UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Hadson Power - Buena Vista PSD Permit Class I Increment Issue

DATE: 7-16-91

FROM: Alan J. Cimorelli, Lead Meteorologist
Technical Assessment Section (3AT12)

TO: Joseph Tikvart, Chief
Source Receptor Analysis Branch (MD-14)

As we discussed at the May 1991 National Modelers Meeting, a major issue related to a specific Class I increment analysis has arisen in the State of Virginia. The PSD applicant is the Hadson Power Company's Buena Vista (BV) cogeneration plant and the Class I area of concern is the Shenandoah National Park (SNP). As you will recall, the issue related to how one should analyze Class I increments when: (1) the increment consuming inventory contains sources both within and beyond 50 km from the receptor area and (2) a number of the sources have their own on-site meteorological data bases.

It was agreed at our May meeting that if the on-site data bases were coincident, then an analysis which combined the use of each source's own on-site meteorological data would be considered. However, if the data was not coincident, then some other procedure would need to be proposed to the Clearinghouse on a case-by-case basis. For the BV situation, the meteorological data bases are unfortunately not coincident. Because of this the State of Virginia, in a June 24, 1991 letter (attached), has requested that Region III provide guidance on how to approach this issue.

We have developed a proposed solution to this issue and are formally requesting that the Model Clearinghouse provide their review and comments. Our proposed solution is provided as an attachment to this memo.

Attachments

cc: M. Spink (3AT10)

BUENA VISTA PSD PERMIT
CLASS I INCREMENT ISSUE
REGION III PROPOSED SOLUTION
DATE: JULY 15, 1991

BACKGROUND:

Over the past couple years, Virginia (VA) has had a dramatic increase in the number of PSD permit applications seeking to construct cogenerations plants throughout the State. This major growth activity has resulted in a heightened interest in the consumption of Class I increment in the Shenandoah National Park. The Buena Vista (BV) project (Hadson Power) is one to the proposed VA cogens.

BV is to be located approximately 60 km southwest of the Park within the Appalachian mountains (see the attached map). The major pollutant of concern is SO2 with proposed allowable emissions of 355 tons/yr. The plant is to locate in complex terrain and therefore, as required in the "Guideline on Air Quality Models," the applicant collected one year on-site meteorological data. Moreover, if it is possible for the design concentration to occur on terrain which is between stack height and plume height, agency policy requires that an intermediate terrain analysis be performed. Since this was the case for BV, an intermediate terrain analysis was performed which utilized the ISC and Complex I models. To perform the analysis, the applicant developed an ISC/Complex I hybrid model. In addition, the applicant was required to show that the hybrid model was equivalent to guideline techniques; an adequate demonstration was submitted by BV.

A Class I increment analysis was required for two areas in Virginia: Shenandoah National Park (SNP) and the James River Face. These analyses were performed using the hybrid model and BV on-site meteorological data. The analysis showed compliance with the increments at the James River Face while predicting violations of the Class I increment in both the central and northern parts of the SNP. These violations resulted from the impact of two increment consuming sources. The central area of violation was caused by a Coors facility which is located within a kilometer or two of the SNP and approximately 100 km from BV. The northern area of violation was caused by a Potomac Electric power station (PEPCO Station H) located in Maryland some 60 km northeast of the SNP and more than 200 km from BV.

Both Coors and PEPCO did collect a year of meteorological data for purposes of their previously approved PSD permit. However, none of the three meteorological data bases (BV, Coors, or PEPCO) were collected during the same year. Analyses performed by Hadson Power have shown that impacts from PEPCO and Coors are greatly reduced when the on-site meteorological data bases from these

previously permitted sources are used. Given the unusual and non-guideline nature of this situation, VA, in a letter dated 6/24/91, has requested that we provide them with advice in resolving this issue.

In a recent letter to VA, Hadson Power has requested that, for purposes of the Class I increment analysis, that they be permitted to use the Coors meteorological data base when modeling southern parts of the SNP and the PEPCO data for modeling northern areas. Hadson bases this request on the opinion that the Coors and PEPCO data are most representative of the major impacts.

We are considering accepting the general approach as stated in the above paragraph. Specifically, we would require the following:

1. Hadson would be required to develop two receptor grids covering the entire Class I area. One grid would be designed to determine maximum impact on the Class I increment in the area where Coors dominates the impacts. The second would be designed for the area where PEPCO dominates.

2. For the Coors area, all sources contained in the increment consuming inventory will be modeled using the Coors data.

3. For the PEPCO area, all sources contained in the increment consuming inventory will be modeled using PEPCO data.

4. This procedure applies only to the Class I area. To perform the required Class II area impact analysis, BV meteorological data is to be used exclusively. The Class II area is centered on the BV plant and is synonymous with the area of significant impact.

Approval of this approach would be strictly case-specific and should not to be construed as general guidance. A solution to the general issue raised by this case will be handled once Mr. Ken McBee, Chief of Virginia's Modeling Section, has defined the general problem. As a result of discussions held at the May, 1991 National Modelers meeting, it was agreed that a solution to the general problem would be sought once the problem was clearly defined. Mr. McBee agreed to provide this definition.

We would justify the BV approach on the following merits of this specific case.

1. Present policy does not cover this situation which has the following characteristics:

   a. Predictions of the applicant source's impact are needed at a distance which is greater than 50 km from the source. That is, the Class I receptor area of interest is displaced more than 50 km from the applicant source.

b. The analysis includes multiple increment consuming sources.

c. While most of the sources in the inventory are more than 50 km from the receptor area, the Coors facility is within a couple kilometers.

d. The applicant source and the two most dominate sources in the inventory (Coors and PEPCO) all have on-site meteorological data.

e. None of the meteorological data sets are coincident.

f. Significantly different impacts are predicted from the various meteorological data bases.

g. Predicted increment violations occur in two areas of the SNP. Impacts in each area are dominated by either Coors or PEPCO. Impacts from the applicant source are very small in comparison to the dominate sources, regardless of which meteorological data base is used.

h. The impacts in each of the two areas of violation would be best represented by the on-site meteorological data from Coors and PEPCO, respectively.

2. There does not exist any significance criteria for evaluating "diminus contributions" to predicted Class I increment violations. As a result, the accuracy in the prediction of the violation, rather than the contribution of the applicant source, is of greatest interest. Since Coors and PEPCO provide the major contribution to the predicted violations, it is logical to use that meteorological data which best represents their impacts.

3. This approach has been considered secondary to the agreed upon approach at May 1991 National Modelers Meeting (i.e., USE MULTIPLE METEOROLOGICAL DATA SETS IF THE DATA IS COINCIDENT). That is, we are taking this approach only because the meteorological data bases are not coincident.