
Report of Audit

E1K2*8-11-0026-9100227

REVIEW OF PM10

MONITORING PROGRAM

VOLUME 2

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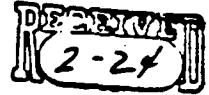
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



0A-238

FEB 24 1989

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Response to the Office of Inspector General's Draft
Audit Report E1K2*8-11-0026, Review of PM₁₀ Monitoring
Program

FROM: Don R. Clay, Acting Assistant Administrator
for Air and Radiation (ANR-443)

TO: Ernest E. Bradley III
Assistant Inspector General for Audit (A-109)

As required under EPA Directive Number 2750, this memorandum responds to the draft of the Office of Inspector General (OIG) report, "Review of PM₁₀ Monitoring Program" (E1K2*8-11-0026).

GENERAL COMMENTS

The audit resulted in three major findings:

(1) EPA needs to ensure that different attainment decisions are not made solely because of the use of different types of PM₁₀ monitors;

(2) EPA needs to provide guidance and clarify authority for using data from nonapproved monitors; and

(3) Additional PM₁₀ monitors are needed and EPA needs to take a more active role to ensure that monitor requirements are met.

With respect to findings number (1) and (2), the Office of Air Quality Planning and Standards (OAQPS), within the Office of Air and Radiation (OAR), has already issued a revised policy on the use of PM₁₀ measurement data. A copy of the revised policy was provided to your staff in November 1988. With respect to finding number (3), as discussed briefly in the IG Draft Report, we maintain that all but four PM₁₀ monitors were needed in

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October 1988 to meet regulatory requirements and our analysis of the PM₁₀ monitoring needs was, in fact, comprehensive. We agree that an analysis of the final PM₁₀ monitoring needs should be conducted on a periodic basis. Thus, we have satisfied the concerns expressed in the stated objectives of the audit.

In reviewing these three major findings (Attachment A), we feel that we have fully addressed each of the issues. We provided the IG auditors with the November 21 policy memorandum, "Revision to Policy on the Use of PM₁₀ Measurement Data" (Attachment B), and the joint Office of Air Quality Planning and Standards (OAQPS)/Environmental Monitoring and Support Laboratory (EMSL) issue paper, "The Treatment of Uncertainty in Ambient PM₁₀ Measurements" (Attachment C). The issue paper and a draft October 12 memorandum (Attachment D) provided the IG auditors with the basis for the revised November 21 policy memorandum.

We have several concerns with the factual accuracy of this report. There are major discrepancies throughout the report and, in this document, we have responded to what we perceive as the major discrepancies (see Attachment A). We are particularly concerned about the draft report's failure to integrate the information provided by staff from the Offices of Air Quality Planning and Standards (OAQPS) and Research and Development (ORD). We believe this failure resulted in a distorted analysis which we believe led to an unfair characterization of OAR efforts to address this important issue. This in turn led to erroneous conclusions (especially in the third major finding) which resulted in what we believe to be inappropriate recommendations.

In particular, we have concerns with the draft report's discussion of the third issue. The vast majority of the discussion of the third issue focuses on a presumed shortfall in PM₁₀ monitoring of 81 monitors. The IG investigators were provided with detailed tabular information on October 12, 1988, which clearly showed that the shortfall as of October was only four monitors needed to satisfy the 1988 monitoring requirements. While the IG investigators reference the draft memo of October 12, 1988, from the Chief of the Monitoring and Reports Branch to the Supervisory Auditor of the OIG, no further contact was made by the IG investigators after October 12 to clarify any questions the IG staff may have had. Over three months passed from the time of that meeting to your memo of January 25. As a result, the emphasis of the entire section was on an outdated estimated shortfall of 81 monitors. We believe that more than ample time was available to avoid the factual inaccuracies contained in this report.

As a final comment, I would like to point out that we have spent a considerable amount of time responding to this audit. This includes not only OAR staff but staff from ORD and the OGC as well. The time was spent in many meetings with the IG

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auditors, and preparing written responses to their requests. We are concerned, however, that much of the information provided the IG was not integrated into the draft report. Consequently, we have had to spend an excessive amount of time in responding to this IG Report. I would hope that we could work together in the future to find a more efficient forum for information exchange to accomplish your goals and, as a result, improve the overall operation of the air program.

RECOMMENDATIONS

I will now specifically address each of the recommendations put forth in this report, as discussed in each Finding. A more detailed response to the recommendations is found in Attachment A, which also includes a review of the factual inaccuracies contained in the draft report.

FINDING NUMBER 1.

IG Recommendation Number 1-1:

"Establish procedures which allow for flexibility in interpreting measurements near the PM₁₀ standard." Such as

- (a) "establishing a panel of experts who would deal with measurements within a specified range on a case-by-case basis;"
- (b) "not requiring any action for monitor measurements within a certain "gray zone" around the standard;" and
- (c) "adjusting measurements by predetermined percentages, depending on the type of monitor."

Response

We feel that the OAQPS policy on the face-value use of reference measurement data, coupled with the PM₁₀ State Implementation Plan (SIP) process, provide sufficient flexibility for interpretation of measurements near the PM₁₀ standard. We feel that the appropriate role for a group of experts is to review PM₁₀ SIPs, and not to review all measurements within a specified range. Although options (b) and (c) above were discussed in the OAQPS/EMSL issue paper, they could not be recommended after weighing and evaluating their various advantages and disadvantages.

We have determined that the use of all PM₁₀ data produced by reference samplers at face value is clearly the best course of action.

IG Recommendation Number 1-2:

"Establish procedures which provide for documenting the basis for deciding an area's attainment status."

Response

There is some subtlety involved with the terminology "attainment status." The new implementation regulations for PM₁₀ do not require that an area's status be formally classified as attainment or nonattainment. This is because PM₁₀ was not the indicator pollutant for the particulate matter national ambient air quality standard (NAAQS) on August 7, 1977, when the Clean Air Act (CAA) was amended. Therefore, it is not bound by the provisions of Section 107 and Part D of the CAA regarding requirements for nonattainment areas. Instead, PM₁₀ is only covered by the implementation plan requirements of Section 110, which specify that an area's SIP is judged to be adequate or inadequate to demonstrate attainment with the NAAQS. The process by which the SIP is developed and approved, therefore, is the appropriate regulatory documentation for defining an area's status with respect to attaining the standard. More details on this issue are contained in our responses to pages 8, 9 and 17 of the Draft IG Report, contained in Attachment A.

IG Recommendation Number 1-3:

"Work with appropriate EPA officials to obtain any regulatory changes that are necessary to provide a clear, authoritative basis for the selected policy."

Response

The November 21 policy memorandum issued by OAQPS to the Regional Air Directors described and communicated the proper use of PM₁₀ measurement data. We have determined, in cooperation with other relevant offices, that regulatory changes are not essential.

FINDING NUMBER 2.

IG Recommendation Number 2-1:

"Not allow data from a nonapproved monitor to be used to determine exceedances if that data was obtained from a monitor that was placed in service after August 1, 1988 (the date by which monitors were to be in place for those areas expected to have the worst PM₁₀ pollution)"

Response

This is consistent with the November 21 policy memorandum.

IG Recommendation Number 2-2:

"Allow data that was acquired in the past or is acquired in the future, from a nonapproved monitor that was part of the SLAMS or NAMS Network that was being used prior to August 1, 1988, to be considered by a panel of experts as a basis for determining whether exceedances have occurred."

Response

SLAMS and NAMS networks were only approved conditionally if nonreference monitors were currently being used. These monitors are supposed to be replaced or upgraded with reference samplers after August 1, 1988. If we were to allow data from nonapproved monitors to continue to be used, then we remove the incentive for the monitoring agencies to upgrade or replace these samplers. According to the November 21 policy, data from nonapproved monitors that were collected prior to August 1, 1988 can be used, subject to the rules specified in the memorandum. Data collected after August 1, 1988 cannot be used, unless the monitor is subsequently approved by EPA.

IG Recommendation Number 2-3:

"Allow measurements from such nonapproved monitors (monitors that were part of the SLAMS and NAMS network prior to August 1, 1988) to be treated like data from approved monitors, for purposes of making attainment decisions, when the PM₁₀ measurements are greatly above or below the PM₁₀ standard (as illustrated by the data from Medford, Oregon); the cutoff points around the standard may be decided by the panel of experts."

Response

In our November 21 memorandum, an analogous approach was, in fact, established. Our approach is to set a general gray zone within which nonreference PM₁₀ data would be viewed with uncertainty and outside of which the data would be used with more authority.

The gray zone limits specified in the November 21 memorandum were recommended by the OAQPS/EMSL committee of PM₁₀ experts, who prepared the issue paper on PM₁₀ measurement uncertainty.

IG Recommendation Number 2-4:

"Allow a panel of experts to be flexible in deciding whether monitor measurements near the standard should be treated as exceedances, depending on the type of monitor, the amount of differences between the measurement and the standard, etc."

Response

The OAR, and ORD believe that a uniform interpretation of PM₁₀ data for all monitoring areas is preferable to one which varies from area to area. With a uniform approach, the rules are defined in advance. This permits a consistent, more unbiased interpretation of available PM₁₀ data. We agree that flexibility is needed in order to make comparisons with the standards, but prefer to do so by permitting exceptions to a general rule, as stated in the November 21, 1988, policy.

IG Recommendation Number 2-5:

"Work with appropriate EPA officials to obtain the regulatory changes that are necessary to implement the selected plan of action including, if appropriate, the modification of 40 CFR Part 50.6(c), which does not clearly allow the use of any data from a monitor not approved by MSB in the determination of whether exceedances have occurred."

Response

While 40 CFR 50.6(c) and Appendix K do not clearly allow the use of nonreference data for corroborative purposes, they also do not disallow the use of the data in this manner. If time were not a factor, we would agree that revising section 50.6(c) to clearly and expressly permit the Agency to consider nonreference

data in making attainment decisions might prove the best course. Amending the regulations would remove any ambiguity that now exists regarding our reliance on Appendix K. It would also require EPA to undertake full notice and comment rulemaking, however. That process could take years. As the IG report points out, reference method monitors were required to be in place by August 1988. There exists the distinct possibility that the Agency would have 3 years of data from approved monitors across the country by the time it finally promulgated a revision to the regulations that would allow the use of nonreference data when less than 3 years of data from an approved monitor was available. Thus, the rulemaking could prove pointless.

Given the practical impediments to revising section 50.6(c), we believe that the best course is the one embodied in the November 21, 1988 Revision to Policy on the Use of PM₁₀ Measurement Data. It is fair, sensible and legally defensible. While it provides a general framework for using nonreference data, it also provides sufficient flexibility in that OAQPS approved exceptions are permitted. Moreover, it may be implemented immediately.

IG Recommendation Number 2-6:

"Communicate EPA policy to State and local officials through the Regional Offices."

Response

This has already been accomplished with the November 21 policy memorandum to the Regional Air Directors.

FINDING NUMBER 3.

IG Recommendation Number 3-1:

"We recommend that the Acting Administrator for Air and Radiation ensure that a comprehensive analysis is completed of PM₁₀ monitor needs, which includes an assessment of the questions we have raised."

Response: We believe that OAQPS has satisfied this recommendation with its ongoing reports on the status of the PM₁₀ network, by tracking the Regions' progress through the Administrator's strategic planning and management system (SPMS) and by initiating a PM₁₀ Task Force to investigate PM₁₀ monitoring efforts.

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As early as 1983, OAQPS conducted a critical review of the existing TSP and PM₁₀ data in an effort to identify those areas of the country having high probabilities of exceeding certain PM₁₀ concentrations. These areas were then used as the basis for planning PM₁₀ monitoring needs and calculating the resources necessary to meet these needs. These analyses were included in the Part 58 monitoring docket. As new data entered the National Aerometric Data Bank, the critical areas were revised, along with the PM₁₀ monitoring resources. Tracking of these critical areas continued and, in February 1985, OAQPS issued the first of 13 PM₁₀ monitoring status reports. The 14th PM₁₀ status report is in the process of being completed. In addition to the status reports, OAQPS also tracked the Regions' progress in establishing PM₁₀ samplers in the critical need areas through the Administrator's SPMS.

Independent of the IG's efforts, OAQPS initiated a PM₁₀ monitoring task force to investigate the PM₁₀ monitoring efforts. The results of these findings will be used to better identify PM₁₀ monitoring deficiencies. The OAQPS believes that this effort, along with its ongoing status report, satisfies the IG's recommendation.

IG Recommendation Number 3-2:

"We recommend that the Acting Administrator for Air and Radiation require that the analysis be updated on a regular basis in accordance with a specific timetable."

Response: The OAQPS plans to continue issuing the PM₁₀ status reports at least over the short term, as well as making a more comprehensive analysis, as needed.

Attachments

Attachment A

Comments on Draft Audit Report Elk2 * 8-11-0026
Review of PM₁₀ Monitoring Program

RESPONSES RELATED TO
AUDIT ITEM NUMBER 1:

"EPA NEEDS TO ENSURE THAT DIFFERENT
ATTAINMENT DECISIONS ARE NOT MADE SOLELY
BECAUSE OF THE USE OF DIFFERENT TYPES OF
PM₁₀ MONITORS"

Page 1. Objective is - "to determine whether the Office of Air Quality Planning and Standards (OAQPS) has implemented a policy to deal with the fact that one of the two primary types of EPA-approved monitors gives consistently higher measurements of PM₁₀ concentrations than the other."

Response

OAQPS has issued a policy memorandum on November 21, 1988, entitled "Revision to Policy on the Use of PM₁₀ Measurement Data". This is provided as attachment B to this review. In this November 21 memorandum, Gerald Emison presents the revised EPA policy regarding the treatment of PM₁₀ data produced by reference and nonreference PM₁₀ samplers. Treatment of data produced by collocated PM₁₀ samplers is also discussed. This policy memorandum follows the recommendations of a joint Office of Air Quality Planning and Standards (OAQPS)/Environmental Monitoring Systems Laboratory (EMSL) committee which has evaluated the issue of potential uncertainty in measurement data produced by PM₁₀ samplers. This committee's issue paper is provided as attachment C. For this discussion, the terms approved or reference sampler shall be used to represent samplers using a reference method based on Appendix J to 40 CFR 50 and designated by EPA in accordance with 40 CFR 53, as well as samplers using an equivalent method designated by EPA in accordance with 40 CFR 53. Nonreference or nonapproved samplers are all other PM₁₀ samplers which have not been formally designated as such.

Page 3. "In regard to the first issue, PM₁₀ experts do not agree on which of the two approved types of PM₁₀ monitors provides the most accurate measurement of PM₁₀ concentrations. The two primary types of monitors that have been tested and approved by EPA do not provide the same measurements under the same conditions. One type of monitor provides relatively consistent, higher measurements than the other."

Note: Office of Air and Radiation page references apply to our draft report.

Response

This paragraph's analysis of the problem is incomplete. It fails to review the inherent possibility of differences between sampler types due to the complexity of particulate matter in the atmosphere and the trade-off made by EPA between flexibility in design and measurement uniformity when the performance based approach was selected for the Federal Reference Method (FRM). This issue is discussed in the introduction to EPA's Issue paper and we believe that summarizing it here would improve the reader's understanding of the issue. The discussion should recognize that some discrepancies between samplers should be expected and was recognized in EPA's response to public comments on the promulgated FRM approach. The issue is the magnitude of the discrepancies, not the fact that they exist.

Thus, the first sentence of the IG's statement over simplifies the issue. Although current manufacturers may not agree on which monitor is most accurate - most "PM₁₀ experts" recognize that there is no reference for judging accuracy in such measurements. The disagreements center around the rationale for why one sampler or another may be biased high or low relative to another sampler due to that sampler's vulnerability to some known or suspected loss or gain mechanism.

See
Appen
Note

Page 3. The IG audit report states that the Office of Air and Radiation needs to address: "the use of data from the two primary types of monitors that have been tested and approved by EPA, in light of the fact that one of these types gives consistently higher PM₁₀ measurements than the others."

Page 4. Then, the report continues with: "To deal with this problem: we recommend that a panel of PM₁₀ experts be established and given the authority to examine all pertinent factors, particularly the type of monitor in use, and decide whether particulate PM₁₀ measurements should cause an area to be treated as being in or out-of-attainment.... we continue to believe that allowing experts to evaluate all circumstances when measurements are near the standard is likely to result in more defensible action than arbitrarily accepting all measurements at face value."

Response

The OAQPS approach differs from the latter statement with regard to two points: (1) the role of a rule

applicable to all data, and (2) the role of experts in the data review process. Our approach was to assemble a group of experts (the PM₁₀ Measurement Working Group) to consider a broad range of options for the treatment of PM₁₀ data produced by EPA approved (and unapproved PM₁₀ samplers), and to recommend a general procedure to follow for all data usage. Site specific information regarding measurement differences among reference method samplers is simply not available to permit a panel of experts to judge PM₁₀ measurement acceptability.

The approach which is stated in the November 21 OAQPS policy memorandum is as follows: "For purposes of evaluating PM₁₀ air quality status, all data produced by reference samplers shall be interpreted at face value and can be used to make comparisons with the National Ambient Air Quality Standards (NAAQS) for the purposes of determining attainment or nonattainment, in accordance with Appendix K to 40 CFR 50". This approach, however, is described in the context of a "general policy" in which the following statement is also provided: "Deviations to this general policy must receive concurrence of OAQPS."

We feel that our approach which specifies a general formula for interpretation of PM₁₀ data is the proper approach which promotes and encourages national consistency. We also desire to allow flexibility and would do so by permitting deviations to the general approach provided that these deviations receive concurrence of OAQPS. In practice, these deviations would be reviewed by a panel of EPA experts. In fact a panel of EPA experts are involved in the review of State Implementation Plans (SIPs) and in the review of air quality data to ensure that existing SIPs do not require revision. SIPs are also subjected to the public review process.

See
Appendix 4,
Note 2

Page 6. "The standard for particulate matter (PM) was known as total suspended particulates (TSP). As the name implies, the TSP standard concerned all particulates, regardless of size."

Response

This statement is not correct. TSP refers to total suspended particulate as measured by the original particulate matter reference sampler (the hi-volume sampler, as described in Appendix B to CFR Part 50). As such, TSP refers to suspended particles ranging up to 45 microns in diameter.

See
Appendix
Note 3

Page 8. The last paragraph of the Summary of Findings indicates an area that requires clarification: "Measurements of PM₁₀ concentrations from monitors are used to determine whether an area is out-of-attainment with the national PM₁₀ standards. A non-attainment area is required to prepare a State Implementation Plan with controls stringent enough to bring the area into attainment. The preparation of SIPs and the implementation of controls is expensive. It is estimated that industry will spend \$1.9 billion over the next 7 years to control PM₁₀."

Response

The role of PM₁₀ data as described above is overstated. Under the new implementation regulations for PM₁₀, areas are not classified attainment or nonattainment under section 107 of the CAA and sanctions are not automatically imposed because a SIP cannot provide for attainment of the PM₁₀ standards. The critical issue is whether or not the State Implementation Plans are adequate to attain and maintain the standards. The review of air quality data with respect to the standards is just one step in the SIP process and does not cause any regulatory action to occur by itself. In particular, the process of developing a State Implementation Plan starts with a periodic evaluation of air quality data to determine if violations of the national ambient air quality standards have occurred. Once violations occur, all data are considered when determining which sources to control. Analysis conducted by air quality dispersion modeling plays an integral role in this process. Thus, monitoring only begins a process wherein dispersion modeling and other analysis provide an independent assessment of the controls, if any, which might be needed. Most of the areas now exceeding the PM₁₀ standards are impacted by area sources such as fugitive dust and residential wood combustion and not as much by industrial sources. The 1.9 billion is an old estimate which is not longer applicable. We now believe that this estimate is likely to be lower.

See
Appendix
Note 4

Page 9. "EPA also needs to anticipate that groups which want an area to be classified as being in attainment may challenge the validity of data from the monitor type that gives consistently higher measurements of PM₁₀ concentration. They are likely to insist that the EPA-approved monitor type that gives a lower reading is accurate."

Response

If a violation of the PM₁₀ standard is observed with monitoring data, it starts a chain of events. This does not necessarily lead to increased controls, it merely starts the SIP Development Process. This process includes identification of the sources, evaluation of monitoring and modeling data, evaluation of control options, etc. In evaluating monitoring and modeling data we seldom find that monitors are located at the points of maximum impacts. Thus, modeling data is usually used as the major tool for determining this level of control required. In other words, monitoring can initiate the process but is seldom, if ever, used only by itself to develop the SIP, particularly when industrial sources are involved.

See
Appendix 4,
Note 5

Page 9. "The 24-hour standard is exceeded if 150 or more micrograms of particulate matter per cubic meter are collected on the PM₁₀ filter during any 24-hour period."

Response

Appendix K to 40 CFR Part 50 states that a daily value for PM₁₀ defines a specific 24-hour period to be used for regulatory purposes and refers to "the 24-hour average concentration of PM₁₀ calculated or measured from midnight to midnight (local time)."

See
Appendix 4,
Note 6

Page 9. "Generally, an area is considered to be out-of-attainment when there are four or more exceedances within a 3-year period."

