Compilation of Regional Comments on Draft PSD Clarification/Modification to Increment Modeling Procedures Rulemaking

Region 1 Comments:

From R1 e-mail:

I've concentrated on the proposed recodification and preamble involving increment modeling practice, especially emission rates.

Details in the attachments, but the code changes need to be linked to a clearly articulated benchmark in the preamble and a TSD. The proposal, whether viewed as a technical (my view) or policy matter, will make real world changes, and could be expected to fail without better support.

There's more to say - what have proprietary GUIs to do with proprietary/black box models? - but there's no time to get into that.

Brian Hennessey

DATE: 22 November 2006

SUBJECT: Region 1 Comments on 'Prevention of Significant Deterioration New Source Review: Clarification/Modification to Increment Modeling Procedures' (13 November 2006 draft)

FROM: Brian Hennessey, Region 1 Air Modeling Contact

TO: Sam Portanova, New Source Review Sublead

Region 1 EPA's comments on the draft proposed rulemaking and its preamble follow:

Rulemaking is welcome on the modeling procedures because practice modeling short-term PSD increment consumption has varied over time and place within Region1.

- See the attachment for summary histories on the procedures 4 of our 6 states use to characterize emission rates for short-term increment consumption.

- Also, in 1989 R1 sought unsuccessfully to obtain final definitive guidance on short-term increment modeling in order to comment on Maine's 8 March 1989 "Baseline and Increment Determination Procedures."

Without final guidance R1 and most of our states have used maximum allowable emissions (or something close to it) to model increment consumption by existing sources. PSD permit applicants are always modeled at maximum allowables because EPA's regulations require it and actual emissions would be difficult to forecast.

Because the draft NPR will change the way EPA reckons increment, consumption, however, EPA should make a technical support document or regulatory impact analysis available for the proposed action. At the R/S/L Modeler's Workshop (Boston 2004) Bill Harnett stated his intention to have a modeler/statistician investigate what difference using 'actual' (annual emissions averaged over actual operating hours) would make in increment assessment by existing sources. Such a study can only be considered if one defines a benchmark for increment assessment. But if the benchmark for increment assessment consists of modeling maximum allowable emissions a study is hardly necessary.

This leads to a second shortcoming in the draft: Rather than clarifying increment modeling practice and what it is seeks to do, the current draft may actually muddle matters more because the preamble does not define a benchmark on how short-term increment would be modelled under ideal circumstances. The preamble should also detail what it means for existing sources to consume increment: For example, does a hypothetical combination of hypothetical short term emissions and hypothetical past meteorology consume increment, or must EPA assess more realistic scenarios?

A hierarchical approach along these lines might work:

- Ideally actual increment-consuming concentrations should be calculated by modeling 2-year hour-by-hour emissions (as from CEM records) with concurrent hourly meteorological data.

- Because such recent data will often not be available and because Appendix W generally requires modeling with the most recent readily available 5 year period of meteorological data, EPA might relax this ideal to accept modeling averaged hour-by-hour emissions (paired hours, one from each year) over the 5-year meteorological period of record. [There may be other ways to reconcile the 2-year 'actual' period with the 5-year modeling requirement...] Averaging the 8760 paired hourly emission rates may moderate worst case short-term impacts, but using 5-years of meteorological data should compensate somewhat. A modeling study could justify this relaxation of the benchmark.

- Absent CEM records, short-term increment analyses should model with an emission rate obtained by dividing annual emissions (tons, whatever) divided by number of operating hours for the year. For something like a power plant, this means neglecting hours on hot-standby, hours down for maintainance, in short any hour when no product is delivered. Again, EPA should conduct a study to show whether or not this is usually acceptable - does not underestimate increment consumption relative to the benchmark.

[**N.B.** The brief codification in the draft appears to allow the use annual emission rates to assess short-term increment consumption. This will fail when, for example, a source is permitted to operate seasonally or is permitted to operate 8760 hours per year but typically operates a much lower number of hours. Again, a technical support document should be prepared to establish, relative to the benchmark, when if ever it is acceptable to model using annual average emissions rather 'actual' emissions, as defined here.

•As a last resort, lacking any data on actual operations, maximum allowable emissions could be used to model increment consumption. This does not need technical support but will often yield an uninformative overestimate, albeit a 'pass'.

Region 2 Comments:

Region 2's Comments on the November 13, 2006 Draft Proposal on PSD Clarification/Modification to Increment Modeling Procedures

To: Sam Portanova,
NSR Sublead Regional Contact, Region 5

From: Annamaria Coulter,
Air Modeling Contact, Permitting Section, Region 2

Thru: Steven Riva, Chief
Permitting Section, Region 2

References made to 40 CFR Part 51 Appendix W, "Guideline on Air Quality Models":

Many of the references made to this part of the CFR are irrelevant and only add confusion. Why are parts that are not being clarified or changed being discussed? For instance, how many and which years of meteorological data must be used in a modeling analysis? This is already clear in the regulations. In some cases, the citations are discussed out of context. For example, the writer of this draft rule claims that the modeling community commonly refers to Appendix W as the "guideline"and by doing so the writer concludes that the "Guideline on Air Quality Models" is only a "Guideline" and not a "Regulation" thereby diminishing its regulatory status. The writer believes that because the name "Guideline" is used it may be subject to misinterpretation. The writer should be reminded that the "Guideline" has undergone full regulatory review and is not a "guideline" but a rather a "regulation". The Guideline is pretty clear when it needs to distinguish between a SIP or PSD requirement or when it is addressing a technical issue that would apply regardless of the application. Furthermore, the writer should be reminded that whole purpose of establishing a Model Clearinghouse was in order to

ensure consistency and avoid misinterpretations of the modeling regulations. Therefore, many of the arguments referencing 40 CFR Part 51, Appendix W should deleted.

Annual Average Emission:

The protection of short term PSD increments cannot be assured using annual average emission rates. The proposal suggests that annual average emissions divided by the short term averaging period may be used for protecting a short term increment standard. This is not equivalent to the short term average emissions. EPA guidance (draft NSR workshop manual) states that "for short term averaging period (24 hours and less), the change in the actual emission rate for the particular averaging period is calculated as the difference between: the current maximum actual emission rate and the maximum actual emission rate..." The underlined emphasis is as it appears in this guidance. The guidance also states that "the average rate is calculated as the average over the previous 2-year period (unless the permitting agency determines that a different time period is more representative of normal source operation).

Although this guidance is "draft", it has been used as support to numerous Environmental Appeals Board decisions and used in Region 2 with the support of OAQPS to develop New York, and New Jersey State regulations, specifically New York's Part 231 and New Jersey's Subchapter 18 and other State modeling guidelines.

Region 2 agrees that the "maximum" need not be an isolated peak in concentration but rather the "average maximum which is representative of normal source operation". There may be other option for determining the likely average maximum including fuel usage, other similar sources, but the there should be a justifiable and defensible hierarchy - not an arbitrary quick answer.

