

US EPA ARCHIVE DOCUMENT



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

AUG 18 2003

Mr. John K. Pitner  
Air Team Leader  
West Virginia Manufacturers Association  
2001 Quarrier Street  
Charleston, West Virginia 25311

Dear Mr. Pitner:

Thank you for your letter dated July 14, 2003 regarding the imminent designations for the 8-hour ozone air quality standard for areas in West Virginia. Your letter raises two major points. First, because you believe that "measured" air quality and whether or not an area "contributes" to nonattainment with air quality standards in nearby areas are the only lawful considerations in designating areas as attainment or nonattainment, you are concerned that our Multi-criteria Integrated Resource Assessment (MIRA) approach to organizing and analyzing data allows for consideration of prohibited criteria as part of the designation process. Next, you seek reassurance that use of the MIRA approach will not result in inconsistent treatment of areas located in different states or inequitable designations with respect to West Virginia areas.

We hope in this letter to allay your concerns that the MIRA approach is being used in a manner contrary to the Federal Clean Air Act, is inconsistent with how other Environmental Protection Agency (EPA) Regions will designate areas for the 8-hour ozone standard, or will produce inequitable results for any area within Region III.

Some Misunderstandings You May Have About the MIRA Approach

The case law cited in your letter suggests up until now we have not done a good enough job in explaining what the MIRA approach is (and perhaps as importantly, what it is not).

Both cases you cite, *Republic Steel Corp. v. Costle*, 621 F.2d 797 (6<sup>th</sup> Cir. 1980), and *PPG Industries, Inc. v. Costle*, 630 F.2d 462 (6<sup>th</sup> Cir. 1980) support EPA's use of computer-modeled air quality data when designating areas as attainment/nonattainment for an air quality standard.

The MIRA approach, although it makes use of some software-based tools, does not model air quality. MIRA is an integrated analytical approach that Region III is using to assist the EPA decision makers evaluate air quality, along with 11 other criteria, in determining those geographical areas that should be included in the designated attainment, nonattainment, or unclassifiable area with respect to the 8-hour ozone standard. The air quality data that is considered within MIRA may be monitored data, or, in areas where no monitor exists, interpolated data.

It is worth noting that computer models reviewed in the two Sixth Circuit cases cited above were not evaluative tools like MIRA (which is similar to air quality computer models only in that MIRA runs on a computer). Rather, they were air quality models used by EPA to make predications about the air quality in areas in lieu of using monitored data (in those cases, even where monitored air quality data existed). One element used in the MIRA approach is a tool to interpolate air quality in areas where no monitored data exists. This particular MIRA input is similar in some respects to the kinds of models the Sixth Circuit upheld in the cases you cite. To the extent the concerns you express about the MIRA approach itself can be transferred to the interpolated air quality data used (along with 11 other criteria) for a MIRA evaluation, we address that concern immediately below.

It is important to keep in mind, unlike computer models that predict air quality, the MIRA approach predicts nothing; it merely allows EPA decision makers to consider the twelve criteria in making decisions about which geographical areas should be included in the boundaries of a nonattainment area. The actual designation decision are made by EPA officials, after considering the data organized by MIRA.

#### The Clean Air Act and Interpolated Air Quality

The “unclassifiable” designation is used when an area cannot be designated either attainment or nonattainment based on the available information. Information that we have considered relevant includes monitored air quality data, if available. However, it is not practical to place a monitor in every county in the country. Further, because there are sound statistical approaches to interpolation, EPA can achieve its statutory mandate to designate based on available information about the air quality in areas without monitors. Interpolation lacks the certainty of monitored data, but the MIRA approach takes this uncertainty into account (as described in more detail in Enclosure 1).

We believe that the interpolation methodology we have used comports with the legal standard required for EPA to use this data within a MIRA analysis.

#### Clean Air Act and EPA Designations Criteria

In March 2000, EPA’s Office of Air Quality Planning and Standards issued a guidance memo that provides a list of 11 criteria to be considered when determining the geographical boundaries of the nonattainment/attainment/unclassifiable area.

