EPA-450/3-75-060
December 1973

SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR COMPLIANCE EXTENSIONS IN 51 AIR QUALITY CONTROL REGIONS

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

EPA-450/3-75-060

SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR COMPLIANCE EXTENSIONS IN 51 AIR QUALITY CONTROL REGIONS

by

Paul Morgenstern

Walden Research Division of Abcor, Inc.
201 Vassar Street
Cambridge, Massachusetts 02139

Contract No. 68-02-0049
Tasks 8 and 11
Program Element No. 2AC129

EPA Project Officer: Dave Barrett

Prepared for

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

December 1973

This report was furnished to the Environmental Protection Agency by Walden Research Division of Abcor, Inc., Cambridge, Massachusetts 02139, in fulfillment of Contract No. 68-02-0049. The contents of this report are reproduced herein as received from Walden Research Division of Abcor, Inc. The opinions, findings, and conclusions expressed are those of the author and not necessarily those of the Environmental Protection Agency. Mention of company or product names is not to be considered as an endorsement by the Environmental Protection Agency.

Publication No. EPA-450/3-75-060

ABSTRACT

This report presents a summary from a series of individual reports covering modeling analysis of power plants in a number of critical AQCRs. The purpose of this study is to determine whether and to what extent variances could be granted for certain plants to relieve the aggregate low-sulfur coal deficit problem projected for 1975. The variances, if granted, would allow an extension of time to meet regulatory requirements of State Implementation Plans (SIPs).

A brief synopsis of the background for this study is presented in the introduction to this report. This is followed by a description of the analysis procedure, and a presentation of the summary results.

The total aggregate annual coal consumption by the 206 power plants included in the study is 290 million tons. The analysis indicated that the allowable sulfur content of approximately 145 million tons can be affected by the application of variances. The major changes projected are a net decrease of 137 million tons of low-sulfur coal (less than 1.0% sulfur), and a net increase of 109 million tons with sulfur content greater than 2.0%. More detailed summaries are provided by AQCR, by state, and by individual power plant.

This study was intended only to demonstrate the general feasibility of reducing the low-sulfur coal deficit by compliance extensions. Any decisions based on material presented in this report pertaining to individual plants should carefully and fully take into account the quality of input data available for the model, the assumptions on which the model is based, and the procedures followed in preparing the analysis.

This study was undertaken prior to the overall oil shortage and energy crisis arising in the fall of 1973. It does not address that situation, but rather was formulated and carried out with only the projected 1975 low-sulfur coal deficit in mind.

ACKNOWLEDGEMENTS

The summary results presented in this report for 51 Air Quality Control Regions are based on studies performed by EPA and Walden Research. The earlier analysis of 8 AQCRs was conducted by the Monitoring and Data Analysis Division of the Office of Air Quality Planning and Standards, Office of Air and Water Programs. This was followed by a similar analysis of 43 AQCRs conducted by Walden, sponsored jointly by MDAD, Strategies and Air Standards Division, OAQPS, OAWP.

The EPA project officer was D.H. Barrett, and the Walden project manager was P. Morgenstern. The project was aided by the cooperation and assistance provided by R.F. Lee, C.E. Mears, and J.S. Davis of MDAD and by J.L. McGinnity of SASD. The technical staff at Walden who contributed significantly to this project are: F. Banta, K.M. Chng, R.C. Furman, C.M. Klima, L.N. Morgenstern, M.C. Shah, R.E. Stockdale, and A.I. Zakak. Publication of all reports was under the direction of C.O. McLatchy.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF TABLES (continued)

I. INTRODUCTION

Recent studies on the aggregate impact of State Implementation Plans (SIPs), conducted by the Office of Air Quality Planning and Standards, have indicated a nationwide potential low-sulfur coal supply deficit in 1975. The deficit arises from extremely low-sulfur SIP requirements all of which cannot be met by available coal and gas cleaning technology within the time required. After making reasonable allowances for added low-sulfur coal availability, limited fuel switching, and use of available stack gas cleaning, a net deficit of about 100 million tons/year still remains for 1975. This deficit is concentrated and most acute in twelve states with high coal consumption rates; a number of other states are involved to a lesser extent.

Although the principal deficit fuel is coal, oil could also be affected to some degree. Considerable supplies of low-sulfur oil can be made available; however, there is some possibility of localized, limited shortages due to the overall dimension of the energy problem.

One means to alleviate the low-sulfur coal deficit would be to grant variances for selected sources within certain areas of the states involved. Such variances would allow a specified amount of additional time, as shown to be required, for these sources to meet SIP regulatory requirements. Also, variances would only be considered where it could be demonstrated that at least primary air quality standards would be maintained during the period of variance.

An early extensive modeling study of all SO_2 emission sources in three Indiana AQCRs showed that most of the large power plants could be temporarily allowed to burn coal at their 1970 sulfur levels without exceeding the annual or 24-hour primary air quality standards [1]. The remaining plants could be required to reduce sulfur content about 13 to 47% to attain the primary standard; this reduction would be much less stringent than the applicable SIP requirements. That study covered all

sources of SO_2 and concluded that power plants are the best source type to consider for possible variances. It was also established that in considering such sources for time-limited variances it is absolutely essential to consider the 24-hour standard since in most cases this is the governing value.

Based upon the results of the Indiana study, it was decided to perform similar modeling analysis for five Priority I, IA, and II AQCRs located in the coal-intensive states [2]. These five Regions along with the three earlier ones are listed in Table 1a. Subsequent to both of these EPA studies, an extensive modeling analysis project was conducted by Walden for an additional 24 AQCRs to determine the degree to which variances might be granted to power plants as one possible element in the solution to the overall coal deficit problem. Table 1b shows a listing of the AQCRs which were analyzed in this project. The results from the analysis of each AQCR were detailed in separate reports [3-26] and were summarized in a final report [48].

In the most recent analyses, the scope was extended to include: some Priority III AQCRs in the coal-intensive states, other states less severely involved in the coal-deficit problem, and a number of AQCRs with oil-fired power plants. This study considered 19 additional AQCRs not previously modeled. These are also listed in Table 1b and the results are detailed in separate reports [29-47].

Using simulation modeling, air quality impact is determined for two basis situations: (1) With SIP regulatory requirements and, (2) with a full variance from SIP requirements for coal-fired boilers. For those plants which would probably exceed the 24-hour primary standard, supplemental calculations are made for a limited variance case. This shows the required reduction in coal sulfur content in order not to exceed the 24-hour standard. In both the full and limited variance cases, any oil burning units are assumed to still have to meet SIP requirements.

It is emphasized that the primary reason for modeling oil-fired power plants is to evaluate possible interactions with emissions of coal-fired plants. This study is not intended to provide a basis for general variances to be granted for oil-fired units since there is no general projected deficit of low-sulfur oil for 1975.

These modeling studies were intended only to indicate the general feasibility of reducing the low-sulfur coal deficit by compliance extensions. The study was not designed nor the individual analyses performed to indicate precise problems or absolute solutions for specific plants. The final evaluation for a given plant must take into account all relevant data on the plant site and plant operations, and must recognize the inherent limitations resulting from the data and procedures used in this modeling effort.

This study was undertaken prior to the overall oil shortage and energy crisis arising in the fall of 1973. It does not address that situation, but rather was formulated and carried out with only the projected 1975 low-sulfur coal deficit in mind.

II. PROCEDURE OF ANALYSIS

A. SOURCE DATA BASE

Data for the large power plants in the AQCRs studied were taken directly from the Federal Power Commission (FPC Form 67) and converted to the computer format required by the model. Base year data were obtained for 1971 operations, the latest year for which FPC Form 67 was available. For purposes of this study, these data were also used for 1975, since generally this is the target year for attainment of at least primary air quality standards. Data on increased demand for new units or new plants to be installed through 1975 were taken from "Steam Electric Plant Factors 1972 " [27], and from information available through the Federal Power Commission.

Use of the FPC data base limits consideration to plants with a generating capacity of 25 megawatts (MW) or more and which are part of a public utility system having a total capacity of 150 MW or more, since these are the only plants which have to file FPC Form 67. For certain AQCRs, the FPC requires that all plants with a station capacity of 25 MW or more must be reported regardless of total system capacity. In general, this data base limitation is reasonable since plants smaller than 25 MW would have rated capacities no larger than many industrial boilers.

B. DIFFUSION MODELING

A single-source model was used to calculate both annual and 24-hour maximum SO_2 concentrations from each power plant. This model was developed recently by the Meteorology Laboratory (NERC, RTP) of EPA. It employs a Gaussian plume model and Brigg's plume rise equation, and uses hourly observations of meteorological conditions. A further description of the model is included in Appendix B. As applied herein, the model calculates estimated 24-hour average concentrations at a preselected field of receptors for each day of the year from each power plant.

The annual average value for each receptor is also calculated. Where interactions between power plants are significant, supplementary calculations are made to account for the impact of two or more facilities.

Since only power plant operations were being modeled, it was not possible, in general, to calibrate the model using measured air quality data. The calculated values of concentration are considered to be reasonable estimates of anticipated concentrations using best available modeling techniques.

Modeling of power plant operations was conducted to determine air quality impact for two basic situations: (1) With full SIP regulatory requirements and, (2) with a full variance from SIP requirements for coal-fired boilers. For the full variance case, it was assumed that the power plants would continue burning coal with the same sulfur content as in the base year (1971); however, any oil burned was assumed to still have to meet SIP requirements. Both annual and 24-hour air quality impact were evaluated as discussed below.

1. Annual Basis

The maximum annual concentration from all power plants in a given AQCR was determined based on application of full SIP regulations and with a full variance. The difference (full variance minus full SIP) is the projected increase over SIP air quality resulting from variances to coal-fired power plants. SIP air quality was assumed based upon attainment data of approved implementation plans.

For most states, SIP air quality was assumed to be 60 $\mu g/m^3$ (annual maximum) in 1975, since implementation plans call for attainment of secondary standards by that time. In this case, if the difference between full variance and full SIP does not exceed 20 $\mu g/m^3$, it is assumed that the annual primary standard (80 $\mu g/m^3$) will not be exceeded during the period of variance. However, for some states SIP air quality was

assumed to be 80 $\mu g/m^3$ in 1975, since the implementation plan only calls for achieving primary standards by that time. Therefore, the increase in SO_2 concentration arising from granting variances would result in the annual primary standard apparently being exceeded and this situation was reported as such.

2. 24-Hour Basis

For each power plant, the point source model was used to determine the maximum 24-hour concentration based on full SIP regulations and full variance. Significant interactions between plants are accounted for externally.

The calculated maximum 24-hour concentration was compared to a criteria value of 290 $\mu g/m^3$. This value was derived by using the 24-hour primary standard (365 $\mu g/m^3$) and allowing 75 $\mu g/m^3$ for the concurrent contribution from other sources. This leaves 290 $\mu g/m^3$ (365 - 75 = 290) as the maximum 24-hour concentration which can be tolerated from power plant operations without endangering the 24-hour primary standard. The value of 75 $\mu g/m^3$ is a conservative estimate of the possible contribution from all other sources. It is three times greater than the highest contribution from other sources to 24-hr concentrations found in the modeling analysis of three Indiana AQCRs, where all sources were considered.

