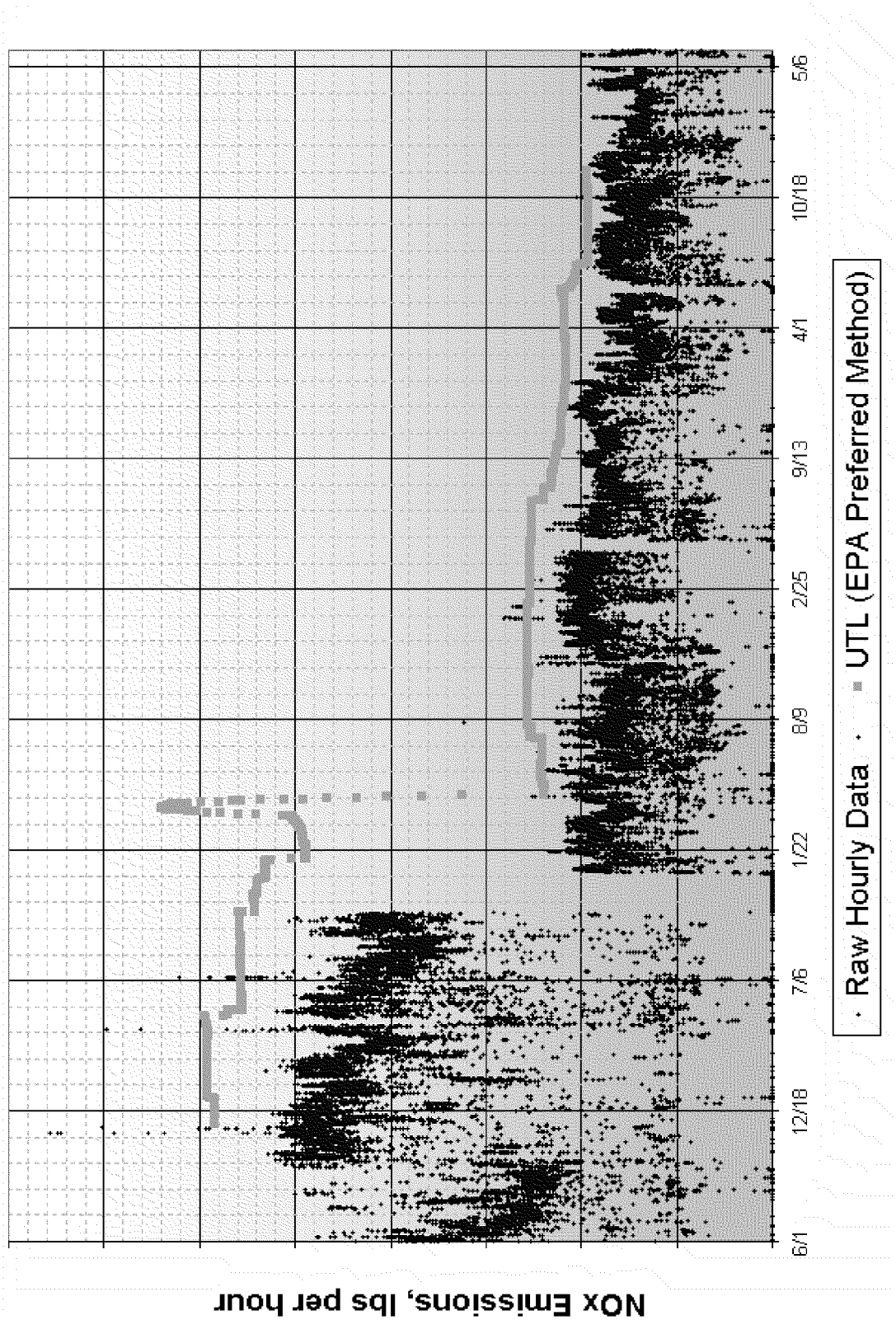

Figure C1. NOx emissions in lbs per hour for 5 years compared to the UTL calculated as the EPA method from the top 10% sorted by emissions rate.