Response

The new PM standards are expressed in terms of expected annual values, thus a monitoring site (and in turn the area) is considered to fail the 24-hour test for attainment when the expected number of exceedances per year is greater than one, or generally, when there are more than three estimated exceedances within a 3-year period. Thus for a site to be in nonattainment with the 24-hour standard, it is sufficient but not necessary for the site to have four or more exceedances within a 3-year period.

See
Appendix
Note 7.

Page 9. "EPA-Approved Monitors Produce Different Measurements."

Response

This title is misleading and should be changed. EPA's performance based approach for specifying PM₁₀ samplers allows for some level of discrepancy between different type samplers. The title should be changed to read: "EPA Needs to Minimize the Potential that Different....." With the existing approach for approving samplers, there will always be some potential for uncertainty in PM₁₀ measurements. EPA's goal is "agreement within 10%." This is a practical and achievable limit. Relative to the other possible uncertainties in the air quality SIP evaluation process, this degree of potential error is not significant.

See
Appendix
Note 8

Page 9. "Groups may question the validity of data on the grounds that measurements for PM₁₀ are sometimes inconsistent with TSP measurement."

RESPONSE

PM₁₀ measurements higher than TSP measurements should always be questioned. Such results may be indicative of operational problems in one or both of the samplers. However, PM₁₀ measurements could be expected to approach TSP measurements when the samplers are collecting mostly fine particles (e.g. smoke). Data should be invalidated if the discrepancy between the two samplers is large. If the problem occurs frequently, the network operations should be subjected to a thorough review.

Page 11. "Moreover, since data from a 3-year period may be used to make an attainment decision, data being currently analyzed may include data from 3 years earlier when the Wedding and the Anderson monitor models were likely to have recorded wider measurement differences than the more recent modes."

Response

This section of the IG report does not properly differentiate between the use of reference and nonreference PM₁₀ data. The samplers in use during the most recent three years were both the currently designated Sierra Anderson and Wedding reference method samplers (eg. SA-321B) as well as their nonapproved processor samplers (eg. SA-321A). These approved

models were not available for use prior to 1987. Thus 1985 and 1986 PM₁₀ data were produced by nonreference samplers. Wider measurement differences are recognized in these nonreference measurements and are treated differently than reference data in OAQPS's revised policy for interpretation of PM₁₀ data. As discussed in the November 21 policy memorandum, these data are interpreted using gray zones and not interpreted at face value like the reference sampler data. The samplers in use during 1987 which were subsequently approved by EPA as reference samplers have the same measurement capabilities as the 1988 models and therefore do not have been wider measurement differences than the more current models. Therefore, the same face value interpretation is appropriate for both years of reference method data.

This section (pages 9-12) also leaves the reader with the impression that progress in solving the problems with those samplers has not been made. There is language addressing this in the EPA issue paper (see pages 2 and 11) that could have been inserted here to clarify EPA's position relative to the impact and magnitude of the differences between these two samplers.

See
Appendix 4,
Note 9

Page 11. "For purposes of this report, it is sufficient to note that the regulations for approving samplers allow some uncertainty between approved samplers and that while differences in measurements between the two monitors are decreasing, a significant difference still remains."

Response

Although the I.G. draft report makes this statement, the report never defines "significant." EPA's issue paper has indicated that differences less than 10 percent are acceptable.

See
Appendix 4,
Note 10

Pages 12-

13. Section subtitled "Potential Development That is Likely to Increase Monitor Measurement Differences."

Response

This section is essentially correct and reflects the trade-off EPA made when the regulations were proposed and finally promulgated. The discussion, however, does not address the primary advantage of allowing equivalent methods, (e.g., approval of continuous PM₁₀ monitors to address everyday sampling and provide

diurnal concentration information). EPA believed at the time of the promulgation that the advantages of allowing continuous monitors for attainment monitoring far outweighed the potential for uncertainty in the measurements.

Se
Appendix
Note 11

Page 15. "In our opinion, this fact [$PM_{10} > TSP$] may cast doubt on the validity of data from PM_{10} monitors, and this uncertainty may be cited, by those who do not want to act, as an excuse for not acting on the basis of PM_{10} data."

Response

See our responses to Page 9 of the Draft Report regarding this issue. A discussion of this issue is also contained in the quotation attributed to the Chief, MSB, on pages 14 and 15 of the IG Drat Report. We disagree that this is a significant problem.

Page 15. "We believe some nonattainment and attainment decisions are likely to be challenged in court because of the limitations of PM_{10} technology and inconsistent readings among the two types of PM_{10} and TSP monitors.

Response

While many EPA regulatory determinations are challenged in court, few are reversed. However, challenges would probably be on the whole State Implementation Plan and not just on the status of air quality measurements.

Both the Wedding and Anderson monitors are approved reference method samplers, and OAR and OGC believe that attainment decisions made using either sampler are defensible. Moreover, EPA's regulations provide for using reference method data at face value. At the present time there is no way to ascertain whether either monitor provides more accurate readings. Using the data from all samplers at face value thus represents a reasonable approach to the problems posed by the divergence in readings from the two samplers and thereby provide a logical starting point for the SIP process.

Concentrations recorded by available TSP monitors would also be considered in the air quality evaluation process. Any apparent discrepancies between PM_{10} and TSP measurements would have to be addressed in the SIP.

Page 16. "We identified two locations, Longmont, Colorado and Fresno, California, where (1985-1987) data from Anderson monitors indicated that the areas were barely out-of-attainment of the 24-hour standard..."

Response

This section of the IG report also confuses the use and availability of reference and nonreference PM₁₀ data. See As indicated above, PM₁₀ data was not produced with EPA approved samplers prior to 1987. For improved clarity of the IG report, we suggest that "approved" or "nonapproved" be used to qualify the appropriate monitors discussed in the audit report. Appendix 4, Note 12

Page 17. "Generally when an area is classified (or reclassified) as being out-of-attainment, the SIP (or SIP revision) should specify the emission reductions that are necessary to bring the area into attainment."

Response

"As previously stated, areas are not classified as being out-of-attainment with the new particulate matter standards. The use of the incorrect terminology suggests that air quality determinations have an immediate regulatory consequence." See Appendix 4, Note 4

Page 18. "We are concerned whether a company might collocate a Wedding monitor next to a government's Anderson monitor and insist that the lower reading be used as the only legitimate basis for action."

Response

Although companies might be expected to use this tactic, OAQPS's November 21, 1988 Revision to Policy on the Use of PM₁₀ Measurement Data would provide a reasonable defense to such a claim. The policy states that "when more than one sampler (or group) is operated independently by one or more monitoring agencies concurrently for attainment assessment purposes, each sampler (or group) shall represent a different monitoring station. The data from each monitoring station shall be used separately to assess attainment or nonattainment with the NAAQS." Thus, any approved sampler measuring NAAQS exceedances at the site should be deemed a separate station, and data that demonstrated a violation of the standard would justify the Agency's decision to call for a SIP revision. It is important to note that all data used to judge

attainment/nonattainment, including data provided by industry or environmental groups is supposed to meet all the requirements for SLAMS specified in 40 CFR 58, includes quality assurance and siting, and a quality assurance program that has been approved by the appropriate Regional Office. This is also stated in the November 21 policy.

- Page 19. "The Office of Air and Radiation needs to issue policy to reduce the potential confusion and inconsistencies in implementing the PM₁₀ regulations. We believe all concerned parties need to be formally advised of OAQPS's policy."

Response

As previously stated, OAQPS issued a policy memorandum on November 21 to clarify the use of PM₁₀ measurement data. See Appendix Note 1

- Page 20. "In our opinion, both of the other two (Issue Paper) options have merit, although criticism would be expected from those who believe all measurements must be treated as if they came from the same type of monitor which always provided consistent measurement."

Response

The joint OAQPS/EMSL committee which consisted of EPA national experts in PM₁₀ instrumentation, PM₁₀ monitoring, PM₁₀ standards interpretation and PM₁₀ standard's implementation determined that their recommended option was the best course of action. See Appendix Note 14

- Page 20. "We believe that the Office of Air and Radiation should establish a group or panel of experts who would deal with specific situations on a case-by-case basis. For example, in regard to the 24-hour standard, the panel would be given the authority to decide whether measurements within a specified range are to be considered exceedances. The panel could consider all information made available to it, such as the type of monitor, the monitor's location, the amount of difference between the measurement and the standard, etc. This panel would document the reasons for its decisions."

Response

OAQPS has determined that the best course of action is to get a general policy for the interpretation of PM₁₀ data and to consider exceptions as warranted on a case-

by-case basis. We believe that this approach emphasizes national uniformity. See Appendix 4, Note 15

Page 20. "Where appropriate, changes which are ultimately made in current policies and procedures may need to be submitted through the formal rulemaking process."

Response

The new OAQPS policy is stated as a general policy and exceptions are permitted. We and OGC believe this approach is lawful and provides a balance between certainty and flexibility. If at some later time we conclude it would be appropriate to adopt rules incorporating these policies, EPA could then undertake rulemaking.

Page 20. "The committee has recommended that PM₁₀ measurements be accepted at face value."

Response

This statement should be qualified to say that the committee recommended that PM₁₀ measurements from EPA approved reference method samplers be accepted at face value. See Appendix 4, Note 16

Page 22. "In other words, in our opinion, no environmental official, or combination of SIP officials, has clear authority to decide that continuous, routine measurements just above the standard should not automatically be treated as exceedances, depending on the type of monitor that generated the data."

Response

The new OAQPS policy requires that when routine measurements are consistently produced with a reference sampler above the standard, then these measurements would be judged as exceedances of the standard. Once a sufficient number of such exceedances are observed, then a nonattainment problem will be evident. This is clearly indicated in Section 2.2 of the PM₁₀ SIP Development Guideline and is not superceded by the revised guidance. See Appendix 4, Note 17

Page 22. "Similarly, in our opinion, no environmental officials or combination of SIP officials has clear authority to decide that continuous routine measurements just below the standard should sometimes be treated as exceedances. In any case, clear policy is needed, and the authoritative basis for this policy needs to be

Response

The revised OAQPS policy clearly states that "all data produced by reference samplers shall be interpreted at face value and can be used to make comparisons with the NAAQS for the purposes of determining attainment or nonattainment, in accordance with Appendix K to 40 CFR 50." Thus measurements just below the standard cannot be treated as exceedances.

See
Appendix

Page 22. "We believe that EPA can better define a policy which allows knowledgeable professionals to interpret monitor data, rather than a policy which categorically states that all monitor measurements must be accepted at face value." Note 1)

Response

For the reasons discussed in our responses, we and OGC believe that accepting data from reference monitors at face value complies with applicable law and regulations. In fact, this approach will present less serious legal problems than the IG's suggested approach of adjusting data from reference method monitors. As the IG report notes, regulatory changes probably would have to be enacted to allow for the adjustment of data.

See
Appendix
No

Page 23. IG Recommendation Number 1:

"Establish procedures which allow for flexibility in interpreting measurements near the PM₁₀ standard."

Such as

- (a) "establishing a panel of experts who would deal with measurements within a specified range on a case-by-case basis;"
- (b) "not requiring any action for monitor measurements within a certain "gray zone" around the standard; and"
- (c) "adjusting measurements by predetermined percentages, depending on the type of monitor."

Response

We feel that the OAQPS policy on the face-value use of reference measurement data, coupled with the PM₁₀ SIP process provide sufficient flexibility for interpretation of measurements near the PM₁₀ standard. We feel that the appropriate role for a group of experts is to review PM₁₀ SIPs, and not to review all measurements within a specified range. Although options (b) and (c) above, were considered by the OAQPS/EMSL committee, they could not be recommended after weighing and evaluating their various advantages and disadvantages.

The use of all PM₁₀ data produced by reference samplers at face value is clearly the best course of action. See

Page 23. IG Recommendation Number 2:

Appendix 4,
Note 19

"Establish procedures which provide for documenting the basis for deciding an area's attainment status."

Response

The new implementation regulations for PM₁₀ do not require that an area's attainment status be categorized. Instead, the implementation regulations specify that an area's SIP is judged to be adequate or inadequate to attain the standards. The SIP, therefore, provides for the appropriate regulatory documentation. See

Page 23. IG Recommendation Number 3:

Appendix 4,
Note 20

"Work with appropriate EPA officials to obtain any regulatory changes that are necessary to provide a clear, authoritative basis for the selected policy."

Response

The November 21 policy memorandum issued by OAQPS to the Regional Air Directors described and communicated the proper use of PM₁₀ measurement data. No regulatory changes are needed. See

Appendix 4,
Note 21

RESPONSES RELATED TO
AUDIT ITEM NUMBER 2 -

"EPA NEEDS TO PROVIDE GUIDANCE AND
CLARIFY AUTHORITY FOR USING DATA FROM
NONAPPROVED MONITORS"

Page 1. Objective - "to determine whether OAQPS has implemented a policy to deal with the fact that most of the PM₁₀ data which has been accumulated through 1988 is likely to have been generated by types of monitors that have not gone through the evaluation and approval process required by regulations."

Response

OAQPS has implemented a policy to deal with the use of PM₁₀ measurement data produced by nonreference (i.e. non-approved) samplers. This is contained in the November 21 OAQPS policy memorandum. We differ with the IG's statement, however, that most of the PM₁₀ data which has been accumulated through 1988 is likely to have been generated by nonapproved monitors. The response to this point will be discussed together with our response to the third topic of the IG audit which deals with the number of required PM₁₀ monitors. See our response to page 37 of the IG

Draft

Report for this discussion.

Page 4. "We believe that current regulations do not clearly allow this data to be used and recommend that the regulations be clarified. Doing so will strengthen the Agency's position should legal challenges arise. Moreover, if adopted, the committee's recommendations would change the present policy for interpreting measurements from nonapproved monitors near the PM₁₀ standard. Accordingly, we recommend that the Office of Air and Radiation clarify its policy on this issue."

Response

We feel that the November 21 policy memorandum provides the required clarification to the regulations.

See
Appendix
Note 22

Page 24. "Most of the PM₁₀ data accumulated through August 1, 1988 has been obtained from types of monitors that have not been approved by EMSL's Methods Standardization Branch (MSB)."

Response

As stated above, this will be answered in the response to the third audit topic.

- Page 24. "Clarification of EPA policy and regulatory authority for using data from nonapproved monitors will conserve significant EPA resources that would otherwise be spent dealing with the issue should legal challenges occur."

Response

The November 21 policy memorandum clarifies the use of data from nonapproved monitors.

See
Appendix 4,
Note 22

- Page 24. "Part 53 describes a very detailed and complicated process by which MSB approves PM₁₀ measurement methods. For purposes of this report, it is sufficient to note that the regulations require PM₁₀ monitor types to be approved by MSB..."

Response

Change MSB to EPA. Under 40 CFR Part 53, reference and equivalent methods are formally approved by the EPA Administrator or his designee. In this case this authority has been delegated to the AA of ORD. This error is made throughout the document and should be corrected.

See
Appendix 4,
Note 23

- Page 25. "Subsection titled "EPA has not approved some monitors."

Response

This section has numerous errors in detail that will not be corrected here. The Chief of MSB, however, will be available to meet with the IG staff to provide them with these corrections to ensure that the IG Final Report is correct.

See
Appendix 4,
Note 24

- Page 27. "We asked the Chief, MSB, whether any of the nonapproved monitors were likely to be submitted for approval."

Response

This paragraph contains several factual errors; however, as indicated above, the Chief of MSB will be available to meet with the IG staff to make these corrections to ensure that the IG Final Report is correct.

See
Appendix 4,
Note 25

- Page 28. "In our opinion, 40 CFR 50.6(c), which we quoted on page 24, does not clearly allow EPA to use PM₁₀ data from nonapproved monitors as the basis for deciding that an area is out-of-attainment."

Response

OAR and OGC agree that the regulations as currently written do not clearly allow EPA to use PM₁₀ data from nonapproved monitors. However, we do not agree that it means that nonreference monitors may not be used for purposes other than to supplement and corroborate data collected by reference samplers where such data are insufficient in quantity to make a determination of whether or not the areas is attaining or not attaining the standards. We feel that the current regulations justify this usage. This is based in part, on the exception clause in Appendix K which refers to existing guidance and approval by the appropriate Regional Administrator. The guidance (Guideline on Exceptions to Data Requirements for Determining Attainment of Particulate Matter Standard) discusses TSP as an example for a surrogate particulate matter indicator. The guideline states that other approaches are also possible. This is discussed more fully in our responses to points raised on pages 31. Since the regulations were not explicit on the usage of nonreference PM₁₀ data, however, some clarification was needed. The November 21 policy memorandum provided this clarification.

See Appendix Note 26

Page 29. "In our opinion, the present regulations do not contemplate or allow data from nonapproved monitors to be used."

Response

As the audit report states on page 29, "we (OAQPS) feel that the present regulations are broad enough to allow data, outside a small range (+ or -20%) on either side of the PM₁₀ standard, to be used to corroborate both positive and negative attainment decisions." See Appendix Note 26

Page 29. "...the Issue Paper recommends that... "(2) measurements within the gray zone should be disregarded; and (3) measurements outside of the gray zone should be taken at face value."

Response

For item (2), both the September draft and final version of the Issue Paper stated that measurements within the gray zone should not be disregarded but used with less authority. For item (3) measurements outside the gray zone should be considered more authoritatively. Specific formulas are provided in the November

21 memorandum. In particular, when nonreference Sierra Anderson or Wedding PM₁₀ data are greater than their respective gray zones, these measurements would be treated as exceedances of the standard. Similarly, when these data are less than their respective gray zones, these data would not be counted as an exceedance. See Appendix 4, Note 27

Page 31. "Our interpretation of Appendix K and the Guideline is that they are referring to using data from certain specific sources (or time), other than the primary source (or time), but not data from nonapproved monitors, to corroborate a positive attainment decision (but not a negative attainment decision) that is already firmly indicated by existing data from an approve monitor.

Response

Section 2.3 of Appendix K states that 3 years of monitoring data from approved reference method PM₁₀ samplers normally are necessary to make a determination that an area is not attaining the standard. But the provision also provides an exception to this data requirement: "Data not meeting these criteria may also suffice to show attainment; however, such exceptions will have to be approved by the appropriate Regional Administrator in accordance with EPA guidance." As the IG report notes, Appendix K does not expressly allow the use of nonreference sampler data to corroborate approved sampler data in determining that an area is in attainment. It also does not preclude the use of nonreference data for this purpose, however. Nor does the Guideline's failure to address the subject mean that it is not permitted. The Guideline on Exceptions to Data Requirements for Determining Attainment of Particulate Matter Standards states that "the present document is intended to provide guidance for such exceptions to data requirements, but it is not intended to list all possible situations in which data may be acceptable; other procedures besides those described in this guideline may be used to determine attainment of the particulate matter standards, if approved by the Regional Administrator." The above statement is emphasized to show that the guideline did not intend to limit the type of data that could be considered. The November 21 memorandum clearly clarifies that PM₁₀ data from nonapproved samplers may be used in a manner similar to that described for TSP in the guideline. See Appendix 4, Note 26

Page 31. "We do not believe the regulations or the Guideline allow data from nonapproved monitors to be used to help corroborate data from approved monitors in making a

negative attainment decision."

Response

It is true that under Appendix K, 3 years of data are not needed for the Agency to determine that a monitoring site is not in attainment with the PM₁₀ standards. There are strong policy and common sense reasons why nonreference data also should be used to corroborate reference data in making nonattainment determinations, however. Concern for human health and welfare suggests that such data showing exceedances of the standards may reasonably be utilized to fill in data gaps caused by the failure to use reference instruments prior to August 1988. The language of Appendix K, section 2.3 supports this view. It states that "there are less stringent data requirements for showing that a monitor has failed an attainment test and thus has recorded a violation of the particulate matter standards" than for showing that a monitoring site has attained the standards. Moreover, the source of measurement data needed to determine nonattainment with the standards is not explicitly specified in the regulations. While 40 CFR 50.61(c) only refers to PM₁₀ measurement methods for the purpose of determining attainment of the standards, the regulations often imply nonattainment in addition to attainment as an intended use of measurement data.

Thus, we and OGC believe that we can use nonreference data both for attainment and nonattainment purposes, provided that they corroborate data produced by an approved PM₁₀ sampler. The November 21 policy memo provides the necessary clarification regarding PM₁₀ data produced by nonapproved samplers to define the manner in which these data can be used to corroborate data from approved samplers for making both a positive and a negative attainment (i.e. nonattainment) See decision.

Appendix 4,
Note 28

Page 33. "The (OAQPS/EMSL) committee recommends that data from nonapproved monitors in a gray zone near the standard be ignored; however, we believe that the gray zone be used like a net to collect marginal data which would be analyzed by a panel of experts who would be empowered to decide whether an exceedance had occurred."

Response

The committee recommends and the November 21 memorandum states that data from nonapproved monitors in a gray zone near the standard not be ignored but be used with less authority. Specifically, such 24-hour measurements would be included in the calculation of the annual mean. Furthermore, the policy governing the use of data produced by nonapproved monitors can create a situation in which sufficient reference and nonreference data are not available to make an unambiguous attainment or nonattainment determination. Instead of asking a panel of experts to decide on the air quality status, our approach recognizes that this situation is too close to call and would require that additional monitoring data be collected until an unambiguous decision could be made.