If the results for a power plant indicated a 24-hour concentration greater than 290 $\mu g/m^3$ at full variance, supplemental calculations were made to determine what percent reduction in coal sulfur content would be required to bring the 24-hour maximum value to just equal 290 $\mu g/m^3$. The required coal sulfur content for a limited variance was then also reported. For plants which have both coal and residual oil burning units, the limited variance case was calculated by assuming that the residual oil would have to meet SIP requirements while the coal sulfur content would have to be reduced to a degree such that the criteria value (290 $\mu g/m^3$) would not be exceeded.

C. MAXIMUM LOAD VERSUS NOMINAL LOAD OPERATIONS

Emission data input to the single-source model is based on average monthly operations for each month of the year. Of course, the level of power plant operations varies from day to day; however, the FPC data are only available on a monthly basis. A power plant could quite possibly operate at near maximum rated capacity for twenty-four hours, especially in an industrialized region. Such operations would not be apparent from the monthly data. If these operations were coincident with the days of highest predicted concentrations, the model's maximum predictions could be significantly low.

Therefore, modeling results are presented in this report for two situations, as follows:

Nominal Load Case - This presents maximum concentrations calculated by the model based on average monthly emission rates.

Maximum Load Case - This case was calculated assuming the plant to be operating at 95 percent of rated capacity during the day of predicted maximum concentration found by using the monthly average emission rates. Since the maximum load case involves a greater plume rise, a somewhat higher concentration may actually occur on a different day. To allow for this contingency, a ten percent safety factor was added to the computed concentration.

Ground-level concentrations arising from nominal and maximum operating loads can be expected to differ, due to the joint effect of changes in emission rates, with corresponding changes in stack gas exit velocity and temperature. The specific interaction of these factors can produce higher concentrations under either nominal or maximum load conditions. Modeling of both cases provides a reasonable estimate of the range of possible values and permits identification of the maximum concentration case. The summary results presented in this report are based upon the maximum ground-level concentration case.

D. REGULATIONS APPLIED AND STRATEGIES SIMULATED

Standards for emission of SO_2 from fuel combustion sources were taken from the appropriate state or local SIP regulations. These regulations were applied to determine the emission rates with full SIP requirements. As previously mentioned, 1971 levels of percent sulfur in coal were used for the full variance case; however, any residual oil burned was still assumed to have to meet SIP requirements.

The full SIP requirements and full variance situations were the two basic strategies simulated. The limited variance case was only calculated where required, as discussed previously. Results are presented and discussed in terms of: plants evaluated; fuel use totals and required percent sulfur of coal at SIP, full variance, and (if applicable) limited variance.

E. SPECIAL ANALYSIS FACTORS

1. Geographic Factors

The 206 power plants included in the analysis of the 51 AQCRs modeled in this study are distributed throughout 20 states as shown in Table 2.

Preliminary analysis of the modeling results for a number of AQCRs indicated that the separation distance between some plants permitted interaction of ground-level concentrations. This factor was subsequently considered during the detailed analysis of maximum concentration levels in the vicinity of these plant sites.

The topography represented within the 20 states analyzed varied from extremely flat areas in the plains states to very mountainous terrain in the Southern Appalachians. Where the topography showed surrounding terrain at higher elevations than those of the plants, the modeling analysis considered this topographic factor by the application of a ground-plane displacement procedure described in Appendix B.

In higher relief areas, the areal topography at certain plant sites was above the calculated plume height for at least one stack at each of these plants. The analysis procedure considered this factor by the application of a special model designed to evaluate ground-level concentrations for the case of elevated receptor sites in valley locations. The general features of this model are also described in Appendix B.

The scope of the analysis conducted with this special model was designed only to determine representative maximum concentration levels. Because plume dispersion from power plants located in valley sites constitutes a complex interaction of source factors, terrain factors, and meteorological factors, a more detailed and exhaustive analysis of the specific power plant site is desirable prior to finalizing the evaluation on the applicable variance status.

2. Meteorological Factors

Surface meteorological data and upper air sounding data used as input to the models were selected from available sources on the basis of representativeness for application to the individual power plant.

For power plants where the calculated plume height was lower than the surrounding terrain, stability class "E" (stable) associated with a wind speed of 2.5 m/sec was selected as the representative worst-case condition. Climatological atlas information was used to specify average surface temperature and pressure for the modeling input.

3. Source Factors

The analyses of these AQCRs included consideration of the impact from the addition of new units at existing plants, and several new power plants. For the purpose of evaluating the variance status for new plants, the programmed sulfur content fuel was applied.

A number of power plant units indicate natural gas and distillate fuel oil consumption. However, combustion of these fuels in the quantities reported constitutes negligible contributions to SO_2 emissions and was not included in the analysis.

Twenty-five power plants indicated residual fuel oil consumption. Although combustion of this fuel in the quantities reported generally constitutes a small contribution to SO_2 emissions, it was included in the analysis. Any plants burning residual oil are assumed to have to meet SIP requirements.

The evaluation of the Portland Plant (AQCR #151 NE Penn.-Upper Delaware Valley) included consideration of the new Cat-Ox scrubber system with a 90 percent efficiency rating.

The evaluation of the Bruce-Mansfield Plant (AQCR #197, S.W. Penn.) also included consideration of an SO_2 scrubber system with a design efficiency of 92 percent.

The analysis of the Widows Creek Plant (AQCR #7, Tenn. River Valley) included consideration of an SO_2 scrubbing system on unit #8 with an assumed efficiency of 80 percent.

III. DISCUSSION OF RESULTS

A. COAL

A summary of the results derived from the analysis of 51 AQCRs is given in Table 3. These data show the total coal demand and net change in coal demand within selected percent sulfur class intervals. A minus sign indicates a net decrease in coal demand; a plus sign indicates a net increase in coal demand.

The total annual coal consumption by power plants in the regions analyzed is 290 million tons. Under SIP conditions, 176 million tons of this demand is projected for low-sulfur coal (less than 1.0 percent sulfur). After application of the allowable variance status, a net decrease in demand for about 137 million tons of low-sulfur coal can be affected. The compensating effects of the variances are a net increase of 36 million tons of 1.0-1.5 percent sulfur coal, a net decrease of 8 million tons of 1.5-2.0 percent sulfur coal, and a net increase of 109 million tons of greater than 2.0 percent sulfur coal.

A summary of the projected coal percent sulfur distribution is shown in Table 4a. These data indicate an overall weighted coal sulfur of 1.2 percent under full SIP regulations, compared to 2.1 percent sulfur with the applicable variance. Moreover, Table 4b shows that a full variance is possible at 62 plants, while a limited variance is possible at 39 plants. The modeling results also indicate that no variance is appropriate at 80 plants. As previously stated, the 25 residual oil-fired plants were not considered for variance.

Tables 5 through 24 provide similar summary projections on a state by state basis. These data indicate that the greatest shift in the average coal percent sulfur demand is projected for Indiana, Florida, and Tennessee. The aggregate consumption for these states is 48 million tons, and the shift is from an aggregate average of less than 1.0 percent sulfur to greater than 2.0 percent sulfur.

A shift of 75 million tons from an aggregate average of less than 1.0 percent sulfur coal to greater than 1.0 percent sulfur coal (but less than 2.0 percent) is shown for Alabama and Ohio. A shift of 99 million tons from an aggregate average of less than 2.0 percent sulfur coal (but greater than 1.0 percent) to greater than 2.0 percent sulfur coal is shown for Kentucky, Michigan, Pennsylvania and West Virginia. A shift of 26 million tons for greater than 1.0 percent but less than 2.0 percent is shown for Georgia and Minnesota. A shift of 23 million tons from an aggregate average of greater than 2.0 percent to greater than 3.0 percent is indicated for Illinois and Iowa. Finally, no change in the percent sulfur for 19 million tons is indicated for Maryland, Mississippi, North Carolina, South Carolina, Virginia and Wisconsin.

B. RESIDUAL OIL

A summary of power plant residual oil sulfur distribution is given by AQCR in Table 25 and by state in Table 26. Because variances are not applicable for oil-fired plants, any plants burning oil are assumed to have to meet SIP requirements.

C. INDIVIDUAL POWER PLANT SUMMARIES

A detailed tabulation of the variance status derived for each of the power plants analyzed is given by state in Appendix A. Also, the specific version of the model used is indicated in parentheses after the plant name. The following designations are used:

no notation - flat terrain; no adjustments to basic model

(E) - Elevated terrain; ground-plane displacement procedure used with basic model (see Appendix B)

(V) - Valley terrain with plume(s) confined to the valley; special model for sources in complex terrain used (see Appendix B)

All the models are subject to numerous assumptions which limit their predictive accuracy for specific applications. In general, greater confidence can be placed in the basic flat terrain model than in the elevated terrain model. An appreciably lower degree of confidence must be assigned to the valley terrain model results.

IV. CONCLUSIONS

The analysis of 206 power plants in 51 AQCR's and 20 states indicates the following broad conclusions:

- Attainment of primary SO_2 air quality standards for the coal-fired plants will not be jeopardized from the application of full variance status to 62 plants and limited variance status to an additional 39 plants. No variance is appropriate for the remaining 80 plants.
- No variance is applicable for the remaining 25 residual oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.
- The projected annual reduction in low-sulfur coal demand (less than 1.0 percent sulfur) is approximately 137 million tons.
- The projected shift in the average coal sulfur distribution is from 1.2 percent under SIP status to 2.1 percent under the applicable variance status.
- The power plant variance strategy appears to offer a viable approach toward ameliorating the low-sulfur coal deficit problem without jeopardizing attainment of primary air quality standards.

TABLE 1a

LISTING OF AQCRs ANALYZED BY EPA

	Name/Number
1.	N. Central Illinois - #71
2.	W. Central Illinois - #75
3.	Louisville - #78
4.	Metropolitan Dayton - #173
5.	N.W. Ohio - #177
6.	Metropolitan Indianapolis - #80
7.	S. Indiana - #83
8.	Wabash Valley - #84

Table 1b

LISTING OF AQCRs ANALYZED BY WALDEN

Name/Number
1. S.W. Pennsylvania (Penn.) - #197
2. Mid Tennessee (Tenn.) - #208
3. Steubenville (Ohio - W. Va.) - #181
4. E. Tennessee - S.W. Virginia (Tenn. - Va.) - #207
5. Tennessee River Valley (Ala. - Tenn.) - #7
6. Metro. Cleveland (Ohio) - #174
7. Metro. Cincinnati (Ohio - Ky. - Ind.) - #79
8. Parkersburg (Ohio - W. Va.) - #179
9. Zanesville (Ohio) - #183
10. Evansville (Ind. - Ky.) - #77
11. South Bend (Ind. - Mich.) - #82
12. Metro. Toledo (Ohio - Mich.) - #124
13. N.W. Pennsylvania (Ohio - Penn.) - #178
14. Cumberland - Keyser (W. Va. - Md.) - #113
15. Burlington - Keokuk (Ill. - Iowa) - #65
16. Minneapolis - St. Paul (Minn.) - #131
17. Paducah - Cairo (Ill. - Ky.) - #72
18. S. Central Michigan (Mich.) - #125
19. S. Central Penn. (Penn.) - #196
20. S.E. Minn. - LaCross (Minn. - Wisc.) - #128
21. Duluth - Superior (Minn. - Wisc.) - #129
22. E. Central Illinois (Ill.) - #66
23. S.E. Illinois (Ill.) - #74
24. S.E. Wisconsin (Wisc.) - #239

(Continued next page)

TABLE 1b (Cont.)