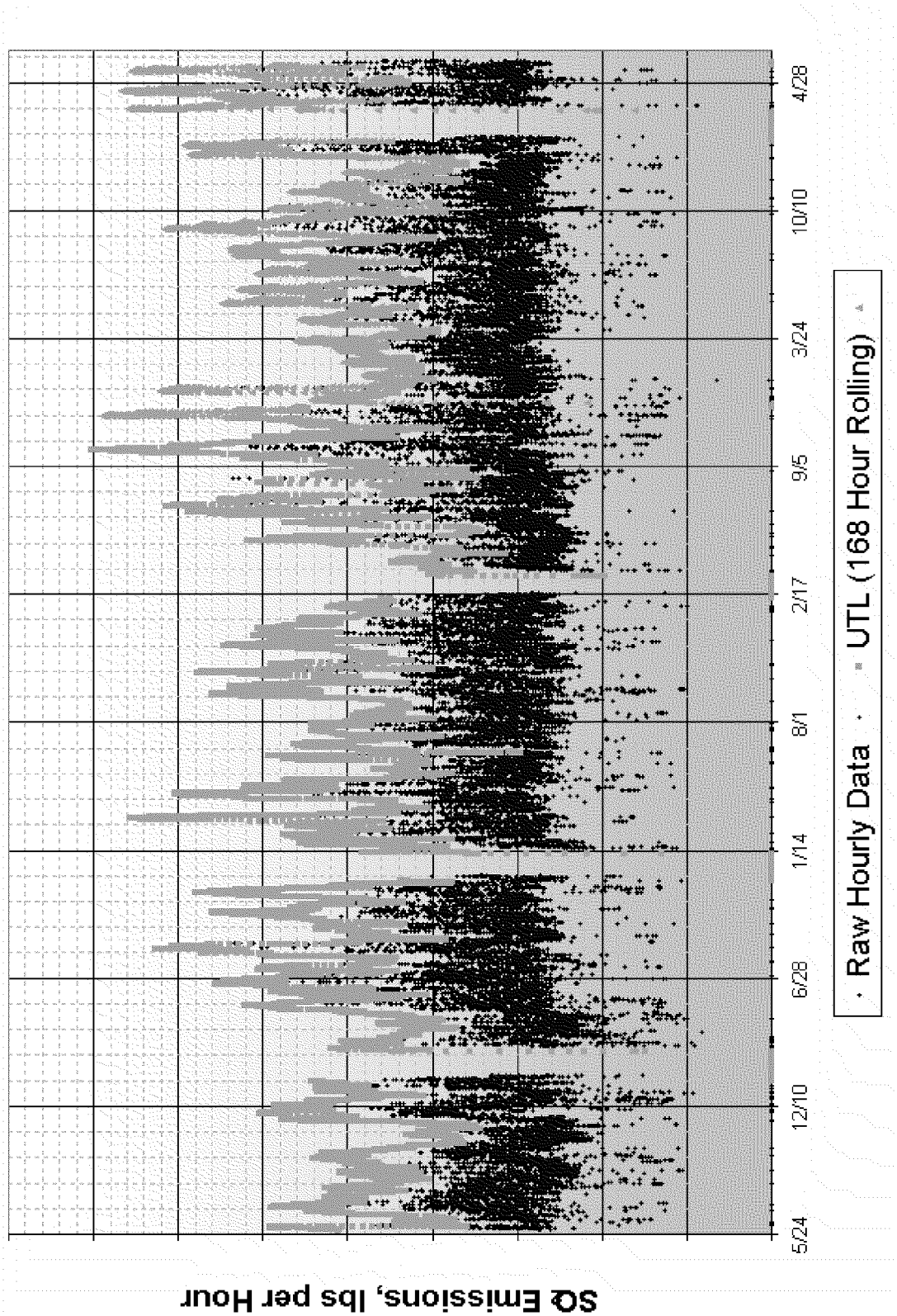

Figure D1. SO_2 emissions in lbs per hour for 5 years compared to the UTL calculated from contiguous 168 hours blocks using all the hourly data except malfunction, startup, and shutdown.