The March 2000 guidance memo is clear about a number of things: (1) the memo is not binding (as described below, Region III has therefore added a twelfth criterion not in the memo to the MIRA analysis, an explicit consideration of the designation preferred by the state); (2) EPA believes that any county with a monitored violation of the ozone standard and any nearby contributing area should be classified as nonattainment; and (3) Metropolitan Statistical Areas or

Consolidated Metropolitan Statistical Areas (CMSA) should be the presumptive boundaries of the area.

The 11 criteria in the guidance are to be used in determining if the boundaries of the nonattainment/attainment/unclassifiable area should be larger or smaller than the CMSA. These criteria are: 1) emissions and air quality in adjacent areas (including adjacent CMSAs), 2) population density and degree of urbanization including commercial development (significant difference from surrounding areas), 3) monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale), 4) location of emission sources (emission sources and nearby receptors should generally be included in the same nonattainment area), 5) traffic and commuting patterns, 6) expected growth (including extent, pattern, and rate of growth), 7) meteorology (weather/transport patterns), 8) geography/topography (mountain ranges or other air basin boundaries), 9) jurisdictional boundaries (e.g., counties, air districts, existing 1-hour nonattainment areas, Reservations, etc.), 10) level of control of emission sources, and 11) regional emission reductions (e.g., Nitrogen Oxide (NO<sub>x</sub>) Standard Implementation Plan (SIP) call or other enforceable regional strategies).

#### National Consistency

These criteria are generally applicable for the designation process and EPA intends to use these criteria consistently throughout the country. Region III is no exception. As detailed in Enclosure 2, all 11 of these criteria are used within the MIRA approach and thereby are used by EPA decision makers in evaluating the boundaries of the areas to be designated.

While it is true that only Region III has organized its decision making process under the "MIRA" rubric, we do not believe that this difference in format means that the designation process in Region III is substantively different from that used in other Regions. The MIRA approach is an automated means of assimilating a large amount of information necessary for analysis.

Furthermore, by having organized the data in this way, West Virginia Manufacturers Association (WVMA) has been able to make specific comments regarding the Region III analysis in its July 14 letter to EPA.

#### Equitable Treatment of West Virginia

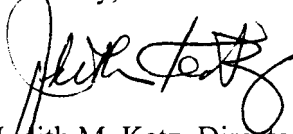
With regard to your comments about Berkeley and Jefferson Counties' membership in the Baltimore-Washington CMSA, we understand your concerns. As noted above, our current guidance requires the consideration of CMSA membership for the designations analysis so its consideration cannot be completely eliminated. However, the entire point of the guidance, and by default, the MIRA approach, is that the use of the CMSA as a default criterion does not automatically make Berkeley and Jefferson Counties part of the Washington, D.C. nonattainment area if the data relevant to the 11 designation criteria can justify a reason to omit them from the

area. Because neither the Clean Air Act nor EPA guidance provides specific thresholds for what is nonattainment, with 12 decision criteria, there is no single criterion (other than a monitored air quality violation) that would "trump" all others to deem a county nonattainment. It is our intention to share with our stakeholders by December 2003 the rationale for inclusion or exclusion of these areas.

While the WVMA states that it believes that using MIRA may result in more counties in West Virginia being designated nonattainment than otherwise, we suggest that continued, meaningful discussions between WVMA and EPA may increase understanding of why that statement is not correct. MIRA cannot "make" more counties become designated nonattainment. Decision makers make these decisions after evaluating available data, whether or not MIRA is the vehicle for this evaluation or not. MIRA does not drive the decisions any more than would a software spreadsheet containing the same data.

EPA encourages you and other stakeholders to continue this dialogue, with the goal of enhancing knowledge and understanding of designation recommendation and decision process. Sometimes in the decision process, stakeholders who enter the dialogue may find that, once informed by the data and the issues, they appreciate the difficult choices that must be made in the designation decision and their participation may help them to better understand the decision problem and final decision. If you have further questions, please contact Makeba Morris, Chief, Air Quality Planning Branch, at 215-814-2187 or Cynthia Stahl at 215-814-2180.