See Appendix 4,
Note 29

Page 33. "The committee recommends that all measurements from unapproved monitors after August 1, 1988 be ignored for purposes of making attainment decisions while we believe such measurements should be used if the monitor was in service prior to that date."

Response

The committee recommendation and the November 21 policy memorandum are consistent with 40 CFR 58 which require that State and Local Air Monitoring Stations (SLAMS) Networks be established by August 1, 1988; the policy memorandum, therefore, stated that "data collected after this date by nonreference samplers shall not be used. If a nonreference sampler without further modification is designated as a reference sampler in the future, then all of its historical data is retroactively defined as data produced by a reference sampler."

See
Appendix 4,
Note 29

We felt compelled to write this requirement to ensure that existing nonreference samplers be upgraded or replaced with samplers which comply with the PM₁₀ monitoring regulations. As is discussed in our response to the third audit issue, only a small number of nonreference samplers are affected by this decision.

Page 33. IG Recommendation Number 1:

"Not allow data from a nonapproved monitor to be used to determine exceedances if that data was obtained from a monitor that was placed in service after August 1,

Response

This is consistent with the November 21 policy memorandum. See Appendix Note 30

Page 34. IG Recommendation Number 2:

"Allow data that was acquired in the past, or is acquired in the future, from a nonapproved monitor that was part of the SLAMS or NAMS Network that was being used prior to August 1, 1988 to be considered by a panel of experts as a basis for determining whether exceedances have occurred."

Response

SLAMS and NAMS networks were only approved conditionally if nonreference monitors were currently being used. These monitors are supposed to be replaced or upgraded with reference samplers after August 1, 1988. If we were to allow data from nonapproved monitors to continue to be used, then we remove the incentive for the monitoring agencies to upgrade or replace these samplers. According to the November 21 policy, data from nonapproved monitors that were collected prior to August 1, 1988 can be used, subject to the approach specified in the memorandum. Data collected after August 1, 1988 cannot be used, unless the monitor is subsequently approved by EPA.

Page 34. IG Recommendation Number 3:

"Allow measurements from such nonapproved monitors (monitors that were part of the SLAMS and NAMS network prior to August 1, 1988) to be treated like data from approved monitors, for purposes of making attainment decisions, when the PM_{10} measurements are greatly above or below the PM_{10} standard (as illustrated by the data from Medford, Oregon); the cutoff points around the standard may be decided by the panel of experts."

Response

In our November 21 memorandum, an analogous approach was, in fact, established. Our approach is to set a general gray zone within which nonreference PM_{10} data would be viewed with uncertainty and outside of which the data would be used with more authority.

The gray zone limits specified in the November 21 memorandum were recommended by the OAQPS/EMSL committee

of PM₁₀ experts.

Page 34. "Allow a panel of experts to be flexible in deciding whether monitor measurements near the standard should be treated as exceedances, depending on the type of monitor, the amount of differences between the measurement and the standard, etc."

Response

A uniform interpretation of PM₁₀ data for all monitoring areas is preferable to one which varies from area to area. With a uniform approach, the procedures are defined in advance. This permits a consistent, more unbiased interpretation of available PM₁₀ data. We agree that flexibility is needed in order to make comparisons with the standards, but prefer to do so by permitting exceptions to a general approach.

Page 34. IG Recommendation Number 5:

"Work with appropriate EPA officials to obtain the regulatory changes that are necessary to implement the selected plan of action including, if appropriate, the modification of 40 CFR Part 50.6(c), which does not clearly allow the use of any data from a monitor not approved by MSB in the determination of whether exceedances have occurred."

Response

As previously discussed, while 40 CFR 50.6(c) and Appendix K do not clearly allow the use of nonreference data for corroborative purposes, they also do not disallow the use of the data in this manner. If time were not a factor, we would agree that revising section 50.6(c) to clearly and expressly permit the Agency to consider nonreference data in making attainment decisions might prove the best course. Amending the regulations would remove any ambiguity that now exists regarding our reliance on Appendix K. It would also require EPA to undertake full notice and comment rulemaking, however. That process could take years. As the IG report points out, reference method monitors were required to be in place by August 1988. There exists the distinct possibility that the Agency would have 3 years of data from approved monitors across the country by the time it finally promulgated a revision to the regulations that would allow the use of nonreference data when less than 3 years of data from an approved monitor was available. Thus, the rulemaking could prove pointless.

Given the practical impediments to revising section 50.6(c), we believe that the best course is the one embodied in the November 21, 1988 Revision to Policy the Use of PM₁₀ Measurement Data. It is fair, sensible and legally defensible. While it provides a general framework for using nonreference data, it also provides sufficient flexibility in that OAQPS approved exceptions are permitted. Moreover, it may be implemented immediately.

Page 34. IG Recommendation Number 6

"Communicate EPA policy to State and local officials through the regional offices."

Response

This has already been accomplished with the November 21 policy memorandum to the Regional Air Directors. See Appen
Note 30

RESPONSES RELATED TO
AUDIT ITEM NUMBER 3 -

"ADDITIONAL PM₁₀ MONITORS ARE NEEDED
AND EPA NEEDS TO TAKE A MORE ACTIVE
ROLE TO ENSURE THAT MONITOR REQUIREMENTS
ARE MET"

Page 5. "In our opinion, the precise number of monitors that were needed at a point in time is less important than the effort that is being made to ensure that the need for future PM₁₀ monitors is accurately assessed and met." Subsequently, the IG estimated that 81 PM₁₀ samplers would be needed to provide full coverage for the PM₁₀ network. This premise is discussed from different perspectives such as: (a) replacement or modification on non-approved samplers, (b) shifting resources from TSP to PM₁₀ monitoring, (c) moving PM₁₀ samplers from Group III to Group I and II areas, and funding for new PM₁₀ samplers.

Response

The statement above strongly implies ineffective action by OAQPS in assessing future PM₁₀ sampling needs and ensuring that these needs are met. The report then proceeds on an exhaustive detailed 23 page description of a March 1988 short fall of 81 PM₁₀ samplers which OAQPS had identified and included in their preliminary draft PM₁₀ status report of January 25, 1988, which was given to the IG auditors. Since additional PM₁₀ samplers were purchased after March 1988, the IG auditors were provided with updated information by OAQPS on October 12, 1988 by memo and meeting. This information showed that only four PM₁₀ samplers were needed to fully cover all Group I and II areas as well as meeting all of the NAMS requirements. The IG draft audit report did not fully utilize the material provided on October 12 but instead focussed on an outdated estimate of an 81 monitor shortfall. See Appendix 4, Note 31

Page 35. "The PM₁₀ monitoring network needs more monitors, but the exact number of needed monitors could not be determined from the information available at the time we concluded our review."

Response

This statement disregards the tabular information OAQPS provided the IG auditors on October 12, 1988, which showed that as of October 1988, only four PM₁₀ samplers were needed to fully implement the PM₁₀ network. This was based on the assumption that all of the first year monitoring requirements for the Group I and II areas as

well as the minimum number of NAMS were met or were very close to being met without additional PM₁₀ samplers being located in the monitoring area. Additional assumptions were based on the urbanized population, magnitude of the concentrations, PM₁₀ area monitor groupings, and expectation that reference status would be granted in the near future for the Oregon sampler and the SA dichot.

It should be noted that OAQPS has tracked and published periodic status reports on the PM₁₀ networks. A total of 13 reports have been issued, the first of which was issued in February 1985 and showed that 117 PM₁₀ samplers were operational as of December 1984. The IG report was using information which was presented in the Status Report Number 12 dated November 1987 and reflected the status as of September 1987. This report showed that there were 884 PM₁₀ samplers operating at 550 sites.

During discussions between OAQPS and the IG during 1988, the IG auditors were given prepublication information on the next PM₁₀ network report which would show the status as of March 1988. The IG auditors calculated from this information that as of that date, 81 PM₁₀ samplers would be needed for the network to be fully implemented based on the Part 58 monitoring regulation requirements. OAQPS concurred that 81 additional PM₁₀ samplers were needed as of March 1988.

The focus of this discussion is to point out that OAQPS has been tracking the requirements and locations of the PM₁₀ samplers for over 4 years. During this time, samplers were purchased in three ways: (a) by EPA directly and given to the States, (b) through the 105 Grant process, and (c) by the State/local agencies direct purchase of samplers with their own funds. As a result, the PM₁₀ networks have grown in size from 117 samplers in 1984 to over 1,000 in 1989. Therefore, in the spirit of cooperation between OAQPS and the IG auditors, OAQPS as noted earlier, provided the IG auditors with the OAQPS latest information on October 12, 1988 at a meeting and by draft memo. This information and analysis showed that 11 samplers were needed to fully implement the PM₁₀ network, and 7 of these 11 samplers were in the process of being ordered. Therefore, OAQPS concluded that the shortfall in October 1988 was 4, and not the 81 samplers the IG used in the report. This was clearly stated in the draft memo. However, this information was largely disregarded by the IG auditors, who proceeded to write another 23 pages on the subject.

See Appendix 4
Note 31

While the four PM₁₀ samplers would complete the monitoring network for existing Group I and II areas as well as the NAMS requirements, it must be understood that new areas may be identified in the future, so that additional samplers may be needed. The PM₁₀ Monitoring Task Force is currently looking into this problem.

Page 35. "As described in Exhibit B, we estimated that a minimum of 81 additional monitors were needed on August 1, 1988. This shortfall consisted of 66 monitors which were needed in locations that did not have enough monitors, and 15 monitors which were needed to replace, or be collocated with, types of monitors that had not been reviewed and approved by EPA."

Response

As discussed above, we are concerned with the IG's draft report focus on the outdated August 1, 1988, estimate of an 81 monitor shortfall. OAQPS informed the IG auditors on October 12, 1988, that only four additional PM₁₀ samplers were needed. We are concerned that this information was largely disregarded.

Also, the IG auditors ignored information provided to them on October 12, 1988 that 573 PM₁₀ sites out of the 603 PM₁₀ sites identified by the IG auditors were using reference samplers. The remaining 30 samplers were in the process of being evaluated for reference status. The approval for the Oregon medium volume PM₁₀ sampler and the SA dichot should be granted by mid 1989. Furthermore, in meetings with the IG auditors, the OAQPS staff, it was explained that most of the non-reference samplers identified by the IG auditors were reference samplers. The situation was simply a coding problem (the data from reference PM₁₀ samplers were incorrectly coded as non-reference samplers) and steps were being taken to correct this situation. Some of the procedures have already been implemented. However, the IG auditors again did not acknowledge the information provided by OAQPS.

See
Appendix 4,
Note 31

Page 36. "However, we do not agree that only 11 sites still needed PM₁₀ monitors because the Branch Chief: (1) assumed that EPA will approve some monitors and (2) did not mention that OAQPS itself believes that 50 to 100 additional monitors are needed for spares, training, and special studies."

Response

In our October 12, 1988 draft memo, the OAQPS position was that there were only 30 non-approved samplers in operation (later revised to 28) and that these would be approved by EPA in 1988. We maintain that position except that the approval has been slightly delayed. The SA 254 medium volume samplers are scheduled to be approved in March 1989 and the SA dichot in April 1989.

Concerning the estimate of an additional 50-100 samplers for spares, training, or special studies, the OAQPS status reports on the PM₁₀ networks have tracked the number and locations of PM₁₀ samplers needed to complete the network, but have never intended to keep track of all the PM₁₀ samplers being used for spares, training, special studies, etc. The spares are not a trackable item, because most of the time only the broken part is replaced and not the complete sampler. OAQPS is keeping track of the samplers being used for special purpose monitoring. The question asked was how many PM₁₀ samplers were needed in October 1988 to fully implement the PM₁₀ networks. This question was See accurately answered.

Appendix 4,
Note 31

Page 36. "We are less concerned with the precise number of monitors that were needed at a particular point in the past than in the efforts that will be made to anticipate and meet future monitoring needs in the constantly changing PM₁₀ environment." Then for the next nine pages, they discuss (a) the role of OAQPS in assigning resources to areas with greater PM₁₀ problems, (b) replacement of non-approved monitors, (c) shifting resources from TSP monitoring to PM₁₀ monitoring, (d) shifting PM₁₀ samplers from Group III to Group I and II areas, and (e) funding of PM₁₀ samplers.

Response

The IG report, as stated previously, fails to acknowledge the fact that as of October 1988, only 11 PM₁₀ samplers were needed to fully implement the PM₁₀ networks, and 7 of the 11 samplers were in the process of being purchased. Also as noted previously, PM₁₀ samplers have continually been added to the network since 1984. The latest OAQPS PM₁₀ status report showed 914 samplers operating in March 1988. Since then, preliminary information for the next PM₁₀ status report show that approximately 150-200 new PM₁₀ samplers have been, or are in the process of being, purchased.

Two of these new PM₁₀ samplers are targeted for the two Ohio counties which were identified as having inadequate sampling frequency. These PM₁₀ samplers will be operational by September 1989. Also, Connecticut has purchased samplers for multiple sites in Fairfield County to provide coverage and are operating these sites on a 1-in-6 day schedule as of October 1988 (but not at the required every day schedule). It may therefore be concluded that based on available information, the PM₁₀ networks will satisfy current requirements by September 1989 except for Fairfield County, Connecticut.

See Appendix 4,
Note 31

Page 37. "We concluded that OAQPS has not fully assessed the need, or confirmed that an assessment has been made of the need, to modify or replace non-approved monitors that are part of the current SLAMS and NAMS network."

Response

OAQPS strongly disagrees with the IG draft report conclusion. As pointed out in page 4 of the draft memo given to the IG auditors on October 12, 1988, of the 603 PM₁₀ sites identified by the IG auditors, 573 PM₁₀ sites are using reference samplers. Twenty-eight of the remaining 30 sites were using samplers for which reference designation was applied for. As noted above and in discussions with the IG auditors, it was explained that this perceived problem was simply a coding problem and steps would be taken to correct this situation. On page 6 of the memo to the IG auditors on October 12, 1988, it clearly states that "the problem of unapproved monitors has been resolved." It is not clear why the IG auditors have chosen to ignore the EPA information.

A summary of the OAQPS actions taken to address the coding problems are discussed below:

(a) Old PM₁₀ samplers with method codes 055, 056, 057, 058, and 059 were in fact reference methods and should not have been counted as non-approved samplers. The IG auditors were informed of this in the October 12, 1988 memo. On January 3, 1989, data from samplers with these codes must be submitted under reference method codes 062, 063, 064, and 065.

(b) The data stored in AIRS under method codes 055, 058, and 059 prior to January 3, 1989 will be converted by the National Air Data Branch (NADB) in the next several weeks to the reference method codes 062, 063, and 064.

(c) The agencies collecting the PM₁₀ data are being requested to convert method codes 056 and 057 to the reference methods 064 and 065. This is because two PM₁₀ modifications were installed and only the collecting agency knows when the modifications were completed.

(d) PM₁₀ samplers with method codes 051, 052, 053, and 054 have all been modified to be reference methods. See Appendix Note 32

Page 38. "We asked the Section Chief how many States still had laws that required TSP monitoring. The Section Chief could not tell us."

Response

The IG auditors were informed that OAQPS was in the process of obtaining this information but that all of the responses were not back at that time. The following information was obtained from the Regional Offices on the 36 States which have retained at least some part of the TSP standard:

Region I- CT, ME, MA, NH, RI, VT
Region II- NJ, NY, PR
Region III- DE, MD, VA, WV
Region IV- AL, FL, GA, KY, MS, NC, SC, TN
Region V- WI
Region VI- NM
Region VII- NE
Region VIII- CO, MT, SD, UT, WY
Region IX- AZ, HI, NV
Region X- AK, ID, OR, WA

It should be noted that a cutback in TSP sampling will result in some savings on manpower but not on capital expenditures for PM₁₀ equipment.

See Appendix 4,
Note 33

Page 38. "Based on our conversations, we concluded that although OAQPS had set goals for disinvestment, it had not gathered information about State TSP monitoring laws which would have been helpful in formulating reasonable goals for States and local agencies' reductions in TSP monitoring. We further concluded that OAQPS had not made a significant effort to encourage, or find out about, State or local offices' efforts to make any changes in TSP monitoring that may appear to be warranted." The IG report also questions in a round about way how EPA estimated that 600 to 700 TSP samplers would be needed for future purposes.

Response

There were 2028 TSP SLAMS and NAMS samplers operating in December 1987 as shown in the OAQPS annual SLAMS status report. Preliminary estimates in January 1988 were that 1676 TSP samplers would continue to run in 1988. However, the Director of the OAQPS Technical Support Division asked each Region to reevaluate the projections for the 1988 SLAMS networks since OAQPS estimated that only 600 to 700 TSP samplers would be needed for various reasons. These TSP samplers would be needed for (a) surrogates for PM_{10} , (b) National Particulate Network (NPN) analyses, (c) collocation for 1 year with PM_{10} , NAMS, (d) sampling in States with a TSP standard, and (e) maintaining an ability to conduct a national trend analysis of TSP based on a greatly reduced number of samplers.

The IG draft report chose to focus on how many States had a TSP standard and whether OAQPS had considered this number in estimating that 600 to 700 SLAMS samplers would be needed. The OAQPS did have some information from various Regions on which States had a TSP standard. This information was factored, along with OAQPS estimates, on what the SLAMS TSP network would shrink to.

The revised TSP number for 1988 based on the reevaluation of needs resulted in 1542 planned to be operated in 1988. Because of the cooperation of the Regions, States, and local agencies, this number had been reduced to approximately 1050 by the end of 1988. Furthermore, the preliminary projections for 1989 are for 800 to 850 TSP samplers to be operating. Projections for 1990 show that the original projections of 600 to 700 TSP samplers will probably be achieved.

The above discussion shows that resources at the State and local levels are being shifted from TSP sampling to PM_{10} sampling. Also, there is a reasonably good chance that the OAQPS target was realistic and will probably be achieved in 1990. However, what is implied in the IG report is that as resources are decreased from TSP sampling, more resources would be available for procurement of PM_{10} samplers to meet the IG deficit of 81 samplers. While some manpower would be shifted to the PM_{10} monitoring program, it will not provide the resources needed to purchase PM_{10} samplers, balances, upgrading weighing rooms, etc.

See Appendix 4,
Note 34

Page 40. "We have not seen any written communication, or been advised of detailed verbal communications, which

indicated to us that the strategy of shifting monitors to meet regulatory requirements has been pursued to the degree that we believe it should have been pursued."

Response

We disagree with this statement. OAQPS recommendations to provide coverage in the Group I and II areas as needed were included in the last several PM₁₀ Status Reports. Also, a memo was sent from the Director, TSD, OAQPS to the Regional Office ESD Directors to re-emphasize this recommendation. (See Attachment E.) Most State/local agencies chose not to relocate PM₁₀ samplers, since plans were underway to cover the remaining areas with new PM₁₀ samplers. See Appendix 4, Note 35

Page 41. "...OAQPS does not know whether State, local, or Federal funds will be used to purchase needed PM₁₀ monitors....".

Response

This section of the IG draft report is based on the implication that 81 PM₁₀ samplers are needed to fully implement the PM₁₀ networks. As stated repeatedly, however, we informed the IG auditors that only four PM₁₀ samplers were needed as of October 1988.

In discussing needed PM₁₀ samplers with the Regional Offices, it was evident that PM₁₀ samplers were being purchased from a combination of Federal, State, and local funds, and that the States and local agencies were making the effort and resources available to fully implement the PM₁₀ networks. The previous discussion indicated that in addition to the 914 PM₁₀ samplers operating in March 1988, preliminary estimates show that 150-200 new PM₁₀ samplers have been, or are in the process of being, purchased. See Appendix 4, Note 36

Page 41. "During the audit, we discussed with OAQPS officials those issues which we believe should be addressed in their analysis. They are as follows:"

(1) "Locations where PM₁₀ monitors are required by regulations (this information can be determined from MRS's Status Reports)."

Response

The OAQPS plans to continue issuing periodic PM₁₀ status reports which will contain this information.

(2) "Locations where PM₁₀ monitors are currently operating (this information is routinely presented in MRB's Status Reports)."

Response

The periodic PM₁₀ status reports will continue to contain this information.

(3) "Locations where non-approved monitors are operating."

Response

OAQPS does not believe that this is a significant issue. As explained in an earlier discussion, all operating PM₁₀ samplers have been modified as needed except as noted below. Reference status has been applied for the SA medium volume and SA dichot sampler, which represents 28 of the 605 PM₁₀ samplers identified in Exhibit A of the IG report. There was also one GMW and one W-10 dichot also identified in Exhibit A, which are not reference samplers. Therefore, 603 of 605 PM₁₀ samplers identified by the IG auditors as of May 1988 were expected to be reference samplers. See Appendix 4, Note 37

(4) "Location where a type of non-approved monitor is operating which can be modified to become a type of sampler that can be approved."

Response

The two PM₁₀ samplers discussed in item 3 above can not be modified at the present time to become reference samplers and will not be used in the NAMS networks.

(5) "Locations where PM₁₀ monitors are currently operating, but are not required to be operating by Federal Regulations."