Period Used for Base Year Emission Estimates:

As stated in the previous comment, actual emissions are based on the 2 year average prior to the year in question. Alternative years may be used if those 2 years are not considered "normal or representative". The proposal claims that there may be a baseline year which is not representative of "normal source operations" such as there may be a change in the sulfur content of coal over the years. This could raise the baseline emissions.

Region 2 believes that alternate years may be used if the operation was not normal or representative such as during a shake down period or labor strikes. However, the argument cannot be arbitrary. The argument must be presented that something unusual was taking place at the time (whether in the baseline year or in the current year). In the above example, fluctuation in sulfur content in coal is normally expected. Therefore, in this case the use of alternative years seems arbitrary. Further, if an argument is presented to describe an alternative "normal and representative" year of operation, the same argument should be presented for the current year operation. Otherwise, one may be subtracting a lower currently emitting operation from a higher baseline emitting operation, thereby underestimating the increment.

References to WESTAR: The draft rule makes many references to WESTAR recommendations as a the justification for changes. To give a balanced and complete argument, the document should also include citations and recommendations from NESCAUM and others who commented on the WESTAR recommendations on the same topics.

Use of proprietary models and software: It is stated that the requirement to be non-proprietary does not apply to data or the software interfaces since this is not explicitly stated in Appendix W. Further, it is stated the proprietary models are listed on EPA's SCRAM website. Both of these concepts are being misinterpreted. First, Appendix W states that the "Model" cannot be proprietary. This "Model" is the complete package including its associated pre and post processors. These are not independent of each other. The model undergoes rigorous regulatory review including review of the model when it undergoes significant changes from draft to final such as was the case with the newly promulgated, AERMOD model. This is why it is a regulatory approved model which EPA defend. The level of integrity is such that even other countries adopt our models. Therefore, stating that the model cannot be proprietary but the pre or post processors are not is incorrect. (One may take exception with the Calpuff model. This model may not have been processed prudently but EPA is currently taking step to correct this action.)

Regarding the software interfaces, It is recognized that many companies have developed user interfaces to assist in the use of the model. These are simply interfaces and not code-changes. The model must produce the same results as the EPA model. Therefore, this argument is irrelevant. Years ago, the Model Clearinghouse would perform sensitivity tests on the various interfaces. This function may not be as rigorous today. Perhaps, this should be revisited. Again, the responsibility is on EPA and not the blind acceptance of proprietary information.

Regarding the list of the proprietary models listed on SCRAM, this is only a list. These models are not EPA endorsed. They must undergo model evaluation to prove their performance before they may be used in an application. Therefore, again, this reference is irrelevant.

Page 17: Remove the word "NAAQS" in the last sentence of the indented paragraph. The paragraph is only referring to increments.

Page 18: The bullets should include the word "significant" in front to the term "impact area".

Page 19: The footnote references the fact that the Significant Impact Levels that were proposed in 1996 were never finalized. Region 2 urges OAQPS to finalize these values expeditiously as possible.

Page 21: Please insert the words "significantly cause or contribute" in front of the clause, "...if modeling shows...a violation..." a permit may not be issued. Care should be taken

that this is clear in the rest of the document as well. In other words, if there is a modeled violation, and the proposed source significantly causes or contributes, then the permit may not be issued.

Page 29: When referring to concentration that are excluded from PSD, please add the quoted word to item (3) new sources outside the United States, "its common wealth and territories". So we don't exclude Puerto Rico, the US Virgin Islands...

Page 33: Please add the word "mobile sources" to list of the source types after major source, minor and area sources.

Region 2 would like to thank OAQPS for the brief opportunity to comment on this draft proposal. We would be willing to provide further comments for future drafts.

Region 3 Comments:
Submitted by Dave Campbell, R3

Comments On
November 13, 2006 Draft

Prevention of Significant Deterioration and Nonattainment New Source Review: Clarification/Modification to Increment Modeling Procedures

40 CFR 51.166(b)(21)(ii)

The proposed addition to the definition of Actual Emissions, **"as of the particular date, based upon any information showing that the source's operations in the 24-months preceding the date were not typical of operations as of the particular date. A period after the particular date may be used, but only if such period is more representative of normal source operations as of the particular date and is not representative of normal source operations first occurring after the particular date. The alternative time period need not be a consecutive 24-month period if the period used is shown to be more representative of normal source operations as described above."** is grossly inadequate. First, the word "any" must be stricken. To allow any information opens the door to totally frivolous documentation such as a recollection from a plant employee that things were different. Whatever information is used must be credible. Then the word "typical" must be defined or explained in terms of normal source operations. The 24-month period preceding a certain date should be the accepted determination of normal operations unless there are specific extenuating circumstances which could either be the usual catastrophic events or a documented long-term business cycle which happens to be in a near-minimum mode in the preceding 24-months. Finally, there should be criteria for showing that an alternative 24 months (if indeed it must be 24 months?) can be more representative.

40 CFR 51.166(b)(21)(v)

The proposed acceptance of evaluating compliance with 3-hour and 24-hour increments by . . . **"dividing an annual emissions rate by the number of 24-hour or 3-hour time periods in a year"** provides the lowest possible degree of protection of short-term increments and it is usually the 24-hour increment that is the most critical. Dividing the annual emission rate (presumably expressed as tons per year) by the number of 24-hour or 3-hour time periods in the year makes the explicit, and probably false, assumption that the source did or will operate for all 365 days or 2620 3-hour periods in the year. The argument, in the preamble, that it is unlikely that multiple sources will experience maximum emissions on the same date is specious. It ignores the reality that some sources, such as EGUs, often have peak production in response to external factors and may well peak concurrently. The modeling "test" consists of inputting two random, and perhaps correlated, variables—emission rate and hourly meteorology—into an algorithm to see if the results exceeds a benchmark value—the increment—more than once per year. Using an annual average emission rate fixes one of the variables at an expected value and considers the effect of varying meteorology. This only ensures that the benchmark value is not exceeded if the emissions are at or below the expected value. It would be equally logical to fix the meteorology at an average value (for wind speed, wind direction, temperature, etc.) and vary emission rates on an hourly basis. If the maximum hourly emission rate did not exceed the benchmark value at the average meteorological condition one would conclude, erroneously, that the increments was protected.

In those instances where it is not possible or practical to precisely specify the maximum short-term emission rate, it should be estimated by an appropriate method such as calculating (or estimating) a standard deviation of emission rates and using the mean plus two standard deviations from the mean as the maximum value for both the baseline and post-construction periods.