LISTING OF AQCRs ANALYZED BY WALDEN

Name/Number
25. Huntington - Ashland-Portsmouth-Ironton (W. Va. - Ohio - Ky.) - #103
26. Metro. Columbus (Ohio) - #176
27. Metro. Birmingham (Alabama) - #4
28. Mobile-Pensacola-Panama City-Southern Miss. (Fla., Miss., Ala.) - #5
29. Central Georgia (Georgia) - #54
30. Chattanooga (Georgia) - #55
31. Jacksonville - Brunswick (Florida) - #49
32. Savannah - Beaufort (Georgia - South Carolina) - #58
33. Metro. Atlanta (Georgia) - #56
34. Southwest Georgia (Georgia) - #59
35. Metro. Charlotte (North Carolina) - #167
36. Augusta - Aiken (South Carolina) - #53
37. Charleston (South Carolina) - #199
38. Central Pennsylvania (Penn.) - #195
39. N.E. Penn. - Upper Delaware Valley (Penn. - N.J.) - #151
40. Bluegrass (Lexington) (Kentucky) - #102
41. North Central West Virginia (West Virginia) - #235
42. Central Michigan (Michigan) - #122
43. Hampton Roads (Norfolk) (Virginia) - #223

TABLE 2

DISTRIBUTION OF POWER PLANTS BY STATE

State	Oil-Fired Plants	Coal-Fired Plants	Total Number of Plants
Alabama	0	7	7
Florida	8	3	11
Georgia	4	8	12
Illinois	0	16	16
Indiana	0	18	18
Iowa	0	1	1
Kentucky	0	15	15
Maryland	0	1	1
Michigan	0	12	12
Minnesota	0	10	10
Mississippi	6	1	7
New Jersey	1	0	1
North Carolina	0	3	3
Ohio	0	32	32
Pennsylvania	1	26	27
South Carolina	2	3	5
Tennessee	0	7	7
Virginia	3	1	4
West Virginia	0	9	9
Wisconsin	0	8	8
Total	25	181	206

TABLE 3

NET CHANGES IN COAL DEMAND BY APPLICATION OF POWER PLANT VARIANCES IN 51 AQCRs

Priority	AQCR	Coal Demand - 10^3 tons/yr(a) Sulfur Content Class - % 1.0<	1.0-1.5<	1.5-2.0<	≥ 2.0	Total Demand
I	#197 S.W. Pennsylvania	-2,600	---	---	+2,600	20,404
II	#208 Mid. Tennessee	-9,759	---	---	+9,759	12,371
I	#181 Steubenville	-4,350	+3,882	-4,777	+5,245	13,669
I	#207 E. Tenn.-S.W. Va.	-2,257	+2,257	---	---	9,697
I	#7 Tenn. River Valley	-2,726	---	+2,726	---	6,604
I	#174 Metro. Cleveland	-8,590	+1,521	---	+7,069	8,590
II	#79 Metro. Cincinnati	-3,822	+3,822	---	---	8,978
II	#179 Parkersburg	-4,828	+4,828	---	---	5,553
IA	#183 Zanesville	-4,671	+ 958	---	+3,713	4,671
II	#77 Evansville	-7,096	-1,378	+2,013	+6,461	8,474
IA	#82 South Bend	-2,444	+1,817	---	627	2,444
I	#124 Metro. Toledo	-1,936	---	-9,060	+10,996	10,996
II	#178 N.W. Pennsylvania	-1,604	--	- 335	+1,939	4,990
I	#113 Cumberland-Keyser	---	---	-4,598	+4,598	4,869
I	#65 Burlington-Keokuk	-8,454	- 559	---	+9,013	9,982
I	#131 Minneapolis-St. Paul	---	--	-1,337	+1,337	3,365
II	#72 Paducah-Cairo	---	-6,751	---	+6,751	14,685
II	#125 S. Central Michigan	---	---	-1,704	+1,704	1,762
II	#196 S. Central Penn.	0	0	---	0	3,905
IA	#128 S.E. Minn.-LaCrosse	---	---	---	0	1,390
II	#129 Duluth-Superior	0	0	---	---	2,571
II	#66 E. Central Illinois	---	---	---	0	631
II	#74 S.E. Illinois	---	---	---	0	942
II	#239 S.E. Wisconsin	---	---	---	0	6,010
IA	#71 N. Central Illinois	0	---	---	0	772

(a) A minus sign indicates a net decrease in coal demand; a plus sign indicates a net increase in coal demand.

(Continued next page)

TABLE 3 (Cont.)

NET CHANGES IN COAL DEMAND BY APPLICATION OF POWER PLANT VARIANCES IN 51 AQCRs

Priority	AQCR	Coal Demand - 10^3 tons/yr[a] Sulfur Content Class - % 1.0<	1.0-1.5<	1.5-2.0<	≥ 2.0	Total Demand
IA	#75 W. Central Illinois	---	---	---	0	7,255
I	#78 Louisville	-6,333	+2,036	---	+4,297	6,333
II	#173 Metro. Dayton	-2,006	+ 996	+1,010	---	2,105
I	#177 N.W. Ohio	- 58	---	---	+ 58	58
I	#80 Metro. Indianapolis	-3,110	---	+1,931	+1,179	3,110
IA	#82 S. Indiana	-3,904	---	---	+3,904	3,904
I	#84 Wabash Valley	-5,991	---	+2,755	+3,236	5,991
III	#103 Huntington-Ashland-Portsmouth-Ironton	-16,532	+13,410	---	+3,122	21,828
III	#176 Metro. Columbus	-303	---	---	+303	303
II	#4 Metro. Birmingham	-10,772	+9,492	+1,280	---	10,772
I	#5 Mobile-Pensacola-Panama City-S. Miss.	-5,041	-218	+218	+5,041	7,202
I	#54 Central Georgia	---	---	---	---	3,622
II	#55 Chattanooga	-11,840	---	---	+11,840	11,840
II	#49 Jacksonville-Brunswick	0	---	---	---	0
I	#58 Savannah-Beaufort	---	---	---	---	684
I	#56 Metro. Atlanta	---	---	---	---	4,359
II	#59 Southwest Georgia	-525	---	+525	---	525
II	#167 Metro. Charlotte	---	---	---	---	5,711
II	#53 Augusta-Aiken	---	---	---	---	314
I	#199 Charleston	---	---	---	---	644
III	#195 Central Penn.	---	---	---	---	5,913

(a) A minus sign indicates a net decrease in coal demand; a plus sign indicates a net increase in coal demand.

(Continued next page)

TABLE 3 (Cont.)

NET CHANGES IN COAL DEMAND BY APPLICATION OF POWER PLANT VARIANCES IN 51 AQCRs

Priority	AQCR	Coal Demand - 10^3 tons/yr[a] Sulfur Content Class - % 1.0<	1.0-1.5<	1.5-2.0<	≥ 2.0	Total Demand
II	#151 N.E. Penn.-Upper Delaware Valley	---	---	---	---	2,451
III	#102 Bluegrass (Lexington)	---	---	---	---	1,519
III	#235 N. Central W. Virginia	---	---	---	---	9,412
III	#122 Central Michigan	-5,851	---	+1,549	+4,302	5,851
II	#223 Hampton Roads	0	---	---	---	0
	Total Net Change	-137,403	+36,113	-7,804	+109,094	
	Total SIP Demand	175,867	31,142	24,925	58.097	290,031
	Total Variance Demand	38,464	67,255	17,121	167,191	290,031
	Net Change - Priority I & IA AQCRs	-62,465	+11,694	-12,142	+62,913	140,615
	Net Change - Priority II AQCRs	-52,252	+11,009	+2,789	+38,454	104,590
	Net Change - Priority III AQCRs	-22,686	+13,410	+1,549	+7,727	44,826
	Total Net Change	-137,403	+36,113	-7,804	+109,094	290,031

(a) A minus sign indicates a net decrease in coal demand; a plus sign indicates a net increase in coal demand.

TABLE 4a

SUMMARY OF POWER PLANT COAL SULFUR DISTRIBUTION FOR 51 AQCRs

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<	9,639	0.4	4,597	0.4
0.5-1.0<	166,228	0.7	35,547	0.6
Sub-total	175,867	0.7	40,144	0.6
1.0-1.5<	31,142	1.1	67,255	1.2
1.5-2.0<	24,925	1.6	17,121	1.6
Sub-total	56,067	1.3	84,376	1.3
2.0-3.0<	47,221	2.3	87,684	2.5
3.0-4.0<	10,876	3.2	74,959	3.3
4.0-6.0<	---	---	2,868	4.3
Sub-Total	58,097	2.5	165,511	2.9
Total	290,031	1.2	290,031	2.1

TABLE 4b

POWER PLANT SUMMARY FOR 51 AQCRs

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 62 Plants	106,532	1.1	2.6
Plants Where Limited Variance Is Possible = 39 Plants	81,442	0.7	1.9
Plants Where No Variance Is Appropriate = 80 Plants	102,057	1.6	1.6
Totals = 181 Plants	290,031	1.2	2.1

TABLE 5a

ALABAMA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	19,635	0.7	3,878	0.7
Sub-total	19,635	0.7	3,878	0.7
1.0-1.5<			9,492	1.2
1.5-2.0<			4,006	1.8
Sub-total			13,498	1.4
2.0-3.0<			2,259	2.6
3.0-4.0<				
4.0-6.0<				
Sub-Total			2,259	2.6
Total	19,635	0.7	19,635	1.4

TABLE 5b

ALABAMA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 5 Plants	13,031	0.7	1.5
Plants Where Limited Variance Is Possible = 1 Plants	2,726	0.7	1.7
Plants Where No Variance Is Appropriate = 1 Plants	3,878	0.7	0.7
Total = 7 Plants	19,635	0.7	1.4

TABLE 6a

FLORIDA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	2,782	0.9		
Sub-total	2,782	0.9		
1.0-1.5<	218	1.0		
1.5-2.0<			218	1.7
Sub-total	218	1.0	218	1.7
2.0-3.0<				
3.0-4.0<			2,782	3.0
4.0-6.0<				
Sub-Total			2,782	3.0
Total	3,000	0.9	3,000	2.9

TABLE 6b

FLORIDA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 3 Plants	3,000	0.9	2.9
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 0 Plants	---	---	---
Totals = 3 Plants	3,000	0.9	2.9

TABLE 7a

GEORGIA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<	1,164	0.4	1,164	0.4
0.5-1.0<	13,880	0.8	3,195	0.7
Sub-total	15,044	0.8	4,359	0.7
1.0-1.5<	3,622	1.2	3,622	1.2
1.5-2.0<			525	1.7
Sub-total	3,622	1.2	4,147	1.2
2.0-3.0<	1,680	2.2	11,840	2.5
3.0-4.0<				
4.0-6.0<				
Sub-Total	1,680	2.2	11,840	2.5
Total	20,346	1.0	20,346	1.9

TABLE 7b

GEORGIA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 1 Plants	525	0.7	1.7
Plants Where Limited Variance Is Possible = 1 Plants	10,160	0.8	2.5
Plants Where No Variance Is Appropriate = 6 Plants	9,661	1.1	1.1
Totals = 8 Plants	20,346	1.0	1.9

TABLE 8a

ILLINOIS POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	8,454	0.7		
Sub-total	8,454	0.7		
1.0-1.5<	559	1.0		
1.5-2.0<				
Sub-total	559	1.0		
2.0-3.0<	4,972	2.6	7,165	2.6
3.0-4.0<	8,207	3.2	15,027	3.3
4.0-6.0<				
Sub-Total	13,179	3.0	22,192	3.0
Total	22,192	2.1	22,192	3.0