Response

Although the PM₁₀ samplers are not explicitly required by the Part 58 Regulations in all Group III areas, the regulations do not preclude the establishment of PM₁₀ samplers in these areas. The Part 58 Regulations allow for PM₁₀ samplers to be operated for SLAMS, NAMS, or SPM purposes. Appendix D of the Part 58 Regulations specifies that the SLAMS network should be designed to meet one of the four basic monitoring objectives. These basic monitoring objectives are: (a) to determine highest concentrations expected to occur in

the area covered by the network, (b) to determine representative concentrations in areas covered by the network, (c) to determine the impact on ambient pollution levels of significant sources or source categories, and (d) to determine general background concentration levels. All of the PM₁₀ sampling sites OAQPS is tracking fall into one of these categories. It appears that the IG investigators did not critically review the valid monitoring objectives allowed by the Part 58 Regulations.

OAQPS does not attempt to keep track of private or industrial PM₁₀ sites. The IG auditors, by implication, still believe that 81 PM₁₀ samplers are needed contrary to the information we provided to them, and that PM₁₀ samplers should be relocated from areas where PM₁₀ sampling is not required (according to the IG) to other areas where it is required. OAQPS strongly disagrees with the IG draft report implication. See Appendix 4, Note 38

(6) "Explanation of why monitors cannot be shifted from locations where they are not required by Federal regulations to locations where they are required (a specific explanation should be identifiable to each monitor that continues to operate where Federal regulations do not require a monitor)."

Response

In light of the preceding discussion, we don't believe further explanation is needed. Furthermore, the critical areas are covered with PM₁₀ samplers. See Appendix 4, Note 38

(7) "Projections on when existing monitors will need to be replaced because of aging."

Response

Whole PM₁₀ samplers are not replaced because of aging. Component parts, such as brushes, motors, timers, extension cords, etc., may have to be replaced over time. The housing itself may never have to be replaced. State and local agencies usually maintain a supply of the critical parts for quick replacement for these PM₁₀ high volume samplers. This is not the case with continuous gaseous monitors. See Appendix Note 39

(8) "Prioritization of where monitors are not needed."

Response

Before the PM₁₀ networks were fully implemented, OAQPS repeatedly gave guidance to provide coverage in the Group I areas and the Group II areas with the higher likelihood of not attaining the NAAQS. However, the IG auditors should refer to item (5) above which explains that PM₁₀ samplers are needed to meet different monitoring objectives. The IG auditors apparently believe that PM₁₀ samplers should only be located to measure in maximum concentration areas. This is, however, contrary to the Part 58 Regulations. See Appendix 4, Note 38

(9) " Evaluation of whether TSP monitoring would be of some use at locations without a sampler."

Response

The Part 58 Regulations allow for the use of surrogate TSP samplers as a part of the SLAMS network. There are valid uses for these surrogates although only a few have been designated as such.

(10) " Summary of expectations that new funds will be obtained to purchase additional PM₁₀ monitors (expectations of local and State officials)."

Response

In addition to the EPA procurement of 662 PM₁₀ samplers in 1984, EPA recommended in their FY-86, FY-87, and FY-88 grant allocations to the Regions the use of \$400,000 to purchase other PM₁₀ monitoring equipment. As discussed earlier, the Agency finds that except for two PM₁₀ samplers in Region I, the PM₁₀ monitoring needs in all Group I and Group II areas as well as the NAMS requirements have been satisfied. The Agency recognizes that there is a need for short term saturation PM₁₀ sampling in potential problem areas not covered with PM₁₀ samplers, for example in areas where extensive wood burning occurs. A FY-90 initiative is being developed which would enable each Regional office to conduct 3-7 PM₁₀ saturation studies per year. Findings from these studies may demonstrate the need to establish permanent PM₁₀ reference method samplers in these problem areas. The initiative would include resource needs to correct these network deficiencies.

(11) "Summary of expectations for reallocation of funds from TSP monitoring to PM₁₀ monitoring."

Response

In the earlier discussion concerning shifting resources for TSP to PM₁₀ sampling, OAQPS projects that 800-850 TSP NAMS and SLAMS samplers will be operating in 1989 and probably close to 700 in 1990. (See the second response to page 38 of the IG Draft Report.) This reduction will not result in any capital funds for PM₁₀ sampler procurement, but will free up resources to operate the PM₁₀ network. It should be noted that in 1984 when EPA purchased the 662 PM₁₀ samplers, there were approximately 2500 TSP monitoring sites as compared to 800-850 TSP sites in 1989.

(12) "Identity of States with laws that require TSP monitoring; expectations of officials for revisions in such laws; etc."

Response

As noted in the responses to pages 37 and 38, this has been completed.

(13) "Summary of pending developments that may impact on monitor needs (for example, prospect of improvements in technology so that only one monitor is needed to accomplish daily sampling."

Response

40 CFR Part 53 includes provisions for approving alternative monitoring techniques such as continuous or sequential samplers. The Ambient Methods Standardization Branch of ORD administers and implements these provisions. In this capacity they have actively encouraged vendors of PM₁₀ equipment to pursue development and formal testing of improvements to current inlets, easier to operate samplers, and continuous and sequential PM₁₀ samplers. The continuous and sequential samplers would provide a solution to the PM₁₀ daily sampling requirement. Several manufactures are currently testing their continuous sequential samplers and if they meet the performance requirements of Part 53, they will be designated equivalent methods. To further encourage vendors to test and seek approval of their continuous or sequential samplers, the AMSB, ORD has established a field test site in Birmingham, AL to provide vendors the opportunity to compare their samplers to EPA reference methods under field conditions.

(14) "Comparative analysis of PM₁₀ monitor needs by region (i.e., do certain regions appear to need comparatively more monitors only because they have done a more thorough job of identifying areas with potential PM₁₀ problems?"

Response

As noted many times throughout the OAQPS response, and specifically the response to the last paragraph on page 36 of the IG report, the deficit in October 1988 was four samplers. PM₁₀ samplers will be deployed by September 1989 for the two areas in Ohio which did not meet the minimum sampling frequency. This leaves only Fairfield County, Connecticut which is not sampling at the every day frequency. The Connecticut strategy is to sample at several locations for 1 year and then a review will be made of the data. They plan to increase the sampling frequency at the worst site if needed, or to apply for a reclassification of the area to Group II or III.

Page 45. (1) "We recommend that the Acting Administrator for Air and Radiation ensure that a comprehensive analysis is completed of PM₁₀ monitor needs which includes an assessment of the questions we have raised."

Response

OAR believes that it has conducted a thorough analysis of the PM₁₀ monitoring needs. We strongly disagree with the draft report's contrary implication for the following reasons. As early as 1983 OAQPS conducted a critical review of the existing TSP and PM₁₀ data in an effort to identify those areas of the country having high probabilities of exceeding certain PM₁₀ concentrations. These areas were then used as the basis for planning PM₁₀ monitoring needs and calculating the resources necessary to meet these needs. These analyses were included in the Part 58 monitoring docket. As new data entered the national air data bank the critical areas were revised along with the PM₁₀ monitoring resources. Tracking of these critical areas continued and in February 1985 OAQPS issued the first of 13 PM₁₀ monitoring status reports. The 14th PM₁₀ status report is in the process of being completed. In addition to the status reports OAQPS also tracked the Regions' progress in establishing PM₁₀ samplers in the critical need areas through the Administrator's strategic planning and management system (SPMS). Independent of the IG's efforts, OAQPS initiated a PM₁₀ monitoring task force to investigate the PM₁₀ monitoring efforts. The results of these findings will be used to better identify PM₁₀ monitoring deficiencies. OAQPS believes that this effort along with its ongoing status report satisfies the IG's recommendation. See Appendix 4, Note 40

(2) "We recommend that the Acting Administrator for Air and Radiation require that the analysis be updated on a regular basis in accordance with a specific timetable."

Response

OAQPS plans to continue issuing the PM₁₀ status reports at least over the short term, as well as making a more comprehensive analysis as needed.

See Appendix 4,
Note 40



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

21 NOV 1988

MEMORANDUM

SUBJECT: Revision to Policy on the Use of PM_{10} Measurement Data

FROM: Gerald A. Emison, Director
Office of Air Quality Planning and Standards (MD-10)

TO: See Attached List

A joint Office of Air Quality Planning and Standards (OAQPS)/Environmental Monitoring Systems Laboratory (EMSL) committee has evaluated the issue of potential uncertainty in measurement data produced by PM_{10} samplers. They considered modifications and/or clarifications to existing Environmental Protection Agency (EPA) policy contained in the PM_{10} SIP Development Guideline (Section 2.3), the supplementary Response to Questions Regarding PM_{10} State Implementation Plan (SIP) Development (published June 1988), and the data requirements of Appendix K to 40 CFR 50 and Part 58. This committee's issue paper which incorporated comments from Regional staff is attached. This memo follows their recommendations and presents the revised EPA policy regarding the treatment of PM_{10} data produced by reference and nonreference PM_{10} samplers. Treatment of data produced by collocated PM_{10} samplers is also discussed. Deviations to this general policy must receive concurrence of OAQPS.

For this discussion, the term reference sampler shall be used to represent samplers using a reference method based on Appendix J to 40 CFR 50 and designated by EPA in accordance with 40 CFR 53, as well as samplers using an equivalent method designated by EPA in accordance with 40 CFR 53. Nonreference samplers are all other PM_{10} samplers which have not been formally designated as such.

USE OF REFERENCE AND NONREFERENCE SAMPLER DATA

For purposes of evaluating PM_{10} air quality status, all data produced by reference samplers shall be interpreted at face value and can be used to make comparisons with the National Ambient Air Quality Standards (NAAQS) for the purposes of determining attainment or nonattainment, in accordance with

Appendix K to 40 CFR 50. Data collected by nonreference samplers may only be used to supplement and to corroborate data collected by reference samplers where such data are insufficient in quantity to make a determination of whether or not the area is attaining or not attaining the standard. Moreover, data collected by some nonreference PM₁₀ samplers shall be interpreted using gray zones to indicate the potential uncertainty in these older data, which was the policy used for determination of Group I, II and III areas. These details for using data produced by nonreference samplers in order to interpret status with respect to the 24-hour and annual NAAQS are contained in Attachment A. Three situations are discussed: attainment, nonattainment and indeterminate. The latter situation is one in which sufficient reference and nonreference data are not available to make an unambiguous attainment or nonattainment determination.

Regulations in 40 CFR 58 require that State and Local Air Monitoring Stations (SLAMS) Networks be established by August 1, 1988; therefore, data collected after this date by nonreference samplers shall not be used. If a nonreference sampler without further modification is designated as a reference sampler in the future, then all of its historical data is retroactively defined as data produced by a reference sampler.

A table providing a general overview of this new policy for interpretation of PM₁₀ measurement data is included as Attachment B. The treatment of reference and nonreference data is described according to the dates associated with its collection.

COLLOCATED PM₁₀ SAMPLERS

In the event that more than one PM₁₀ sampler is operating concurrently at a location, data from reference method samplers always takes precedence over data from nonreference samplers. If multiple samplers are collocated for data quality assessment purposes (i.e., precision and accuracy), similar sampler types must be used and one sampler must be designated a priori for data reporting purposes (Appendix A to 40 CFR 58). Furthermore, if more than one type of sampler is used by a reporting organization, collocated precision sites should be established for each sampler type.

In order to sample more frequently than every 6th day, more than one sampler may be operated at a monitoring site. This group of samplers, plus any samplers sited for data quality assessment purposes, shall represent a single monitoring

station. When more than one sampler (or group) is operated independently by one or more monitoring agencies concurrently for attainment assessment purposes, each sampler (or group) shall represent a different monitoring station. The data from each monitoring station shall be used separately to assess attainment or nonattainment with the NAAQS, provided that the data meet all the requirements for SLAMS specified in 40 CFR 58, includes quality assurance and siting, and a quality assurance program that has been approved by the appropriate Regional Office.

Attachments

Addressees:

Director, Air Management Division, Regions I, III, IX
Director, Air and Waste Management Division, Region II
Director, Air, Pesticides and Toxics Management Division,
Region IV
Director, Air and Radiation Division, Region V
Director, Air, Pesticides and Toxics Division, Region VI
Director, Air and Toxics Division, Regions VII, VIII, X
Director, Environmental Services Division, Regions I-VIII, X
Director, Office of Policy and Management, Region IX

cc. G. Foley, AREAL
A. Eckert, OGC

bcc. D. Novello, OGC
J. Bachmann (MD-11)
PM₁₀ Measurement Data Working Group
PM₁₀ Monitoring Contacts
PM₁₀ SIP Contacts

ATTACHMENT A:

USE OF NONREFERENCE PM₁₀ DATA TO SUPPORT AND CORROBORATE
REFERENCE PM₁₀ DATA

COMPARISONS WITH THE 24-HR NAAQS

Data produced by nonreference samplers may be interpreted subject to the following conditions: (1) Exceedances measured with certain PM₁₀ dichotomous samplers¹ shall be treated the same as exceedances measured with reference or equivalent method samplers, but only when there also are one or more exceedances subsequently measured with reference samplers at the same location. (2) Data produced with other nonreference samplers shall be interpreted using gray zones (as previously defined in the PM₁₀ SIP Development Guideline and which were used for SIP area grouping) as follows - (a) an exceedance measured with a nonreference sampler outside its gray zone can be treated as an exceedance of the NAAQS, only when there also are one or more exceedances subsequently measured with reference samplers at the same location, and (b) a PM₁₀ value produced by a nonreference sampler which is in its gray zone is not treated as an exceedance of the NAAQS nor is it treated as a nonexceedance of the NAAQS (i.e. it is treated as an uncertain data value for purposes of making comparisons with the NAAQS), but it does count as a measurement used to satisfy data completeness and compute annual averages.

Accordingly, data produced by nonreference method samplers in combination with data produced with reference method samplers may be used to identify the following situations:

24-hr NAAQS - Attainment Situation

If (1) the total number of observed exceedances measured by reference and nonreference samplers results in an estimated number of exceedances to be less than or equal to one (subject to the rounding conventions and adjustments specified in Appendix K), (2) uncertain data values produced by nonreference samplers as defined above do not exist, and (3) the combined data produced by these samplers satisfy the data completeness requirements in Appendix K and are in accordance with the established EPA guidelines, i.e. Guideline on Exceptions to Data Requirements for Determining Attainment of Particulate Matter Standards (EPA-450/4-87-005, April 1987), then the State can

¹Samplers with inlet models SA246B, GMW9200 and WA10.

solicit approval by the appropriate Regional Administrator to demonstrate attainment with the 24-hr NAAQS.

24-hr NAAQS - Nonattainment Situation

If (1) the total number of observed exceedances measured by a reference sampler results in an estimated number of exceedances to be greater than one, or (2) one or more exceedances are observed by a reference sampler and the total number of observed exceedances measured by reference and nonreference samplers results in an estimated number of exceedances to be greater than one (subject to the rounding conventions and adjustments specified in Appendix K), then the State should acknowledge that a nonattainment problem exists and take appropriate action.

24-hr NAAQS - Indeterminate Situation

If the total number of observed exceedances results in an estimated number less than or equal to one, but the available data is insufficient to demonstrate attainment as judged under Appendix K, the State or local monitoring agency must continue PM_{10} sampling until attainment or nonattainment of the NAAQS can be established.

COMPARISONS WITH THE ANNUAL NAAQS

When insufficient reference data are available to estimate the PM_{10} expected annual mean according to Appendix K, then nonreference data can be used to supplement and corroborate data produced by the reference samplers. In order to facilitate this discussion, the following definitions are introduced:

- (1) \bar{x}_r and \bar{x}_n represent the annual means computed from data produced by reference and nonreference samplers, respectively.
- (2) \bar{x}'_n represents the nonreference mean adjusted for the effect of the gray zone, as follows:

$x'_m = 1.2 x_m$, if nonreference data is Wedding',
= $0.8 x_m$, if nonreference data is Sierra
Anderson',

= x_m , if nonreference data is produced by certain
dichotomous samplers specified in footnote 1.

- (3) x and x' represent the range of estimated annual means
resulting from a combination of data produced by
reference and nonreference samplers and the effects of
the gray zones:

$$x = p * x_m + (1-p) * x_r, \text{ and}$$
$$x' = p * x'_m + (1-p) * x_r,$$

where p is the relative weight placed on the
nonreference data (e.g. $p = 1/3$ when 1 year of
nonreference and 2 years of reference data are
available).

Annual NAAQS - Attainment Situation

If x_r is less than or equal to 50 ug/m³ and both
 x and x' are also less than or equal to 50 ug/m³
(subject to the rounding conventions and
adjustments specified in Appendix K), then the
nonreference data have corroborated that the
expected annual mean is less than the level of
the NAAQS and the State can solicit approval by
the appropriate Regional Administrator to
demonstrate attainment with the NAAQS.

Annual NAAQS - Nonattainment Situation

If x_r is greater than 50 ug/m³ and both x and x'
are also greater than that concentration level
(subject to the rounding conventions and
adjustments specified in Appendix K), then the
State should acknowledge that a nonattainment
problem exists and take appropriate action.

Annual NAAQS - Indeterminate Situation

If (1) x_r is less than or equal to 50 ug/m³,
and x or x' is greater than 50 ug/m³, or (2)
 x_r is greater than 50 ug/m³, and x or x' is
less than or equal to 50 ug/m³, then the

'GMW9000 or any comparable Wedding designed high volume PM₁₀
sampler without a cleaning port.

status with respect to the annual standard is indeterminate and the State or local monitoring agency must continue PM_{10} sampling until attainment or nonattainment of the NAAQS can be established.

ATTACHMENT B

REVISED POLICY FOR INTERPRETATION OF PM₁₀ MEASUREMENT DATA

<u>DATA COLLECTION TIME PERIOD</u>			
	Prior to Aug. 1, 1987 (effective date of promulgation)	Aug 1, 1987 to July 31, 1988	From Aug. 1, 1988
<u>PM₁₀ Sampler:</u>			
Reference Samplers	Face Value	Face Value	Face Value
Unapproved Samplers ¹			
SA & Wedding (older)	Gray Zone ²	Gray Zone	Not to be Used ³
Dichots	Face Value	Face Value	Not to be Used ³

- ¹ Data produced by unapproved samplers may only be used to support and corroborate data produced by reference samplers.
- ² A zone of uncertainty within which PM₁₀ data are used with less authority, as discussed in Attachment A; Gray zone limits were defined in the PM₁₀ SIP Development Guideline.
- ³ For attainment/nonattainment and design values only; Regional Administrator approval for other SIP purposes (40 CFR 58.14(b)).

Attachment C

ISSUE PAPER:

TREATMENT OF UNCERTAINTY IN AMBIENT PM_{10} MEASUREMENTS

Prepared by

PM_{10} MEASUREMENT WORKING GROUP:

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September 1988

ISSUE PAPER: TREATMENT OF UNCERTAINTY IN AMBIENT PM₁₀ MEASUREMENTS
September 1988

ISSUE: Field comparisons of various different types of PM₁₀ samplers generally indicate consistent measurement differences or "relative biases" between or among the different samplers, suggesting uncertainty in the PM₁₀ measurements. The magnitude of this uncertainty, which appears to be somewhat greater than corresponding uncertainties associated with gaseous pollutants, raises questions and concerns about the utilization of PM₁₀ data in the determination of attainment of the NAAQS and in the development of SIPs.

INTRODUCTION

Background on PM₁₀ Measurement Method

The nature of particulate matter in the atmosphere is very complex. Airborne particles exist in a wide variety of sizes, shapes, density, surface characteristics, chemical composition and other features. Various equilibria may exist between the volatile, semi-volatile, and non-volatile components of the atmospheric particle mixture. Consequently, measurement of particulate matter in the ambient air, especially in the 0 to 10 micrometer size range (PM₁₀), is difficult. Various mechanical techniques for discrimination and collection of particles in the PM₁₀ size range are likely to perform somewhat differently, depending on the particular characteristics of the particles in the atmosphere being sampled. Further, PM₁₀ measurements will tend to be somewhat characteristic of the type of sampler used, and measurements from different types of samplers are likely to be characteristically discrepant, to some extent. Finally, since no absolute concentration standard for particulate matter exists, particulate matter samplers cannot be calibrated against known reference materials, as is done in the measurement of single-compound gaseous pollutants such as SO₂, NO₂, CO and O₃. Accordingly, PM₁₀ measurement methods can provide only estimates of the "true" PM₁₀ concentrations.

The recently promulgated Federal Reference Method (FRM) for PM₁₀ (40 CFR Part 50, Appendix J) specifies an integrated 24-hour PM₁₀ measurement based on discrimination of particles in the PM₁₀ size range by inertial separation,

followed by conventional filtration of a measured volume of sampled air and determination of the net weight gain of the filter. Under these new FRM requirements and associated requirements in 40 CFR Part 53, PM₁₀ samplers are specified by performance (i.e., wind tunnel tests for sampling effectiveness and 50 percent cutpoint and field tests for precision and flow rate stability) rather than by sampler design specifications. This approach was taken to provide greater engineering flexibility to allow for the use of various existing sampler designs and to encourage continuing improvements and innovative new sampler designs. But in providing this design flexibility, the performance specification approach inherently allows for some measurement differences between approved PM₁₀ samplers due to the necessary tolerances in the performance specifications (e.g., D50 cut-point: 10+0.5 micrometers, expected mass: +10%). It was anticipated that samplers which meet the performance requirements would provide PM₁₀ measurements within a 10 percent range at the majority of the required sampler locations.