Attachment E

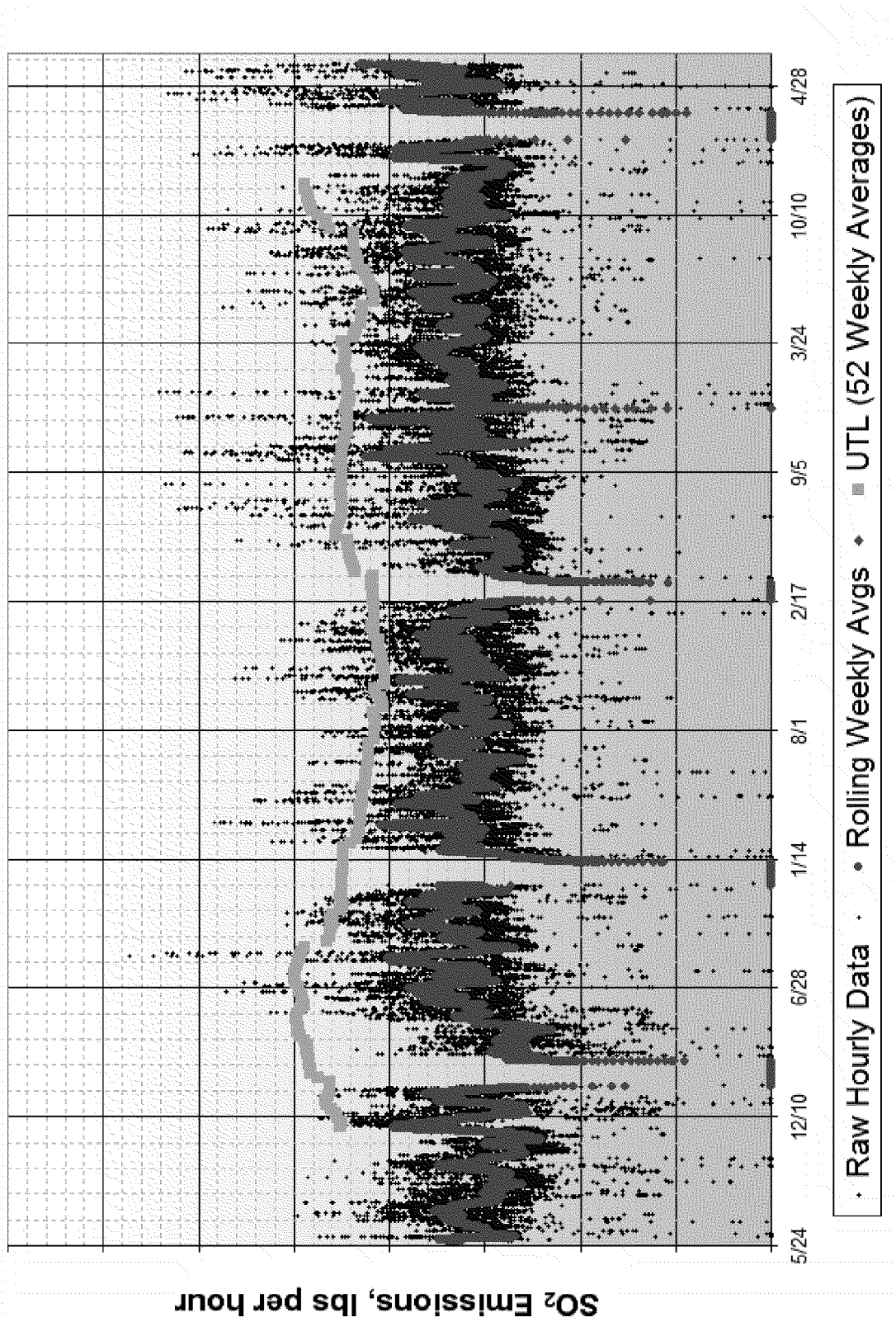

Figure E1. SO_2 emissions in lbs per hour for 5 years compared to the UTL calculated from a rolling year of 52 weekly averages of the hourly data. Also the rolling weekly averages are shown.