TABLE 8b

ILLINOIS POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 3 Plants	3,224	1.2	2.7
Plants Where Limited Variance Is Possible = 1 Plants	6,261	0.7	3.4
Plants Where No Variance Is Appropriate = 12 Plants	12,707	3.0	3.0
Totals = 16 Plants	22,192	2.1	3.0

TABLE 9a

INDIANA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	25,047	0.7	1,972	0.8
Sub-total	25,047	0.7	1,972	0.8
1.0-1.5<			1,817	1.4
1.5-2.0<			6,699	1.6
Sub-total			8,516	1.6
2.0-3.0<			4,671	2.5
3.0-4.0<			9,888	3.3
4.0-6.0<				
Sub-Total			14,559	3.0
Total	25,047	0.7	25,047	2.4

TABLE 9b

INDIANA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 12 Plants	16,802	0.7	2.7
Plants Where Limited Variance Is Possible = 6 Plants	8,245	0.7	1.7
Plants Where No Variance Is Appropriate = 0 Plants	---	---	---
Totals = 18 Plants	25,047	0.7	2.4

TABLE 10a

IOWA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<				
Sub-total				
1.0-1.5<				
1.5-2.0<				
Sub-total				
2.0-3.0<	497	2.7		
3.0-4.0<			497	3.0
4.0-6.0<				
Sub-Total	497	2.7	497	3.0
Total	497	2.7	497	3.0

TABLE 10b

IOWA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 1 Plants	497	2.7	3.0
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 0 Plants	---	---	---
Totals = 1 Plants	497	2.7	3.0

TABLE 11a

KENTUCKY POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	7,507	0.7	242	0.9
Sub-total	7,507	0.7	242	0.9
1.0-1.5<	15,600	1.1	10,969	1.1
1.5-2.0<				
Sub-total	15,600	1.1	10,969	1.1
2.0-3.0<	1,124	2.2	10,493	2.6
3.0-4.0<			2,259	3.5
4.0-6.0<			268	4.1
Sub-Total	1,124	2.2	13,020	3.1
Total	24,231	1.1	24,231	2.0

TABLE 11b

KENTUCKY POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 5 Plants	4,105	1.2	2.2
Plants Where Limited Variance Is Possible = 6 Plants	12,413	1.0	2.5
Plants Where No Variance Is Appropriate = 4 Plants	7,713	1.1	1.1
Totals = 15 Plants	24,231	1.1	2.0

TABLE 12a

MARYLAND POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<				
Sub-total				
1.0-1.5<	271	1.0	271	1.0
1.5-2.0<				
Sub-total	271	1.0	271	1.0
2.0-3.0<				
3.0-4.0<				
4.0-6.0<				
Sub-Total				
Total	271	1.0	271	1.0

TABLE 12b

MARYLAND POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 0 Plants	---	---	---
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 1 Plants	271	1.0	1.0
Totals = 1 Plants	271	1.0	1.0

TABLE 13a

MICHIGAN POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	5,851	0.9		
Sub-total	5,851	0.9		
1.0-1.5<	58	1.0	58	1.0
1.5-2.0<	10,764	1.5	1,549	1.5
Sub-total	10,822	1.5	1,607	1.5
2.0-3.0<			5,649	2.3
3.0-4.0<			9,417	3.1
4.0-6.0<				
Sub-Total			15,066	2.8
Total	16,673	1.3	16,673	2.7

TABLE 13b

MICHIGAN POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 6 Plants	10,866	1.4	3.0
Plants Where Limited Variance Is Possible = 5 Plants	5,749	1.0	2.0
Plants Where No Variance Is Appropriate = 1 Plants	58	1.0	1.0
Totals = 12 Plants	16,673	1.3	2.7

TABLE 14a

MINNESOTA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	2,278	0.9	2,278	0.9
Sub-total	2,278	0.9	2,278	0.9
1.0-1.5<	1,305	1.2	1,305	1.2
1.5-2.0<	2,353	1.5	1,016	1.5
Sub-total	3,658	1.4	2,321	1.4
2.0-3.0<	72	2.0	72	2.0
3.0-4.0<			1,337	3.1
4.0-6.0<				
Sub-Total	72	2.0	1,409	3.0
Total	6,008	1.2	6,008	1.6

TABLE 14b

MINNESOTA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 2 Plants	1,355	1.5	3.1
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 8 Plants	4,653	1.1	1.1
Totals = 10 Plants	6,008	1.2	1.6

TABLE 15a

MISSISSIPPI POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<				
Sub-total				
1.0-1.5<				
1.5-2.0<				
Sub-total				
2.0-3.0<	1,943	2.4	1,943	2.4
3.0-4.0<				
4.0-6.0<				
Sub-Total	1,943	2.4	1,943	2.4
Total	1,943	2.4	1,943	2.4

TABLE 15b

MISSISSIPPI POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 0 Plants	---	---	---
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 1 Plants	1,943	2.4	2.4
Totals = 1 Plants	1,943	2.4	2.4

TABLE 16a

NEW JERSEY POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<				
Sub-total				
1.0-1.5<				
1.5-2.0<				
Sub-total				
2.0-3.0<				
3.0-4.0<				
4.0-6.0<				
Sub-Total				
Total	0	0	0	0

TABLE 16b

NEW JERSEY POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = Plants			
Plants Where Limited Variance Is Possible = Plants			
Plants Where No Variance Is Appropriate = Plants			
Totals = 0 Plants	0	0	0

TABLE 17a

NORTH CAROLINA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	1,051	0.9	1,051	0.9
Sub-total	1,051	0.9	1,051	0.9
1.0-1.5<	4,660	1.1	4,660	1.1
1.5-2.0<				
Sub-total	4,660	1.1	4,660	1.1
2.0-3.0<				
3.0-4.0<				
4.0-6.0<				
Sub-Total	---	---	---	---
Total	5,711	1.1	5,711	1.1

TABLE 17a

NORTH CAROLINA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 0 Plants	---	---	---
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 3 Plants	5,711	1.1	1.1
Totals = 3 Plants	5,711	1.1	1.1

TABLE 18a

OHIO POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	55,063	0.6	7,825	0.6
Sub-total	55,063	0.6	7,825	0.6
1.0-1.5<			27,955	1.2
1.5-2.0<			1,010	1.6
Sub-total			28,965	1.2
2.0-3.0<			13,532	2.4
3.0-4.0<			4,741	3.2
4.0-6.0<				
Sub-Total			18,273	2.6
Total	55,063	0.6	55,063	1.6

TABLE 18b

OHIO POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 13 Plants	16,233	0.6	1.6
Plants Where Limited Variance Is Possible = 15 Plants	31,189	0.6	1.8
Plants Where No Variance Is Appropriate = 4 Plants	7,641	0.6	0.6
Totals = 32 Plants	55,063	0.6	1.6

TABLE 19a

PENNSYLVANIA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<	8,475	0.4	3,433	0.4
0.5-1.0<	1,089	0.6	3,531	0.6
Sub-total	9,564	0.4	6,964	0.5
1.0-1.5<	716	1.2	716	1.2
1.5-2.0<	401	1.6	66	1.9
Sub-total	1,117	1.3	782	1.2
2.0-3.0<	25,378	2.4	21,871	2.5
3.0-4.0<			3,842	3.1
4.0-6.0<			2,600	4.3
Sub-Total	25,378	2.4	28,313	2.7
Total	36,059	1.9	36,059	2.3

TABLE 19b

PENNSYLVANIA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 4 Plants	9,796	2.0	3.3
Plants Where Limited Variance Is Possible = 2 Plants	2,442	0.3	0.7
Plants Where No Variance Is Appropriate = 20 Plants	23,821	2.0	2.0
Totals = 26 Plants	36,059	1.9	2.3

TABLE 20a

SOUTH CAROLINA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<				
Sub-total				
1.0-1.5<	1,328	1.2	1,328	1.2
1.5-2.0<	314	1.5	314	1.5
Sub-total	1,642	1.3	1,642	1.3
2.0-3.0<				
3.0-4.0<				
4.0-6.0<				
Sub-Total				
Total	1,642	1.3	1,642	1.3

TABLE 20b

SOUTH CAROLINA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 0 Plants	---	---	---
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 3 Plants	1,642	1.3	1.3
Totals = 3 Plants	1,642	1.3	1.3

TABLE 21a

TENNESSEE POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	20,150	0.7	8,134	0.7
Sub-total	20,150	0.7	8,134	0.7
1.0-1.5<			2,257	1.4
1.5-2.0<				
Sub-total			2,257	1.4
2.0-3.0<				
3.0-4.0<			9,759	3.6
4.0-6.0<				
Sub-Total			9,759	3.6
Total	20,150	0.7	20,150	2.2

TABLE 21b

TENNESSEE POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 2 Plants	9,759	0.7	3.6
Plants Where Limited Variance Is Possible = 2 Plants	2,257	0.7	1.2
Plants Where No Variance Is Appropriate = 3 Plants	8,134	0.7	0.7
Totals = 7 Plants	20,150	0.7	2.2

TABLE 22a

VIRGINIA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	1,918	0.7	1,918	0.7
Sub-total	1,918	0.7	1,918	0.7
1.0-1.5<				
1.5-2.0<				
Sub-total				
2.0-3.0<				
3.0-4.0<				
4.0-6.0<				
Sub-Total				
Total	1,918	0.7	1,918	0.7

TABLE 22b

VIRGINIA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 0 Plants	---	---	---
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 1 Plants	1,918	0.7	0.7
Totals = 1 Plants	1,918	0.7	0.7

TABLE 23a

WEST VIRGINIA POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<				
Sub-total				
1.0-1.5<	2,805	1.4	2,805	1.4
1.5-2.0<	11,093	1.6	1,718	1.7
Sub-total	13,898	1.6	4,523	1.5
2.0-3.0<	8,419	2.0	5,053	2.3
3.0-4.0<			12,741	3.3
4.0-6.0<				
Sub-Total	8,419	2.0	17,794	3.0
Total	22,317	1.8	22,317	2.7

TABLE 23b

WEST VIRGINIA POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 5 Plants	17,339	1.8	3.1
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 4 Plants	4,978	1.6	1.6
Totals = 9 Plants	22,317	1.8	2.7

TABLE 24a

WISCONSIN POWER PLANT COAL SULFUR DISTRIBUTION

Sulfur Content Class - %	With Full SIP Regulations 1,000 Tons/Yr	Avg %S	With Applicable Variance 1,000 Tons/Yr	Avg %S
0.0-0.5<				
0.5-1.0<	1,523	0.6	1,523	0.6
Sub-total	1,523	0.6	1,523	0.6
1.0-1.5<				
1.5-2.0<				
Sub-total				
2.0-3.0<	3,136	2.1	3,136	2.1
3.0-4.0<	2,669	3.2	2,669	3.2
4.0-6.0<				
Sub-Total	5,805	2.6	5,805	2.6
Total	7,328	2.2	7,328	2.2

TABLE 24b

WISCONSIN POWER PLANT SUMMARY

Situation	1975 Coal Use 1,000 Tons/Yr	Coal Percent Sulfur At SIP	At Variance
Plants Where Full Variance Is Possible = 0 Plants	---	---	---
Plants Where Limited Variance Is Possible = 0 Plants	---	---	---
Plants Where No Variance Is Appropriate = 8 Plants	7,328	2.2	2.2
Totals = 8 Plants	7,328	2.2	2.2