Observed Measurement Differences Among PM₁₀ Samplers

Ambient PM₁₀ concentration data have been collected with a variety of samplers over the last several years. These include high-volume samplers currently designated as PM₁₀ reference methods, earlier commercially available versions or prototypes of reference method samplers, and low volume dichotomous samplers. The PM₁₀ sampler type most commonly used has been the Sierra-Andersen (SA) high volume sampler, which was procured and distributed to many state and local monitoring agencies by EPA. There also have been a substantial number of Wedding & Associates (Wedding) high-volume PM₁₀ samplers in use, as well as a limited number of low-volume dichotomous (dichot) samplers with PM₁₀ inlets manufactured by both SA and Wedding.

Significant characteristic differences between PM₁₀ measurements from earlier versions of the SA and Wedding samplers were identified during several field studies designed to evaluate sampler performance. Generally, SA samplers produced higher concentration measurements than Wedding samplers. These observed differences indicated uncertainty in the PM₁₀ measurements. But the characteristic differences between these dissimilar sampler types were significant and separate from the random uncertainty that is associated with the overall measurement process. These differences are referred to as "relative biases" or "biases", because they can be quantified only on a relative basis, since no absolute PM₁₀ reference standard exists.

Sampler manufacturers have incorporated various improvements into their respective samplers, resulting in the versions that are currently in use and have been recently designated as reference methods for PM₁₀ under the provisions of 40 CFR Part 53. Although the improvements substantially reduced the relative biases observed between the SA and Wedding samplers, subsequent field studies have indicated that residual biases still exist between these reference method samplers. The biases are variable and site-dependent to some extent. Variations may also be related to seasonal changes, weather, or other local variables. Average differences between EPA-designated, collocated SA and Wedding samplers varied between 5 and 15 percent at four locations.

Differences between earlier SA and Wedding sampler versions were somewhat greater. Since PM₁₀ reference method samplers have been part of State and local air monitoring stations since early 1988, the PM₁₀ data currently being collected should be less uncertain than data collected with earlier versions. EPA is continuing to work with sampler manufacturers to try to identify the causes of the biases and to further reduce them.

Current Interpretation and Use of PM₁₀ Measurement Data

PM₁₀ data is essential in the determination of attainment/non-attainment status and in the development of SIPs. At the time of the promulgation of the PM₁₀ standards, available PM₁₀ data was analyzed together with historical TSP data to estimate current PM₁₀ air quality status and to group areas for SIP development purposes. Uncertainty was recognized in existing PM₁₀ measurements, and "gray" uncertainty zones were utilized to interpret these data to predict the probability of attainment with the standards. A gray uncertainty zone of 0 to +20 percent was placed around the level of the standard for data produced by the SA sampler, and a zone of 0 to -20 percent was employed for data from Wedding samplers. Using existing PM₁₀ monitoring data that was outside of these gray zones, areas could be categorized as either likely to be in non-attainment (Group I), or likely to be in attainment (Group III). When PM₁₀ data fell into the applicable gray zone, the area was categorized as too close to call (Group II) and additional time was given to collect more PM₁₀ data and ascertain unequivocal attainment status.

The gray zones were derived from the results of a field study conducted in Phoenix, Arizona, which indicated that differences between SA and Wedding samplers of plus or minus 20 percent were possible. At that time, EPA believed that the Phoenix test site was atypical and that measurements from existing samplers would be in better agreement in more typical sampling sites. Therefore, EPA's guidance for subsequent SIP development stated that "data collected with all instruments will be taken at face value when demonstrating attainment or non-attainment with the standards." However, to allow for the possibility that potential sampler bias could exist in specific locations, the guidance also stated that an appropriate adjustment would be permitted for attainment demonstrations if influence by coarse particles could be demonstrated.

Since a determination of attainment with the PM₁₀ standards generally requires at least 3 years of monitoring data, existing guidance allows that both newer reference method data as well as older unapproved method data may be utilized for these assessments. In light of the results from recent field studies of PM₁₀ samplers, questions and concerns continue to be raised as to the treatment of the uncertainties in PM₁₀ data from both reference method samplers and earlier versions in the application of the data to the attainment and SIP determination processes. Accordingly, this paper addresses this issue, and recommends a policy for interpretation of PM₁₀ data to facilitate these processes.

Options

A joint OAQPS/EMSL committee has evaluated this issue and identified three cases where the treatment of uncertainties of PM₁₀ monitoring data

should be considered. The first and most important case is the treatment of PM₁₀ data obtained currently or previously with EPA-designated reference method samplers. This case primarily addresses many of the data collected during the past year and all future data collected for determining attainment status with the PM₁₀ standards. The second case is the treatment of data collected over the last two or three years with earlier, unapproved samplers (non-EPA-designated). This case addresses data collected with earlier unapproved versions of the SA and Wedding PM₁₀ samplers and applies only to data collected prior to August 1, 1988. (Under the provisions of 40 CFR Part 58, approved PM₁₀ samplers must be operational for attainment purposes after this date.) Finally, the third case addresses the special situation where two or more samplers are collocated and produce concurrent PM₁₀ monitoring data.

The committee identified three possible optional approaches for contending with the uncertainty in the PM₁₀ data with respect to the attainment and SIP determinations for cases I and II identified above. Two of the options are further divided into two suboptions. The options are:

1. Use all PM₁₀ measurement data at face value.
2. Adjust PM₁₀ measurement data with adjustment factors developed for each type of sampler:
 - A. Universal factors used nationwide.
 - B. Site-specific factors.
3. Use PM₁₀ measurement data selectively:
 - A. By defining a particular specific sampler as "correct" or as the "reference sampler".
 - B. By using a "gray zone" in interpreting and using PM₁₀ data from the various PM₁₀ samplers.

These options are addressed individually, highlighting the positive and negative aspects of each with respect to cases I and II. Since all of the optional approaches have significant drawbacks or disadvantages, selection of the best option for each category of data involves careful evaluation and weighing of the tradeoffs between the various advantages and disadvantages. The nature of case III is somewhat different from cases I and II and four special alternatives are discussed for this case.

I. TREATMENT OF PM₁₀ DATA OBTAINED WITH EPA-DESIGNATED REFERENCE METHOD SAMPLERS

OPTION 1: Use all PM₁₀ measurement data at face value.

In this approach, all validated PM₁₀ concentration data from any approved reference (or equivalent) sampler are reported and used at face value with full authority, just as data for other criteria pollutants are reported and used.

No special adjustments are made or special treatments are utilized. All pollutant measurements contain uncertainty, and this uncertainty is accommodated in the policies governing the application of the measurement data. Differences between PM_{10} data from dissimilar samplers would be viewed as a component of the overall uncertainty associated with PM_{10} monitoring data and accommodated in the same way as for the other pollutants.

Advantages

1. This approach is entirely consistent with the established data reporting and utilization mechanism established for the other criteria pollutants. No changes or deviations are required for PM_{10} . There will be no delay before the data are available for use, and no additional effort or resources are needed to process or interpret the data.
2. The approach implies adequacy of the data and avoids undermining its credibility by not drawing attention to problems or questions of data quality and applicability.
3. This approach supports the FRM concept of functional specifications for PM_{10} samplers and reaffirms EPA's confidence in and commitment to that concept. Further, it represents the ultimate ideal goal as the sampler manufacturers continue to improve the samplers and reduce or eliminate significant bias between different sampler models.
4. The approach is reasonable in the sense that all criteria pollutant measurements contain uncertainty to some extent, and accepting a higher level of uncertainty for particulate matter measurements than for gaseous pollutant measurements is not inappropriate. If a substantial bias exists between two samplers, it is reasonable to assume that the "true" concentration lies between the two estimates. Therefore a bias of as high as 15 to 20% may represent an actual error of only 5 to 10% or less. That level of uncertainty is not unacceptable in the context of other uncertainties in the air quality assessment process, such as locating a sampler at a point of maximum pollutant impact, losses of semi-volatile particles from the filter, other operational errors inherent in any particle collection method, and the recognized uncertainty associated with the use of dispersion models.
5. The approach is defensible because the advantages listed above are reasonably clear, readily supportable, and can be weighted heavily in comparison to the disadvantages and to the relative advantages of other approaches.

Disadvantages

1. The uncertainty in PM_{10} measurements appears to include a relative bias reflected by a consistent difference between measurements produced by different sampler types. The magnitude of this uncertainty is apparently

larger than uncertainties associated with other criteria pollutants. Perhaps more significant, the PM_{10} uncertainties may exceed a level of 10%, which is widely perceived as an upper limit of acceptability for data uncertainty. If the higher levels of uncertainty in the PM_{10} data can be justified as acceptable (see advantage #4), this may not represent a profound problem.

2. To the extent that relative biases exist among various types of samplers, monitoring agencies and certainly industry may strive to use the lowest-reading sampler available. Correspondingly, sampler manufacturers may try to modify or redesign their samplers to provide relatively lower PM_{10} measurements while still meeting the EPA sampler performance test specifications.
3. This approach does not deal directly with whatever bias problem may exist and may be perceived as failure to take action to address the problem. It also places a burden on the EPA to continue to perform field studies to ensure that approved samplers are operating according to expectations and that biases between approved samplers are identified and addressed.
4. Where bias exists between two types of PM_{10} samplers, replacing one sampler with another at a particular site may present a problem in trends analysis at the site. Similarly, the further improvements and reduction of biases between samplers that is expected to occur, though it may result in only small changes, could interfere with trends analysis. Finally, although current guidance for collocation sampling for precision assessment strongly recommends use of similar-type samplers, monitoring agencies that collocate dissimilar PM_{10} sampler types (for whatever reason) could be faced with dealing with characteristically discrepant measurements from the two samplers. See Case III (Treatment of PM_{10} data obtained concurrently with collocated samplers) for further discussion of this situation.

OPTION 2: Adjust PM_{10} measurements with adjustment factors developed for each type of sampler on either (A) a universal, nationwide basis or (B) a site-specific basis.

Under this approach all validated PM_{10} data collected with approved samplers would be adjusted in an attempt to reduce or eliminate the observed biases between the different sampler types. Relative bias would have to be quantified and apportioned to the various samplers in some logical and equitable fashion to establish the various adjustment factors. This process could be based on all available comparative PM_{10} sampler data to establish universal factors for nation-wide application. However, since sampler biases are likely to be site-dependent, factors developed on a site-specific basis would likely be more accurate and more credible.

An adjustment factor can be viewed as simply a means of fine-tuning the accuracy of a PM_{10} sampler, which lacks any physical means for doing so. As such, the adjustment serves the same purpose as the span control on a gaseous pollutant analyzer. The only difference is that since no absolute concentration standards exist for PM_{10} , the factor cannot be determined in an absolute sense and therefore must necessarily be established on a relative basis.

Advantages

1. This approach addresses the bias problem actively and directly, presumably reducing the biases (and hence the uncertainty in the PM_{10} data) to levels comparable to those of other criteria pollutants.
2. Once the data corrections are accomplished, the data may be stored, retrieved and used via the same mechanisms used for other pollutants, with the same authority and with no further special considerations. Data credibility would be restored and with the use of a universal factor (developed by EPA), no additional burdens on state or local reporting agencies would be imposed.
3. Reductions of bias among various samplers will greatly reduce the tendency for industry and monitoring agencies to select or switch samplers to obtain the lowest PM_{10} measurements. Accordingly, manufacturers will be under much less pressure to arbitrarily modify or redesign samplers for lower PM_{10} measurements to compete successfully in the sampler marketplace. Equitable allocation of the relative adjustment factors will not favor any one manufacturer.
4. Use of site-specific adjustment factors could more effectively reduce observed biases at individual sites and therefore mitigate site-to-site variations in biases that would not be addressed with universal sampler adjustment factors applied nationwide.
5. If sampler biases are effectively reduced with appropriate adjustment factors, there could be less incentive for manufacturers to redesign already approved samplers. This would introduce stability into the collection and reporting of PM_{10} measurements.

Disadvantages

1. Even though the adjustment factors need not be established on an absolute basis, quantitative determination of the relative factors is difficult because of the variations observed at different sites and under different conditions. Existing test data are not sufficient. Additional field testing of samplers to obtain more complete relative bias data is very expensive, and the site-dependence of the relative biases is not well enough understood to accurately categorize various sites to insure adequate representation of the test sites. Other variables such as sampler maintenance, seasonal variations, weather, and other local variables further complicate the testing. Also, weather and other seasonal variations raise the question of whether the site-specific adjustment should be season specific.
2. Newly-approved samplers would definitely have to be tested for relative bias with respect to previously approved samplers, since there would be no existing test information. Since bias adjustments would be made on a relative basis among approved samplers, rather than against a known standard, data from the new sampler (or any new test data that become

available) might necessitate new adjustment factors. The resulting changes would interfere to some extent with trends analyses and previous attainment determinations.

3. Establishment of relative adjustment factors would almost certainly be viewed negatively by the sampler manufacturers, particularly manufacturers of samplers characteristically producing the lowest PM_{10} measurements. Any manufacturer could claim its own sampler as most nearly "correct" and thus object to adjustments of its sampler's data to accommodate claimed "error" in the PM_{10} data from its competitors' samplers.
4. The approach would be subject to criticism and somewhat difficult to defend. Since the adjustment factors would be based on relative bias among the samplers and not on an absolute basis, the adjustment factors would have to be supported with arguments based on logic and expediency rather than on absolute scientific accuracy.
5. Adjustments to PM_{10} data could raise difficulties or undermine the confidence in the performance or comparative tests for reference and equivalent methods, because such factors would be relative rather than absolute. Any subsequent change in the correction factor associated with the reference method used in an equivalent method comparative test could bring the validity of the equivalent method designation into question.
6. If sampler biases are effectively reduced with appropriate adjustment factors, there could be much less incentive for further modification or redesign of already approved samplers to further reduce relative biases, which should be the ultimate goal.
7. Because of site-to-site variations in the biases, application of a universal adjustment factor could actually be counter productive in some specific cases.
8. Implementation of site-specific adjustment factors appears to be impractical. Who would be responsible to develop the individual factors? Who would keep track of so many factors? Would individual factors be developed for each monitoring site or could factors be developed for all sites in a larger monitoring area? What basis could be used to define such a larger area? It would seem to be prohibitively costly to try to obtain test data at each individual site. How would data from a particular site be treated before the appropriate adjustment factor was established?

OPTION 3A: Use PM_{10} measurement data selectively by defining a particular specific sampler as "correct" or as the "reference sampler."

This option would select one type of PM_{10} sampler as the "best" or the one that produces measurements "closest to the true PM_{10} " concentration. The selected sampler would be designated as the "reference" sampler, and all PM_{10} data collected with any other type of sampler presumably would be adjusted, to the best extent possible, to eliminate bias with respect to the reference sampler.

Advantages

1. The advantages for this option are essentially the same as those listed for Option 2 (adjustment of PM_{10} measurements with sampler-specific factors). In addition, the option would be simple in concept and straightforward to implement.

Disadvantages

1. This approach has the serious disadvantage that it is in conflict with the performance specification concept promulgated in 40 CFR Parts 50 (Appendix J) and 53. Thus, adoption of this approach would appear to require extensive revision and repromulgation of those regulations. Changing the regulations would result in extensive disruption of current monitoring, substantial delay before revised regulations are in place, and the need for an interim policy for treatment of PM_{10} data collected prior to implementation of the revised regulation.
2. There is little basis for selection of the "best" sampler for reference method status, given the present state of the art of PM_{10} monitoring and the lack of absolute PM_{10} standards. Thus, the selection would be largely arbitrary. Manufacturers of nonselected samplers would surely object very strongly, and the approach will be difficult to support on a scientific basis.
3. This option would be equivalent to the design approach concept for specifying PM_{10} samplers that was rejected during the development of the current PM_{10} reference method because of the need for technical flexibility in sampler types and design approaches.

OPTION 3B: Use PM_{10} measurement data selectively by using a "gray zone" in interpreting and using PM_{10} data from the various PM_{10} samplers.

Under this approach, data would be reported and stored at face value. However, during use of the data, a "zone of uncertainty" (gray zone) would be associated with the PM_{10} measurements, and the true measurement would essentially be viewed as an interval of possible values. For the critical comparisons with the level of the PM_{10} standards, the zone would be defined around the level of the standard, as was previously done for SIP area groupings. The magnitude of the zone would reflect the estimated uncertainty for the sampler used, and the zone would be nonsymmetrical or offset (+0% to -15%, for example), depending on the magnitude of the relative bias among PM_{10} samplers. PM_{10} concentrations within the gray zone would be considered less authoritatively than concentration outside the gray zone.

Advantages

1. No changes are needed to PM_{10} data collected either previously or currently with reference method samplers.

2. Less attention would be drawn to problems of data quality or credibility than the correction factors of Option 2.
3. The approach acknowledges the bias problem and provides a mechanism to consider the effects of relative biases between samplers during data interpretation. The approach was used successfully in the previous area grouping process to establish initial PM₁₀ sampling requirements.
4. This approach is consistent with the FRM concept of functional specifications for PM₁₀ samplers.
5. Consideration of the effects of relative bias among various samplers will reduce the tendency for industry and monitoring agencies to select or switch samplers to obtain the lowest PM₁₀ measurements. Accordingly, manufacturers will be under less pressure to arbitrarily modify or redesign samplers for lower PM₁₀ measurements to compete successfully in the sampler marketplace.

Disadvantages

1. A separate and substantially different interpretation process than the process currently used with reference or equivalent data for the other criteria pollutants would be required. This will result in possible confusion among data users in knowing exactly what the special treatment process is and considerable additional effort in learning and carrying out the different process for PM₁₀ data.
2. Less stringent enforcement of PM₁₀ concentrations that fall within the gray zone may be regarded as relaxation of the PM₁₀ standards and prove to be embarrassing to EPA.
3. This approach may delay the attainment determination process. It could require additional time and or data to determine attainment and shorten the available time for control strategy implementation.
4. The width and offset parameters for the gray zones must be established for each sampler. Quantitative determination of these parameters must be made on a relative basis and will be difficult because of the variations in biases observed at different sites and under different conditions. Existing test data is not sufficient. Additional field testing of samplers to obtain more complete relative bias data is very expensive, and the site-dependence of the relative biases is not well enough understood to accurately categorize various sites to insure adequate representation of the test sites. Other variables such as sampler maintenance, seasonal variations, weather, and other local variables further complicate the testing.
5. Newly-approved samplers would have to be tested for relative bias with respect to previously approved samplers, since there would be no existing test information to use as a basis to establish the gray zones. Moreover, the bias data from the new sampler (or any new bias test data that becomes available) might necessitate changes to other gray zone parameters.

6. Establishment of the gray zones will tend to reduce the credibility of the PM_{10} data, and therefore enforcement may be more difficult. The approach would be subject to criticism because the gray zones would be based on relative bias among the samplers and not on an absolute, scientific basis.

Recommendation

Upon weighing and evaluating the various advantages and disadvantages of the three optional approaches, we believe that option 1, use of all PM_{10} data at face value, is clearly the best course of action. The approach fully supports the FRM functional specification concept that provides the technical flexibility needed for competitive sampler innovation, and it is fully consistent with the interpretation of data for the other criteria pollutants. It is a reasonable approach that implies data credibility. Further, it encourages and anticipates further improvements in the currently designated reference method samplers and any new candidate reference or equivalent methods. Significant improvements have been made to the two designated samplers, and additional improvements are anticipated, which should result in further reductions in the relative bias between these samplers. Manufacturers of new samplers should benefit from the experience with these initial samplers and should be better able to address or avoid the problems encountered in their use.

When the performance-based approach for specifying PM_{10} samplers was selected, the potential for bias between approved samplers due to effects not directly addressed by the wind tunnel performance tests (e.g., effects from soiling during field use) was recognized. It was anticipated that the magnitude of these effects would be relatively small, and when problems were identified that the manufacturers would take proper corrective actions. Although the relative bias between the first two designated reference method samplers is larger than anticipated, the manufacturers are working on correcting the problems. We believe that it would be premature at this point in time to presume that these problems are not solvable and that one of the other options for PM_{10} data treatment should be pursued.

These are compelling arguments in support of this approach. The disadvantages, while significant, appear to be substantially less serious than those listed for the other approaches and can be realistically accommodated. Accordingly, this option is recommended and, we believe, represents a valid, workable, and defensible approach to treatment of the observed relative biases among various PM_{10} samplers.

Given this recommendation, we recognize, nonetheless, that some variability in PM_{10} measurements may be due to instrument differences. Therefore, we encourage monitoring agencies to try to assure historical continuity in PM_{10} measurements by using comparable reference monitoring methods (e.g., same manufacturer) at the same location over time. Furthermore, when multiple instrument are used at the same location to perform every-other-day or everyday sampling, comparable methods should also be used.