Sincerely,



Judith M. Katz, Director  
Air Protection Division

Enclosures (2)

cc: The Honorable Stephanie Timmermeyer, Secretary, WVDEP  
John Benedict, Director, WVDEP  
Fred Durham, WVDEP

## Enclosure 1

### Determining Uncertainty Component for Interpolated Air Quality Estimates

The uncertainty component assesses the accuracy of the interpolation<sup>1</sup> methodology in estimating ozone design values. This interpolation uncertainty is addressed by deriving it from a modeled field of 8-hour ozone design value concentrations based on the 2010 full compliance volatile organic compounds (VOC) and NO<sub>x</sub> emissions inventory in Region III. This modeled spatial field was obtained by using an air quality model that predicts 8-hour ozone design value concentrations across the study area based on inputted emissions of VOC and NO<sub>x</sub>. Over this modeled spatial field, the locations of the monitors in the actual ozone monitoring network are superimposed. At these locations only, the modeled 8-hour ozone design value concentrations are extracted and the remainder of the spatial field is deleted. The modeled air quality data from those ozone monitor locations is interpolated, producing a new spatial field of 8-hour ozone design value concentrations for the study area. This is a field of interpolated modeled design values. Consistent with EPA policy for counties with multiple violating monitors, the highest interpolated modeled 8-hour ozone design value in each county is selected as the one that is representative of that county.

By comparing this original modeled field with the interpolated modeled field, the accuracy of the interpolation method is estimated by using the air quality model as the benchmark. At each point on the map, uncertainty of the interpolated 1-hour ozone design values is determined by subtracting the interpolated value from the modeled value, which is the residual plot. For the decision analysis, the difference between the highest modeled value and highest interpolated value for each county is used as the air quality uncertainty indicator for counties where air quality must be estimated by interpolation. The more positive the difference of these two values, the greater is the certainty that the interpolated ozone design value is underestimated and therefore, should be more nonattainment than the design value alone would indicate.

For additional information on interpolation as a useful technique in air quality applications at EPA, please see the August 2003 edition of EM (the journal of the Air & Waste Management Association), D. M. Holland et al., pages 31-35.

#### References

Cressie, N. A. C. 1991. *Statistics for Spatial Data*. New York: John Wiley and Sons, Inc.

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<sup>1</sup> Interpolation or the use of spatial fields averaging is a scientific technique that is widely used and accepted in many fields, including air quality (Cressie, 1991; Isaaks and Srivastava, 1989e; Diem and Comrie, 2002b; Ionescu et al., 2000d; Greenland and Yorty, 1985c). It allows scientists to gather information about pollutant concentrations across spatial fields using the available monitored or sampled data.

Diem, J. E. and A. C. Comrie. 2002b. Predictive mapping of air pollution involving sparse spatial observations. *Environmental Pollution* 119: 99-117.

Greenland, David and Richard A. Yorty. 1985c. The Spatial Distribution of Particulate Concentrations in the Denver Metropolitan Area. *Annals of the Association of American Geographers* 75: 69-82.

Ionescu, A., Y. Candau, E. Mayer and I. Colda. 2000d. Analytical determination and classification of pollutant concentration fields using air pollution monitoring network data - Methodology and application in the Paris area, during episodes with peak nitrogen dioxide levels. *Environmental Modelling & Software* 15: 565-573.

Isaaks, Edward H. and R. M. Srivastava. 1989e. *Applied Geostatistics*. New York: Oxford University Press.



## Enclosure 2

### COMPARISON OF 11 EPA DESIGNATION CRITERIA AND REGION III ANALYTICAL CRITERIA

EPA Guidance Memo (3/00)	Region III Analysis
1. Emissions and air quality in adjacent areas	1. VOC/NOx (Point, area, mobile) emissions and Air quality estimates in all adjacent areas
2. Population density/urbanization	2. Population density/population/CMSA
3. Air quality monitoring data	3. Air quality monitoring data for counties with monitors
4. Emission sources	4. VOC/NOx (point, area, mobile) emissions for all areas
5. Traffic/commuting patterns	5. CMSA, VMT
6. Expected growth	6. VMT and population growth
7. Meteorology	7. Meteorology considered in data for AQ modeling
8. Geography/topography	8. Geography and topography considered in data for AQ modeling
9. Jurisdictional boundaries	9. County, CMSA, and 1 hour O3 NA areas
10. Level of emission controls	10. Control margin
11. Regional emission reductions	11. NOx SIP call (Relative Reduction Factors)
	12. State preference