40 CFR 51.166(f)

The exclusion as stated gives a permanent "pass" to sources that happen to obtain a variance regardless of subsequent events. In some cases a variance might be granted based upon error or mischief. It is also possible, although unlikely, that changing circumstances may alter the assessment of AQRVs. There should be a provision for the FLM to reconsider the variance and initiate a reconsideration of the source's increment consumption. If a State has an obligation to periodically review increment it should also have the ability to reassess the contribution of regulated sources.

Region 4 Comments:
(submitted by Jim Little and Stan Krivo)
from R4 e-mail:

> Attached are Region 4 abbreviated review comments on the proposed PSD Increment Modeling rule. Please note that the limited review time was not sufficient to provide comments on the complete proposed rule nor has it allowed a

more appropriate detailed review to better ensure the propose rule text clearly and accurately clarifies the increment modeling issues.

Because of the importance of this rule, we hope that time can be made available to properly review subsequent drafts of this rule.

Thank you for this opportunity.

Stanley J. Krivo

PSD and Nonattainment NSR: Clarification/Modification to Increment Modeling Procedures

The following are our review comments on the proposed increment modeling rule. Because of the limited review time, our comments are abbreviated. More time would allow detailed and specific comments that would be more appropriate to ensure the proposed rule clearly and accurately clarifies the increment modeling issues.

1. The title of the proposed rule is "Prevention of Significant Deterioration and Nonattainment New Source Review: Clarification/Modification to Increment Modeling Procedures." The rulemaking has little to do with nonattainment areas. Essentially the only mention of nonattainment is in Footnote 2 on page 19. Should the title be changed to delete "Nonattainment"?

2. The section on sources issued an FLM variance is rather lengthy given the fact that variances are highly uncommon in most EPA regions. (Have there been any variances other than the one or two in North Dakota?) Is it necessary to go into this much detail?

3. This statement appears on page 23 with reference to the NSR Workshop Manual: "We never finalized this draft document, and accordingly never intended it as final EPA policy." Unless the discussion about the NSR Workshop Manual, including this statement, is absolutely essential to the overall context of this rulemaking, it should be deleted. The quoted statement could cause complications for EPA's position in other NSR-related areas, specifically the following two areas. (1) The NSR Workshop Manual is the primary reference for the procedure to be used by permit applicants and reviewing authorities in conducting a top-down BACT evaluation. (2) The Manual has been used by EPA and the courts in NSR enforcement cases.

4. This statement appears on page 31: "The absence of specific direction in the Act concerning how to calculate an increase in concentration for increment purposes is similar to the gap in the Act concerning how to calculate an increase in emissions for purposes of identifying a major modification." This reference to major modification serves no purpose in the context of modeling and should be deleted.

5. In the discussion of "baseline dates" on page 16, it is suggested that nitrogen oxides (NO) be changed to nitrogen dioxide (NO2).

6. The 2nd sentence of Section 2 (page 17) is confusing. It is suggested that it be changed to something like "Monitoring increments and baselines concentrations of air pollutants have not been performed because ambient measurements reflect emissions from all sources including those that should be excluded from the measurements."

7. "Gaussian" should be deleted from the 2nd sentence on page 19. EPA recommends approved "air quality models" of all types. Delete also the 3rd sentence as EPA recommended models also apply to Class I areas analyses that are more than 50 km from the source of concern.

8. Throughout the supplemental discussion a distinctions between Class I and Class II area analyses should be made. For example on page 19 the 5th sentence should read "Thus, for any PSD source, the Class II area ...". The next sentence should read " ...are below Class I and Class II significant impact levels...". There are more places in the discussion where this distinction should be made.

9. The discussion of Appendix W on page 23 appears in error. It is indicated that Appendix W applies to other types of analyses and not just PSD increments so not all the guidance in Appendix W is applicable to increment analysis. The introduction to Appendix W states "The guideline recommends air quality modeling techniques that should be applied to SIP revisions for existing sources and to new source review (NSR), including PSD." The main purpose of the guideline was NRS permitting.

10. Discounting the importance of the NSR Workshop Manual (page 23) in providing guidance and EPA policy since 1990 is a mistake. This document has been used by EPA, consultants, and permit applicants as the basis for PSD permitting. It is suggested that this document be acknowledged as past guidance and policy but that some of the material has become obsolete and new approaches are needed – the reason for the proposed rule.

11. Other guidance documents and memoranda to include in Section 2 on page 23 are the Model Clearinghouse repository and The Model Clearinghouse Information Storage and Retrieval System (MCHISRS).

12. Through the proposed rule discussion it has emphasized the reason for the rule is to provide greater clarity (page 24). I believe the discussion should also emphasis the fact that this rule also incorporates changes and reforms that have been suggested/proposed by other groups – WESTAR, etc. It appears that we are trying to deemphasize this important purpose of the rule.

13. In the discussion of baseline and PSD inventories (page 17+) and the modeling approach used to address increment consumption, only the requirements of the various inventories are addressed. The fact that these ever changing, project-specific inventories of sources with their actual emissions are difficult if not impossible to obtain was not addressed. This section should also address differences between the inventories needed for Class I and Class II area assessments and practical modeling approach that are used or proposed to compensate for deficiencies in available inventories.

14. In a Class I where a variance has been granted it appears that two sets of PSD increments exist for all subsequent analyses. One analysis addresses the Class I increments but without the source emissions that have been granted the variance. The second required analysis for the Class I area addresses the alternate Class I increments (e.g., Class II increment values) where the emissions from the variance source are included in the assessment. The proposed rule is not clear on the required analyses (e.g., two increment and AQRV assessments) for other subsequent PSD sources at Class I area where a variance has been granted. This should be explicitly addressed in the proposed rule.

15. The procedure of addressing "normal operations" to estimate actual emissions for PSD applicability is not the same as a concentration that existed on a particular date (i.e. PSD baseline concentrations). The "normal operations" also appear appropriate when defining the increment consuming emissions associated with the major source being permitted for modeling purposes. The application of the concept of "normal operations" to the PSD baseline concentration(s) does not appear appropriate as it makes PSD baseline concentration(s) up for interpretation by every applicant. For baseline concentration determination, the concept of "normal operation on the baseline date" should be used in developing these estimates.

[Note: To compile with the requested 1 PM CST 22 November 2006 deadline for review comment I must stop my review short of completion (page 60). If additional time is available to complete this review, please let me know.]

Region 5 Comments:
(comments have been reviewed by Division Director)

The following are comments on the draft rulemaking, in the order they appear in the document.

Page 19 - The sentence "Such models are recognized to be accurate within a distance of approximately 50 kilometers from the source being modeled." is misleading. It would be better to state something like "Such models may be appropriate within a distance of approximately 50 kilometers from the source being modeled."

Page 58 – The bottom paragraph discusses the intent to propose language that will, in practice, limit the use of post-baseline date emissions for consideration as "normal" baseline source operations. The text further recognizes the importance of a limitation to ensure that incremental air quality is not being degraded in violation of the intent of the PSD regulations. It's difficult to judge this general clarification without the details of when it will be allowed to be used and exactly what language is to be added to Sections 51.166(b)(21) and 52.21(b)(21). I suggest that the limiting language be developed and included in this proposed notice before promulgation for comment.