II. TREATMENT OF PM₁₀ DATA OBTAINED WITH UNAPPROVED SAMPLERS

There have been several types of unapproved PM₁₀ samplers which have produced PM₁₀ data over the last few years. The most prevalent data producers, by far, were older versions of currently approved high-volume samplers. Although used to a much lesser extent, dichotomous samplers have, nevertheless, produced a significant amount of PM₁₀ data. Dichotomous sampler inlets have been changed or modified very little since their introduction, and comparative tests show generally consistent results that agree well with currently designated high-volume PM₁₀ samplers. Designation of the first dichotomous sampler as reference method is anticipated soon. For these reasons, dichotomous data requires no special treatment and should be used at face value. Accordingly, the following discussion will focus only on alternative treatments of data produced by the earlier versions of the currently designated high volume PM₁₀ samplers manufactured by Sierra-Andersen and Wedding & Associates, Inc.

OPTION 1: Use PM₁₀ measurement data from unapproved methods at face value.

In this approach, all validated PM₁₀ concentration data from any unapproved PM₁₀ sampler are reported and used at face value with same authority as reference or equivalent method data. No special adjustments are made or special treatments are utilized.

Advantages

1. This approach is identical to the current EPA policy regarding the use of measurements from unapproved PM₁₀ methods, even if these measurements were affected by a gray zone in the area grouping process. This policy is based on the judgement that the field study situation in Phoenix was atypical and that sampler agreement would be better in most areas without the pervasive large particles characteristic of the Phoenix test site.
2. This approach permits an area to make full use of PM₁₀ data collected prior to the NAAQS promulgation in order to compile the 3 years of data generally needed to assess attainment with the standards.
3. This approach is simple to implement and requires no change in current policy.

Disadvantages

1. This approach ignores the reported bias between the earlier PM₁₀ sampler versions. Recent field studies have shown that large biases exist in more locations than previously suspected.
2. This approach could cause an erroneous attainment or non-attainment determination.
3. This approach is inconsistent with data usage for other NAAQS pollutants in which data from non-reference or non-equivalent data is not used.

4. With the existing EPA guidance regarding the face-value use of data produced by unapproved samplers, monitoring agencies may want to demonstrate that adjustment factors are appropriate. This policy places a burden on the reporting agencies to demonstrate that the affected data were biased.

OPTION 2: Adjust PM_{10} measurements from unapproved methods with factors developed for each type of sampler on either (A) a universal, nationwide basis or (B) a site-specific basis.

Under this approach, all validated PM_{10} data collected with unapproved samplers would be adjusted in an attempt to reduce or eliminate the apparent biases between the different PM_{10} samplers.

Advantages

1. As indicated for the use of data produced by approved reference method samplers, this approach addresses the bias problem directly, and the adjusted data may be used via the same mechanisms used for other pollutants. In this case, adjustment factors may have to be established based on comparative test data from approved sampler versions if test data for the unapproved version is unavailable.
2. Use of site-specific adjustment factors would more effectively mitigate site-to-site variations in biases that would not be addressed with universal sampler adjustment factors applied nationwide.
3. The current EPA policy tentatively allows adjustment of older data on a local basis if bias can be demonstrated. This could involve development of factors derived from data obtained from collocated reference method and unapproved samplers.

Disadvantages

1. The development and application of factors for data obtained with unapproved methods have the same disadvantages as those for data obtained with approved samplers.
2. If factors were derived from collocated sampling with approved and unapproved samplers, the factors may be developed with data collected during one time period and applied to data collected during a different time period. This would involve making potentially questionable assumptions regarding similarities in sampling conditions (e.g., PM_{10} emissions, meteorology, and particle size distribution).

OPTION 3A: Use PM_{10} measurement data selectively by defining a particular specific sampler as "correct" or as the "reference sampler".

For completeness of the discussion, Option 3A is also included for the treatment of unapproved sampler data. With this approach, however, the selected sampler must be one of the reference samplers; therefore, data produced by any unapproved PM_{10} sampler would not be used for air quality assessment.

Advantages

1. If data from unapproved samplers were considered invalid, this approach would be entirely consistent with data usage for other criteria pollutants.
2. This approach is simple to implement.

Disadvantages

1. Although many measurements produced by unapproved PM₁₀ samplers in some sampling situations are uncertain or may be potentially biased, these measurements are not totally useless. When measured PM₁₀ concentrations produced by a sampler that is apparently biased lower than other samplers are greater than the level of the standard, there is a high probability that an exceedance has occurred. Similarly, when measurements by a sampler that is apparently biased higher than other samplers are less than the level of the standard, then there is a high probability that an exceedance has not occurred. These data, therefore, can play a useful role in demonstrating that a location is clearly in attainment or non-attainment.
2. Selection of measurements from only one PM₁₀ sampler is not practical to consider for the same reasons discussed for the reference samplers.
3. Although application for approval of certain PM₁₀ samplers has not yet been formally submitted to EPA, these samplers are unofficially recognized as producing relatively unbiased PM₁₀ measurements. Such instruments include dichotomous samplers.

OPTION 3B: Use PM₁₀ measurements selectively by using a "gray zone" in interpreting and using PM₁₀ data from unapproved PM₁₀ samplers.

With this approach, data would be reported and stored at face value. However, during use of the data, a "zone of uncertainty" (gray zone) would be associated with the PM₁₀ measurements, as discussed under option 3B for measurements from approved samplers. The same zones used for the area grouping process (0 to +20 percent for the SA and 0 to -20 percent for the Wedding samplers) would be utilized for attainment determination and SIP development.

Advantages

1. The advantages discussed in Section I, Option 3B for the reference method samplers are also applicable to the unapproved samplers.
2. The use of the gray zone option does not require any direct adjustments to the monitoring data, but permits their selective use for attainment/non-attainment determinations. The data may be helpful to support and corroborate a determination of attainment or non-attainment, or to establish that the status is indeterminate, in which case additional data would be required.

3. The use of the gray zone permits the use of nonreference data to support the determination of attainment or nonattainment for many areas (i.e., whose critical data is not close to the levels of the PM_{10} standards) while recognizing relative biases that may exist in those data.

Disadvantages

1. Gray zone treatment for older data is more likely to cause an area to have an indeterminate attainment status. This could potentially delay the SIP process for some areas with affected data. The delay would be due to extending the time period necessary to collect additional data for unequivocal attainment/nonattainment determination. However, this would primarily involve those areas which are borderline attainment/nonattainment.
2. Application of the gray zone approach to data collected with unapproved samplers after the time reference samplers were generally available could permit an additional delay in attainment/nonattainment determination for Group II areas and subsequent SIP development.

Recommendation

We believe that option 3B, use of data selectively by using a gray zone interpretation to support and corroborate data produced by reference samplers, is clearly the best course of action for measurements from unapproved SA and Wedding samplers. This approach recognizes the potential uncertainty in older PM_{10} measurements and reinstates a precedential policy that has been used successfully and with which people are already familiar. The same zones of plus or minus 20 percent would be utilized. Specifically, this translates to unapproved SA concentration ranges of 50 to 60 ug/m^3 for the annual standard and 150 to 180 ug/m^3 for the 24-hour standard. Unapproved Wedding sampler ranges are 40 to 50 ug/m^3 and 120 to 150 ug/m^3 , respectively. Data within these ranges would be used with less authority than data outside these ranges. Alterations to this general rule could be considered on a case-by-case basis and must be discussed with OAQPS.

We recommend that the gray-zone policy only be applied to data produced by unapproved SA or Wedding samplers before August 1, 1988. This date is one year from the effective date of the PM_{10} regulations. After this date, the use of data produced by unapproved samplers is not permitted for determinations of attainment/nonattainment and calculation of design values (40 CFR Part 58.14(a)). With Regional Administrator approval, however, these data may be used for other SIP purposes (40 CFR Part 58.14(b)). We also note that older PM_{10} data from unapproved SA or Wedding samplers may no longer be needed for current air quality assessment when 3 years of data from approved samplers are available.

An effect of reinstating the gray zone approach may be a temporary delay in the immediate determination of attainment or nonattainment for some areas with older data from unapproved samplers in the gray zone (i.e., close to the standard). Control agencies with data affected by gray zones must

recognize that these measurements represent potential exceedances and, therefore, they must anticipate the possibility of future control strategy development. Additional SIP development guidance may be needed for this situation (e.g., requirement of accelerated sampling, dispersion modeling, etc.).

Finally, we note that data produced by dichotomous samplers should be interpreted the same as data produced by EPA-designated samplers (i.e. at face value) but only to support measurements produced with reference samplers. However, as long as the dichot is not approved as a reference sampler, only data collected before August 1, 1988, may be used to support attainment assessment and calculation of design values. Nonetheless, these data may continue to be used for control strategy development and other SIP purposes with RA approval.

III. TREATMENT OF PM₁₀ DATA OBTAINED CONCURRENTLY WITH COLLOCATED SAMPLERS

PM₁₀ samplers may be collocated to produce concurrent measurement data at the same site for quality assurance, attainment assessment or other SIP purposes. The samplers may be operated by a single monitoring agency or by separate monitoring agencies (governmental, environmental or industry). The PM₁₀ regulations specify different sampling and data requirements according to the intended application of the data. For attainment assessment and calculation of design values, monitors must meet all Part 58 requirements for SLAMS as well as minimum data requirements specified in Appendix K to 40 CFR Part 50. For quality assurance (QA) and other SIP purposes, monitors and data must only meet less stringent requirements.

Accordingly, where two or more PM₁₀ samplers are collocated and operated simultaneously, treatment of the PM₁₀ data from these samplers depends on the intended purpose of the measurement data and compliance with the appropriate regulatory requirement. In all cases, measurements from an approved sampler take precedence over measurements from unapproved samplers. If two (or more) approved samplers are collocated and operated concurrently by a single monitoring agency for any purpose, one sampler must be designated, a priori as the primary sampler whose samples will be used to report air quality for the site. All other samplers are designated as duplicate or special purpose monitors (SPMs). This is established data reporting procedure and is described in Section 3.3 of Appendix A to CFR Part 58. In general, data from duplicate samplers are not used for attainment assessment; only the primary sampler's data are used. However, according to Appendix K to CFR Part 50, data from such duplicate monitors must also be used for assessing attainment if the appropriate SLAMS requirements (including sampling frequency) are met. Furthermore, separate monitoring agencies (governmental, environmental or industry) may be operating one or more approved collocated samplers which also meet all of the SLAMS requirements and whose data also meet the appropriate completeness requirements specified in Appendix K. When two agencies operate samplers at the same location, only one agency's sampler(s) are part of the SLAMS. The other agency's sampler's represent a special purpose monitoring site. However, the monitoring regulations specify that this data must be used as well. The data treatment issue is: how must this data be used?

The following discussion applies to the treatment of data for the purpose of attainment assessment where two or more approved samplers are collocated and operated concurrently by one or more separate monitoring agencies and each sampler meets all Part 58 requirements for SLAMS. The first three options discussed assume that each monitoring agency individually reports all its data to EPA. The user would perform the selected data treatment. The fourth option furnishes control of the data to the responsible monitoring agency, by permitting the agency to select and report a single set of data to represent the monitoring site. This data may be produced by a designated sampler or the daily average of measurements produced by several available reference samplers.

OPTION 1: Measurement data are submitted separately by each monitoring agency. The data user would average the corresponding measurements from approved samplers.

When multiple measurements are concurrently produced by two approved samplers and are reported to EPA, the ambient PM₁₀ concentration estimated for the location would be the average of these measurements. When only one daily measurement is available in this situation, because other measurements are missing (e.g., due to sampler malfunction), the reported measurement would be used without correction. Similarly, the estimate of annual average PM₁₀ for the location would be based on the average of the reference samplers' average PM₁₀ concentrations. Daily values and annual reference samplers' averages would only be considered if the data were produced in accordance with the requirements of 40 CFR Part 58 and 40 CFR Part 50, Appendix K.

Advantages

1. When multiple measurements are available from approved reference or equivalent method samplers, each measurement is an estimate of the true PM₁₀ concentration. If the errors associated with the measurements are random, a better estimate of the true value is usually produced by averaging the measurements. PM₁₀ measurements produced by dissimilar samplers may be consistently higher or lower than one another, indicating that the errors are not totally random. Nevertheless, in the absence of absolute calibration standards, there is no information to indicate which measurement is the better estimate. Accordingly, averaging the measurements is appropriate.

Disadvantages

1. Averaging collocated measurements would cause inconsistency in estimation of daily and annual average PM₁₀ concentrations. Some estimates would be produced by a single measurement from one instrument type while others would be the result of different samplers.
2. Averaging of collocated measurements would be a change to the air quality data usage conventions. Currently, when a single agency operates multiple samplers at a site, only the primary designated reference sampler's data is used for making comparisons with the NAAQS. Also, when multiple agencies operate monitors at the same location, the highest reported daily or average concentration is used for making comparisons with the NAAQS.

3. The public could complain that a NAAQS violation was "averaged away".

OPTION 2: Measurement data are submitted separately by each monitoring agency. The data user would select the highest concentration measurement produced by collocated samplers.

Advantages

1. When multiple measurements are available, a higher measurement would provide better protection of public health.
2. Using the higher measurement would help to discourage multiple monitoring agencies from collocating dissimilar samplers to obtain lower measurements.
3. In general, monitored concentrations underestimate the worst concentration in an area. This is due to the limited size of monitoring networks and the problem of finding the site of maximum pollutant impact. Air quality simulation models usually find higher concentrations due to the larger grid of receptors. For PM_{10} , monitored concentrations may also be low due to losses of semi-volatile or secondary particles (e.g., nitrates). Using the higher of duplicate measurements would tend to compensate for these effects.

Disadvantages

1. PM_{10} measurements produced by one reference sampler are not necessarily better than another.
2. If the two samplers were unbiased, relative to each other, then this approach would introduce bias in selected peak values. This is due to the effect of the imprecision of individual samplers.
3. With this approach, areas would be more likely to be determined as not in attainment with the standards. There would also be an impact, albeit small, on the design value and the development of control strategies.

OPTION 3: Measurement data are submitted separately by each monitoring agency. The data produced by each agency are treated as data produced by different sampling stations.

Advantages

1. This interpretation is consistent with historical data usage for collocated sampling by different monitoring agencies. It is also straightforward, simple to implement and doesn't require any changes to existing data processing software.

2. The data produced by any monitoring agency using an approved reference method sampler that satisfies all of the pertinent Part 58 requirements can demonstrate that the site is in violation of the NAAQS and thereby be used to protect public health.
3. When two or more agencies operate the same type of PM₁₀ sampler, treating the agencies' data separately avoids the bias that could be introduced by selecting the maximum daily collocated measurement. (See disadvantage 2 under option 2 above.)
4. The advantages 2 and 3 discussed under option 2 above are also applicable to this option.

Disadvantages

1. All measurements produced by approved collocated reference method samplers estimate PM₁₀ air quality at a specific location. However, with this option for treatment of data, measurements from only one agency's samplers are sufficient to establish nonattainment, while measurements from each agency's approved samplers are necessary to demonstrate attainment. Therefore, this approach favors a sampler which produces systematically higher measurements.
2. The disadvantages 1 and 3 discussed under option 2 above are also applicable to this option.

OPTION 4: Allow the responsible control agency to submit a single set of data for the location. This data set could be obtained by a) designating a primary approved sampler or b) averaging data from multiple approved samplers.

Advantages

1. The State would clearly be responsible for the one data set that would be used for attainment/non-attainment decisions.
2. Designation of one sampler as the primary sampler is consistent with existing duplicate sampler data usage, when a single monitoring agency is involved.
3. This approach provides flexibility to the responsible control agency in deciding how much weight should be placed on the supplemental information.

Disadvantages

1. Lack of specific guidance on how the additional measurement information would be used may produce inconsistent use of data nationally and present the potential for inconsistent data interpretation among States and Regional Offices.

2. Selective use of reference method data which meets all of the Part 58 and Appendix K requirements may be in conflict with Appendix K to CFR Part 50, which states that all data must be used. However, this approach does not specify a uniform procedure in which the supplemental data must be considered for attainment assessment.
3. In the case of averaging data, State Agencies might feel that the impact of their data is being diluted by being combined with data from other sources. Also, unless submission of all data for each monitor is required there would be no record of the individual State monitor measurements.
4. This approach may be viewed as a departure from existing data usage conventions wherein the highest reported values are currently used in a multiple agency situation for all pollutants.

Recommendation

For the case when samplers are collocated for data quality assessment purposes (i.e., precision and accuracy), it seems reasonable to recommend that similar sampler types must be used, and one sampler must be designated a priori for data reporting purposes. Furthermore, if more than one type of sampler is used by a reporting organization, collocated precision sites should be established for each sampler type.

When more than one sampler is operated by one or more monitoring agencies for attainment assessment purposes, we recommend Option 3, treating each agency's data as data produced by a different sampling station. We feel that this option is more legally defensible, is consistent with existing interpretation of NAAQS pollutant measurement data, and supports the Federal Reference Method approval process. We do expect the multiple agency sampling situation to be common and certainly do not encourage the collocation of different sampler types for routine air quality monitoring and data reporting.

With a multiple agency sampling situation, one monitoring station shall be designated as the SLAMS station and the others shall be designated as SPM stations. Any special purpose ambient air quality monitoring station, from which the State intends to use the data as part of a demonstration of attainment or nonattainment or in computing a design value for control purposes of the NAAQS, must meet all the requirements for SLAMS (40 CFR Part 58.14), including quality assurance, monitoring methods, and probe siting. This requires that a quality assurance program be described in detail, suitably documented and approved by the appropriate Regional Office (40 CFR Part 58 Appendix A).

10/12/88

DRAFT

MEMORANDUM

SUBJECT: Comments on Draft Position Papers on PM₁₀

FROM: William F. Hunt, Jr.
Chief, Monitoring and Reports Branch, TSD (MD-14)

TO: Chris Dunlap, Supervisory Auditor
Office of Inspector General (MD-53)

The following are our comments on your three position papers on PM₁₀. As you know, your first two position papers correspond very closely in content and ideas to an issue paper on PM₁₀ measurement uncertainty developed by a joint EMSL/OAQPS committee which was established in March. OAQPS is currently proceeding to issue a revised policy regarding the treatment of PM₁₀ data which follows the recommendations of this committee. We feel that the recommendations of your position papers and the EMSL/OAQPS Issue Paper are very close. Here are some specific points on the three position papers.

1. Position Paper No. 1

Position Paper No. 1, entitled "EPA Need To Ensure That Different Attainment Decisions Are Not Made Solely Because Of The Use Of Different Types Of PM₁₀ Monitors," is well written and is conceptionally very similar in content and recommendations to the EMSL/OAQPS Issue Paper on PM₁₀ Uncertainty. In fact, many of your comments and recommendations are addressed in this issue paper. In both reports, the issue of potential differences in PM₁₀ measurements near the PM₁₀ standard level is considered. The major difference, we feel, is in the approach recommended to implement the basic ideas. In your report, you recommend that OAQPS consider establishing a group of experts who would deal with specific situations on a case-by-case basis. Our approach was to assemble a group of experts (the PM₁₀ Measurement Working Group) to consider a broad range of options for the treatment of PM₁₀ data produced by EPA approved and unapproved PM₁₀ samplers, and to recommend a general procedure to follow for all data usage. We feel that our approach which specifies a general rule for interpretation of PM₁₀ data is the proper approach which promotes and encourages national consistency. We also desire to allow flexibility and would do so by permitting deviations to the general rule provided that

these deviations receive concurrence of OAQPS. In practice, these deviations would be reviewed by a panel of EPA experts. In fact, a panel of EPA experts are involved in the review of SIPs and in the review of air quality data to ensure that existing SIPs do not require revision. Under the Implementation regulations for PM₁₀, areas are not classified attainment or nonattainment and sanctions are not automatically imposed because of a nonattainment designation. The critical issue is whether or not the State Implementation Plans are adequate to attain and maintain the standards. The review of air quality data with respect to the standards is just one step in the SIP process and does not cause any regulatory action to occur by itself.

2. Position Paper No. 2

Position Paper No. 2, entitled "EPA Needs to Develop a Policy For Dealing With The Fact That Regulations Do Not Allow Attainment Decisions To Be Based On Most Of The PM₁₀ Data Collected Through August 1, 1988," is also well written and essentially discusses the second data treatment of the EMSL/OAQPS Issue Paper. Again, the intended results are conceptionally similar and only differ slightly in implementation. Unlike your Position Paper No. 1, this paper does not reference the Issue Paper. We feel that it would be appropriate to do so. Before I compare recommendations, I list some specific comments:

Page 5: The SA 321-A is not an approved monitor.

Page 7: "EPA cannot comply with Federal Regulations if it uses PM₁₀ data from nonapproved monitors to make attainment decisions."

This statement is not true. Appendix K permits exceptions to the general rule that three years of [reference] PM₁₀ data are needed to determine attainment, provided that approval is granted by the appropriate Regional Administrator and is in accordance with established guidance. In the Guideline for Exceptions to Data Requirements for Determining Attainment of Particulate Matter Standards, examples are included to serve as guides. One such example permits the use of TSP as a surrogate PM₁₀ indicator. The EMSL/OAQPS Issue Paper recommends that PM₁₀ data from unapproved samplers can also be used as a surrogate PM₁₀ indicator, subject to the conditions of the gray zone and provided that the unapproved data is only used to support and corroborate reference PM₁₀ data. Regarding your recommendations on Position Paper No. 2, I submit comments on each of the six items.