TABLE 25

SUMMARY OF POWER PLANT RESIDUAL OIL SULFUR DISTRIBUTION BY AQCR*

Priority	AQCR	SIP Oil Demand - 10^3 gals/yr Sulfur Content Class - %					Total Demand
		0.5<	0.5-1.0<	1.0-1.5<	1.5-2.0<	>2.0	
II	#151 NE. Penn.-Upper Delaware Valley	487,956	---	---	---	---	487,956
II	#223 Hampton Roads	13,696	---	573,195	---	203,994	790,885
I	#199 Charleston	---	---	---	22,814	232,624	255,438
I	#5 Mobile-Pensacola-Panama City-S. Mississippi	17,543	2,741	---	1,001	12,647	33,932
III	#122 Central Michigan	14,341	---	---	---	---	14,341
II	#49 Jacksonville-Brunswick	---	612,948	166,992	48,104	---	828,044
I	#58 Savannah-Beaufort	---	71,736	63,613	---	5,926	141,275
	Total SIP Demand	533,536	687,425	803,800	71,919	455,191	2,551,871
	Total Priority I&IA AQCRs	17,543	74,477	63,613	23,815	251,197	430,645
	Total Priority II AQCRs	501,652	612,948	740,187	48,104	203,994	2,106,885
	Total Priority III AQCRs	14,341	---	---	-- ---	---	14,341

*Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE 26

SUMMARY OF POWER PLANT RESIDUAL OIL SULFUR DISTRIBUTION BY STATE*

State	SIP Oil Demand -10^3 Gals/Yr Sulfur Content Class - % 0.5<	0.5-1.0<	1.0-1.5<	1.5-2.0<	>2.0	Total Demand
Florida	---	612,948	166,992	---	---	779,940
Georgia	---	71,736	63,613	48,104	5,926	189,379
Michigan	14,341	---	---	---	---	14,341
Mississippi	17,543	2,741	---	1,001	12,647	33,932
New Jersey	84,000	---	---	---	---	84,000
Pennsylvania	403,956	---	---	---	---	403,956
South Carolina	---	---	---	22,814	232,624	255,438
Virginia	13,696	---	573,195	---	203,994	790,885
Total SIP Demand	533,536	687,425	803,800	71,919	455,191	2,551,871

*Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

REFERENCES*

1. "Fuel Distribution Study for the Indianapolis, Southern Indiana, and Wabash Valley AQCRs," EPA draft report, March 1973, & addendum dated April 12, 1973. (AQCRs 80, 83, 84, APTIC 75403)

2. "Fuel Distribution Study for 5 Mid-West AQCRs," EPA draft report, revised May 1973. (AQCRs 71, 75, 78, 173, 177, APTIC 75404)

3. "Modeling Analysis of Power Plants for Compliance Extensions - Southwest Pennsylvania AQCR," draft report prepared by Walden Research for EPA, August 21, 1973. (AQCR 197, APTIC 75441)

4. "Modeling Analysis of Power Plants for Compliance Extensions - Mid Tennessee AQCR," draft report prepared by Walden Research for EPA, June 27, 1973. (AQCR 208, APTIC 75444)

5. "Modeling Analysis of Power Plants for Compliance Extensions - Steubenville AQCR," draft report prepared by Walden Research for EPA, July 31, 1973. (AQCR 181, APTIC 75437)

6. "Modeling Analysis of Power Plants for Compliance Extensions - E. Tennessee - S.W. Virginia AQCR," draft report prepared by Walden Research for EPA, June 8, 1973. (AQCR 207, APTIC 75443)

7. "Modeling Analysis of Power Plants for Compliance Extensions - Tennessee River Valley AQCR," draft report prepared by Walden Research for EPA, July 22, 1973. (AQCR 7, APTIC 75407)

8. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Cleveland AQCR," draft report prepared by Walden Research for EPA, July 27, 1973. (AQCR 174, APTIC 75433)

9. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Cincinnati AQCR," draft report prepared by Walden Research for EPA, July 21, 1973. (AQCR 79, APTIC 75420)

10. "Modeling Analysis of Power Plants for Compliance Extensions - Parkersburg AQCR," draft report prepared by Walden Research for EPA, August 1, 1973. (AQCR 179, APTIC 75436)

11. "Modeling Analysis of Power Plants for Compliance Extensions - Zanesville AQCR," draft report prepared by Walden Research for EPA, June 28, 1973. (AQCR 183, APTIC 75438)

12. "Modeling Analysis of Power Plants for Compliance Extensions - Evansville AQCR," draft report prepared by Walden Research for EPA, June 18, 1973. (AQCR 77, APTIC 75419)

*With the exception of references #27 and #28, the following reports may be obtained from the Air Pollution Technical Information Center, Environmental Protection Agency, Research Triangle Park, North Carolina 27711. The APTIC number for each report is noted in parentheses.

13. "Modeling Analysis of Power Plants for Compliance Extensions - South Bend AQCR," draft report prepared by Walden Research for EPA, May 1, 1973. (AQCR 82, APTIC 75421)

14. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Toledo AQCR," draft report prepared by Walden Research for EPA, August 1, 1973. (AQCR 124, APTIC 75426)

15. "Modeling Analysis of Power Plants for Compliance Extensions - N.W. Pennsylvania AQCR," draft report prepared by Walden Research for EPA, August 3, 1973. (AQCR 178, APTIC 75435)

16. "Modeling Analysis of Power Plants for Compliance Extensions - Cumberland - Keyser AQCR," draft report prepared by Walden Research for EPA, August 10, 1973. (AQCR 113, APTIC 75424)

17. "Modeling Analysis of Power Plants for Compliance Extensions - Burlington - Keokuk AQCR," draft report prepared by Walden Research for EPA, July 9, 1973. (AQCR 65, APTIC 75415)

18. "Modeling Analysis of Power Plants for Compliance Extensions - Minneapolis - St. Paul AQCR," draft report prepared by Walden Research for EPA, July 26, 1973. (AQCR 131, APTIC 75430)

19. "Modeling Analysis of Power Plants for Compliance Extensions - Paducah - Cairo AQCR," draft report prepared by Walden Research for EPA, June 15, 1973. (AQCR 72, APTIC 75417)

20. "Modeling Analysis of Power Plants for Compliance Extensions - S. Central Michigan AQCR," draft report prepared by Walden Research for EPA, August 7, 1973. (AQCR 125, APTIC 75427)

21. "Modeling Analysis of Power Plants for Compliance Extensions - S. Central Pennsylvania AQCR," draft report prepared by Walden Research for EPA, August 21, 1973. (AQCR 196, APTIC 75440)

22. "Modeling Analysis of Power Plants for Compliance Extensions - S.E. Minnesota - LaCrosse AQCR," draft report prepared by Walden Research for EPA, July 21, 1973. (AQCR 128, APTIC 75428)

23. "Modeling Analysis of Power Plants for Compliance Extensions - Duluth - Superior AQCR," draft report prepared by Walden Research for EPA, August 6, 1973. (AQCR 129, APTIC 75429)

24. "Modeling Analysis of Power Plants for Compliance Extensions - E. Central Illinois AQCR," draft report prepared by Walden Research for EPA, July 28, 1973. (AQCR 66, APTIC 75416)

25. "Modeling Analysis of Power Plants for Compliance Extensions - S.E. Illinois AQCR," draft report prepared by Walden Research for EPA, July 9, 1973. (AQCR 74, APTIC 75418)

26. "Modeling Analysis of Power Plants for Compliance Extensions - S.E. Wisconsin AQCR," draft report prepared by Walden Research for EPA, August 21, 1973. (AQCR 239, APTIC 75447)

27. Steam-Electric Plant Factors/1972 Edition, National Coal Association, Washington, D.C. (1973).

28. Turner, D.B., "Workbook of Atmospheric Dispersion Estimates," U.S. Dept. of H.E.W., PHS Pub. No. 992-AP-26 (Rev. 1970).

29. "Modeling Analysis of Power Plants for Compliance Extensions - Huntington-Ashland-Portsmouth-Ironton AQCR," draft report prepared by Walden Research for EPA, September 25, 1973. (AQCR 103, APTIC 75423)

30. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Columbus AQCR," draft report prepared by Walden Research for EPA, August 21, 1973. (AQCR 176, APTIC 75434)

31. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Birmingham AQCR," draft report prepared by Walden Research for EPA. September 11, 1973. (AQCR 4, APTIC 75405)

32. "Modeling Analysis of Power Plants for Compliance Extensions - Mobile-Pensacola-Panama City-Southern Mississippi AQCR," draft report prepared by Walden Research for EPA, November 5, 1973. (AQCR 5, APTIC 75406)

33. "Modeling Analysis of Power Plants for Compliance Extensions - Central Georgia AQCR," draft report prepared by Walden Research for EPA, September 11, 1973. (AQCR 54, APTIC 75410)

34. "Modeling Analysis of Power Plants for Compliance Extensions - Chattanooga AQCR," draft report prepared by Walden Research for EPA, September 25, 1973. (AQCR 55, APTIC 75411)

35. "Modeling Analysis of Power Plants for Compliance Extensions - Jacksonville-Brunswick AQCR," draft report prepared by Walden Research for EPA, October 11, 1973. (AQCR 49, APTIC 75408)

36. "Modeling Analysis of Power Plants for Compliance Extensions - Savannah-Beaufort AQCR," draft report prepared by Walden Research for EPA, October 8, 1973. (AQCR 58, APTIC 75413)

37. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Atlanta AQCR," draft report prepared by Walden Research for EPA, September 20, 1973. (AQCR 56, APTIC 75412)

38. "Modeling Analysis of Power Plants for Compliance Extensions - Southwest Georgia AQCR," draft report prepared by Walden Research for EPA, September 14, 1973. (AQCR 59, APTIC 75414)

39. "Modeling Analysis of Power Plants for Compliance Extensions - Metropolitan Charlotte AQCR," draft report prepared by Walden Research for EPA, October 8, 1973. (AQCR 167, APTIC 75432)

40. "Modeling Analysis of Power Plants for Compliance Extensions - Augusta-Aiken AQCR," draft report prepared by Walden Research for EPA, September 18, 1973. (AQCR 53, APTIC 75409)

41. "Modeling Analysis of Power Plants for Compliance Extensions - Charleston AQCR," draft report prepared by Walden Research for EPA, October 10, 1973. (AQCR 199, APTIC 75442)

42. "Modeling Analysis of Power Plants for Compliance Extensions - Central Pennsylvania AQCR," draft report prepared by Walden Research for EPA, October 2, 1973. (AQCR 195, APTIC 75439)

43. "Modeling Analysis of Power Plants for Compliance Extensions - NE. Penn.-Upper Delaware Valley AQCR," draft report prepared by Walden Research for EPA, October 29, 1973. (AQCR 151, APTIC 75431)

44. "Modeling Analysis of Power Plants for Compliance Extensions - Bluegrass (Lexington) AQCR," draft report prepared by Walden Research for EPA, September 14, 1973. (AQCR 102, APTIC 75422)

45. "Modeling Analysis of Power Plants for Compliance Extensions - N. Central W. Virginia AQCR," draft report prepared by Walden Research for EPA, September 13, 1973. (AQCR 235, APTIC 75446)

46. "Modeling Analysis of Power Plants for Compliance Extensions - Central Michigan AQCR," draft report prepared by Walden Research for EPA, October 31, 1973. (AQCR 122, APTIC 75425)

47. "Modeling Analysis of Power Plants for Compliance Extensions - Hampton Roads (Norfolk) AQCR," draft report prepared by Walden Research for EPA, October 18, 1973. (AQCR 223, APTIC 75445)

48. "Modeling Analysis of Power Plants for Compliance Estensions in 32 Air Quality Control Regions," final report prepared by Walden Research for EPA, September 26, 1973. (Unpublished since entire report material is included in current report.)