Page 69/70 – The sentence at the bottom of page 69 reads, "Although we have historically called for use of maximum short-term rates, more recent experience indicates that the modeled change in concentration may be less accurate when increment consumption modeling is based on maximum emissions rates from all sources that consume increment." This sentence implies that an analysis, or field study work, etc. has been done showing concentration change results compared to a known baseline. If this is the case, the studies should be cited. If not, the sentence should be reworded to make clear that the basis for the argument is theoretical. Also, in the case where hotspots are due to single sources, the use of average short-term rates will likely underestimate expected actual short-term concentration increases.

Page 69 - This section should reinforce that emission rates for the proposed new source or modification must the maximum allowable emissions.

Page 71 - The cite near the top of the page (4.2.2(b) of Appendix W) is incorrect. The language following the cite appears in the earlier versions of Appendix W but does not appear in section 4.2.2, or anywhere else in the most recent version of Appendix W (FR 70, November 9, 2005).

Page 80/81 - The paragraph requesting comment on adding in previously modeled meteorological years should include a cite to Appendix W (i.e., Section 8.3.1.2(c)) where this issue is discussed.

If you have questions or comments, please contact Randy Robinson, Region 5, at 312 353-6713.

Region 9 Comments:
Submitted by Gerardo Rios, R9

Region 9 Comments on Draft "Prevention of Significant Deterioration New Source Review: Clarification/Modification to Increment Modeling Procedures", 11/13/06

Thank you for the opportunity to provide comments on the draft rule. While we did not have a lot of time to review the proposal, we note below some areas of concern that should be carefully considered as the draft rule is revised prior to it being proposed.

We are concerned that the proposed revisions to the regulatory definitions and procedures for calculating increment consumption would allow state and local authorities with excessive discretion. The likely result of allowing excessive discretion will be a significant underestimation of actual increment consumption. The CAA directs EPA to ensure that increment consumption is accurately calculated, designating a purpose of the Prevention of Significant Deterioration program "to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision-making process." CAA Section 160(5).

Two aspects of allowing unlimited discretion in determining "actual emissions" are particularly troubling. First, the proposal adds a section to the definition of "actual emissions" that allows "using the maximum observed 24-hour or 3-hour emissions rate or **by dividing an annual emissions rate by the number of 24-hour or 3-hour time periods in a year**." Draft Proposed 40 CFR 51.166(b)(21)(v) (emphasis added). Allowing the use of the annual emissions rate rather than a source's maximum emissions rate could seriously underestimate the change in concentration for the 24-hour or 3-hour time periods. The proposed revision does not provide any criteria for determining if using the annual emissions rate in a case-by-case basis following may be appropriate.

The second issue with revising the definition of "actual emissions" is allowing unlimited discretion to state and local agencies to define the 24-month period a source must use. The draft proposed definition does not establish any criteria for the type of information that is required to substantiate using a particular period. Most likely, this absence of any boundaries on the 24-month period a source can select will result in underestimating actual increment consumption. In addition, we believe that this revision to the existing regulatory language is contrary to allowing informed public participation in the process.

We are also opposed to the draft proposed provision in 40 CFR 51.166(f)(2) which provides: "The plan may provide that the reviewing authority may select the data and emissions estimation methodology that it judges to be most appropriate for estimating actual emissions for each increment analysis, provided that they are reasonable, representative of actual emissions, rationally based, and verifiable." We believe that our regulations, as currently written, allow use of reasonable, representative, rational and verifiable methodologies on a case-by-case basis after consultation between the source, state or local agency, and EPA Regional office. Therefore, the addition of this specific regulation may undermine the consultation with the EPA Regional offices to determine the advisability of allowing a particular methodology. We are concerned that limiting EPA Regional office involvement could ultimately leave sources at risk as well as allowing air quality deterioration.

Finally, the draft preamble to the proposal states at page 83 that a source applying for a PSD permit is not required to release "proprietary data and/or software that may be used in the development of model inputs." The preamble states that "EPA sees no benefit to be gained in requiring such proprietary data or software to be made available to the

general public." We believe that the public should be entitled to review all of the data used to analyze increment consumption, and should also be able to understand how the model is treating the data. We are not aware of any anecdotal actual instances when a company would be prejudiced by releasing this data to the general public at the time of proposing to grant the PSD permit.

In summary, we believe that this proposal, for the reasons stated above, would jeopardize protection of the PSD increments and limit the public's ability to be involved contrary to the provisions of CAA Section 160.

Please note that these comments have not been reviewed by our Division Director.

Gerardo C. Rios
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Air Division
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Region 10 Comments:
submitted by Dave Bray and Herman Wong, R10

Region 10 Comments on Draft Proposed Revisions to the PSD Increment Provisions in 40 CFR Parts 51.166 and 52.21

To begin, Region 10 is very disappointed with this draft package. This rulemaking represents EPA's opportunity to address some issues related to increment analysis and increment tracking that have plagued the program since its inception in 1980. However, rather than addressing the issues and giving clear guidance to permitting authorities and permit applicants, this draft proposal would further confuse the issues.

Preamble

1. Generally, the preamble is very wordy and confusing. And in general, the preamble does not correctly describe the current PSD increment system.

2. Section II.B. "What are PSD increment analyses" is full of errors with respect to how increments work and how increment analyses are done.

- For example, on page 12, the preamble incorrectly describes the "maximum allowable concentration" as the ceiling established by adding the PSD increment to the baseline concentration. However, the "maximum allowable concentration" is the NAAQS as clearly stated in the implementing rules (40 CFR 51.166(k) and 52.21(k)). Since the "baseline concentration" is not a fixed concentration but varies depending upon the meteorological data set used in the modeling, there is

no relationship between the baseline concentration and the maximum allowable concentration.