(a) Under existing procedures, OAQPS already utilizes a panel of experts to review air quality data as part of the SIP review process. These individuals are representatives of the Regional Office and OAQPS who review SIPs to ensure that the standards will be attained and properly maintained and review data to ensure that existing SIPs do not require additional revision.

(b) and (c) The Issue Paper recommends that data from unapproved samplers produced after August 1, 1988, not be used for making comparisons with the standards. It does not differentiate between samplers which were put in service before this date. EPA wants to ensure that all nonreference samplers are replaced with reference samplers. If EPA specified a general policy that permitted the continued use of nonreference samplers, we feel that there would be no incentive to retire the older instruments.

(d) We agree that flexibility is needed in order to make comparisons with the standards, but prefer to do so by permitting exceptions to a general rule as described by our comments to your Position Paper No. 1.

(e) Our approach would be to set a general gray zone within which nonreference PM₁₀ data would be viewed with uncertainty and outside of which the data would be used with more authority.

(f) Based on the comments of our Office of General Counsel, we do not appear to need any regulatory changes in order to implement the recommendations of the EMSL/OAQPS Issue Paper.

3. Position Paper No. 3

Position Paper No. 3, entitled "Additional PM₁₀ Monitors are needed and OAQPS needs to Take A More Active Role To Ensure That Monitor Requirements Are Met," implies that EPA Headquarters should be much more intimately involved in the day to day management of activities which are the formal responsibility of the Regional Offices. We disagree with this approach and would like to emphasize that the Part 58 monitoring regulation reinforces our position.

Page 1: The IG identifies a deficit of 81 PM₁₀ samplers which were needed to fulfill the regulatory requirements. Pages 1-6 include a detailed discussion of the Part 58 monitoring regulation as it applies to the number of required monitors. This deficit of 81 samplers is mentioned numerous other times throughout the rest of the position paper and is used to make other assumptions and conclusions.

MRB Response:

- o As of March 31, 1988, a deficit of 81 PM₁₀ samplers was identified to fully cover all NAMS, Group I, and Group II areas.
- o As of October 1988, the deficit is 11 samplers and 7 of the 11 are in the process of being purchased. (See Attachment A)
- o Therefore, only 4 PM₁₀ samplers are still needed.
- o OAQPS is responding to the present and future deficit through \$400 K in the FY-89 budget. TSD is preparing a memorandum to ROs to actively pursue the use of these funds to procure needed PM₁₀ samplers.

Page 6: The IG report discusses the designation of PM₁₀ samplers by EMSL as reference instruments. They further state that "nonapproved monitors do not satisfy the regulatory requirements for a PM₁₀ monitoring network." Exhibit A of the report lists 9 types of unapproved samplers which were operating at 386 sites in 1987.

MRB Response:

- o The IG's issue of approved versus nonapproved samplers has essentially disappeared as noted below.
- o As of October 1988, all of the SA321A samplers have been converted to the SA321AG. The SA321AG is identical to the SA321B which is a reference sampler.
- o Reference designation has been applied for the SA254 medium volume sampler and the SA246B dichot. Discussions with MSB indicate both should be approved in 1988.
- o The SA244-E refers to a base and should be converted to the SA246-B, and reference designation has been applied for.
- o No application has been received for the Wedding dichots (GMW9200 and W-10)
- o Information from ROs indicate no SA321 are in operation at this time.
- o Conclusion: Of the 603 PM₁₀ sites identified by the IG in Exhibit A, 573 PM₁₀ sites (95 percent) are using reference or equivalent samplers.

Page 7: The IG raises questions that the shortage of 81 samplers may be much higher because of (a) the number of NAMS PM₁₀ sites is unknown, and (b) unapproved PM₁₀ samplers that cannot be modified must be replaced.

MRB Response:

The PM₁₀ NAMS networks have been approved for 44 of 49 States. Based on the approved networks and the number of PM₁₀ sites in the remaining 5 State networks under review, it is projected that the NAMS PM₁₀ network will consist of 286 sites. The unapproved PM₁₀ sampler issue has been addressed.

Page 8, sixth sentence: Report notes that more PM₁₀ monitors may be required by the regulatory section of Part 58 because of the provision in the regulation which allows TSP monitoring as a surrogate for PM₁₀ SLAMS monitoring. This provision requires that the surrogates be replaced with a PM₁₀ monitor if the surrogate measurements are above a certain level. In the following two paragraphs, pages 8 and 9 of the report, the IG expands their discussion of the surrogate concept in their attempt to show that a significant number of new PM₁₀ monitors would be required in Group III areas.

MRB Response:

The IG does not have a clear understanding of the Part 58 PM₁₀ surrogate monitor provision. Their discussion and subsequent conclusion implies that any existing TSP monitor is a SLAMS PM₁₀ surrogate and if the TSP levels exceed the levels of the PM₁₀ standard the TSP monitor would automatically be required to be converted to a PM₁₀ monitor. This simply is not true. The PM₁₀ surrogate provisions only apply to officially designated SLAMS PM₁₀ surrogate samplers. If the State chooses to continue running other TSP monitors, it's their decision and there is nothing in the regulations which prevent them from taking this action. The PM₁₀ surrogate provision was included in the regulation as a PM₁₀ network design cost saving measure and allows the States to expand their approved SLAMS network through the use of TSP samplers. The IG should be aware that an area that has TSP levels that slightly exceed the PM₁₀ standards have a probability of exceeding the PM₁₀ standards of less than 5 percent. Encouraging the widespread placement of PM₁₀ monitors in such areas would be largely unnecessary.

Page 9, 1st and 2nd sentence, second paragraph: Preliminary Summary- 81 additional PM₁₀ monitors needed on August 1, 1988.

MRB Response:

As noted earlier, more recent figures show the deficit to be only four PM₁₀ monitors.

Page 9: Did OAQPS either assess monitoring needs or confirm that needs were reasonably assessed? Did OAQPS either take all practical actions to meet present and future monitoring needs or confirm that such actions were taken? Questions on Page 9, subsequent discussion on page 11. Two IG conclusions were identified on page 11:

- (a) OAQPS does not know whether State, local or Federal funds will be used to purchase needed PM₁₀ monitors or to what extent the need will be met.
- (b) OAQPS has not fully assessed the need, or confirmed that an assessment has been made of the need, to modify or replace nonapproved monitors that are part of the current SLAMS and NAMS network.

MRB Response:

IG's discussion on page 10 notes that the Monitoring Section Chief's August 9, 1988, memorandum provides estimates of the projected future NAMS and SLAMS networks but no worksheets or documents to support these estimates were available. The report proceeded to note that the IG's earlier estimate of the need for 81 PM₁₀ monitors was supported by IG workpapers which identified the 81 locations where monitors were needed. Implication here is that if worksheets are not available, any projections are unreliable and therefore inadequate. It must be noted that the IG's estimate of 81 monitors was based on a highly detailed report prepared by the Monitor

Section. (This report was the 13th of the series on the status of PM₁₀ monitors.) We believe that the Monitoring Section's August 9 projections of NAMS/SLAMS PM₁₀ monitors which were based on a combined MRB experience with other NAMS/SLAMS network reviews, analyses and reports of at least 60 years were at the time precise enough for Headquarters needs. Since then, MRB has formed a PM₁₀ task force to review PM₁₀ monitoring networks, identify any deficiencies and develop recommendations for improvements. This action should result in responses to many of the concerns raised by the IG.

Page 11: The IG concluded that OAQPS does not know whether State, local or Federal funds will be used to purchase needed PM₁₀ monitors or to what extent the need will be met.

MRB Response:

The IG's conclusion reiterates our opening objection that the IG is advocating an expanded management role for OAQPS which would involve doing the work of the Regional Offices. MRB maintains the position that the overall national PM₁₀ monitoring needs (Group I and II areas and NAMS) are essentially being met (some fine tuning undoubtedly will be required). Shortfalls that appear should be corrected by the \$400K identified as a line item in EPA's documentation supporting the President's Budget for Fiscal Years 1989 and 1990.

Page 11: Report concludes that OAQPS has not fully assessed the need, or confirmed that an assessment has been made of the need, to modify or replace nonapproved monitors that are part of the current SLAMS and NAMS network.

MRB Response:

As noted earlier, the problem of unapproved monitors has been resolved.

Page 12: The IG addressed the concern about how many States had a standard for TSP and whether this information was factored in the estimates of disinvestment of TSP samplers. The IG concluded that OAQPS had not made any significant attempt to gather this information from State/local agencies. The report implies that the February 5, 1988, memorandum from the Director, TSD, concerning TSP disinvestment only went to Region X.

MRB Response:

- o In early 1988 preliminary information was gathered by MRB which indicated that some States would retain a TSP standard for at least 1 or 2 years. This information was factored into MRB's estimate of the future TSP network. In August, MRB conducted a survey of all the ROs on the current status of State TSP standards and the number of TSP samplers that would be retained. All Regional responses are not in.

- o Concerning the February 5 memorandum, it should be noted that similar memorandums were sent to all 10 Regions.

Page 12-13: The IG remarks that OAQPS officials should have placed more emphasis on shifting PM₁₀ samplers is based on the IG premise of a deficit of 81 samplers.

MRB Response:

- o The deficit of 81 samplers has already been discussed.
- o Recommendations, as noted in the IG report, were included in the last several PM₁₀ Status Reports to provide coverage in the Group I and Group II areas as needed.
- o Memorandum from Director, TSD, on December 23, 1987, to Regional Office ESD Directors re-emphasized this recommendation.
- o Region VIII moved approximately 20 PM₁₀ samplers from one State to a different State.
- o Several Regions have moved SSI and dichots for special studies.

Page 14: The report states that "Aside from providing policy and publishing statistics, we believe OAQPS should be very active in: (1) identifying problems, such as failures to comply with Federal regulations and EPA policies; (2) compiling information related to solving the problem; (3) ensuring that all reasonable approaches to solving the problem are known by the officials who can affect a change, and (4) ensuring that inaction, or inadequate action, is brought to the attention of the highest responsible official, including the Assistant Administrator for Air and Radiation. We believe the Director, OAQPS, should consider making a policy statement regarding OAQPS' role in identifying the need for PM₁₀ monitors and ensuring that the need is met. We also believe that the Director should ensure that a comprehensive analysis is completed of the present and future need for PM₁₀ monitors." The report continues (pages 14 and 15) with detailed suggestions on the contents of the comprehensive analyses.

MRB Response:

We agree in principle with the suggestions noted by the IG concerning the actions OAQPS should be involved in. However, we are concerned that the IG statements strongly imply that OAQPS did not take a strong proactive role of ensuring implementation of the Part 58 PM₁₀ monitoring and data reporting regulations. On the contrary we believe OAQPS took early, effective steps at the highest management levels to implement the monitoring examples. Four specific examples can be cited (a) 105 grants, (b) operating guidance, (c) budget, and (d) the Agency's Strategies Planning and Management System.

In FY 86 OAQPS was successful in getting \$400K of 105 grant funds allocated to the Regions for purchase of PM₁₀ monitors and related support equipment. Approximately 40 PM₁₀ monitors were procured. In FY-87 Office of Air and Radiation guidance to the Regions recommended that completion of the PM₁₀ network was to be a high national priority for use of FY-87 grant funds and pointed out that amounts similar to those targeted in FY-86 should be considered in FY-87. Records show a total of 49 PM₁₀ monitors were procured by 105 funds in FY-87. In FY-88 a total of 74 PM₁₀ monitors were purchased with 105 funds.

The Agency uses the Annual Operating Guidance as a mechanism for identifying the Administrator's major program goals and objectives and allows the Assistant Administrators to identify the program areas that should be given the highest priority. Since FY-86 establishment of PM₁₀ monitoring network has been included in the Agency's Operating Guidance. FY-86/87 guidance directed the Regions to use FY-86 grant funds, when required to purchase PM₁₀ monitoring equipment. FY-87 guidance recommended completion of the PM₁₀ networks as a high national priority. In FY-88 the Agency's guidance directed the Regions to provide technical and financial support to assist States in establishing PM₁₀ networks. FY-89, guidance although less focused on purchases than in prior years, still directs the Regions to closely monitor State and local Agency progress in implementing the PM₁₀ monitoring regulations.

Measuring EPA and the States progress towards agreed-upon goals and objectives is accomplished through the Agency's Strategic Planning and Management System (SPMS). Since FY-86 some PM₁₀ monitoring measures were included as SPMS activities. In FY-86, we tracked Regional Office purchase of PM₁₀ monitors with grant dollars as well as other PM₁₀ network development actions. FY-87 SPMS covered the tracking of the establishment of PM₁₀ network and the submittal of PM₁₀ network descriptions. In FY-88, five PM₁₀ measures were tracked and most targets were met indicating that a very high percentage of the Group I and II areas are being adequately monitored.

Page 15: The IG recommends these actions be taken by the Director, OAQPS.

MRB Response:

We totally disagree with this recommendation. We believe that MRB has had a thorough and clear understanding of the various PM₁₀ issues raised by the IG report and likewise understands the Branch's responsibility in ensuring that identified needs are met. We refer to the various management and staff actions taken since FY-86 towards implementing the PM₁₀ monitoring and data reporting regulations.

We agree with the second recommendation that a comprehensive analysis of PM₁₀ monitoring needs to be conducted, and refer to the formation of the PM₁₀ task force as an example of a significant positive action towards this goal.

cc: W. Laxton
D. Tyler

October 12, 1988

NOTE TO BILL HUNT

SUBJECT: Comment on SIP Development for Response to
IG's Draft Position Paper #2

The process of developing a State implementation plan (SIP) starts with a periodic evaluation of air quality data to determine if violations of the national ambient air quality standards have occurred. Once violations occur, all data are considered when determining which sources to control. Analysis conducted by air quality dispersion modeling plays an integral role in this process. Thus, monitoring only begins a process wherein dispersion modeling and other analyses provide an independent assessment of the controls, if any, which might be needed. Erroneous data could be identified by this independent assessment. Also, in the case of PM₁₀, the areas with the worst PM₁₀ problems were classified as Group I based on total suspended particulate data (see FR 29383, August 7, 1987). We are requiring States to submit SIP's for these areas regardless of the type of PM₁₀ monitor used.


Tom Pace

PM-10 Short-fall Status

10/11/88

Region	State	Area	Area Group	March 1988 Status	October 1988 Status	Samplers Purchase Underway	October 1988 Deficit
I	CT	New Haven	I	3-4 sites required, have 2	third sampler start 11/88		0
		Fairfield Co.	I	3 sites @ 1/6	3 sites @ 1/6, start 9/88		2
II	NY	Syracuse	II	all 3 sites @ 1/6	equivalent year done 8/88		0
V	IL	La Salle Co.	II	1 site @ 1/6, start 1/86	will have eq. year in 1/89		0
	OH	Cleveland	I	have 3 sites, need 6	sampler purchase underway	1	0
		Sandusky Co.	II	1 site @ 1/3, start 8/86	will have eq. year in 8/89		0
		Seneca Co.	II	1 site @ 1/6, start 8/88	no change		1
		Wyandot Co.	II	1 site @ 1/6, start 8/88	no change		1
VI	NM	Santa Fe	II	1 site @ 1/6	1 site @ 1/2		0
		Sandoval Co.	II	1 site @ 1/6	1 site @ 1/2		0
		Taos Co.	II	1 site @ 1/6	1 site @ 1/2		0
	OK	Linton	II	1 site @ 1/6	1 site @ 1/2		0
VIII	CO	Greeley	II	1 site @ 1/6	1 site @ 1/2		0
		Adams Co.	II	no site	1 site @ 1/2, start 10/88		0
		Prowers Co.	I	1 site @ 1/2	have 1 year @ 1/1 at another site		0
	MT	Blaine Co.	II	no site	Indian site, sampler purchase underway	2	0
		Deer Lodge Co.	II	no site	Superfund site, sampler purchase underway	2	0
		Rosebud Co.	I	1 site @ 1/6	Indian site, sampler purchase underway	2	0
II	AZ	Tuza	I	1 site @ 1/6	equivalent year done 4/88		0
		Apache Co.	II	no site	represented by site in Navajo Co. (Shoulen)		0
		Cocconino Co.	II	1 site @ 1/6	will have eq. year in 4/89		0
		Navajo Co.	II	1 site @ 1/6	will have eq. year in 7/89		0
		Pima (part)	II	1 site @ 1/6	equivalent year done 3/88		0
		Pinal Co. (part)	II	1 site @ 1/6, start 10/86	equivalent year done 10/88		0
		Pinal Co. (part)	I	no site	represented by site in Gila Co. (Hayden)		0
	CA	San Jose	II	4-6 sites req., had 2 sites	4 sites operating		0
		San Bernardino-Riverside	I	4-6 sites req., had 3 sites	4 sites operating		0
		Fresno	I	3-4 sites req., had 2 sites	third site start 10/88		0
		Fresno Co.	I	1 site @ 1/6	equivalent year done 8/88		0
		Imperial Co.	I	2 sites @ 1/6	equivalent year done 8/88		0
		Humboldt Co.	I	2 sites @ 1/6	equivalent year done 9/88		0
		Stanislaus Co.	II	no site (was in error)	equivalent year done 1/88		0

PN-10 Short-fall Status

10/11/00

Region	State	Area	Area Group	March 1988 Status	October 1988 Status	Samplers Purchase Underway	October 1988 Deficit
	NV	Elko Co.	II	no site (should be Group II)	represented by site in Lander Co. (Battle Mt.)		0
		Eureka Co.	II	no site	represented by site in Lander Co. (Battle Mt.)		0
		Humboldt Co.	II	no site	represented by site in Lander Co. (Battle Mt.)		0
I	ID	Boise City	I	2 sites @ 1/6	will have eq. year 12/00		0
		Pocatello	I	1 site @ 1/6	will have eq. year 12/00		0
		Donner Co.	II	1 site @ 1/6	will have eq. year 12/00		0
		Caribou Co.	II	1 site @ 1/6	will have eq. year 12/00		0
		Power Co.	I	no site	site for point source in Bannock Co.		0
		Shoshone Co.	I	1 site @ 1/6	will have eq. year 12/00		0
OR	Portland		II	4-8 sites req., had 3 sites	4 sites operating		0
WA	Yakima		I	1 site @ 1/6 & 1 site @ 1/2	equivalent year done 10/00		0
	Olympia		I	1 site @ 1/3	will have eq. year 11/00		0
	Walla Walla		I	believed no site	1 site @ 1/2, eq. year completed 2/00		0
						7	4



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

DEC 23 1987

MEMORANDUM

SUBJECT: Status Report for PM₁₀ Samplers

FROM: William G. Laxton, Acting Director *Bill Laxton*
Technical Support Division (MD-14)

TO: Director, Environmental Services Division, Regions I-VIII, X
Deputy Director, Office of Policy and Management, Region IX

Attached is a copy of the twelfth quarterly "Status Report of PM₁₀ Samplers," which reflects the status as of September 30, 1987. Tables are presented which show the location of the operating and future samplers by urbanized areas. As of this date, there were 884 samplers operating at 550 sites with another 14 samplers scheduled to begin operating by December 31, 1987. Of the 662 samplers EPA supplied to the Regions in 1984, 641 (97 percent) are being utilized.

The status report provides information on the number of operating PM₁₀ sites submitting data to the NADB. Also, the data completeness was calculated and shown for those sites which reported data. An overview describes the national coverage of PM₁₀ samplers and sampling frequency according to the PM₁₀ monitor groupings. The groupings were determined by the Regions based on the 1984 to 1986 TSP/PM₁₀ data base.

Several problem areas exist and your assistance is needed to resolve the following:

(1) No start date has been specified for the remaining 21 samplers distributed in August 1984, although I understand that approximately 9 of the 22 samplers are in the process of being relocated. These samplers need to be put into the network. Also, 40 of the 51 samplers targeted for procurement with EPA FY-86 funds have been purchased and only 13 have been identified as being operational. The remainder of these samplers need to be purchased and put into operation.

(2) Twenty-three States have been identified as operating 66 PM₁₀ samplers which submitted no data to the NADB for 1983 through the second quarter of 1987. The report shows that data submittals to NADB are very

slow. For 1985 there are still 29 operating sites which have no data on AIRS. For the 4 quarters of 1986 the percentages of sites reporting data are 89, 89, 88, and 87 percent, respectively. Only 51 percent of the operating sites reported data for the first quarter of 1987 and 5 percent for the second quarter. For PM₁₀ data submitted to NADB, the data completeness for 1983 to 1986 ranged between 85 and 87 percent. You are requested to look into the problems associated with data submittals so that the data will be submitted in a timely fashion.