APPENDIX A

STATE SUMMARIES OF POWER PLANT MODELING RESULTS

TABLE A-1

SUMMARY OF POWER PLANT MODELING RESULTS
ALABAMA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#7 Tennessee River Valley	Colbert	Colbert	2,726	0.7	Limited	1.7	---	---
	Widows Creek (V)[b]	Jackson	3,878	0.7	SIP[a]	0.7	---	---
#4 Metropolitan Birmingham	Gaston (V)	Shelby	5,701	0.7	Full	1.1	---	---
	Green County (E)	Greene	1,280	0.9	Full	1.9	---	---
	Gorgas (E)	Walker	3,791	0.7	Full	1.4	---	---
#5 Mobile-Pensacola-Panama City-S. Mississippi	Barry	Buck	2,138	0.8	Full	2.6	---	---
	Chickasaw	Mobile	121	0.8	Full	2.7	---	---

(a) Modeling calculations indicate that the 24-hour air quality standard will be exceeded even at SIP.

(b) V indicates use of the special "valley" model for sources in complex terrain; E indicates ground displacement procedure used with the basic model; no notation is shown for cases where the basic flat terrain model was used.

TABLE A-2

SUMMARY OF POWER PLANT MODELING RESULTS
FLORIDA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S[a]
#49 Jacksonville-Brunswick	Palatka (E)	Putnam	---	---	---	---	38,766	1.0
	Suwannee	Suwannee	---	---	---	---	42,168	1.0
	Kennedy	Duval	---	---	---	---	79,548	1.0
	Southside	Duval	---	---	---	---	130,158	0.8
	Northside	Duval	---	---	---	---	443,058	0.7
	Hopkins	Leon	---	---	---	---	252	1.1
	Purdom	Wakulla	---	---	---	---	6,258	1.1
	Deerhaven	Alachua	---	---	---	---	39,732	0.7
#5 Mobile-Pensacola-Panama City-S. Mississippi	Crist	Escambia	2,011	0.9	Full	3.0	---	---
	Lansing-Smith	Bay	771	0.9	Full	3.1	---	---
	Scholz	Jackson	218	1.0	Full	1.7	---	---

(a) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-3

SUMMARY OF POWER PLANT MODELING RESULTS
GEORGIA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP[c] %S
#55 Chattanooga	Hammond (V)[a,b]	Floyd	1,680	2.2	SIP[a]	2.2	---	---
	Bowen (E)	Bartow	10,160	0.8	Limited	2.5	---	---
#54 Central Georgia	Arkwright (E)[b]	Bibb	196	1.2	SIP	1.2	---	---
	Harlee Branch (E)[a]	Putnam	3,426	1.2	SIP[a]	1.2	---	---
#58 Savannah-Beaufort	Port Wentworth	Chatham	---	---	---	---	63,613	1.1
	Riverside	Chatham	---	---	---	---	5,926	2.4
	Effingham	Effingham	---	---	---	---	71,736	0.8
#56 Metro. Atlanta	Atkinson (E)[b]	Cobb	143	0.7	SIP	0.7	---	---
	McDonough(E)[b]	Cobb	1,164	0.4	SIP	0.4	---	---
	Yates (E)	Coweta	3,052	0.8	SIP	0.8	---	---
#49 Jacksonville-Brunswick	McManus	Glynn	---	---	---	---	48,104	1.5
#59 SW Georgia	Mitchell (E)	Dougherty	525	0.7	Full	1.7	---	---

(a) The 1971 coal percent sulfur content is below SIP regulation requirements; therefore, 1971 coal percent sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(c) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-4

SUMMARY OF POWER PLANT MODELING RESULTS
ILLINOIS

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#65 Burlington-Keokuk	Edwards (E)	Peoria	2,193	0.8	Full	2.5	---	---
	Wallace	Tazewell	559	1.0	Full	3.0	---	---
	Powerton	Tazewell	6,261	0.7	Limited	3.4	---	---
	Havana	Mason	472	3.2	Full	3.3	---	---
#72 Paducah-Cairo	Joppa	Massac	3,107	2.7	SIP(a)	2.7(b)	---	---
#66 East Central Illinois	Vermilion	Vermilion	486	2.9	SIP(a)	2.9	---	---
	Abbott	Champaign	145	2.6	SIP(a)	2.6	---	---
#74 SE Illinois	Grand Tower(E)	Jackson	509	2.3	SIP(a)	2.3(b,c)	---	---
	Hutsonville	Crawford	433	2.3	SIP(a)	2.3	---	---
#71 North Central Illinois	Dixon	Lee	292	2.8(a)	SIP(a)	2.8	---	---
	Hennepin	Putnam	480	3.1(a)	SIP(a)	3.1	---	---

(a) 1971 coal percent sulfur content is below SIP regulation requirements; therefore, 1971 coal percent sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(c) Calculations indicate that annual primary standard may be exceeded even at SIP.

(Continued next page)

TABLE A-4 (Cont.)

SUMMARY OF POWER PLANT MODELING RESULTS
ILLINOIS

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#75 West Central Illinois	Coffeen	Montgomery	2,815	3.1	SIP	3.1[b]	---	---
	Dallman	Sangamon	501	3.3	SIP	3.3[b]	---	---
	Kincaid	Christian	2,999	3.1	SIP	3.1[b]	---	---
	Lakeside	Sangamon	248	3.3	SIP	3.3[b]	---	---
	Meredosia	Morgan	692	3.5	SIP	3.5[b]	---	---

(a) 1971 coal percent sulfur content is below SIP regulation requirements; therefore, 1971 coal percent sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

TABLE A-5

SUMMARY OF POWER PLANT MODELING RESULTS
INDIANA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#78 Louisville	Gallagher	Floyd	1,679	0.7	Full	3.3	---	---
#80 Indianapolis	Noblesville	Hamilton	115	0.9	Full	2.9	---	---
	Perry	Marion	289	0.7	Full	3.2	---	---
	Pritchard	Morgan	775	0.7	Full	2.4	---	---
	Stout	Marion	1,931	0.7	Limited	1.8	---	---
#83 Southern Indiana	Clifty Creek	Jefferson	3,904	0.7	Full	3.1	---	---
#84 Wabash Valley	Breed	Sullivan	979	0.7	Full	3.8	---	---
	Cayuga	Vermilion	1,866	0.7	Full	2.3	---	---
	Dresser	Vigo	391	0.7	Limited	3.4	---	---
	Edwardsport	Knox	420	0.7	Limited	1.9	---	---
	Wabash River	Vigo	2,335	0.7	Limited	1.5	---	---
#82 South Bend	Michigan City	La Porte	1,817	0.7	Full	1.4	---	---
	Twin Branch	St. Joseph	627	0.7	Full	3.2	---	---
#79 Metropolitan Cincinnati	Tanners Creek(E)	Dearborn	1,972	0.7	Limited	0.8	---	---
#77 Evansville	Petersburg (Frank Ratts)(E)	Pike	719	0.7	Full	2.9	---	---
	Petersburg (E)	Pike	2,019	0.7	Full	3.4	---	---
	Culley	Warrick	1,196	0.7	Limited	2.6	---	---
	Gibson (E)	Gibson	2,013	0.7	Full	1.5	---	---

TABLE A-6

SUMMARY OF POWER PLANT MODELING RESULTS
IOWA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#65 Burlington-Keokuk	Burlington (E)	Des Moines	497	2.7	Full	3.0	---	---

TABLE A-7

SUMMARY OF POWER PLANT MODELING RESULTS
KENTUCKY

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#72 Paducah-Cairo	Green River	Muhlenburg	657	1.2	Limited	2.7	---	---
	Paradise (E)	Muhlenburg	6,094	1.1	Limited	2.7	---	---
	Shawnee	McCracken	4,827	1.1	SIP	1.1[a,b]	---	---
#77 Evansville	Coleman (E)	Hancock	1,008	1.1	Limited	3.7	---	---
	Reid	Henderson	268	1.2	Full	4.1	---	---
	Smith (E)	Daviess	1,149	0.8	Full	3.3	---	---
	Owensboro	Daviess	102	1.1	Full	3.2	---	---
#79 Metropolitan Cincinnati	Ghent (E)	Carroll	1,462	0.7	Full	1.0	---	---
#78 Louisville	Cane Run	Jefferson	2,036	0.7	Limited[c]	1.3	---	---
	Mill Creek	Jefferson	2,391	0.7	Limited[c]	2.7	---	---
	Paddy's Run	Jefferson	227	0.7	Limited[c]	2.1	---	---

(a) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(b) Calculations indicate that annual primary standard may be exceeded even at SIP. Air quality in Kentucky portion of AQCR #72 is presently below primary standards; attainment date for secondary standard is July 1978.

(c) Calculations indicate that annual primary standard may be exceeded with variances as shown. Kentucky's attainment date for both primary and secondary standards in AQCR #78 is 1977.

(Continued next page)

TABLE A-7 (Cont.)

SUMMARY OF POWER PLANT MODELING RESULTS
KENTUCKY

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#102 Bluegrass (Lexington)	Tyrone (V)[a,b]	Woodford	153	1.0	SIP[b]	1.0	---	---
	Brown (E)	Mercer	1,124	2.2	Full	2.3	---	---
	Dale (V)[a,b]	Clark	242	0.9	SIP[b]	0.9	---	---
#103 Huntington-Ashland-Portsmouth-Ironton	Big Sandy(E)[b]	Lawrence	2,491	1.1	SIP[b]	1.1	---	---

(a) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(b) The 1971 coal percent sulfur content is below SIP requirements; therefore, the 1971 percent sulfur was used and reported as SIP.

TABLE A-8

SUMMARY OF POWER PLANT MODELING RESULTS
MARYLAND

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#113 Cumberland-Keyser	Smith (E)	Washington	271	1.0	SIP[(a)]	1.0	---	---

(a) 1971 coal percent sulfur content is exactly at SIP requirements.

TABLE A-9

SUMMARY OF POWER PLANT MODELING RESULTS
MICHIGAN

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP[c] %S
#124 Metropolitan Toledo	Whiting	Monroe	984	1.5	Full	2.7	---	---
	Monroe	Monroe	8,076	1.5	Full	3.0	---	---
#125 South Central Michigan	Elm Street	Calhoun	58	1.0	SIP[a]	1.0	---	---
	Eckert	Ingham	671	1.5	Limited	2.1	---	---
	Ottawa	Ingham	102	1.5	Full	2.5	---	---
	Erickson	Ingham	665	1.5	Limited	2.8	---	---
	Harbor Beach	Huron	266	1.5	Full	2.6	---	---
#122 Central Michigan	Weadock	Bay	1,452	0.9	Limited	1.5	---	---
	Saginaw	Saginaw	97	0.9	Full	1.5	---	---
	Karn[b]	Bay	1,427	0.9	Limited	2.1	14,341	0.2[b]
	Campbell (E)	Ottawa	1,341	0.9	Full	3.4	---	---
	Cobb	Muskegon	1,534	0.9	Limited	2.1	---	---

(a) Estimated 1971 coal percent sulfur is below SIP regulation requirements; therefore, the 1971 coal sulfur content was used and reported as SIP.