- Further down on page 12, the preamble incorrectly states that "All other areas in the United States are currently classified as Class II,..." To the contrary, there are several Indian Reservations that have been redesignated to Class I by the respective Tribes. The preamble fails to correctly state that both States and Tribes have the authority to redesignate Class II areas to **either** Class I or Class III.
- On pages 14 and 15, the discussion of PSD baseline areas and baseline dates contains numerous errors. It fails to explain that the minor source PSD baseline date is set by the first complete PSD application and that it is pollutant specific; that is, the minor source baseline date is established only for pollutants that would be emitted in significant amounts. It also uses many generalities such as stating that [all] emission increases that occur after the baseline date will be counted toward the amount of increment consumed whereas the definition of baseline concentration in the Act and the rules requires some increases to be included in the baseline and allows for some increases to be excluded from increment consumption by States.
- On page 14, the preamble incorrectly states that, "Once the baseline area is established, subsequent major sources undergoing PSD review and locating in that [baseline] area must address the fact that a portion of the available increment has already been consumed by previous emission increases." This completely ignores the fact that increment consumption is spatially and temporally dependent (i.e., each square inch of land has its own amount of increment consumption or expansion) and the fact that baseline areas are generally of large enough that most new or modified major sources will not have overlapping impact areas. There are many situations (especially in the West) where subsequent major sources locating in a baseline area will be located in an area where no increment consumption has yet occurred.
- On page 15, it incorrectly states that "any air quality changes occurring after that [baseline] date would be considered to consume the applicable PSD increment. Air quality changes do not consume increment – actual emission changes consume increment. Air quality changes from year to year based on changes in meteorology even if actual emissions remain the same. Furthermore, some emission changes do not consume increment even though they will affect the actual air quality concentrations.
- On page 19, the preamble implies that the use of approved air quality models is only "recommended." However, both the Act and EPA's PSD regulations require permitting authorities to use EPA-approved models and to specifically get EPA approval for use of any non-Guideline model or modification to a Guideline model.
- On page 21, the preamble states that, per EPA guidance, "while basing the emission inventory for shorter averaging periods on the maximum emissions over each averaging period as determined from available data..." While this is what is stated in the 1990 Draft New Source Review Workshop Manual, this is not what has been generally done in practice by permitting authorities. This is the primary issue that needs to be clearly resolved by this rulemaking.

3. Section IV.A.2. "Treatment of Emissions from Sources Issued an FLM Variance" incorrectly describes how the PSD increment variance provisions work and therefore proposes the wrong approach for addressing the emissions from sources previously issued a variance.

- On page 37 to 40, the preamble incorrectly states that the alternative increments are "established for the area due to the variance." The alternative increments only apply to the specific permitting action and not to the Class I area or to any other increment consuming emissions. The preamble fails to recognize that a Class I variance is a source-specific, permit-specific variance that allows a single permit to be issued "notwithstanding that the change in air quality resulting from emissions from **such source or modification** would cause or contribute to concentrations which would exceed the maximum allowable increases for a Class I area." (emphasis added). The determination by the Federal Land Manager that the particular source or modification would not have an adverse impact on air quality related values is specific to the modeling analysis of the proposed new source or modification. The FLM does not assess the impact on Class I area resources that are not within the geographic scope of the modeling analysis (e.g., for large Class I areas) nor whether additional emissions increases (in addition to the source with the variance) would result in an adverse impact on an AQRV. When evaluating whether a specific proposed new source or modification would not cause an adverse impact on an AQRV, the FLM is not performing a comprehensive analysis that every resource at every location throughout the entire Class I area would not be adversely impacted if concentrations exceeded the applicable Class I increment. The Class I variance provision works like any other "variance" in that it allows a single new source or modification to construct and operate in a manner that would normally be precluded by an applicable requirement – in this case an impact that would exceed the Class I increment. It does not change the applicable requirement nor does it apply to any other source.
- On pages 41 and 42, the preamble incorrectly states that the granting of a source-specific variance would rebut the presumption that AQRV's will be adversely impacted by an increase in concentrations in excess of the Class I increment **for the entire Class I area**. A source-specific variance based on an impact analysis for a small portion of a Class I area (usually only a few modeling receptors) cannot rebut a general presumption that applies to an entire Class I area. In the West, Class I areas are often the size of small States with towering mountain ranges and extensive valleys, rivers, lakes, etc. The scope of a PSD Class I modeling analysis, both for increments and AQRV's almost never evaluates impacts on an entire Class I area or on all of the resources within that area. Because of this fundamental misunderstanding of the permit process and the lack of understanding of how variances work, this rulemaking misses the mark on the appropriate solution to the issue of increment consumption for sources with variances. The proposed changes here would have the ultimate effect of precluding any future Class I variances. If the granting of a variance to one source will effectively allow all areas of the Class I area to degrade up to the

Class II increments, the FLM will not grant a variance unless the proposed new source or modification demonstrates that there would be no adverse impact on AQRV's at all locations for all resources and for any and all future degradation regardless of the source of emission increases (since the granting of one variance will effectively be the granting of a variance to all future new sources and modifications). Since the cost of doing such an analysis is prohibitive, no future Class I variances would likely be granted

- While the idea of revising the increment exclusion provisions to address the additional increment consumption resulting from sources with variances is good, the proposed language does not correctly address the issue. As quoted from the D.C. Circuit Court on page 43, a source with a variance is, in effect, treated as a facility operating in compliance and that treatment should extend to the State's obligation to address increment violations (Region 10 does not agree with the 12/12/01 Seitz letter regarding SIP revisions to correct increment violations resulting from a variance). In effect, the increment should not be considered to be violated when the amount of degradation in excess of the applicable increment is due solely to the emissions from a source granted a variance under this provision. So the increment exclusion section should simply states that any concentration in excess of the applicable increment resulting from the permitted emissions of a source with a variance is excluded from increment consumption. In this way, a source that has been granted a variance will be considered to only consume 100% of the available increment at affected receptors (as is the case with many permitted PSD sources) and subsequent sources will approach their increment analysis in the same manner as any proposed new source or modification where there is another increment consuming source within the impact area. This approach would address this issue in a manner that would reconcile the variance provision with the SIP increment protection provision, be consistent with how source-specific variances work and the PSD impact analysis process, and ensure protection of Class I area AQRV's.

4. On page 62, the WESTAR approach to how to estimate emissions is mentioned. Region 8 and Region 10 disagreed with the WESTAR approach during its development because we wanted a hierarchy. Without a hierarchy, the states, contractors and project proponents will select as Region 8 states it, the "lowest common denominator."

5. On meteorological data (pages 72 to 80), there are two parts - acceptable meteorology and years of meteorology.

- We suggest the use of a program called METSTAT with criteria a range of acceptability to evaluate the appropriateness of the mesoscale meteorology
- We suggest that five years of mesoscale meteorology be used to determine impacts due to long range transport.
- In Appendix W, the word "should" is used to describe whether observations should be used with mesoscale meteorology. The use of this word has created confusion and must be clarified as to what it actually means.

- While the use of photochemical grid modeling procedures is a start, experts on mesoscale modeling should derive the acceptability criteria of mesoscale meteorology in long transport that is longer than some episode event.

6. On documentation and data and software availability (pages 81 to 84):

- The use of proprietary models and data should be disallowed. All program codes and data should be in the public domain.
- Particularly for the application of Appendix A models in air permitting, the program code, utility program codes and all data should be in the public domain. This is necessary to allow regulatory agencies and the public to verify the modeling results and its associated conclusions.
- As for Appendix B models, should meet the same standards as Appendix A models.