(3) As noted in Table 17, there are still some problems with the PM₁₀ sampler coverage in the high and medium nonattainment probability areas/counties. Seven of the high probability areas (distributed among Regions V, VIII, IX and X) and 24 of the medium probability areas/counties (distributed among Regions III, V, VI, VIII, and IX) do not have any PM₁₀ samplers. Also, for the high and medium probability areas, there are 33 and 38 areas/counties, respectively, which do not have a site operating at the required minimum sampling frequency. Immediate action should be taken to place samplers in the high probability areas/counties not presently covered. In addition, samplers should be placed in medium probability areas/counties (excluding the fugitive dust counties) with priority given to those areas/counties having a probability \geq 50 percent. I understand from the 1988 SPMS commitments that most of these areas will be covered during FY-88.

(4) There are 145 sites in 33 States which still have errors in the interim parameter codes, duplicate data, or AIRS site file. Your assistance in getting these problems corrected is also requested.

Also attached is a list of specific problem areas for your Region. I realize that some of these may have been resolved by now, but urge you to resolve any remaining problem areas.

Attachments

cc: G. Emison
W. Hunt
J. Puzak
Director, Air Management Division, Regions I, III, V and IX
Director, Air and Waste Management Division, Region II
Director, Air, Pesticides, and Toxic Division, Regions IV, VI
Director, Air and Toxics Division, Regions VII, VIII, X
SAMWG Members
ALAPCO Monitoring Committee

ADDITIONAL OIG COMMENTS TO FEBRUARY 24, 1989
RESPONSE TO DRAFT AUDIT REPORT

The following notes present our responses to Office of Air and Radiation (OAR) comments which are not addressed in body of the report.

Note 1

The Acting Assistant Administrator suggests that we discuss ". . . the inherent possibility of differences between sampler types due to the complexity of particulate matter in the atmosphere and the trade-off made by EPA between flexibility in design and measurement uniformity . . ." The Acting Assistant Administrator believes that our draft report discussion is "incomplete" and "oversimplifies the issue" because we have not included a summary of the information in the introduction to EPA's Issue Paper (pages 54 through 56 of Appendix 3), which discusses the subject in technical terms.

We believe that including this information would obscure our overriding point that regardless of "inherent differences" and "trade-offs", the fact remains there is a relatively consistent pattern for one monitor type to read higher than the other monitor type.

Note 2

The Acting Assistant Administrator describes key elements of the policy established on November 21, 1988. We discuss all of these elements in the body of our report except the following:

Site specific information regarding measurement differences among reference method samplers is simply not available to permit a panel of experts to judge PM10 measurement acceptability.

We recognize there are "site" measurement differences that may never be known. However, it is known that there are measurement differences between the primary types of approved monitors and these differences have been quantified in different parts of the country. We do not believe the inability to eliminate all measurement bias should prevent EPA from eliminating that part of the bias that EPA knows about and can estimate. If the presently available information about differences between monitors is not sufficient ". . . to permit a panel of experts

to judge PM10 measurement acceptability," then SIP experts must be expected to ignore all of the information that is known about differences between monitor types.

Note 3

We have clarified our report on page 7.

Note 4

The Acting Assistant Administrator states that, ". . . areas are not classified as being out-of-attainment with the new particulate matter standards." In a memorandum to us, dated February 24, 1989, the Acting Assistant Administrator explains this statement:

There is some subtlety involved with the terminology "attainment status." The new implementation regulations for PM10 do not require that an area's status be formally classified as attainment or nonattainment. Instead . . . an area's SIP is judged to be adequate or inadequate to demonstrate attainment with the NAAQS.

In our opinion, it is meaningful, if not technically accurate, to refer to areas as being "in attainment" or "out-of-attainment". We know from our fieldwork that this terminology is used by EPA personnel, State and local government personnel, and private industry, and that it is used in Office of Air and Radiation correspondence. In our opinion, it is not essential, and would not be constructive, to amend our report by replacing the common expression that an "area is out-of-attainment" with the statement that an "area's SIP is judged to be inadequate to demonstrate attainment with the NAAQS." We also believe that it would not be constructive to provide a footnote about the "subtlety involved with the terminology" every time we use the expression "attainment" or "nonattainment" in our report. We believe the Acting Assistant Administrator's comments, and our consideration of them in these appendices to the final report, will provide ample record of the subtleties in terminology.

Note 5

The Acting Assistant Administrator's comments have not caused us to change our opinion. We do not believe these groups will cease to oppose control measures, that may cost them money and jobs, simply because of the information about modeling, etc., which is contained in the Acting Assistant Administrator's response.

Note 6

We changed the clause "any 24-hour period" to read "any 24-hour period measured from midnight to midnight". (See page 10 of the report.)

Note 7

The statement in our draft report was qualified by the word "generally" and we have retained this wording in our final report.

Note 8

Our report contains a lengthy quote from the Chief, Methods Standardization Branch (see page 11) which addresses the reasons that EPA-approved monitors produce different measurements. We have included the Acting Assistant Administrator's additional comments on this subject on page 11 of the report.

Note 9

We understand that nonapproved monitor data from 1985 and 1986 that is outside of the gray zone may be used with data from 3 years later. The Acting Assistant Administrator's response does not consider this possibility.

The Acting Assistant Administrator also states that this section of the report ". . . leaves the reader with the impression that progress in solving the problem with these samplers has not been made." We believe any such impression should be attributed to the statement we quoted, not any opinion which we expressed. For example, we quoted the Chief, Methods Standardization Branch: "Although improvements in PM10 technology should result in samplers with better agreement, differences are allowed and likely will continue to occur." Our opinion is contained in our statement ". . . the technology for measuring particulate matter

concentration appears to have improved in recent years and narrowed the measurement differences between the two types of PM10 monitors"

Note 10

We have changed our wording on page 12 of the report. We used the term "significant" in our draft report because we understood that while measurement differences are decreasing the amount of difference is of concern to OAR. For example, the PM10 Task Force stated that "The magnitude of this uncertainty, which appears to be somewhat greater than corresponding uncertainties associated with gaseous pollutants, raises questions and concerns about the utilization of PM10 data in the determination of the attainment of the NAAQS and in the development of SIPs."

Note 11

We have not raised any issue concerning the merits of the equivalent method concept. We continue to believe that detailed discussion of the equivalent method concept is beyond the scope of our report.

Note 12

The point of our discussion is simply to illustrate that a monitor may only show a few exceedances over an extended period of time that are very close to the standard. This point does not depend on whether the monitor was approved or not approved. We have not suggested that the OAR take action, or not take action, based on the actual measurements of the specific monitors at the two areas we discuss. If all areas that did not have 3 years of data from approved monitors were excluded from our consideration there would be little, if any, opportunity for us to evaluate whether situations like Longmont, Colorado and Fresno, California are likely to occur.

Aside from this consideration, we note that at the time we identified the Longmont and Fresno areas, EPA's policy was to accept the data from nonapproved (nonreference) monitors at face value (i.e., there was no distinction between data from approved and nonapproved monitors for purposes of evaluating compliance with the PM10 standard). As of November 21, 1988, the measurements we cited in our draft report from Longmont and Fresno would be treated as an "uncertain data value" for purposes of evaluating compliance with the PM10 standard:

. . . a PM10 value produced by a nonreference sampler which is in its gray zone is not treated as an exceedance of the NAAQS nor is it treated as a nonexceedance of the NAAQS (i.e, it is treated as an uncertain data value for purposes of making comparisons with the NAAQS). . . .

By following this policy, we believe that attainment decisions for areas with nonapproved monitors will be delayed because the measurements fall within the gray zone.

We do not believe we could improve the clarity of our report by discussing these issues in the body of our report. Therefore, we have not changed the wording in our final report.

Note 13

We have revised our report to indicate that a new policy is no longer pending.

Note 14

The Acting Assistant Administrator states that the new policy which was adopted on November 21, 1988 was determined to be a better course of action than the two options which the committee examined and we reported. We did not develop either of these options or recommend that they be adopted. We merely learned of their existence from a committee member and reported their consideration for the dual purpose of disclosing ongoing developments and illustrating flexible options to accepting monitor measurements at face value.

Note 15

The Acting Assistant Administrator states that setting a general policy which allows "exceptions" is the preferable course of action. We discuss our understanding of this policy in the body of our report. In this note, we will only comment briefly on the reference to "exceptions". We do not understand what this term means in the context of evaluating PM10 data. For example, does someone or some group decide, on a periodic basis, that continuous monitor measurements above the standard should not ultimately call for action to reduce PM10 levels? If so, are there any criteria for making these decisions? If there are such criteria, are the decisions documented? To our knowledge, such

actions are not currently taken and are not contemplated for the future. We do not know what type of actions would represent "exceptions" under OAR's new policies. We presume the concept does not refer simply to situations where data is known to have been distorted, such as high PM10 measurements that are caused by a forest fire.

Note 16

The Acting Assistant Administrator suggests that we amend a statement in our draft report to specify ". . . that the committee recommended that PM10 measurements from EPA approved reference method samplers be accepted at face value." According to our understanding of the new policy, this statement would be incomplete. It does not say that measurements from a dichot monitor, which is not an EPA-approved monitor, may also be accepted at face value if these measurements were recorded prior to July 31, 1988. (See page 52 of Appendix 3). We do not want to add this degree of complexity to the body of our final report.

In addition, we believe it is very clear from the report context (one sentence before the questioned sentence) that we are only talking about the two primary types of EPA-approved monitors, and are not making any statement at all concerning the committee's recommendation about accepting data from nonapproved monitors. For these reasons, we have not changed the wording in our final report.

Note 17

Based on the Acting Assistant Administrator's comments, we remain concerned that when measurements are near the standard, EPA will make different attainment decisions solely based on the type of monitor used.

Note 18

We have never suggested that data be "adjusted" in the sense that it would be changed. Allowing a panel of experts the flexibility to interpret monitor measurements does not mean that data needs to be adjusted.

Note 19

The Acting Assistant Administrator indicates ". . . that the appropriate role for a group of experts is to review PM10 SIPs, and not to review all measurements within a specific range." We agree that PM10 experts should review PM10 SIPs and we have not written anything that implied otherwise. We do not believe there is necessarily any redundancy between reviewing SIPs and evaluating how the face value of a measurement should be interpreted.

Note 20

In response to the second recommendation in our draft report, the Acting Assistant Administrator states: "The SIP, therefore, provides for the appropriate regulatory documentation." We agree. The Acting Assistant Administrator apparently interprets our second recommendation as being a critical comment, perhaps implying that attainment decisions should be documented in a different way. Our second recommendation presumes that the first recommendation is accepted and a change is made. If a change is made, such as periodically convening a panel of experts to evaluate all measurements near the standards, the panel's discussions and decisions should be carefully documented.

Note 21

Our third recommendation presumes that the first recommendation is accepted and a different course of action is followed. We agree that if no change is made, no regulatory changes are needed.

Note 22

We agree with the Acting Assistant Administrator's response that "The November 21 policy memorandum clarifies the use of data from nonapproved monitors." We discuss this clarification in several sections of our final report, including the summary section.

Note 23

We have amended our final report to indicate that EPA, not MSB, approves equivalent methods for sampling PM10.

Note 24

On September 27, 1988 we provided copies of our position paper on this subject to the Chief, Monitoring Section, Monitoring and Reports Branch, Technical Support Division, OAQPS and to the Chief, Methods Standardization Branch, EMSL. We did not receive any comments regarding questions of fact.

On March 16, 1989, we met with the Chief, Methods Standardization Branch. As a result of this meeting, we made minor changes to four sentences in our final report to incorporate the Chief's comments. Each of the four sentences which we changed were present, verbatim, in our September 27, 1988 position paper.

Note 25

The subject paragraph in the draft report is virtually identical to the paragraph in our position paper which we provided on September 27, 1988 to the Chief, Monitoring Section, Monitoring and Reports Branch, Technical Support Division, OAQPS and to the Chief, Methods Standardization Branch, EMSL. The paragraph states what we were told at the time the interview was conducted. This paragraph is qualified in two separate instances to indicate that the presented information applies to the situation "as of August 1, 1988."

On March 16, 1989, we met with the Chief, Methods Standardization Branch, and learned that the paragraph was no longer accurate because new developments had taken place either since we issued our draft report or since we held the interview. Specifically, the manufacturer referenced in the paragraph has reportedly submitted the referenced monitors for evaluation by EPA personnel.

We do not believe this new information materially impacts our final report and have not made any other changes.

Note 26

According to the Acting Assistant Administrator, OAR and the Office of General Counsel believe that the authority to use data from nonapproved monitors can be inferred from Section 2.3 of Appendix K. We have not changed our draft report discussion of this issue primarily because we want to document our concern with the regulations.

We also continue to believe that data from nonapproved monitors, such as those from Medford, Oregon, which are far above or below the standard, should be used without data from approved monitors in making attainment decisions. The November 21, 1988 policy does not allow data to be used in this manner.

Note 27

In our draft report, we indicated the Issue Paper recommended that measurements from nonapproved monitors within the gray zone should be disregarded. In our final report we added wording to make it clear we were discussing disregarding the measurements "for purposes of making attainment decisions." To ensure that we addressed the Acting Assistant Administrator's concern, we have included his following response in our final report:

" . . . measurements within the gray zone should not be disregarded but used with less authority."

In our draft report, we also indicated that measurements outside of the gray zone should be taken at face value. In our final report, we also added the wording, "for purposes of making attainment decisions" and, to ensure the Acting Assistant Administrator's concerns were addressed, we included his following response: "measurements outside the gray zone should be considered more authoritatively . . . [and measurements] greater than their respective gray zone . . . would be treated as exceedances of the standard."

Note 28

The Acting Assistant Administrator presents various reasons, including "concern for human health and welfare", for why data from nonapproved monitors should be used to corroborate data from approved monitors. We agree. Our concern is that the regulations do not clearly allow this to be done.

Note 29

In our final report, we have qualified the wording to indicate that the committee's recommendation was to use data with "less authority." We understand this to mean that OAR will essentially ignore data from nonapproved monitors in the gray zone when determining whether an area is out-of-attainment. (See note 27 above.)

Note 30

Since the action we recommended in our draft report has been taken, we have deleted this recommendation.

Note 31

Our draft report presented an estimate of monitor needs as of August 1, 1988. The draft report also referred to subsequent OAQPS information which we analyzed. In our draft report, we concluded that the number of monitors needed was less (as of a different point in time) than the estimate we made. However, we do not agree with OAR's conclusion that only four monitors were needed as of October 1988 for the reasons discussed on page 42 of the report. (We have included additional reasons in our final report.)

Regardless of our disagreement over the exact number of monitors which were needed at a particular point in time, our primary focus was, and is, the effectiveness of OAQPS actions to ensure a complete system is in place. We believe that the results of our inquiries on various issues (see pages 43 through 47 of the report) indicate that OAQPS needs to take a more active role.

In regard to this issue, the Acting Assistant Administrator raises a question repeatedly throughout his response to our draft report. This question is whether we "fully utilized" certain information. The Acting Assistant Administrator states:

" . . . the IG auditors were provided with updated information by OAQPS on October 12, 1988 by memo and meeting. This information showed that only four PM10 samplers were needed to fully cover all Group I and II areas as well as meeting all of the NAMS requirements. The IG draft audit report did not fully utilize the material provided on October 12 but instead focused on an outdated estimate of an 81 monitor shortfall."

Our draft report and final report clearly quoted the October 12 memorandum in detail, and we clearly identified how we used the information:

"During our fieldwork, we communicated our preliminary conclusions to the Chief, Monitoring and Reports Branch (Branch Chief). On October 12, 1988, the Branch Chief provided preliminary comments on our estimate. Using data recently obtained from the regional offices, the Branch Chief wrote us:

- o As of March 31, 1988, a deficit of 81 PM10 samplers was identified to fully cover all NAMS, Group I, and Group II areas.
- o As of October 1988, the deficit is 11 samplers and 7 of the 11 are in the process of being purchased.
- o Therefore, only 4 PM10 samplers are still needed.
- o OAQPS is responding to the present and future deficit through \$400 K [\$400,000] in the FY-89 budget. TSD [Technical Support Division] is preparing a memorandum to ROs [regional offices] to actively pursue the use of these funds to procure needed PM10 samplers.

Based on the additional information provided by the Branch Chief, we updated our information and modified our conclusions. We agree that some of the 81 sites which we identified no longer needed PM10 monitors as of October 12, 1988. However, we do not agree that only 11 sites still needed PM10 monitors because . . ."

Note 32

The Acting Assistant Administrator expresses "strong disagreement" with our conclusion that OAQPS has "not fully assessed" the need for more monitors. We understand that the desire to fully assess monitor needs was the reason that OAQPS formed a special task force on August 9, 1988 ". . . to review PM10 monitoring networks, identify any deficiencies and develop recommendations for improvements." (See page 79 of appendix 3.)

After expressing disagreement with our conclusion, the Acting Assistant Administrator discusses expected future developments ("reference designators" are pending) and coding problems. Our conclusion that OAQPS had "not fully assessed" the need for more monitors was not based, at all, on the coding problems that are discussed in the response to the draft report, or the status of the PM10 network at a time after we completed our evaluation. Our conclusion was based solely on the answers to the questions we asked, including those identified in our draft report. (See pages 43 through 47 of the report.)

We did not ignore the coding problem or choose "to ignore the EPA information". As indicated by the Acting Assistant Administrator in his response to our draft report: "It is not clear why the IG auditors have chosen to ignore the EPA information." Our evaluation of this data was the reason our draft and final reports stated: "We agree that some of the 81 sites which we identified no longer needed PM10 monitors as of October 12, 1988."

Note 33

Our draft report contained virtually every bit of information on this subject that we were provided. Our draft report stated "In his draft memorandum to us, dated October 12, 1988, the Branch Chief indicated that some preliminary information had been gathered in early 1988 on the subject, and that the results of an ongoing survey had not yet been finalized:

In early 1988 preliminary information was gathered by MRB [Monitoring and Reports Branch] which indicated that some States would retain a TSP standard for at least 1 or 2 years. This information was factored into MRB's estimate of the future TSP network. In August, MRB conducted a survey of all the ROs [regional offices] on the current status of State TSP standards and the number of TSP samplers that would be retained. All Regional responses are not in.

Note 34

The Acting Assistant Administrator provides a great deal of information concerning TSP networks and shifting resources from TSP monitoring to PM10 monitoring. We generally agree with all the information presented except the implication that is attributed to us in his following statement:

However, what is implied in the IG report is that as resources are decreased from TSP sampling, more resources would be available for procurement of PM10 samplers to meet the IG deficit of 81 samplers.

Our concern is the same as that expressed by the Acting Director, Technical Support Division, in a memorandum on February 5, 1988: "Because of our mutual concerns about cost-effective monitoring programs and the need to identify real and timely disinvestments"

Note 35

During our audit, we reviewed the Status Reports and the December 23, 1987 memorandum referred to by the Acting Assistant Administrator. Our draft report quotes the same Acting Director on the same subject a year later. Our draft report identified the type of documents or records which would likely have caused us to reach a different conclusion, including "notices of . . . plans to shift monitors" . . . , explanations of ". . . why each monitor that remained in a Group 3 area had not been shifted to a Group 1 or Group 2 area?"

Note 36

As discussed in note 31, we do not agree that only four monitors were needed as of October 12, 1988. Prior to this estimate, we asked OAQPS officials how additional monitors would be funded. Our point is that OAQPS officials did not obtain information including documentation which we believe would assist them in assessing monitor needs on a national basis.

Note 37

The Acting Assistant Administrator states there will soon be few, if any, nonapproved monitors in the monitoring networks which concern EPA. We concur that when this becomes a fact, questions about nonapproved monitors would not have an impact on an EPA analysis of monitoring needs.

Note 38

As discussed in note 31, we do not agree that the system was complete as of October 1988. Moreover, additional monitors will be needed to implement regulations which become effective in the future.

In our draft report, we suggested areas for OAQPS to study. If an issue is no longer relevant, we believe it would be useful to document this.

We also note that this review was conducted solely by OIG auditors; no OIG investigators were involved. OIG investigations have criminal implications.

The Acting Assistant Administrator also comments that the OIG apparently did not critically review the valid monitoring objectives allowed by Part 58 of the regulations. The issue of shifting monitors from Group 3 areas to Group 1 and Group 2 areas was originally raised by an OAQPS Section Chief. We recognize that these are valid monitoring objectives for Group 3 areas. However, Group 3 areas are expected to have the least PM10 pollution. Therefore, when assessing monitor needs, we believe a valid area for study is the shifting of monitors from Group 3 areas.

We are confused by the following statements by the Acting Assistant Administrator:

. . . PM10 samplers are needed to meet different monitoring objectives. The IG auditors apparently believe that PM10 samplers should only be located to measure in maximum concentration areas.

Our draft report and final report state:

We recognize there may be many good reasons for operating a PM10 monitor in an area where Federal regulations do not require monitoring. For example . . . [etc.].

Concerning the Acting Assistant Administrator's comments regarding "private or industrial sites," we are unsure how this statement applies to our report because we are referring to monitor needs for the SLAMS and NAMS networks.

Note 39

We believe that aging monitors, or component parts of monitors, should be considered in planning for future monitoring needs. We presume the Acting Assistant Administrator agrees. We do not believe it would be constructive to revise our draft report to differentiate between component parts, housings, etc.

Note 40

Our response is explained on page 51 of the report.