(b) The projected oil percent sulfur content will be below SIP regulation requirements; therfore, the projected oil percent sulfur was used and reported as SIP.

(c) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-10

SUMMARY OF POWER PLANT MODELING RESULTS
MINNESOTA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#129 Duluth-Superior	Aurora (E)	St. Louis	351	0.9	SIP[a]	0.9[b]	---	---
	Clay Boswell (E)	Itasca	1,927	0.9	SIP[a]	0.9	---	---
	Hibbard (V)	St. Louis	293	1.4	SIP[a]	1.4[b]	---	---
#128 SE Minnesota-La Crosse	Fox Lake	Martin	18	2.0	Full	2.1	---	---
	Wilmarth (E)	Blue Earth	26	2.0	SIP	2.0[b]	---	---
	Winona	Winona	28	2.0	SIP	2.0[b]	---	---
#131 Minneapolis-St. Paul	Riverside (E)	Hennepin	1,012	1.2	SIP[a]	1.2[b]	---	---
	Black Dog (E)	Dakota	554	1.5	SIP	1.5[b]	---	---
	High Bridge (E)	Ramsey	462	1.5	SIP	1.5[b]	---	---
	King (E)	Washington	1,337	1.5	Full	3.1	---	---

(a) 1971 coal percent sulfur content was below SIP requirements; therefore, 1971 coal sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

TABLE A-11

SUMMARY OF POWER PLANT MODELING RESULTS
MISSISSIPPI

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP[c] %S
#5 Mobile-Pensacola-Panama City-S. Mississippi	Wilson[a]	Warren	---	---	---	---	17,543	0.2[a]
	Natchez (E)[a]	Adam	---	---	---	---	1,001	1.6[a]
	Brown[a]	Hinds	---	---	---	---	5,796	2.8[a]
	Eaton[a]	Forrest	---	---	---	---	3,232	3.9[a]
	Watson[b]	Harrison	1,943	2.4	SIP[b]	2.4	---	---
	Sweatt (V)[a]	Lauderdale	---	---	---	---	3,619	3.7[a]
	Moselle[a]	Jones	---	---	---	---	2,741	0.7[a]

(a) The 1971 oil percent sulfur content is below SIP requirements; therefore, the 1971 oil percent sulfur was used and reported as SIP.

(b) The 1971 coal percent sulfur content is below SIP requirements; therefore, the 1971 coal percent sulfur was used and reported as SIP.

(c) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-12

SUMMARY OF POWER PLANT MODELING RESULTS
NEW JERSEY

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S (a)
#151 NE Penn.- Upper Delaware Valley	Gilbert (V)	Hunterdon	---	---	---	---	84,000	0.3

(a) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-13

SUMMARY OF POWER PLANT MODELING RESULTS
NORTH CAROLINA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#167 Metropolitan Charlotte	Allen (E)[a,b]	Gaston	3,268	1.1	SIP[a]	1.1	---	---
	Riverbend[a,b]	Gaston	1,392	1.1	SIP[a]	1.1	---	---
	Buck	Rowan	1,051	0.9	SIP[a]	0.9	---	---

(a) The 1971 coal percent sulfur content is below SIP regulation requirements; therefore, 1971 coal percent sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

TABLE A-14

SUMMARY OF POWER PLANT MODELING RESULTS
OHIO

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#178 NW Pennsylvania	Niles	Trumbull	634	0.6	Full	2.8	---	---
	Ashtabula	Ashtabula	970	0.6	Limited	3.0	---	---
#174 Metropolitan Cleveland	Avon Lake	Lorain	2,899	0.6	Full	2.6	---	---
	Lake Shore	Cuyahoga	1,290	0.6	Limited	1.2	---	---
	East Lake	Lake	3,523	0.6	Limited	2.1	---	---
	Cleveland Municipal	Cuyahoga	231	0.6	Limited	1.1	---	---
	Edgewater	Lorain	339	0.6	Full	2.9	---	---
	Gorge (E)	Summit	238	0.6	Limited	2.6	---	---
	Painsville	Lake	70	0.6	Full	2.5	---	---
#181 Steubenville	Cardinal (E)	Jefferson	2,584	0.6	SIP[a]	0.6	---	---
	Burger (V)[b]	Belmont	1,380	0.6	SIP[a]	0.6	---	---
	Toronto (E)	Jefferson	468	0.6	Full	2.4	---	---
	Sammis (E)	Jefferson	3,882	0.6	Limited	1.1	---	---
	Tidd (V)	Jefferson	578	0.6	SIP[a]	0.6	---	---

(a) Modeling calculations indicate that the 24-hour air quality standard may be exceeded even at SIP.

(b) Subsequent to the modeling of this plant, it has been learned that a 1000 ft. stack will be built in 1975. Any additional analysis based on this new stack would show the plant to be a non-valley case, and results would differ significantly.

(Continued next page)

TABLE A-14 (Cont.)

SUMMARY OF POWER PLANT MODELING RESULTS
OHIO

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#173 Dayton	Hutchings	Montgomery	897	0.6	Full	1.2	---	---
	Mad River	Clark	99	0.6	Full	1.4	---	---
	Piqua	Miami	99	0.7	Limited	0.9	---	---
	Tait	Montgomery	1,010	0.6	Full	1.6	---	---
#177 Northwest Ohio	Woodcock	Allen	58	0.6	Full	3.0	---	---
#124 Metropolitan Toledo	Acme	Lucas	383	0.6	Full	2.6	---	---
	Bay Shore	Lucas	1,553	0.6	Full	2.1	---	---
#179 Parkersburg	Poston (E)	Athens	635	0.6	Limited	1.3	---	---
	Muskingum (E)	Morgan	4,193	0.6	Limited	1.4	---	---
#183 Zanesville	Philo (E)	Muskingum	958	0.5	Limited	1.1	---	---
	Conesville (E)	Coshocton	3,713	0.6	Limited	3.2	---	---
#79 Metropolitan Cincinnati	Municipal Light (E)	Butler	85	0.6	Full	0.8	---	---
	Miami Fort (E)	Hamilton	2,360	0.6	Limited	1.4	---	---
	Beckjord (E)	Clermont	3,099	0.6	SIP(a)	0.6(b)	---	---

(a) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(b) Calculations indicate that annual primary standard may be exceeded even at SIP.

(Continued next page)

TABLE A-14 (Cont.)

SUMMARY OF POWER PLANT MODELING RESULTS
OHIO

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#176 Metro. Columbus	Picway	Pickaway	303	0.6	Limited	2.5	---	---
#103 Huntington-Ashland-Portsmouth-Ironton	Kyger Creek (E)	Gallia	3,122	0.6	Limited	2.3	---	---
	Stuart (E)	Adams	5,672	0.6	Limited	1.4	---	---
	Gavin (E)	Gallia	7,738	0.6	Full	1.0	---	---

TABLE A-15

SUMMARY OF POWER PLANT MODELING RESULTS
PENNSYLVANIA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#197 SW Pennsylvania	Cheswick (E)	Allegheny	1,264	0.4	SIP	0.4[b]	---	---
	Elrama (V)	Washington	1,396	0.3	Limited	0.6	---	---
	Phillips (V)	Allegheny	1,125	0.3	SIP	0.3[b]	---	---
	Armstrong (V)	Armstrong	959	2.5	SIP	2.5[b]	---	---
	Hatfield (E)	Greene	3,507	2.6	Full	3.0	---	---
	Mitchell (V)	Washington	1,046	0.4	Limited	0.5	---	---
	Springdale (V)	Allegheny	646	0.5	SIP	0.5	---	---
	Conemaugh (E)	Indiana	2,045	2.4	SIP	2.4[b]	---	---
	Keystone (E)	Armstrong	3,332	2.2	SIP[a]	2.2	---	---
	Seward (V)	Indiana	648	2.6	SIP	2.6[b]	---	---
	Homer City (E)	Indiana	1,836	2.1	SIP[a]	2.1	---	---
	Bruce-Mansfield (E)	Beaver	2,600	0.4	Full	4.3	---	---

(a) 1971 coal percent sulfur content is below SIP regulation requirements; therefore, 1971 coal sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(Continued next page)

TABLE A-15 (Cont.)

SUMMARY OF POWER PLANT MODELING RESULTS
PENNSYLVANIA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP[c] %S
#178 NW Pennsylvania	Front Street	Erie	335	1.5	Full	3.9	---	---
	Shawville (V)	Clearfield	1,704	2.6	SIP	2.6[b]	---	---
	Warren (V)	Warren	303	2.5	SIP	2.5[b]	---	---
	New Castle (V)	Lawrence	1,044	0.4	SIP	0.4[b]	---	---
#196 S. Central Pennsylvania	Crawford (E)	Dauphin	108	1.4	SIP	1.4[b]	---	---
	Brunner Island (E)	York	3,354	2.6	Full	2.8	---	---
	Holtwood (E)	Lancaster	443	0.7	SIP[a]	0.7[b]	---	---
#195 Central Pennsylvania	Saxton (V)[b]	Bedford	66	1.9	SIP[a,b]	1.9	---	---
	Sunbury (V)[b]	Snyder	1,294	2.5	SIP[b]	2.5	---	---
	Milesburg (V)[b]	Centre	159	2.3	SIP[b]	2.3	---	---
	Montour (E)[b]	Montour	4,394	2.4	SIP[b,d]	2.4	---	---
#151 NE Penn.-Upper Delaware	Eyler (V)	Berks	---	---	---	---	29,694	0.4
	Titus (V)[b]	Berks	608	1.1	SIP[b]	1.1	---	---
	Portland (V)[b]	Northampton	1,035	2.5	SIP[b]	2.5	---	---
	Martin's Creek (V)[b]	Northampton	808	2.6	SIP[b]	2.6	374,262	0.4

(a) The 1971 coal percent sulfur content was below SIP requirements; therefore, 1971 coal sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour air quality standard may be exceeded even at SIP.

(c) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

(d) The 1971 coal percent sulfur is not significantly different from SIP.

TABLE A-16

SUMMARY OF POWER PLANT MODELING RESULTS
SOUTH CAROLINA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP[c] %S
#53 Augusta-Aiken	Urquhart (E)	Aiken	314	1.5	SIP[a]	1.5	---	---
#58 Savannah-Beaufort	Canadys[b]	Colleton	684	1.2	SIP[b]	1.2	---	---
#199 Charleston	Williams	Charleston	---	---	---	---	225,866	2.2
	Hagood	Charleston	---	---	---	---	6,758	2.2
	Jefferies[b]	Berkeley	644	1.1	SIP[b]	1.1	22,814	1.9

(a) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(b) The 1971 coal percent sulfur content is below SIP regulation requirements; therefore, the 1971 coal percent sulfur was used and reported as SIP.