7. The discussion of actual emission rates used to model short term increment compliance on pages 67 to 72 fails to discuss the fundamental question which is what was intended to be protected as a result of establishing short-term increments. Since there are 8760 discrete (albeit overlapping) 3-hour and 24-hour periods in any year, is it the intent of Congress that no more than 1 individual period experience degradation more than the applicable increment? It could be argued that no 3-hour or 24-hour period should experience and increase greater than the applicable increment which would have to be evaluated by modeling the minimum emission rate during the baseline period and compare that with the maximum emission rate during the current period.

Region 10 has struggled with this issue for many years and has not been able to decide which approach would be best, since each has its plusses and minuses. The following approaches are ones that we've considered in the past.

(First off, remember than any averaging period for an emission inventory is ultimately reduced to emission rates in grams/second for use in dispersion modeling. The model presumes that the emissions are constant over all 31,536,000 seconds of a year.)

- Average annual emission rate during both the baseline and current 24-month periods.

- Maximum 3-hour or 24-hour actual emission rate during both the baseline and current 24-month periods.

- Minimum 3-hour or 24-hour actual emission rate during the baseline 24-month period and the maximum 3-hour or 24-hour actual emission rate during the current 24-month period.

- Actual average emission rate for operating hours during the baseline and current 24-month periods.

Each of these approaches will produce different results with respect to increment consumption based on whether long term and/or short term emissions are actually changing. For example, use of maximum emission rates to evaluate increment consumption for a peaking unit that changes to a base-load unit will show no increment consumption (since there would be no increase in its maximum emission rate) when the increase in operation from a few days to year-round may actually have resulted in the area going from pristine to nonattainment. In the same manner, use of annual average emissions would not detect the peak impacts of a facility that previously operated a few hours each day for the entire year and then increases daily hours of operation but only operates seasonally.

When taking all of the plusses and minuses into account, Region 10 has previously favored the fourth approach. It more accurately reflects what the short-term emissions are when the facility is actually operating. For periodic increment assessments, both the baseline emissions and current emissions would reflect the actual emission rates and operating schedules of increment consuming sources during the respective periods. For the permitting process of a new source or modification, it would be sensitive to both increases in short term emissions and increases in operating hours when projecting increment consumption.

8. In the note on page 69 of the preamble the reference to a Region 10 periodic increment assessment should be removed. While a project to do such an assessment was discussed, it was never done.

9. Page 84 and 85 – We do not see how we can say that SIP changes would not be required for these rule revisions, especially if the rules address the variance issue by requiring excess concentrations to be excluded from increment consumption. Given the current regulatory language for increment exclusion, States cannot simply interpret their rules to exclude something that is not specifically allowed.

10. Page 85 – There should be no transition issues for 40 CFR Part 51.166 and SIP-approved programs since the States will have plenty of time to prepare for implementation of their revised rules. However, for the federal program 40 CFR Part 52.21, there should be a transition provision in 52.21(i) that exempts any permit action for which a complete permit application has been submitted prior to the effective date of any revisions to 52.21.

11. Page 91 – The preamble erroneously states that this action would not have tribal implications. To the contrary, this action will directly affect how permitting authorities would determine increment consumption on the Tribal lands that have been redesignated to Class I. At a minimum, EPA should offer formal consultation to each Tribe that has redesignated, or is in the process of redesignating, Tribal lands to Class I status.

Regulatory Language

40 CFR 51.166(b)(21) and 40 CFR 52.21(b)(21) – We have several concerns with the proposed changes to the definition of "actual emissions."

1. Paragraph (ii). While the regulation has always allowed the use of a different time period, Region 10 has generally required that the different time period must be another 24-month period that **preceded** the particular date, not one after the particular date. While the new provision allowing for a time period after the particular date is adequately conditioned, Region 10 questions why it is needed since, to our knowledge, there has been no issue around establishing representative emissions using alternative periods that preceded the particular date. If, however, we are going to go in this direction, Region 10 recommends that similar criteria be added for alternative periods that precede the particular date, specifically that the alternative period is not representative of source operations that had ceased prior to the particular date.

2. Paragraph (ii). Region 10 strongly objects to the new language allowing for actual emissions to be calculated using non-consecutive months. This language would allow a source to "cherry-pick" individual months over a 12 to 20-year period to establish baseline actual emissions (or even longer for a PSD baseline concentration set in 1978 if we allow months both preceding and after the particular date to be used). Since the source can currently choose any consecutive 24-month period preceding (and now after) the particular date, there should be no problem finding a consecutive period that is representative of (the high end of) normal operation. Besides, we can find no discussion or justification of this proposed change in the preamble.

3. Paragraph (v). Region 10 strongly objects to the new paragraph (v) which allows for the use of either one of two entirely different emission inventories (presumably on a case-by-case basis) for short-term increment analyses. The two inventories can be different by as much as two orders of magnitude (e.g. for a utility peaking unit that only operated a few days per year) and will therefore produce entirely different results for each permitting action or increment consumption analysis. This rulemaking needs to propose one, and only one, "definition" for short-term emission inventories. As discussed above, Region 10 recommends that the actual average emission rate for operating hours during the baseline and current 24-month periods be used.

4. Paragraph (v). While the regulation should be clear with respect to averaging time of the emissions inventory used for short term increment analysis, the method to calculate the best short-term emissions inventory should not be prescriptive. As recommended by WESTAR, a hierarchy of calculation approaches should be employed.

40 CFR 51.166(f)(1)(e) and 52.21(f)(1)

1. As discussed above, these new paragraphs implementing the Class I variance provisions are not consistent with the Act or how a source-specific variance works. We suggest the following alternative language for 51.166(f)(1)(e) and 52.21(f)(1) respectively:

> "Concentrations in excess of an applicable Class I increment attributable to the actual emissions from a new major source or major modification that obtained a permit based on a variance issued pursuant to paragraph (p)(4)."
>
> "In determining compliance with the maximum allowable increase, the Administrator shall exclude concentrations in excess of an applicable Class I increment attributable to the actual emissions from a new major source or major modification that obtained a permit based on a variance issued pursuant to paragraph (p)(5)."

And as discussed above, if this approach is used to clarify how the excess increment consumption is addressed and a State chooses to incorporate the variance provision into its SIP, then it must be required in 51.166(f)(1) and not be a "may." Similarly, where 52.21 applies and is being implemented by EPA or a delegated permitting authority, the exclusion should clearly apply.

40 CFR 51.166(f)(2) and 52.21(f)(2)

1. As discussed above, the calculation of actual emissions must not be at the total discretion of the reviewing authority. A more realistic and equitable approach would be to use a hierarchy approach. Since it is better to discuss a hierarchy approach in the preamble, Region 10 recommends not including this regulatory language.

40 CFR 51.166(p) and 52.21(p)

1. Region 10 supports correcting the cross references. Many States are adopting EPA's rules by reference, including the incorrect cross references, and have issues (although minor) with implementing the rules.

On page 71, the proposal states that the derivation of short term emission rates from longer term averages is acceptable to EPA. First, the cited text (Section 4.2.2(b) of GAQM), does not appear anywhere within the latest (November 9, 2005) publication of GAQM. Assuming that it was present, it appears that this section is important to the justification for allowing averaged short term emission rates.

In rule making dating back only to 2005, the EPA stated that use of annualized emission rates likely underestimates short-term impacts. In the Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations, EPA opined that the use of an annualized emission rate potentially underestimate visibility impacts. According to 70 FR 39119, features of the modeling examples which may understate visibility impacts include:

- **An annual emission rate was used for the example modeling (e.g. 10,000 TPY divided by 365 days divided by 24 hours). ``Real world'' sources have variable emission rates, and in any 24 hour period may be operating well above the annual rate.**
- The monthly average relative humidity was used, rather than the daily average humidity, and would contribute to lowering the peak values in daily model averages.
- A 24-hour average was calculated from modeled hourly visibility impacts, reducing the impact of any one particular hour that could be higher due to a number of meteorological effects.

The process of annualizing short term emission rates functions as an equivalent procedure to the transformation of long term to short term concentration averages by application of a scaling factor. Most EPA approved near-field dispersion models (ISC, AERMOD) use variants of the Gaussian equation below:

$$\chi = \frac{Q}{2\pi u \sigma_y \sigma_z}$$

where χ is the modeled concentration
Q is the model emission rate;
u is the wind speed (usually 10m);
σy is the horizontal dispersion coefficient; and
σz is the vertical dispersion coefficient.

The emission rate (Q) varies directly (linearly) with the concentration (χ). Thus, when the emission rate is scaled up or down, the concentration is also scaled up or down proportionally. This functions equivalently as a concentration scalar, transforming the

long-term concentration to short-term which was prohibited. Whether performed prior to modeling by adjustment of model emission rates or in post-processing model results by applying a scalar to concentrations. In this argument, it is important to review how a short-term model such as ISC or AERMOD calculates both short-term and long-term concentrations.

A short-term concentration produced by either of these models is a function of averages (3 hour, 8 hour, 24 hour, etc.) of impacts of successive, individual hourly impacts. A 24-hour average in an air quality model is, therefore, the average of 24 successive hourly averages. In most source categories with variable operation rates, it is entirely reasonable to assume that higher operation levels than the level represented by the annual average. By annualizing a short-term emission rate, the assumption is then being made that the annualized rate is representative of normal short-term source operations. The fact that higher source operation levels are likely to exist is neglected, which will result in underestimation of short-term concentrations. In order to demonstrate this effect of annualized short-term emission rates upon short-term concentrations, we use one of the developmental datasets of the AERMOD from the Kinkaid database available on EPA's Support Center for Air Quality Modeling Website (http://www.epa.gov/scram001). According to 70 FR 39129, during peak operating periods, the 24-hour actual emission rate can be more than double the long-term daily average. Therefore, as a simple demonstration of the reverse effect, we transform the short-term emission rate to a "long-term average" by reducing the hourly emission rate by a factor of 2 (representing the idea that a short-term actual emission rate can be double that of the long-term average).

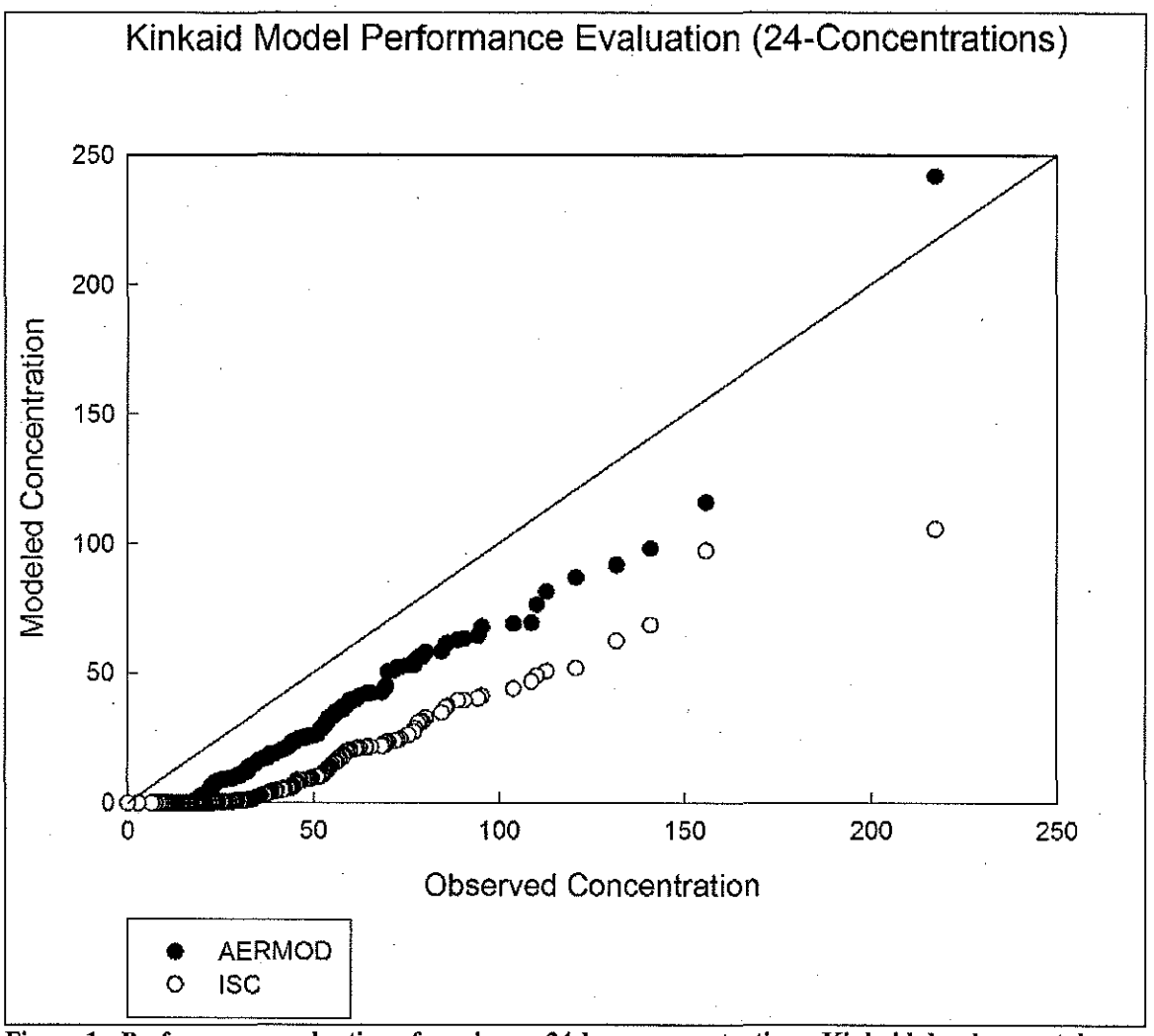

Figure 1 - Performance evaluation of maximum 24-hour concentrations, Kinkaid developmental database.