(c) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-17

SUMMARY OF POWER PLANT MODELING RESULTS
TENNESSEE

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#208 Mid. Tennessee	Gallatin (E)	Sumner	2,611	0.7	Full	3.4	---	---
	Johnsonville (E)	Humphreys	2,612	0.7	SIP[b]	0.7	---	---
	Cumberland (E)	Stewart	7,148	0.7	Full	3.7	---	---
#207 E. Tennessee-SW Virginia	Bull Run (V)	Anderson	2,185	0.7	Limited	1.4	---	---
	John Sevier (V)	Hawkins	1,587	0.7	SIP[a]	0.7	---	---
	Kingston (V)	Roane	3,935	0.7	SIP[a]	0.7	---	---
	Watts Bar (V)	Rhea	72	0.7	Limited	1.4	---	---

(a) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(b) Not significantly different from SIP and reported as SIP.

TABLE A-18

SUMMARY OF POWER PLANT MODELING RESULTS
VIRGINIA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S[c]
#207 E. Tennessee-SW Virginia	Clinch River (V)	Russell	1,918	0.7	SIP[a]	0.7	---	---
#223 Hampton Roads	Portsmouth[b]	Chesapeake	---	---	---	---	203,994	2.1[b]
	Reeves[b]	Norfolk	---	---	---	---	13,696	0.2[b]
	Yorktown (E)[b]	York	---	---	---	---	573,195	1.1[b]

(a) 1971 Coal percent sulfur content was below SIP requirements; therefore, 1971 coal sulfur content was used and reported as SIP.

(b) The 1971 oil percent sulfur content is below SIP regulation requirements; therefore, the 1971 oil percent sulfur was used and reported as SIP.

(c) Variances are not applicable for oil-fired plants. Any plants burning oil are assumed to have to meet SIP requirements.

TABLE A-19

SUMMARY OF POWER PLANT MODELING RESULTS
WEST VIRGINIA

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#181 Steubenville	Kammer (E)	Marshall	1,511	1.7	Full	4.0	---	---
	Mitchell (E)	Marshall	3,266	1.6	Full	3.7	---	---
#179 Parkersburg	Willow Island (V)	Pleasants	725	1.5	SIP[a]	1.5	---	---
#113 Cumberland-Keyser	Mt. Storm	Grant	4,598	1.6	Full	2.3	---	---
#235 N. Central W. Virginia	Rivesville (V)[a]	Marion	455	2.1	SIP	2.1	---	---
	Fort Martin (E)	Monongalia	2,579	2.1	Full	3.1	---	---
	Albright (V)[a]	Preston	993	1.9	SIP	1.9	---	---
	Harrison (E)	Harrison	5,385	2.0	Full	3.0	---	---
#103 Huntington-Ashland-Portsmouth-Ironton	Sporn (E)[b]	Mason	2,805	1.4	SIP[b]	1.4	---	---

(a) Modeling calculations indicate that the 24-hour air quality standard will be exceeded even at SIP.

(b) The 1971 coal percent sulfur content is below SIP regulation requirements; therefore, the 1971 sulfur content was used and reported as SIP.

TABLE A-20

SUMMARY OF POWER PLANT MODELING RESULTS
WISCONSIN

AQCR	Plant	County	1975 Coal Use, 10^3 Tons/Yr	At SIP %S	At Variance Status	At Variance %S	1975 Oil Use, 10^3 Gal/Yr	At SIP %S
#128 SE Minnesota-La Crosse	Alma (E)	Buffalo	562	3.1	SIP(a)	3.1	---	---
	Genoa (E)	Vernon	723	3.7	SIP(a)	3.7	---	---
	French Island	La Crosse	33	3.1	SIP(a)	3.1	---	---
#239 SE Wisconsin	North Oak Creek (E)	Milwaukee	830	2.1	SIP(a)	2.1(b)	---	---
	Port Washington (E)	Ozaukee	682	3.0	SIP(a)	3.0	---	---
	South Oak Creek (E)	Milwaukee	2,306	2.1	SIP(a)	2.1(b)	---	---
	Valley (E)	Milwaukee	669	3.1	SIP(a)	3.1	---	---
	Columbia (E)	Columbia	1,523	0.6	SIP(c)	0.6	---	---

(a) State of Wisconsin regulations do not specify a coal percent sulfur limitation for existing plants; therefore, 1971 coal sulfur content was used and reported as SIP.

(b) Modeling calculations indicate that the 24-hour primary air quality standard may be exceeded even at SIP.

(c) New plant with programmed coal percent sulfur less than SIP requirements; therefore, programmed coal percent sulfur used and reported as SIP.

APPENDIX B
DESCRIPTION OF THE SINGLE SOURCE AND VALLEY MODELS

The model used to estimate the short-term concentrations is one developed by the Meteorology Laboratory, EPA. This model is designed to estimate concentrations due to sources at a single location for averaging times of 1 hour, 24 hours and 1 year, with emphasis on the 24-hour value.

The model is a Gaussian plume model using diffusion coefficients based on Turner [28]. Concentrations are estimated for each hour of the year based on the wind direction (in increments of ten degrees), wind speed, mixing height and Pasquill stability class. For the 1- and 24-hour values, it is assumed that the pollutant does not "decay" significantly between the source and the receptors because of the short travel time involved. Also, decay depends on a number of meteorological variables and might well be insignificant when the meteorological conditions occur which lead to highest SO_2 concentrations.

Meteorological data for 1964 were used. The reasons for this choice are: (a) Data from earlier years did not have sufficient resolution in the wind direction, and (2) data from subsequent years are readily available on magnetic tape only for every third hour.

Mixing height data were obtained from the twice-a-day upper air observations made at the nearest upper air station. Hourly mixing heights were estimated by the model using an objective interpolation scheme.

To simulate the effect of elevated terrain in the vicinity of certain plant sites, a ground-plane displacement procedure was used in the modeling analysis. This procedure consists of adjusting (decreasing) the effective height of the plant stacks by an amount equal to the difference in elevation between the plant site and the average surrounding terrain. This "reduced" stack height is input to the diffusion model described above.

The model used to estimate short-term concentrations in valley

terrain is one developed previously by EPA for application to sources located in complex terrain. Elevations of the receptor sites are derived from contours on U.S.G.S. quadrangle maps of the area. The model calculates a daily average concentration at these receptor locations based on a 10 meter nearest-approach point of the plume, and an assumed persistence of meteorological conditions for 6 hours out of the 24 hours. During this period, the wind direction azimuth is considered to be confined to a 22.5 degree sector. In the current application, receptor sites were selected along the azimuth which is normal to the valley axis to identify the maximum concentration.

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-450/3-75-060		

4. TITLE AND SUBTITLE	5. REPORT DATE
Summary Report on Modeling Analysis of Power Plants for Compliance Extensions in 51 Air Quality Control Regions	December 1973
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
P. Morgenstern	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Walden Research Division of Abcor, Inc. 201 Vassar Street Cambridge, Mass. 02139	2AC 129
	11. CONTRACT/GRANT NO.
	68-02-0049 Tasks 8 and 11
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
EPA OAWM OAQPS, MDAD, Research Triangle Park, N. C. 27711	Final
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report presents a summary of the modeling analysis of power plants in a number of critical AQCR's. The purpose of this study is to determine whether and to what extent variances could be granted for certain plants to relieve the aggregate low-sulfur coal deficit problem projected for 1975. The variances, if granted, would allow an extension of time to meet regulatory requirements of State Implementation Plans (SIPs).

The total aggregate annual coal consumption by the 206 power plants included in the study is 290 million tons. The analysis indicated that the allowable sulfur content of approximately 145 million tons can be affected by the application of variances. The major changes projected are a net decrease of 137 million tons of low-sulfur coal (less than 1.0% sulfur), and a net increase of 109 million tons with sulfur content greater than 2.0%.

This study was intended only to demonstrate the general feasibility of reducing the low-sulfur coal deficit by compliance extensions and is not based on sufficient analysis to allow the formulation of decisions regarding individual power plants.

This study was undertaken prior to the overall oil shortage and energy crisis arising in the fall of 1973 and does not address that situation.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
power plant modeling power plant variances low-sulfur coal deficit dispersion modeling SO_2 impact of power plants		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release unlimited	Unclassified	83
	20. SECURITY CLASS *(This page)*	22. PRICE
	Unclassified	

EPA Form 2220-1 (9-73)

INSTRUCTIONS

1. **REPORT NUMBER**
Insert the EPA report n mber as it appears on the cover of the publication.

2. **LEAVE BLANK**

3. **RECIPIENTS ACCESSION NUMBER**
Reserved for use by each report recipient.

4. **TITLE AND SUBTITLE**
Title should indicate clearly and briefly the subject coverage of the report, and be displayed prominently. Set subtitle, if used, in smaller type or otherwise subordinate it to main title. When a report is prepared in more than one volume, repeat the primary title, add volume number and include subtitle for the specific title.

5. **REPORT DATE**
Each report shall carry a date indicating at least month and year. Indicate the basis on which it was selected *(e.g., date of issue, date of approval, date of preparation, etc.)*.

6. **PERFORMING ORGANIZATION CODE**
Leave blank.

7. **AUTHOR(S)**
Give name(s) in conventional order *(John R. Doe, J. Robert Doe, etc.)*. List author's affiliation if it differs from the performing organization.

8. **PERFORMING ORGANIZATION REPORT NUMBER**
Insert if performing organization wishes to assign this number.

9. **PERFORMING ORGANIZATION NAME AND ADDRESS**
Give name, street, city, state, and ZIP code. List no more than two levels of an organizational hirearchy.

10. **PROGRAM ELEMENT NUMBER**
Use the program element number under which the report was prepared. Subordinate numbers may be included in parentheses.

11. **CONTRACT/GRANT NUMBER**
Insert contract or grant number under which report was prepared.

12. **SPONSORING AGENCY NAME AND ADDRESS**
Include ZIP code.

13. **TYPE OF REPORT AND PERIOD COVERED**
Indicate interim final, etc., and if applicable, dates covered.

14. **SPONSORING AGENCY CODE**
Leave blank.

15. **SUPPLEMENTARY NOTES**
Enter information not included elsewhere but useful, such as: Prepared in cooperation with, Translation of, Presented at conference of, To be published in, Supersedes, Supplements, etc.

16. **ABSTRACT**
Include a brief *(200 words or less)* factual summary of the most significant information contained in the report. If the report contains a significant bibliography or literature survey, mention it here.

17. **KEY WORDS AND DOCUMENT ANALYSIS**
(a) DESCRIPTORS - Select from the Thesaurus of Engineering and Scientific Terms the proper authorized terms that identify the major concept of the research and are sufficiently specific and precise to be used as index entries for cataloging.

(b) IDENTIFIERS AND OPEN-ENDED TERMS - Use identifiers for project names, code names, equipment designators, etc. Use open-ended terms written in descriptor form for those subjects for which no descriptor exists.

(c) COSATI FIELD GROUP - Field and group assignments are to be taken from the 1965 COSATI Subject Category List. Since the majority of documents are multidisciplinary in nature, the Primary Field/Group assignment(s) will be specific discipline, area of human endeavor, or type of physical object. The application(s) will be cross-referenced with secondary Field/Group assignments that will follow the primary posting(s).

18. **DISTRIBUTION STATEMENT**
Denote releasability to the public or limitation for reasons other than security for example "Release Unlimited." Cite any availability to the public, with address and price.

19. & 20. **SECURITY CLASSIFICATION**
DO NOT submit classified reports to the National Technical Information service.

21. **NUMBER OF PAGES**
Insert the total number of pages, including this one and unnumbered pages, but exclude distribution list, if any.

22. **PRICE**
Insert the price set by th National Technical Information Service or the Government Printing Office, if known.