Figure 1 is a simple scatter plot of the distribution of maximum 24-hour concentrations (observed v. modeled), unpaired in space and time of the Kinkaid developmental dataset. In Figure 1, the scatter plot shows a tendency of both AERMOD and ISC towards underprediction. However, the performance of AERMOD, while exhibiting a slight bias towards underprediction, is within the "factor of two" range (±100%), indicating a better ability to replicate 24 hour design concentrations from the Kinkaid dataset.

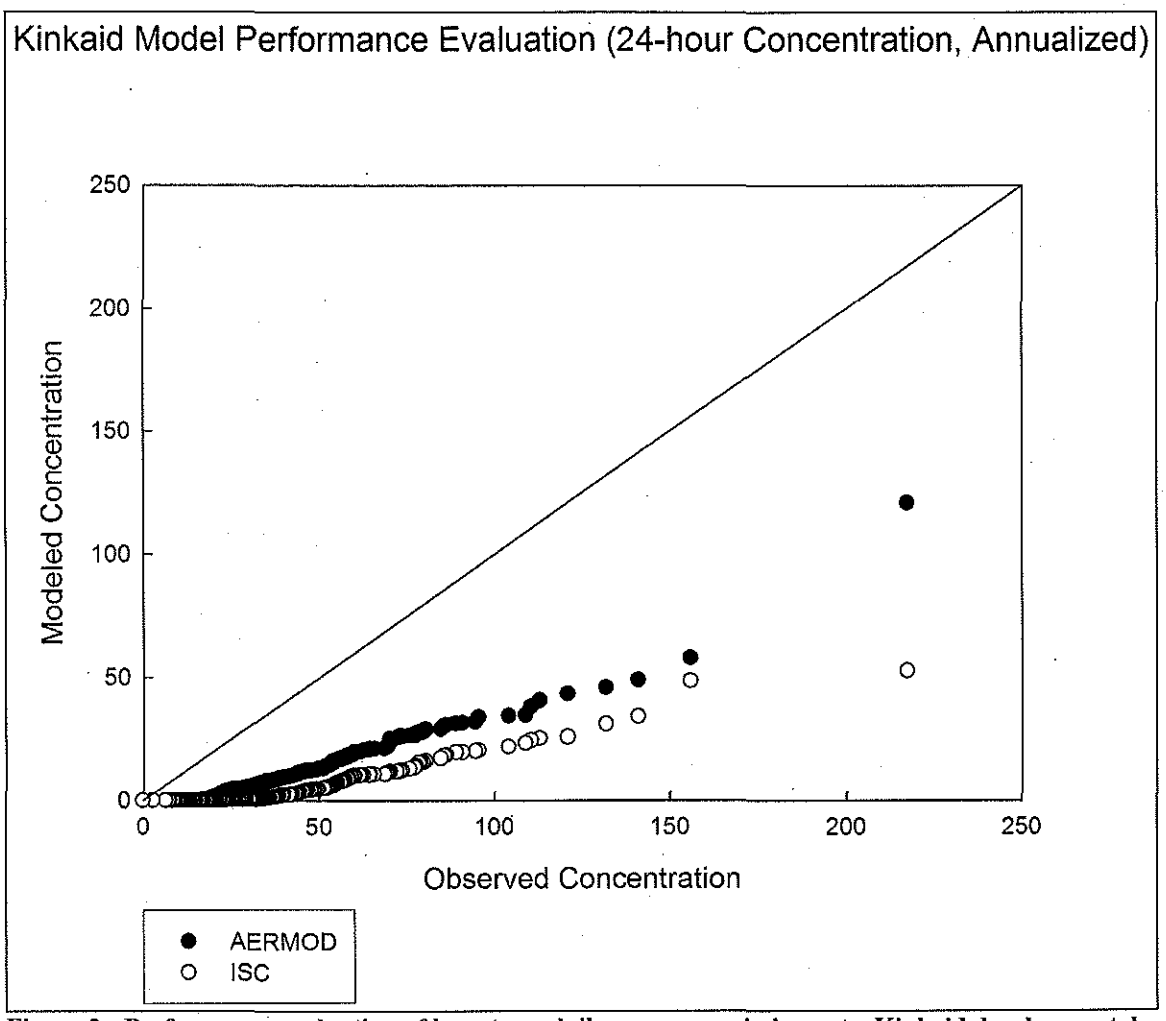

Figure 2 - Performance evaluation of long-term daily average emission rate, Kinkaid developmental database.

In Figure 2, the short-term emission rates are transformed to a long-term average and the distribution of modeled concentrations are presented. As shown, both AERMOD and ISC are well outside of the "factor-of-two" range. The process of annualizing a short-term emission rate will almost always mask a short term concentration peak and will usually result in a bias towards underprediction of design concentrations.

It is also very important to note an erroneous assumption regarding the collective impact of multiple sources on short-term increments. On page 70 of the preamble text, it is stated that:

> "...In many cases, combining the average emissions rates of all increment consuming sources in an emissions inventory may produce a more representative picture of the actual pollution concentration over a short-term period. Although some sources may be operating at higher or lower rates for any given short-term period, other sources will be experiencing variability in their short-term emissions as well. The variability of one source will likely offset the variability in emissions at other sources. When average short-term rates are used in a

dispersion model in conjunction with emissions from multiple sources, the use of an average emissions rate for one source will not necessarily mask the peak short term concentrations of pollutants that are actually in the ambient air."

The argument presented above lacks foundation. Modeling staff from EPA Region 7 have performed or reviewed numerous increment analyses for PSD permits over the past 20 years. In most PSD permits, especially for near-field Class II increment analysis, the modeling showed that there was very little interaction between sources such that no collective impacts were experienced, especially when analyzing for short-term averaging periods. In other words, unless emission units from different source are very near and are directly downwind of emission units of other sources, there is usually little collective impacts. Therefore, local short-term increment consumption becomes a function of the emission rate of individual emission rates of individual increment consuming sources, but usually not the combination of impacts from multiple sources. Thus, "offsets" in variability described above due to annualized emission rates above will likely serve to bias short-term concentrations towards underprediction and will likely mask the peak short term concentrations of pollutants, contrary to what is stated. Since the form of short-term maximum allowable increase (increment) are deterministic (e.g. usually not be exceeded more than one time per year) as opposed to statistically based such as the PM10 NAAQS, we strongly believe that conditions which are representative of maximum actual conditions consistent with the Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations would be more representative for short-term increment analyses.